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DISSERTATION TITLE:

THE RATING OF ENVIRONMENTAL, SOCIAL, AND GOVERNANCE CORPORATE PERFORMANCE AND ITS RELATIONSHIP WITH CREDIT RISK ASSESSMENTS

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Table of Contents

Περίληψη

Μέσα στο πλαίσιο των ραγδαίων παγκόσμιων εξελίξεων σε όλους τους τομείς, το θέμα της βιώσιμης ανάπτυξης έχει έρθει στο προσκήνιο του ενδιαφέροντος από φορείς λήψης μέτρων πολιτικής, αλλά και μεταξύ του επιχειρηματικού κόσμου. Πρόκειται για ένα φλέγον ζήτημα, το οποίο αποτελεί προτεραιότητα σε διεθνές επίπεδο, ενθαρρύνει και παροτρύνει τις κοινωνίες, τις επιχειρήσεις, τους οργανισμούς αλλά και τους επενδυτές, οδηγώντας τους στην εφαρμογή νέων πρακτικών. Η έννοια του ESG περιλαμβάνει όλα τα θέματα που σχετίζονται με το περιβάλλον, την κοινωνία και την εταιρική διακυβέρνηση. Μέσω αυτού, αξιολογείται η ικανότητα των εταιρειών να είναι μακροπρόθεσμα αποδοτικές. Έχει παρατηρηθεί ότι η υψηλή αξία των επιχειρήσεων δεν είναι μόνο αποτέλεσμα της οικονομικής τους απόδοσης. Πλέον, είναι αξιοσημείωτη η συμβολή των μη οικονομικών κατευθύνσεων, καθώς η προστασία του περιβάλλοντος, τα ανθρώπινα δικαιώματα και οι κοινωνικές αξίες έχουν προσελκύσει έντονο ενδιαφέρον. Υπό αυτό το πρίσμα, εδραιώνεται όλο και περισσότερο η ιδέα της πλήρους αφομοίωσης της βιώσιμης ανάπτυξης στη λειτουργία των επιχειρήσεων, η οποία είναι άρρηκτα συνδεδεμένη με την επιτυχία τους.

Η παρούσα διπλωματική, μελετάει την επίδραση των παραγόντων ESG σε τομείς όπως η λήψη επενδυτικών αποφάσεων, η εταιρική και τραπεζική χρηματοδότηση. Στα πλαίσια της έρευνας συντάχθηκε ένα ερωτηματολόγιο, το οποίο αποσκοπούσε στην αξιολόγηση του ρίσκου του ESG σε τομείς όπως είναι οι τράπεζες, οι ασφαλιστικές, οι επενδυτικές και χρηματοοικονομικές εταιρείες. Επιπλέον, η έρευνα που πραγματοποιήθηκε αποτέλεσε τη βάση για τη μελέτη των βαρών των κριτηρίων από τα οποία προκύπτει ποιά από αυτά είναι τα πιο σημαντικά. Επιπρόσθετα, συγκεντρώθηκαν τα στοιχεία των 22 μεγαλύτερων οίκων αξιολόγησης ESG, με σκοπό την έρευνα του τρόπου ενσωμάτωσης των παραγόντων ESG στη διεξαγωγή των βαθμολογιών των εταιρειών.

Η διπλωματική εργασία οργανώνεται σε έξι κεφάλαια, περιλαμβάνοντας την εισαγωγή. Στο 2ο κεφάλαιο γίνεται μια εκτενής αναφορά στην έννοια του ESG, της ιστορίας του και της συμβολής του στους διάφορους τομείς. Στη συνέχεια, δόθηκε έμφαση στην Ευρωπαϊκή βιώσιμη χρηματοδότηση. Το

3^{o} κεφάλαιο επικεντρώνεται στη σημασία και τη χρησιμότητα των αξιολογήσεων ESG. Επιπλέον γίνεται σύντομη αναφορά στους 22 πιο σημαντικούς οίκους αξιολόγησης ESG. Στη συνέχεια, το 4^{o} κεφάλαιο καλύπτει την ανάλυση για τις σχετικές μεθοδολογίες που συνεχώς αναπτύσσονται καθώς και για την ενσωμάτωση αυτών στη λειτουργία των διεθνών χρηματοπιστωτικών ιδρυμάτων. Στο 5^{o} κεφάλαιο παρουσιάζεται το ερωτηματολόγιο καθώς και τα αποτελέσματα που προέκυψαν από την ανάλυση των

απαντήσεων. Τέλος, συνοψίζονται τα ευρήματα της συγκεκριμένης έρευνας και παρουσιάζονται ορισμένα ζητήματα που σχετίζονται με τη βιώσιμη ανάπτυξη και χρήζουν εξέλιξης στο μέλλον.

Chapter 1 Introduction

Every period sets at the heart of it a different issue. Talking in 2020, in a world which is characterised by major socio-economic and technological changes, companies constitute a decisive part. Typically, it is assumed that a firm's sole goal is to maximise its shareholders' wealth. However, it is now acknowledged among professionals and academics, that the value of a firm encompasses various dimensions, which extend beyond typical financial aspects. For instance, it is commonly accepted that if the environment is not able to support the actions that are being held on that, nothing can mark long lasting success. Moreover, issues such as human rights and social values have attracted major interest. In this context, the operation of any corporate organisation and its financial performance should be aligned with global and regional policies that target towards sustainable development. Therefore, the integration of factors related to sustainability, the environment, as well as social and corporate governance issues (ESG) into the operation of firms is an essential prerequisite for their success. The present dissertation examines the contribution of ESG factors in the areas of investment decision making, corporate finance and banking, and credit pricing. To this end, a survey is conducted to investigate how international financial institutions (IFIs) incorporate ESG factors in their actions. ESG is a topic that continues to gain significant interest among investors and entrepreneurs, and it is expected that this trend will be strengthened in the upcoming years, as sustainable development is set at the heart of global policies. Except for IFIs, the thesis also seeks to examine the ESG factors that are typically used by global ESG rating agencies, in an attempt to formulate a comprehensive framework for deriving such ratings through a systematic process. The evaluation of corporate ESG performance through a common methodology and criteria is supported from the European Union (EU). In that direction, the biggest 22 ESG rating agencies were considered through a questionnaire study, aimed towards the clarification of the way that raters use ESG factors in deriving their ratings.

The overall structure of this dissertation comprises 6 chapters, including the introduction part. The second chapter refers more extensively to the meaning of ESG by making a brief historical reference and understanding about how ESG has involved in investment decision making, in corporate finance and banking, and how ESG assessments affect credit pricing. At this point, an extensive analysis regarding the EU Sustainable Finance Framework was made, emphasising on EU Taxonomy, EU Non-Financial Reporting Directive, on EU-Benchmarks and on EU Green Bond Standards. Section 3 presents an overview of ESG scores and ratings and their uses. In addition, a description of the 22 most important

ESG rating agencies is given. Chapter 4 covers the ESG methodologies and the importance of the factors involved in the evaluation of ESG performance. The relation between ESG ratings and IFIs is also discussed in chapter 4, along with the emerging trends in ESG ratings. Chapter 5 presents the empirical analysis of the survey data and discusses the obtained results. The last chapter concludes the dissertation and proposes some areas for further research.

Chapter 2 An overview of ESG

2.1 What is ESG ?

Corporate Social Responsibility (CSR) is an even older term than environment, social, governance (ESG). When companies first began thinking of the consequences that their activity has on the environment and on the society, they started to integrate CSR principles. CSR describes a frame, different for each firm, which aims at dealing with the principles of sustainable development. CSR is a general framework which is relevant to a firm's actions about handling the social and environmental consequences. From that point of view every company becomes socially accountable. CSR is a management concept which helps companies to enhance the society and the environment, while at the same time maintaining their accountability to their stakeholders. On the other hand, the term of ESG is a recently established concept, which is closely related to CSR and it has a leading role in describing the responsibility of business operations. The difference between the two terms is that CSR involves the effort that businesses make to have a positive impact in social and environmental sectors. However, ESG emphasises the quantitative description of these actions in order to assess the performance of each company with regard to its sustainable activities. (Sherwood & Pollard, 2019) make an interrelation and characterise ESG as tools of huge power as the measurement of environmental, social and governance factors gives important information to governments, corporations and stakeholders.

Nowadays organisations, firms, and external stakeholders (e.g., creditors and investors) take sustainability issues into serious consideration. It is a new world investment trend, in which investors are not paying attention only to financial attributes but also to ESG criteria, which refer to the environmental, social and governance aspects of an investment or financing decision. Such factors have both short-term and long-term effects on the performance of a firm or an investment.

From an investment point of view, another related concept is that of Socially Responsible Investment (SRI), which describes investments with a socially responsible character. (Hill, 2020) supports that SRI pays attention to the impact of companies in particular fields, by supporting investments which aim at enhancing the social and the environmental factors.

All the above concepts constitute a set of similar frameworks that involve a wide range of actors in the business environment. Here the Principles for Responsible Investments (PRI) must be added which is supported by the United Nations and also supports the sustainability activities. PRI is an international network of investors, that aims at promoting the principles that help investors include environment, social and governance into their investment process.

2.2 A brief history of ESG

Even though ESG is a recently established term, its principles are not new. In fact, principles related to social responsibility can be traced back many centuries, in the ethical codes and moral laws of most religions. For instance, (Sherwood & Pollard, 2019) note that "in the Christian era, Methodists, Quakers, and various other religious faith-based investors consciously avoided investing in stocks that they labeled "sin stocks," which included a range of industries such as the alcohol, gambling, tobacco, and war-related materials industries". That indicates that the ESG investing began in the 1960s, with socially responsible investing character. At the end of the 19th century, investors started to realize that portfolio construction and capital allocation are connected with the role of firms and organisation in social development.

In 1997, John Elkington, co-founder of the business consultancy firm "SustainAbility", published a book entitled "Cannibals with Forks: the Triple Bottom Line of 21st Century Business" in which he identified the newly emerging cluster of non-financial considerations, which should be included in the factors determining corporate value. He coined the phrase the "triple bottom line", referring to the financial, environmental and social factors.

However, over the years there have been many doubts about the negative impact that ESG could have on the financial performance of firms. Advocates of ESG and the related frameworks of CSR/SRI, like the journalist Milton Moskowitz have argued that sustainability not only helps to increase financial performance but also maximizes productivity and ensures corporate efficiency.

In 1998 two journalists, Robert levering and Milton Moskowitz published a list which classified the best-practicing companies regarding the corporate social responsibility and their financial performance. Firstly the two factors of ESG had the most attention but Moskowitz brought the light to the governance factor too as he made an extensive analysis about the corporate governance that firms must take into account. In the early 2000s the success of Moskowitz's list and its impact on companies' ease of recruitment and brand reputation began to challenge the historical assumptions regarding the financial effect on ESG factors.[1]

ESG gained greater focus in January 2004 when former UN Secretary General Kofi Annan invited several CEOs of major financial institutions to participate in an initiative to promote the integration of ESG into capital markets. Talking about the remarkable rise of ESG [2], the report entitled "Who Cares Wins", which resulted from this initiative, noted that embedding environmental, social and governance factors in capital markets makes business sense and leads to more sustainable markets and better outcomes for societies. During the same period, the UN Environment Programme Finance Initiative (UNEP/Fi) produced the "Freshfield Report" which showed that ESG issues are relevant for financial valuation. These two reports formed the backbone for the launch of the Principles for Responsible Investment (PRI) at the New York Stock Exchange in 2006 and the launch of the Sustainable Stock Exchange Initiative (SSEI) the following year. Today, the UN-backed PRI initiative has over 1,600 members representing over $70 trillion assets under management.

2.3 ESG in Investment Decision Making

It is really important to integrate ESG in investment decision making and dealing with the concept of socially responsible investments. Nowadays environmental protection, social responsibility, and corporate governance play material role for investors who pay attention to the ESG performance of firms rather than just to their financial characteristics. In that way, investors and fund managers can decide in which investments they want to invest having the benefits of traditional investments, while also contributing to sustainable development, through their personal values.

Investors are constantly aiming at being able to know the results that occurred through ESG integration in the business that they are interested in. That is happening because in that way they can integrate their ESG assessments with greater safety in their portfolios. The contribution of ESG is getting more and more important. On account of this, investors take decisions about their investment steps based on companies' performance about sustainability. (Deloitte, 2019)

1 https://en.wikipedia.org/wiki/Environmental,_social_and_corporate_governance
2 https://www.forbes.com/sites/georgkell/2018/07/11/the-remarkable-rise-of-esg/#4e5934841695

Another study (Kiesel & Lücke, 2019) investigated the role of ESG ratings on capital markets. In order to end up in the desired results it was analyzed if and how the rating agencies integrate ESG in their credit risk analysis. This issue is an aftereffect of not knowing much about the application of sustainability criteria. However, they finally found that there is a small complicity of ESG in rating decisions. Moreover, the study examined the impact of ESG ratings on stock returns and credit default swap (CDS) spreads. (Semenova & Hassel, 2014) studied the disclosure of important ESG information and the materiality and uniformity of environmental metrics from three ratings agencies, KLD, GES, ASSET4. The first outcome was that the variety of environmental performance scores and rankings are remarkably related between organisations. It turned out that companies which are not environmentally friendly take higher ESG scores than green companies. Another result was that KLD environmental concerns metric show the environmental risk which is an index of industrial activities' effect that affects corporate environmental performance. Investors also are interested in the aspects of social responsibility and (Girerd-Potin, Jimenez-Garcès, & Louvet, 2012) distinguish which are those dimensions. The authors investigated their correlation of ESG with financial and especially with stock returns. That study is based on Vigeo Eiris SR dimensions and they ended up that if a company does not follow a responsible character will have less opportunities and higher financial risks. They support that these dimensions prove that companies have three targets, direct non-financial, indirect and financial stakeholders. Furthermore, they answered questions regarding how stock returns or equity markets are affected, they examined their relation with sub-ratings and consequently their connection with the CSR. It was proved that CSR has a positive but not that important impact on stock returns.

To make the above well-supported, some cases are put forward. The content has to do with circumstances where an ESG model was not followed, something which led in negative results. Through these examples the significance of ESG for investment screening becomes evident. The first one is the Volkswagen group and the emission scandal which occurred in September 2015[3]. The Environmental Protection Agency (EPA) found that many VW cars being sold in the United States had a "defeat device" - or software - in diesel engines that could detect when they were being tested, changing the performance accordingly to improve results. The German car giant has since admitted cheating emissions tests in the United States. The results were not only really harmful for the environment but for the automotive sector too. The engines emitted nitrogen oxide pollutants up to 40 times above what

3 https://www.bbc.com/news/business-34324772

is allowed in the United States and VW was forced to spend $7.3 billion to cover the cost of the biggest scandal in its 78-year history.

The second example involves the case of Cambridge Analytica, which occurred in July 2018, when it was revealed that Cambridge Analytica had collected the personal data of millions of Facebook's users without their consent for political advertising purposes. Aiming to explore how the ESG got into the field of investment decision making, it would be interesting to study the growth of sustainable investment in five major regions, namely Europe, United States, Canada, Japan, Australia and New Zealand. Useful information for that subject comes from the 2018 report of the Global Sustainable Investment Alliance (GSIA), which studies the buildup of sustainable investing. According to that report there has been a considerable growth of sustainable investment assets in each region. Between 2016 and 2018 the total amount of assets jumped from almost $23trillion US dollars to $30 trillion US dollars (Table 1).Overall, Japan had the highest growth during that period, followed by with Australia, New Zealand, and Canada. Their sustainable investing assets growth can be seen in (Table 2).

Table 1: Value of sustainable investment assets in five major regions (in trillions of US dollar; source: Global Sustainable Investment Alliance)

Region	2016	2018
Europe	12,040	14,075
United States	8,723	11,995
Japan	474	2,180
Canada	1,086	1,699
Australia/New Zealand	516	734
Total	22,890	30,683

Table 2: Growth of sustainable investing assets by region in local currency 2014-2018 (source: Global Sustainable Investment Alliance)

Region	2014	2016	2018
Europe (in Euros)	9,885	1,045	12,306
United States (in $)	6,572	8,723	11,995
Canada (in CAD)	1,011	1,505	2,132
Australia/ New Zealand (in AUD)	203	707	1,033
Japan (in Yen)	840	57,056	231,952

For the integration of ESG in investment decision making, the SRI framework plays a crucial role, as an investment strategy which takes into account both financial aspects as well as social and environmental goals in order to accomplish social development. A majority of studies, as for example (Girerd-Potin, Jimenez-Garcès, & Louvet, 2012) show that the link between stock returns and SRI can be either positive or negative. It depends on how risky a SR company is, on performance measures, countries and assets or portfolios.

As noted by (Camilleri, 2017) responsible investors differ in how they invest in diversified portfolios. As SRI funds have become a great investment opportunity, many investors choose to combine their personal value with their willingness to finance and invest. They are interested in fields that have to do with environmental protection, protection of human rights, elimination of diversity and social justice. In addition to that is important to mention that by incorporating ESG in investment decision making investors are not attracted by companies which deal with tobacco, weapons, gambling, pornography, alcohol and fossil fuel production.

(Amel-Zadeh & Serafeim, 2018) through their global survey and by collecting data from large investment companies, studied the reasons and the ways that investors use ESG information. The most frequent answer was about the financial advantages they offer in investment performance as it is easier to predict potential risk. They also use them for increasing the client and stakeholder demand, for indicating firm development and also for changing the corporate sector to address ESG issues. Nevertheless there is not enough information about how investors use ESG data. Actually ESG integration is followed by negative screening. They also made an assumption about how investors will use this information in the future, underlying that positive screening and active ownership will play a significant role. The issue of not having enough data and the lack of reporting standards still composes important barriers as they prevent the usage of ESG information for decision making. The economic impacts are linked with data regarding sustainability and responsible investments. Making the information transparent brings lower capital constraints and cost of capital, positive environmental profiles and the relations between firms and stakeholders are getting stronger and stronger.

2.4 ESG in corporate finance and banking

Another field in which the ESG integration is significant is the financial and banking sector. It is important to detect how important ESG performance is for themes that banks are interested in, such as corporate valuations, investments, mergers and acquisitions, investments lending and project finance among others. As the financial and banking sector plays a decisive role towards a more sustainable global growth it is completely regulated, something that uncovers the strong link between banks and ESG. Here it comes a study[4] to give information regarding the contribution of ESG in the banking field. Investments which have good environmental impacts and create good relations between the stakeholders lead banks to improve economic performance. It is important to mention that it was not observed any connection among firm's value and ESG performance, in the European scenario. Specifically in May 2018 the European Commission created a Technical Expert Group on Sustainable Finance to contribute in the development of the bank's sustainable side.

Banks can affect the whole economic development, which is the result of implementing environmental, social and governance factors into its activities. It is a difficult task to build a cost-effective responsible banking strategy but it is essential. Banks are responsible for important assets, for providing sustainable loans, eliminating portfolio risks and for achieving higher growth.

On the other hand, it is important to mention that banks are inextricable with sustainability services and at the same time they accept ratings from the rating agencies. This can affect the financial performance of each bank. In a world where investors integrate ESG in their asset allocation decisions, the need of ESG consideration is getting higher and higher.

4 https://clsbluesky.law.columbia.edu/2020/01/14/the-role-of-esg-in-the-financial-performance-of-banks/

(Bendersky & Burks, 2019) made an executive research regarding the relation between ESG and corporate financial performance. Using data collected from more than 2000 studies, they found that the consideration of ESG plays an important role mainly when the material ESG aspects are integrated with the appropriate way because this is determinant for the overall performance. Investors use ESG as the most important tool to appoint their strategy. They strengthen their results by presenting an extensive empirical study on ESG and financial performance by (Friede, Busch , & Bassen, 2015) who also found a positive relation between ESG and corporate financial performance.

But why investors, organisations and stakeholders pay so much attention to ESG issues? Sustainability is an important part in a company's assessment. So if a firm complies with its material sustainability factors it is expected to achieve higher revenues, less environmental and social risks, productivity increase and significant reputation. These are only some of the basic advantages that ESG implementation has. Generally speaking the entrance of these three central factors in financial performance helps every factor – either financial or non-financial- to be improved, to achieve better results, eliminate harmful actions in the environment, to attract more dedicated future investors and employees and finally to increase corporate value in the long-term. It also helps to achieve better stock price performance and lower capital cost. Moreover, it is interesting to study how the largest 250 firms from all over the world integrate the ESG in their function. (Deloitte, 2019) mentioned that almost 93% of these firms publish their ESG performance. Here it comes the role of ESG agencies which evaluate the above 250 companies, either publicly-listed or private. From these assessments, as the Global Initiative for Sustainable Ratings points out, turns out the huge amount of ESG metrics and performance indicators. Moreover, several studies clarify which are the advantages of using ESG. Firms can decrease their cost of capital, accomplish greater functional performance and also higher stock prices. Also more responsible investors will be interested in such companies and seems more possible to keep these investors for a long period.

A useful result that appears is that companies with good ratings in material ESG issues have important advantages in contrast with the rest which do not have the same ratings. But it is also remarkable to mention that this is valid only for material ESG issues as otherwise the rating difference between the firms is not that important.

In a different study (Eccles, Ioannou & Serafeim, 2014) compare the performance of firms that are connected with sustainability policies and those that are not. Their results showed that organisations which integrate ESG into their strategy build a methodology with the ultimate purpose to achieve sustainable growth and to create long-term shareholder value. Such firms usually have a board of directors related to sustainability and they establish a formal stakeholder engagement process, while they also adopt more transparent reporting policies. Moreover, they found that high sustainability corporations have stronger financial and stock market performance. Other important elements have been brought out. As the same study points out, firms try to maximise their profits, through different ways. Regarding that, responsible businesses which integrate social and environmental principles are growing faster. However, significant questions have been turned out, as for the governance structure and how these firms operate. There are two different opinions about the positive sense of integrating the social and environmental factors in the way a firm works. Through academic research it transpires that stakeholders are gaining advantage from ESG, but other scholars argue that the consideration of ESG has a negative economic effect, basically they support the stakeholders' wealth destruction. The results of the study by (Eccles, Ioannou, & Serafeim,2014), showed that firms which include sustainability principles comprise a different kind of companies which except for aiming only at the highest financial performance, they are also interested in the social and the environmental impacts. In addition to that, they divided businesses in two categories. The first one, is the high sustainability group and the second one is the low sustainability group. By using a four factor model they succeed in understanding the differences between them. It is a burning issue for stakeholders in order to decide if it is worth it to invest in these companies. They firstly ascertain that the annual performance is better for the first group, which also performs better when taking into account rates of return like return on equity (ROE) and return on assets (ROA). Moreover, they consider more aspects in which high sustainability firms outperform. More analytically, they have an independent board committee which deals with sustainability issues, they want to attract long-term investors and stakeholders and simultaneously they give more long-term information. At the same time high sustainability firms publish more no-financial data. While the high sustainability group outbalances in many aspects in contrast with the low sustainability group, analyst predictions of annual earnings show that the market underestimated the future profitability of the high sustainability companies.

2.5 How ESG scores affect Credit Pricing?

Credit risk analysis refers to the assessment of an obligor's ability (individual, a company or a country) to service existing or new debt obligations according to agreed payment terms. Credit risk assessments are performed through credit rating and scoring systems, which provide estimates for the likelihood of credit default. These estimates are used by financial institutions for credit pricing and credit granting decisions.

Credit pricing also refers to the specification of a loan's interest rate based on the policy of the credit institution, the type and duration of the loan, as well as the risk profile of the obligor. The latter is derived through credit scoring and risk rating systems. The widespread adoption of such systems has made credit more easily accessible to consumers and firms, allowing financial institutions to better monitor and assess their risk exposures, while providing credit terms that match with the characteristics of their customers and the risks they face.

Credit pricing is related with companies' reliability to be consistent in paying their debts. Specifically it describes the possibility that the borrower will be able to meet his loan obligations without the risk of bankruptcy.

It is interesting to investigate the relation of ESG performance with credit ratings. During the creditworthiness evaluation of borrowers, ESG parameters have effect on their cash flows and also on their possibility to be inconsistent in their obligation. (Devalle, Fiandrino, & Cantino, 2017) studied 56 Italian and Spanish public companies which integrate ESG factors in 2015. Their results showed that ESG performance affects credit ratings, especially regarding the social and governance factors.

ESG impacts are an important factor that rating agencies take into account in order to output the results of credit ratings. However, the study of (Kiesel & Lücke, 2019) found a limited consideration of ESG in rating decisions, with corporate governance having the most important role. Moreover, the results of the study showed that ESG rating announcements have negative effects on stocks returns and positive effects on the spreads of credit default swaps, thus implying that ESG factors are important to assess downside risks on credit quality.

ESG providers also evaluate bond issuers to provide information of how reliable a borrower is. In fact, ESG scores affect credit rating and every bond issuer wants to achieve the highest ESG rating. Thus, a strong ESG performance creates a better profile for the company and more possibilities for an investor to be interested in that case.

In order to come along on sustainability development, it is important to make clear the correlation between corporate social responsibility (CSR) and credit ratings. Through CSR performance, important no-financial data come out about the crucial points for which raters must be concerned in order to work successfully and CSR investments are connected with low financial costs. (Attig, Boubakri, Ghoulc, & Guedhami, 2016) collected different opinions about the effects of CSR on companies' credit ratings and with the help of the CSR scores issued by MSCI ESG Research and the credit ratings of S&P, they found that investments in CSR are associated with higher credit ratings and if one company wants to reduce its costs and improve its credit rating it is compulsory to improve its CSR performance too.

All the above details come together to show that banks do not regard CSR as significantly value enhancing or risk reducing. It is important to examine the role of ESG in financing. Several studies support the positive impact of integrating ESG factors in credit pricing and in corporate risk reduction. Firstly firms can reduce their cost of capital and create a competitive profile that increases shareholders' value while having a positive social and environmental impact. (Kiesel & Lücke, 2019) examined the capital market reactions from a deeper analysis of stock returns and credit default swap spread changes and found out that there is a positive correlation between ESG and these market variables.

Moreover, companies support the information publicity which helps them to be more transparent and at the same time to face the issue of asymmetric information. At the same time as (Principles for Responsible Investing (PRI), 2017) refers, climate change, corporate scandals which lead to serious financial losses and also the results of the global financial crisis are the reasons that responsible investors matter in credit risk analysis. PRI has extensively studied the integration of ESG in credit ratings as it is really interested in helping the improvement of integration and transparency of ESG factors in credit risk analysis. An important fact took place in May 2016 when investors confirmed that relation and they accepted to enhance the better understanding of ESG issues which are related to creditworthiness and also to create a better integration of ESG aspects in credit ratings and analysis.

Finally, (Attig, Sadok El Ghoul, & Guedhami , 2013) study the case how Corporate Social Responsibility (CSR) effects corporate financial performance (CFP). This is one more issue for which there is not enough information to end up in one conclusion. While (Orlitzky, Schmidt, & Rynes, 2003) supported that there is a positive relation between CSR and financial performance, another empirical research which uses accounting profitability as a measure of financial performance does not complete agree with that finding. Actually it supports both positive and negative elements on the link between CSR and CFP. One step forward the initial study, tries to find the consequences of CSR on firm's credit ratings. Through original information from MSCI ESG Research and S&P they investigate the last question. The outcome was that firm's performance is strictly connected with credit risk assessment and in turn investing in CSR leads to higher credit ratings, less financial and capital costs.

2.6. ESG regulatory trends (The EU Sustainable Finance Framework)

The European Union (EU) in an attempt to step up on sustainable finance, has brought out the new EU regulation on sustainability-related disclosures. The aim of the EU is to promote the financing of sustainable growth by integrating sustainability considerations into its financial policy framework. In the EU's policy context, sustainable finance is understood as the set of financial services, products and operations that aim to support economic growth, while at the same time taking into account the pillars of ESG. The main concern is the transition to a low-carbon, more resource-efficient and sustainable economy. These actions are supported from the 2030 Agenda for Sustainable Development, which contains 17 Sustainable Development Goals (SDGs) and 169 targets to be done during the next 10 years. Its main concept is the protection of human rights, human dignity, the environmental protection and prosperity.

In order to achieve that, the EU has set another significant goal, to help countries to take part in serious actions especially for environmental protection and global sustainable development. The Paris Agreement, is the first legally binding global climate agreement which was adopted in December 2015, confirmed on 5 October 2016, and put into action on 4 November 2016.

The European Commission (EC) according to the Commission's legislative proposals of May 2018, created the Technical Expert Group (TEG)[5] on sustainable finance to help the EC in creating an EU Taxonomy, an EU Non-Financial Reporting Directive, Methodologies for EU climate Benchmarks and disclosures for Benchmarks, and, finally, an EU Green Bond Standards.

5 https://ec.europa.eu/info/publications/sustainable-finance-technical-expert-group_en

1. EU Taxonomy

The EU Taxonomy (EU Technical Expert Group on Sustainable Finance, 2020) defines the nature of environmentally sustainable economic activities. The final report of the EU Taxonomy came out on 9 March 2020. It explains how the EU taxonomy is structured and it also gives direction about how businesses and generally the financial organisations can use and disclosure against the taxonomy. The whole concept is related with the transition to a low-carbon economy. For the purpose of achieving that goal taxonomy sets some limits on companies' actions. The point is that all the activities must respect the environmental protection and help to recognise which actions are already environmentally friendly. With that development, companies, investors and individuals can contribute to the EU's actions for having a constantly sustainable growing economy. Through the EU Taxonomy the ability to improve the environmental performance and mitigate the climate change is increasing, the low-carbon sectors are growing and the high-carbon sectors are eliminating.

2. EU Non-Financial Reporting Directive

The EU has set specific rules, regarding the publicity of non-financial information from large companies, as it is compulsory for firms to include such information in their annual reports from 2018 onwards. The Non-Financial Reporting Directive 2014/95/EU (NFRD) [6] applies to companies that meet specific size criteria, mainly in terms of their personnel. These criteria differ by country. For instance, in Sweden and Finland the rules imposed by the Directive apply to companies with at least 250 employees, whereas in Greece companies with more than 10 employees are covered. Companies which must comply with the regulation are those which are listed, banks, insurance companies and other companies as decided by national authorities. According to the directive large companies must publish non-financial reports about the social and environmental impacts of their activities. This requirement promotes the transparency of data and they help investors, consumers and stakeholders to evaluate the companies' ESG performance. Critical information that must be reported is related with the protection of the environment, the protection of human rights, firms' relationship with their employees, the diversity of corporate councils and committees, as well as anti-corruption and bribery policies. The main goal of the

6https://rb.gy/rej3xq

European Green Deal[7] is to make Europe carbon neutral till 20150, thus European Union makes the best effort to support business to integrate the sustainable point of view on their operation.

3. EU Benchmark

Another objective for which TEG is responsible is to suggest the minimum standards for the "EU Climate Transition" and an "EU Paris-aligned" benchmark, which are connected with the goals of the Paris Agreement. The TEG is also in charge of publishing the disclosure ESG requirements in the benchmark evaluation and methodology followed for every benchmark.[8]

The European Commission has set more measures in order to support the ESG transparency of benchmark methodologies and the standards for the methodology of low carbon benchmarks in the EU. To succeed, the actions should already have been done, till the end of 2019 with the help of TEG. The Regulation (EU) 2019/2089 of 27 November 2019 amending Regulation (EU) 2016/1011 is effective from 30 April 2020, and it is related with the EU climate transition benchmarks, EU Paris-aligned Benchmarks and sustainability-related disclosures for benchmarks.

4. EU Green Bond Standard

On 11 December 2019 it was clarified the need of turning towards the financial and capital flows to green investments. During the third quarter of 2020 the Commission will proclaim an amount of actions which will enhance investors to find credible responsible investments and subserve that Commission will create an EU Green Bond Standard (GBS). In a world where the transition to low carbon green bonds play a material role. Finally the Commission began a process of evaluating the consequences of creating Green Bonds in Europe and at the same time set the foundations for discovering the possibility of a legislative initiative for an EU Green Bond Standard.

So the aim of the EU to establish the development of the EU Green Standards, seeks to promote the growth of the green bond market. The successful operation of such a market requires transparency and credibility. To this end, several reports have been prepared, with the last one published in June 2019. (EU Technical Expert Group on Sustainable Finance, 2020) The reports contain suggestions and

7 https://ec.europa.eu/info/research-and-innovation/strategy/european-green-deal/call_el

8 https://ec.europa.eu/info/publications/sustainable-finance-technical-expert-group_en#taxonomy

guidelines about issuance of green bonds, whereas more recently additional efforts have been made to attract market participants in investing in EU green bonds.

Chapter 3 Overview of ESG ratings

3.1 ESG Scores and Ratings

ESG scores are calculated to examine how sustainable an investment is for a company and represents an assessment of the ESG performance of a company. The global ESG scores are weighted aggregates of component assessments on the three main ESG dimensions (environment, social and governance) accepts an appropriate weight. These ESG pillars are evaluated on the basis many indicators.

ESG scores and ratings are calculated from specialised rating agencies. Currently, these ratings are subjective as commonly accepted standards for ESG scoring and rating systems are lacking. However, ESG has a leading role in the financial sector and there is a growing need for adopting common ESG standards. The considered set of criteria is organized into a hierarchy involving the three ESG pillars and raters assign different weights to these pillars, depending on the sector that the rated firm belongs to.

Except for ESG ratings, ESG indices are another popular tool for monitoring the adoption of ESG principles by firms. ESG indices are financial indices which include listed companies that meet specific ESG standards. The oldest ESG index is the family of Dow Jones Sustainability Indices (DJSI), which was launched in 1999. It is based on long-term economic, environmental and social criteria and evaluates subjects like climate change, corporate governance and risk management. Other well-known families of indices include the FTSE4Good series, which was launched in 2001 by the FTSE Group, and the MSCI ESG Indexes.

3.2 ESG Rating Agencies

This huge increase of responsible investments created the necessity to rate companies all over the world, on the basis of their ESG performance. Various rating agencies have developed ESG rating methods, evaluating companies on their environmental, social and governance performance thus providing investors with comprehensive information which does not rely exclusively on economic data. As described below, Table 3 refers to the 22 rating agencies studied in this thesis.

Table 3: ESG Raters (**Source**: Global Sustain Group)

Provider	Tool	Methodology	Rating Sample
Bloomberg	Bloomberg ESG Data	ESG Brochure	N/A
CDP	CDP Scores	Guidance for Companies	N/A
Covalence	ESG Ratings	Approach	ESG Snapshot Sample
CSR Hub	CSRHub	Ratings Methodology	N/A
	ESGHub	User Guide	N/A
EcoVadis	CSR Rating	EcoVadis Methodology	Scorecard Example
ECPI Group	ECPI Company Rating	ESG Rating Methodology	Sample Portfolio
Fitch Ratings	ESG Template Compendium		
FTSE Russell	ESG Ratings	Recalculation Policy and Guidelines ESG Products	ESG Ratings and Data Model
Institutional Shareholder Services (ISS)	ISS ESG	ESG Corporate Rating	N/A
Moody's Investor Services	ESG & Credit Analysis	Approach to assessing ESG in credit analysis	N/A
MSCI	ESG Ratings	ESG Ratings Brochure	N/A
Refinitiv	ESG Scores	ESG Scores Methodology	
RepRisk	ESG Risk Platform	N/A	N/A
RobecoSAM	SAM Corporate Sustainability Assessment	MSA Methodology Guidebook	Company Benchmarking Scorecard
S&P Global Ratings	ESG Evaluation	ESG Evaluation Brochure	ESG Evaluation Sample
Sustainalytics	ESG Ratings & Research	ESG Risk Ratings	Rating Report
Thomson Reuters	Thomson Reuters/S-Network ESG Best Practices Ratings & Indices	ESG Ratings Rule Book	ESG Best Practices Ratings & Indices

Vigeo Eiris	ESG Indices and Rankings	Methodology and Quality Assurance	N/A
Sensefolio	ESG Framework	ESG Framework Brochure	N/A
Corporate Knights	Global 100	Global 100 Methodology	2020 Global 100 Results

Morningstar	Sustainability Rating	Rating Methodology	N/A
GRESB	Real Estate Assessment	Real Estate Assessment	GRESB Benchmark Report

Figure 1 presents a summary of the reasons motivating companies to use ESG ratings. Most firms support that ESG provides important information to investment performance and enhances an organisation's further research on corporate ESG performance and risk. Moreover there is a huge demand from stakeholders to use ESG ratings as a supplementary source of information on corporate performance. Last but not least, companies are required to integrate ESG ratings into investment analysis and decision making, whereas reputation benefits are also reported as a reason that promotes the use of ESG ratings.

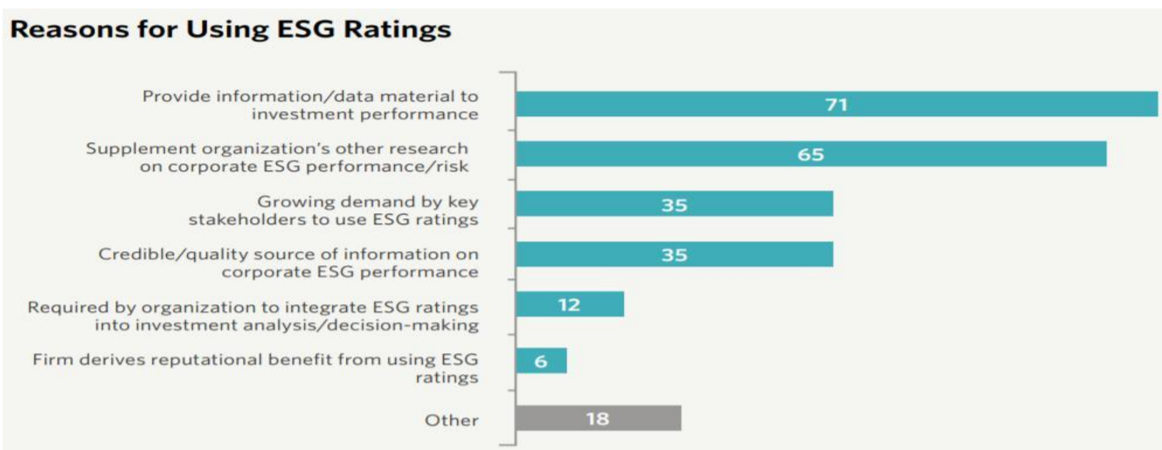

Figure 1: Reasons for using ESG Ratings (Source: Rate the Raters 2020: Investor Survey and Interview Results)

At the same time, investors have been exploring pathways for ESG integration, reactively looking to better understand corporate ESG performance in order to respond to client pressure, and proactively seeking means to apply ESG in ways that might improve investment decisions. Meanwhile, stakeholder pressure was increased since asset owners are facing growing demand from clients to ensure that their investments make a difference in the world.

Institutional investors, asset managers, financial institutions and other stakeholders are increasingly relying on ESG reports and ratings to assess and measure corporate ESG performance over time and as compared to peers, helping them to classify the market, forecast the future performance of companies and exercise their proxy-voting rights.

Figure 2 presents the most useful sources of information on corporate ESG performance. The first two are the corporate ESG ratings and the direct engagement with companies. They also extract data from corporate sustainability reports and after that useful enough is the in-house research. Other sources follow, like corporate ESG rankings, ESG information disclosure and media.

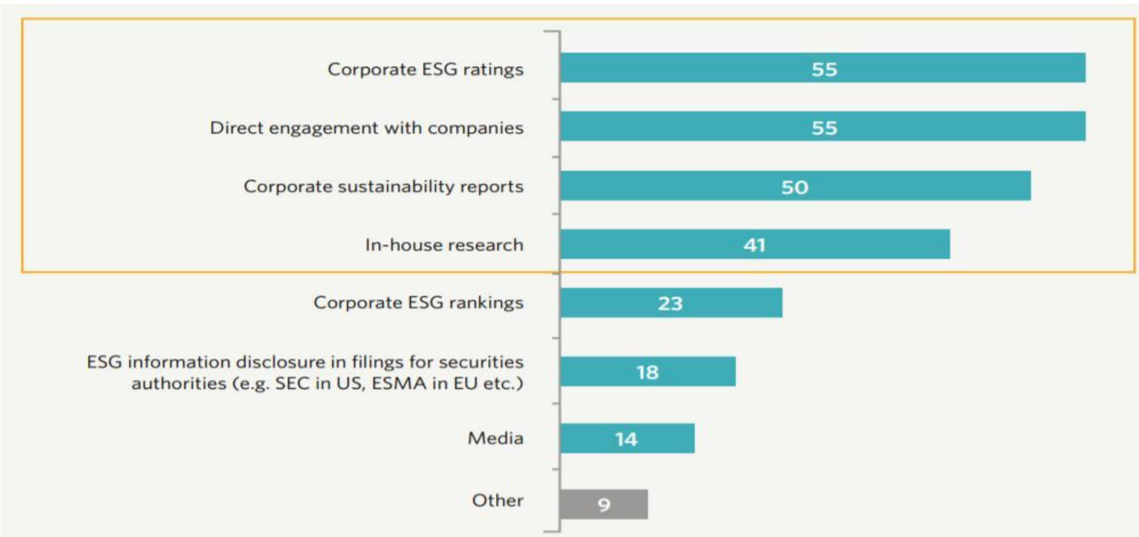

Figure 2: Most Useful Sources of Information on Corporate ESG Performance (Source: Rate the Raters 2020: Investor Survey and Interview Results)

Furthermore, these assessments and measurements often form the basis of informal and shareholder proposal-related investor engagement with companies on ESG matters. Reporting and ratings methodologies, scope and coverage, however, vary greatly among providers.

The size, influence, and complexity of the ESG ecosystem have all increased significantly. The number of ESG ratings has grown more than fivefold from the beginning of the previous decade. Currently, it is estimated that there are over 600 ESG ratings globally. In 2018, one in every four dollars invested in the US was aligned with a sustainable, responsible or impact (SRI) investment strategy, primarily thanks to widespread ESG incorporation in investment vehicles.

Figure 3 presents the frequency of ESG ratings use. The 35% of investors either use them very regularly, actually multiple times per week while the 30% of them use the ESG scores at least once per week. The 30% do not use the ratings often, like at least once per month or sometimes per year and only 4% never uses the ratings.

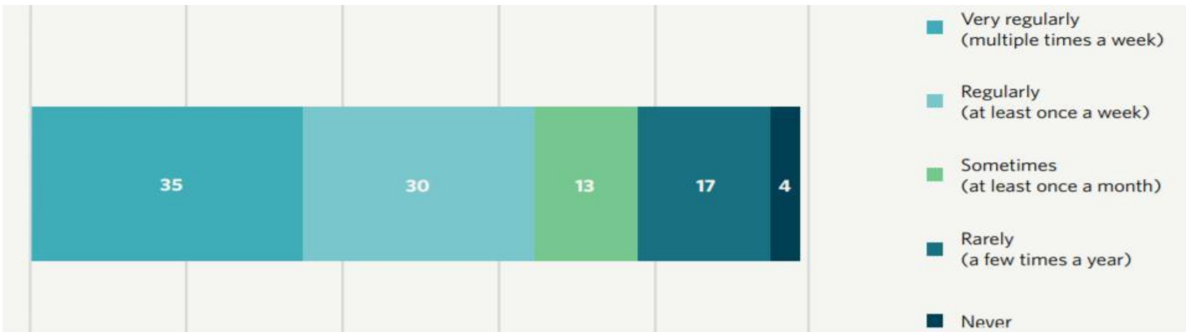

Figure 3: Frequency for the use of ESG ratings by investors Source: Rate the Raters 2020: Investor Survey and Interview Results)

Ratings have promoted greater awareness of ESG issues while helping to educate the investment community and other stakeholders on how those issues are relevant to business. They have added credibility by formalizing ESG evaluation and analysis into packaged products, which have enabled further integration of sustainability topics. ESG ratings deserve recognition for helping drive sustainability towards the center of investment thinking and practice

Currently, several rating providers operate in the ESG ecosystem, some of them representing renowned institutions, monitoring thousands of companies based on ESG criteria. The ratings differ among the providers since they have developed their own methodology, something which may provoke confusion to clients. The clients may use the data for better and more efficient investing decisions making their portfolios ESG-friendly.

The comparative analysis of ESG ratings has on its base the different scoring scale each rater uses, the number of rating companies, the number of their employees and their annual revenues. As a result they end up in different kinds of scores. The most common scoring methodology is from 0 to 100 with 100 being the highest grade. Others can be from 1 to 5 or from AAA to D. Every rating agency creates its own way of evaluating companies and gives different pillar weights. After that, they end up in the final score.

The following sub-sections provide some fundamental information about the rating agencies which referred before (Table 3).

3.2.1 Bloomberg

Bloomberg (www.bloomberg.com), founded in 1981, is a privately held financial, software, data, and media company headquartered in New York, USA. It provides financial software tools and enterprise applications such as analytics and equity trading platforms, data services, and news to financial companies and organisations. Also, Bloomberg includes a global television, websites, radio stations, subscription-only newsletters magazines, among others.

Bloomberg has been involved with ESG making relevant data available to market participants with a coverage from more than **11,500** companies in **83** countries.

Bloomberg distribute ESG data alongside fundamental financial data on the same screens that Bloomberg users consult to make critical investment decisions every day offering key ratios and highlighting the most important performance indicators so users can compare ESG and financial performance across companies.

ESG Rating Tool: Bloomberg ESG Data

Methodology: ESG Brochure

3.2.2 CDP

CDP (www.cdp.net) is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. Over the past 15 years, CDP has created a system that has resulted in the engagement on environmental issues worldwide.

The organisation has developed the CDP Scores, a scoring list of the world's most pioneering companies and cities leading on environmental transparency and performance, aiming to incentivize and guide towards becoming leaders on environmental transparency and action.

In 2019, over **8,400** companies and **920** cities, states and regions disclosed through CDP and more than 200 corporates have been recognized as the leaders acting to address environmental risks and build our future sustainable economy - one that works for both people and planet.

ESG Rating Tool: CDP Scores

Methodology: Guidance for Companies

3.2.3 Covalence

Covalence (www.covalence.ch), founded in 2001, helps investors integrate ESG factors with its multi-source, AI-powered scoring system. The services include ESG ratings, ESG news monitoring, portfolio advisory, and impact stories, and support sustainable and responsible investment, ESG investing and impact investing strategies. Covalence, also delivers data and research to corporates, academics and non-profits relying on its EthicalQuote reputation index.

Covalence provides investors and asset managers with ESG ratings, ESG news monitoring, portfolio advisory, and impact stories, supporting sustainable and responsible investment, ESG investing and impact investing strategies. Thanks to its multi-source, AI-powered scoring system Covalence rates more than **6,000** companies on their ESG practices. For investment managers, data are available on sectoral exclusions (controversial weapons, tobacco, etc.).

The ESG ratings can be used for risk management, investment management, positive and negative screening, ESG integration, and thematic investment. ESG Rating Tool: ESG Ratings

Methodology: Approach

Rating Sample: ESG Snapshot Sample

3.2.4 CSRHub

CSRHub (www.csrhub.com) provides access to corporate social responsibility and sustainability ratings and information on more than **17,000+** companies from **134** industries in **143** countries.

CSRHub rates **12** indicators of employee, environment, community and governance performance and flags many special issues. It offers subscribers immediate access to **186 million** detailed data points from **618** data sources. The data comes from socially responsible investing research firms, well-known indexes, publications, "best of" or "worst of" lists, NGOs, crowd sources and government agencies.

CSRHub has developed the ESGHub, a new tool which combines Bloomberg's ESG metrics with CSRHub consensus scores based on more than **650+** ESG sources rating on **9,000** companies. Asset owners and analysts can use the tool to select instruments for new portfolios, examine the ESG risks in existing portfolios, and discover new investment opportunities. Also managers and researchers may use ESGHub to benchmark peers, analyze an industry or supply chain, and look for trends in company performance.

ESG Rating Tool: CSRHub, ESGHub
Methodology: CSRHub Ratings Methodology, ESGHub User Guide

3.2.5 EcoVadis

Ecovadis (www.ecovadis.com) provides business sustainability ratings, intelligence and collaborative performance improvement tools for global supply chains.

Backed by a powerful technology platform and a global team of domain experts, EcoVadi's easy to use and actionable sustainability scorecards provide detailed insight into environmental, social and ethical risks across **190** purchasing categories and **150** countries, constituting a trusted partner for procurement teams in more than **450** leading multinational organisations to reduce risk and drive innovation in their sustainable procurements.

Industry leaders such as Johnson & Johnson, L'Oreal, Nestle, Schneider Electric, Michelin and BASF are among the more than **50,000** businesses on the EcoVadi's network, all working with a single methodology to assess, collaborate and improve sustainability performance in order to protect their brands, foster transparency and innovation and accelerate growth.

ESG Rating Tool: CSR Rating

Methodology: EcoVadis Methodology

Rating Sample: Scorecard Example

3.2.6 ECPI Group

ECPI (www.ecpigroup.com), founded in 1997, works to interpret sustainability themes into investable solutions, based on a solid and rigorous proprietary ESG research model with over **15** years of track record. Product innovation and ability to respond to client needs with custom driven/tailor made solutions are at the heart of ECPI success.

ECPI represents a “unicum” in the market thanks to its independency, an ample and granular research database and the ability to build off-the-shelves Sustainable Investments Solutions. The company can assist asset owners and asset managers in developing Sustainable Investments Solutions, so to enrich and differentiate their product offer, spanning from investable Indices to ESG Portfolio Screening.

ECPI’s proprietary research model focuses primarily on the ESG performance factors that determine issuers’ sustainability and intangible market value. This research covers over **4,000** issuers and maintains one of the world’s largest sustainability databases. ECPI research process is both rigorous and disciplined and its proprietary methodology is based only on publicly available information from companies, data provider and media.

ECPI uses an objective, sector-based, best-practices approach to analyzing ESG data of issuers with the objective of translating qualitative data into quantitative indicators, assigning to each issuer a score and a rating.

ESG Rating Tool: ECPI Company Rating

Methodology: ESG Rating Methodology

Rating Sample: Sample Portfolio

3.2.7 Fitch Ratings

Fitch Ratings (www.fitchratings.com) is an American provider of credit ratings, commentary and research constituting one of the "Big Three credit rating agencies".

The Fitch Ratings' ESG Relevance Scores, which have been produced by analytical teams, transparently and consistently present both the relevance and materiality of ESG elements to the rating decision. They are sector-based and entity-specific.

Using a standardised and transparent scoring system, Fitch is introducing ESG Relevance Scores across all asset classes, starting with over **1,500** non-financial corporate ratings. This will be followed by banks, non-bank financial institutions, insurance, sovereigns, public finance, global infrastructure and structured finance.

ESG Rating Tool, Methodology and Rating Sample: ESG Template Compendium

3.2.8 FTSE Russell

FTSE Russell (www.ftserussell.com), established in 1995, is a of the London Stock Exchange Group (LSEG). FTSE Russell is Global provider of benchmarks, analytics, and data solutions with multi-asset capabilities.

FTSE Russell's solutions offer a true picture of global markets across asset classes, styles, and strategies. Our global perspective is underpinned by specialist knowledge gained from developing local solutions and understanding client needs around the world.

FTSE Russell's ESG Ratings and data model allows investors to understand a company's exposure to, and management of, ESG issues in multiple dimensions. The ESG Ratings are comprised of an overall Rating that breaks down into underlying Pillar and Theme Exposures and Scores. The Pillars and Themes are built on over **300** individual indicator assessments that are applied to each company's unique circumstances.

ESG Rating Tool: ESG Ratings

Methodology: Recalculation Policy and Guidelines ESG Products

Rating Sample: ESG Ratings and Data Model

3.2.9 Institutional Shareholders Services (ISS)

ISS (www.issgovernance.com), founded in 1985, empowers investors and companies to build for long-term and sustainable growth by providing high-quality data, analytics, and insight. With nearly **2,000** employees spread across **30** U.S. and international locations, ISS is a leading provider of corporate governance and responsible investment solutions, market intelligence and fund services, and events and editorial content for institutional investors and corporations, globally.

ISS offers ESG solutions which enable investors to develop and integrate responsible investing policies and practices, engage on responsible investment issues, and monitor portfolio company practices through screening solutions. It also provides climate data, analytics, and advisory services to help financial market participants understand, measure, and act on climate-related risks across all asset classes. In addition, ESG solutions cover corporate and country ESG research and ratings enabling its clients to identify material social and environmental risks and opportunities.

ISS ESG's scientifically based rating concept places a clear, sector-specific focus on the materiality of non-financial information. It is constantly reviewed and developed to cover all relevant environmental, social and governance related topics.

ESG Rating Tool: ISS ESG

Methodology: ESG Corporate Rating

3.2.10 Moody's

Moody's (www.moodys.com) is a global integrated risk assessment firm that empowers organisations to make better decisions. The company offers data, analytical solutions and insights helping decision-makers identify opportunities and manage the business risks. With over **11,000** employees in more than **40** countries, Moody's combines international presence with local expertise and over a century of experience in financial markets.

Moody's principles for assessing ESG risk in its credit analysis, which is an important component of its credit analysis, seeking to incorporate a forward-looking view of all issues that can materially impact the credit quality of a given sector or debt issuer. In the analysis, Moody's identifies and assesses the credit risks arising from ESG considerations either today or in the future, any mitigating and/or adaptive behavior undertaken by related issuers and, in some instances, the ESG trends that may present credit-positive outcomes.

ESG Rating Tool: ESG & Credit Analysis

Methodology: Approach to assessing ESG in credit analysis

3.2.11 MSCI

MSCI (www.msci.com) is a US-based company headquartered in New York, which serves as a global provider of equity, fixed income, hedge fund, and stock market indexes, as well as multi-asset portfolio analysis tools. It publishes the MSCI BRIC, MSCI World and MSCI EAFE Indexes.

MSCI seeks to bring clarity to dynamic and increasingly complex financial markets believing that ROI also means return on community, sustainability and the future that we all share. Healthy economies stimulate job creation, encourage infrastructure development and generate the returns necessary to improve living standards for everyone, everywhere.

MSCI has developed ESG Ratings aiming to measure a company's resilience to long-term, financially relevant ESG risks. The company leverages artificial intelligence and alternative data to deliver dynamic investment-relevant insights to power your investment decisions.

ESG Rating Tool: ESG Ratings

Methodology: ESG Ratings Brochure

3.2.12 Refinitiv

Refinitiv (www.refinitiv.com), was founded in 2018 and is jointly owned by Blackstone Group LP and Thomson Reuters. The company provides information, insights and technology that drive innovation and performance in global financial markets.

Serving more than **40,000** institutions in approximately **190** countries, the company has an annual turnover of **USD 6 bn**.

Refinitiv puts ESG thinking at the heart of its investment process, aiming to help its clients to make sound, sustainable investment decisions Refinitiv's ESG data covers nearly **70%** of global market cap and over **400** metrics. It helps clients to assess the risks and opportunities posed by corporate performance in critical areas such as climate change, executive remuneration, and diversity and inclusion.

ESG Rating Tool: ESG Scores

Methodology and Rating Sample: ESG Scores Methodology

3.2.13 RepRisk

RepRisk (www.reprisk.com) is an ESG data science company based in Zurich, specializing in ESG and business-conduct risk research and quantitative solutions.

The company runs an online database of the risk exposure of companies, projects, sectors, and countries related to ESG issues. RepRisk methodically assesses, on a daily basis, risks, allegations, and criticism pertaining to environmental degradation, human rights abuses, child labor, forced labor, fraud, and corruption that can impact an organisation's reputation, financial profitability, or lead to compliance issues. Financial institutions and corporations use the database to monitor and assess risk.

The database includes over **120,000** companies and **30,000** projects reported to have links to ESG risks. The database also analyzes ESG risks related to sectors and countries. It also includes data on ESG issues and topics, over **20,000** NGOs, and over **14,000** governmental bodies.

ESG Rating Tool: ESG Risk Platform

3.2.14 RobecoSAM

RobecoSAM (www.robecosam.com), founded in 1995, is an investment companies that specialises on sustainable investing, offering a comprehensive palette of products including in-house asset management, sustainability indices, corporate sustainability assessments, active ownership and engagement, and customized portfolio benchmarking solutions.

ESG Rating Tool: SAM Corporate Sustainability Assessment

Methodology: MSA Methodology Guidebook

Rating Sample: Company Benchmarking Scorecard

3.2.15 S&P Global Ratings

S&P Global Ratings (www.spglobal.com), a subsidiary company of S&P Global, is a provider of multi-asset class and real-time data, research, news and analytics to institutional investors, investment and commercial banks, investment advisors and wealth managers, corporations, and universities.

S&P Global Ratings has developed an ESG rating tool, called "ESG Evaluation" which provides assessments for a company's ESG strategy and ability to prepare for potential future risks and opportunities. The ESG Evaluation is the ideal tool for investors in that it provides a forward looking, long term opinion of readiness for disruptive ESG risks and opportunities. The methodology is founded on an expert judgment approach.

It is worth noting that in January 2020, S&P Global acquired the SAM ESG Ratings and Benchmarking business from RobecoSAM, which includes the widely-recognized SAM Corporate Sustainability Assessment (CSA), an annual evaluation of a company's sustainability practices.

The CSA has been carefully developed over 20 years and is regarded as a leading ESG assessment by global sustainability professionals. Since 1999, SAM and S&P Dow Jones Indices have teamed up to utilize the CSA as the performance indicator for inclusion on the Dow Jones Sustainability Indices (DJSI) and the new S&P ESG Index family including the S&P 500® ESG and S&P Global 1200 ESG.

ESG Rating Tool: ESG Evaluation

Methodology: ESG Evaluation Brochure

Rating Sample: ESG Evaluation Sample

3.2.16 Sustainalytics

Sustainalytics (www.sustainalytics.com) is a global leader in ESG and Corporate Governance research and ratings. Over the last **25** years, Sustainalytics has brought together leading ESG research and client servicing professionals to retain that personal touch that has helped company to grow. Today, Sustainalytics supports hundreds of the world's foremost investors who incorporate ESG and corporate governance insights into their investment processes.

With **16** offices globally, Sustainalytics has approximately **600** employees, including over **200** analysts with varied multidisciplinary expertise across more than **40** industry groups. Over the last three consecutive years, investors named Sustainalytics among the top three firms for both ESG and corporate governance research in the Independent Research in Responsible Investment Survey.

Sustainalytics' ESG Risk Ratings are designed to help investors identify and understand financially material ESG risks at the security and portfolio level. The ESG Risk Ratings measure the degree to which a company's economic value is at risk driven by ESG factors or, more technically speaking, the magnitude of a company's unmanaged ESG risks.

ESG Rating Tool: ESG Ratings & Research

Methodology: ESG Risk Ratings

Rating Sample: Rating Report

3.2.17 Thomson Reuters

Thomson Reuters (www.thomsonreuters.com) is one of the world's most trusted providers of business and financial data.

The Thomson Reuters has developed the S-Network ESG Best Practices Ratings to measure the ESG performance of over **7,000** companies worldwide. The ratings are derived by company comparisons for a total of **156** key performance indicators derived from over **500** separate data points to facilitate accurate and transparent ESG screening.

ESG Rating Tool: Thomson Reuters/S-Network ESG Best Practices Ratings & Indices

Methodology: ESG Ratings Rule Book

Rating Sample: ESG Best Practices Ratings & Indices

3.2.18 Vigeo-Eiris

Vigeo-Eiris (www.vigeo-eiris.com) is an independent international provider of ESG research and services for investors and public & private organisations. It undertakes risk assessments and evaluates the level of integration of sustainability factors within the strategy and operations of organisations.

Vigeo-Eiris offers a wide range of services for investors and companies, covering all sustainable and ethical investment approaches (ratings, databases, sector analyses, portfolio analyses, structured products, indices), supporting the integration of ESG criteria into business functions and strategic operations (sustainable bonds, corporate ratings, CSR evaluations and more).

Vigeo-Eiris has developed a framework of 38 sustainability criteria, chosen based on international standards, which are grouped into 6 domains of analysis. These are segmented into **41** sector sub-frameworks selecting and weighting the most relevant objectives. Overall, **330** indicators are used in this framework.

ESG Rating Tool: ESG Indices and Rankings

Methodology: Methodology and Quality Assurance

3.2.19 Sensefolio

Sensefolio (www.sensefolio.com) was founded in 2015.

The company has incorporated computer processing capacity and Machine Learning/Natural Language Processing (NLP) techniques and developed sophisticated algorithm able to aggregate, read, and analyze many different sources of information to assess and monitor more than **20,000** companies from more than **100,000** sources of information on a near real-time basis, including company reports, company reviews, social media posts, as well as financial news.

Sensefolio has developed an ESG framework allowing finance professionals to compare companies in a robust way performance of firms on various areas, such as climate change, sustainability, biodiversity and water, health & safety, employee standards, community responsibility, human rights, leadership & management structure, business innovation & performance, outside activities and business ethics.

ESG Rating Tool: ESG Framework

Methodology: ESG Framework Brochure

3.2.20 Corporate Knights

Corporate Knights (www.corporateknights.com), founded in 2002, publishes a sustainable business magazine and has a research division that produces rankings and financial product ratings based on corporate sustainability performance.

Corporate Knights releases every year a ranking of corporate sustainability performance during the World Economic Forum in Davos. The ranking is based on publicly disclosed data (e.g., financial filings, sustainability reports). All the required data points are pre-populated and submissions from companies are not necessary to be included in the list.

The ranking is based on up to **21** KPIs covering resource management, employee management, financial management, clean revenue and supplier performance.

ESG Rating Tool: Global 100

Methodology: Global 100 Methodology

Rating Sample: 2020 Global 100 Results

3.2.21 Morningstar

Morningstar (www.morningstar.com), founded in 1984, is a global financial services firm headquartered in Chicago, USA.

It provides an array of investment research and investment management services. Morningstar's research and recommendations are considered by financial journalists as extremely influential in the asset management industry, and a positive or negative recommendation from Morningstar analysts can drive billions of dollars into or away from any given fund. Through its asset management division, the firm currently manages over **USD 200 bn** (March 2019).

Morningstar helps advisors and wealth managers to choose suitable funds and perform stock research. It can also help asset managers build sustainable products and evaluate their competitors. The Morningstar Sustainability Rating™ for funds allows investors to understand how the companies in their portfolios are managing their environmental, social, and governance – or ESG – risks relative to their peers.

This rating is built to enable advisors and investors to directly compare companies across industries, and a refined design aims to make it easier to use as they make investment decisions.

ESG Rating Tool: Sustainability Rating

Methodology: Rating Methodology

3.2.22 GRESB

GRESB (www.gresb.com) was established in 2009 by a group of large pension funds who wanted to have access to comparable and reliable data on the ESG performance of their investments. Since then, GRESB has grown to become the leading ESG benchmark for real estate and infrastructure investments across the world.

GRESB’s ESG data cover **USD 4.5 tn** in real estate and infrastructure value and is used by more than **100** institutional and financial investors to make decisions that are leading to a more sustainable real asset industry.

GRESB Assessments capture information regarding ESG performance and sustainability best practices for real estate and infrastructure funds, companies, and assets worldwide. The Assessments are guided by what investors and the industry consider to be material issues in the sustainability performance of real asset investments, and are aligned with international reporting frameworks, such as GRI and PRI.

Assessment participants receive comparative business intelligence on where they stand against their peers, a roadmap with the actions they can take to improve their ESG performance and a communication platform to engage with investors. Investors use the ESG data and GRESB’s analytical tools to monitor their investments, engage with their managers, and make decisions that lead to a more sustainable real asset industry.

ESG Rating Tool: Real Estate Assessment
Methodology: Real Estate Assessment
Rating Sample: GRESB Benchmark Report

3.3 How ESG Ratings and Scores are used?

During the past two decades, sustainability issues have attracted a lot of interest among all participants in the global financial industry.

In a recent study (Amel-Zadeh & Serafeim, 2018) conducted a survey among senior investment professionals at asset-managing and asset-owning institutions, from different regions. According to the results more than 82% of the respondents stated that they use ESG information. There is a wide range of reasons that lead stakeholders to consider environmental, social and governance factors, which have to do either with strategic reason or ethical ones. However, discrepancies between different regions were observed, with the percentage of investors that do not use ESG factors, being higher in the US (24.8%) than in Europe (15.5%). Among the US investors that do not use ESG, 22% claimed that ESG information is not material to investment performance. The percentage for European investors who are not keen on implementing ESG principles was only 4%. Instead, European investors noted the lack of reliable non-financial data as an important barrier for not using ESG information. The same study also examined the way that investors use ESG data in their investment decisions. (Amel-Zadeh & Serafeim, 2018) presented all the ESG investment styles which show how stakeholders incorporate ESG in their strategies. The most common was the engagement /active ownership which expresses the shareholders' ability to change the corporate behavior. The second one was the full integration of individual stock valuation which represents the integration of ESG issues into financial analysis. Negative screening was also found important, especially as far as it concerns issues and practices that negatively contribute to financial performance. On the other hand positive screening was found to be less frequently used by the participants in the survey. More than 20% of the survey participants integrate ESG data through thematic investment and 14.2% through overlay/portfolio tilt, which is used for specific investment processes. A percentage about 11.3%, reported that ESG information is really important in order to reduce investment risk and 9.2% reported that this information is used for improving class screening (e.g., for investing in sectors with strong ESG performance).

Not only investors pay attention in companies' scores and ratings. Except for them, ESG ratings and scores are also used by the firms themselves. A survey by (Wong, Brackley, & Petroy, 2019) indicated that more than the half participants use ratings to their methodologies. Most of them were corporate respondents while the fewer were the government and academic experts. Whilst, they mention that using ESG data and integrating them into decision making need much more progress, they presented interesting survey results regarding how the ESG ratings are used. The corporate respondents integrate ESG scores into the process of decision making. Also sustainability experts use them for internal assessment and strategy development, information collection and disclosure, gap analysis and trends and lastly for stakeholders engagements. Moreover (Kiesel & Lücke, ESG in credit ratings and the impact on financial markets, 2019) found that ESG has not been engaged enough with decision making. The study also concluded that that stock returns are positively affected by the ESG integration by the firms.

However there are not much data about how companies react to ESG ratings. A study from (Clementino & Perkins, 2020) tried to investigate that matter. The study was based on Italian companies and provided indications about the positive effects if businesses improve their environmental and social performance. They wanted to explore the factors for which companies may react differently when they are rated. The study found that corporate responses depend on manager's thoughts about the business value of positively responding to ESG ratings and their viewpoint about corporate objectives and strategy.

Chapter 4 ESG rating methodologies

4.1 ESG Methodologies

ESG methodologies have to do with the way that companies integrate the environmental, social and governance aspects into their operation. While in responsible investing the important is to incorporate the ESG strategies into investment analysis.

Every ESG data provider uses different methodology for the evaluation. It is possible to find common elements but there is no common framework in ESG assessments. For that reason, one company may be evaluated with different ESG ratings from two separate raters.

There are many differences on the way ESG rating agencies collect data, the metrics they use, as well as the weights they assign to ESG factors and criteria. Moreover, every rating agency uses different rating scale. Section 3.2 presented details about the 22 most important rating agencies and the methodologies they follow.

As for the ESG providers that were studied in the present dissertation the results are the following:

1) Bloomberg ESG Data Service uses 0-100 rating scale
2) ISS uses 1st to 10th score scale with the "1" being the higher grade and 10 the lower
3) MSCI ESG Research to calculate the fund ESG Rating uses AAA to CCC scale which matches with 10-0.
4) RepRisk uses a rating scale AAA to D , with "D" being the worst
5) Sustainalytics Company ESG Reports uses scale out of 100
6) Thomson-Reuters ESG Research Data uses scores range from 0.0 to 1 which matches with grade from D- to A+
7) Refinitiv uses score range from 0 to 1 which matches with D- to A+
8) S&P Global uses scale from AAA to D
9) Fitch uses 0%-100% scale or 1-5 scale
10) ECPI uses a scale from EEE to F, with "EEE" being Very Good rate and F being Poor rate

11) EcoVadis Ratings uses a scale from 0 to 100 with 0 meaning high risk and 100 meaning high opportunity
12) FTSE Russel ESG Ratings uses a scale from 0 to 5 with 0 meaning no disclosure and 5 meaning best practice
13) Moody's Investor Services uses a scale from Aaa to C
14) Vigeo-Eiris Ratings uses rating scale from 0 to 100
15) RobecoSAM uses rating scale from 0 to 100
16) Covalence uses 0-100 rating scale
17) CSR Hub also uses different scales, from 0.0-1.0 and "+" or "-" but they attempt to use a 0 to 100 scale with 100 being the best ranking
18) CDP uses a scale from A to F. CDP also uses the following expressions:

    "Not requested" when the company was not requested to disclose by investors or its customers

    "See Another" when the company's data has been covered by its parent company's response "Not scored" when the response was not eligible to receive a score

    "Not available" when the score is private to the company and any requesting customers the response has been submitted to

    "Forthcoming" when the score has not yet been released
19) Sensefolio uses the 100 point scale
20) Corporate Knights uses the F-score
21) Morningstar uses the scale from 0 to 100
22) GRESB uses the scale from 0 to 100

In conclusion, it is obvious that every rater uses the type of rating scale that best suits to it, because there is no common way to make the evaluation yet.

4.2 Defining weights in ESG scoring methodologies and Common ESG Issues for all ESG Rating Agencies

The ESG pillars have to do with the environmental, social and governance sectors. Environmental criteria include pollution, waste, treatment of animals, water use, material emissions and everything else related with the environment. The social criteria represent the diversity, costumer privacy, health and safety, equal opportunities and similar elements. Finally, the governance factor includes the diversity in the board of directors, product governance, the investor's satisfaction and anything else which enhances the company's management quality.

In order for an agency to derive the final ESG score it must consider the metrics in which each firm pays attention and select the appropriate weights. These metrics can vary from sector to sector and there is a huge amount of such metrics. Part of that dissertation involves the identification of these metrics for the 22 main ESG rating agencies mentioned above.

The study of (Desclée, Hyman, Dynkin, & Polbennikov, 2016) found that the ESG aspects deeply differ. The environment and social elements attribute in an indirect way and they show the company's possibilities to achieve worse or better results. Contrary to that, the governance aspect expresses how well-defined the firm's corporate governance is and how satisfied its shareholders are. The majority of investors believe that governance is the most important variable to increase the financial performance but this differs across business sectors with different weights used in each of the ESG elements. This is one reason why asset managers and asset owners evaluate differently the ESG. Also the study shows the weights of every ESG metric for asset owners and asset managers. There is significant difference between these two cases. Firstly, 79% of large fixed-income asset managers believe that governance is the most important factor, followed by the environment (18%), while only 3% of the asset managers consider the social aspect as important. On the other hand, the results are different for asset owners as 57% of them consider the environment to be the most important pillar, followed by the society (23%) and governance (20%).

Moreover, from the results of the survey in the present dissertation (more details will be discussed in chapter 5) the following findings have been obtained.

In the environmental pillar, the most common issues that rating agencies take into account are biodiversity, waste, waste management, pollution, water management, emissions, climate change, energy management, greenhouse gas emissions (figure 4). Although these are the most common, usually only 5-7 of them are considered by agencies into their assessments. For the social pillar, the common criteria are about human rights policy as well as health and safety. Most of the ESG rating agencies pay attention to the social factor (figure 5). Other commonly used criteria are diversity as well as communities and training. Finally, regarding the governance pillar, the main criteria are anticompetitive practices, corruption and bribery and business ethics (figure 6). There are many more criteria which ESG agencies evaluate, but the above are the most commonly used. In combination with some other, in the present thesis it was studied how many of the agencies use the 20 most often criteria.

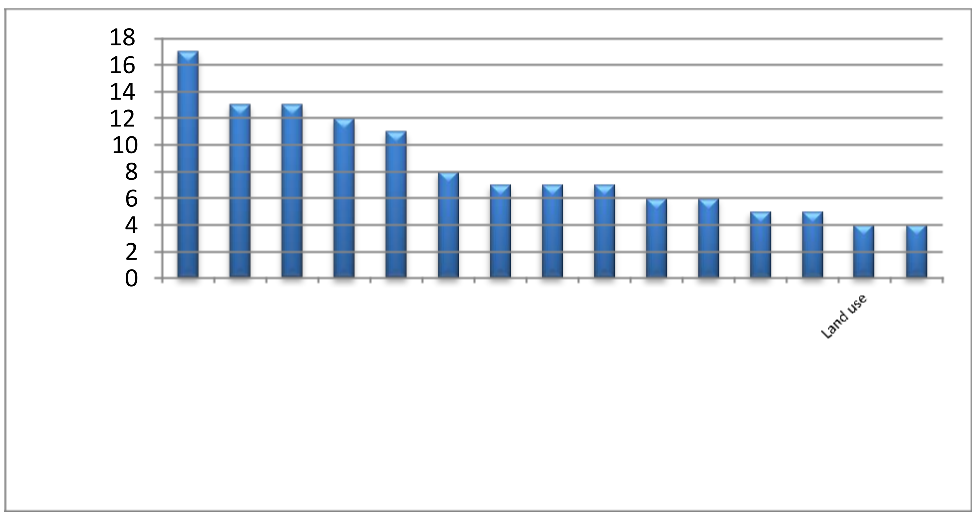

Figure 4: Environmental criteria used by ESG raters

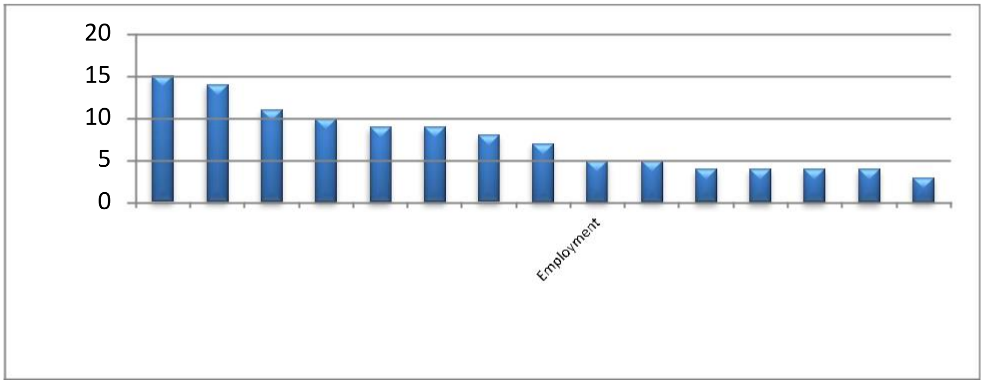

Figure 5: Social criteria used by ESG raters

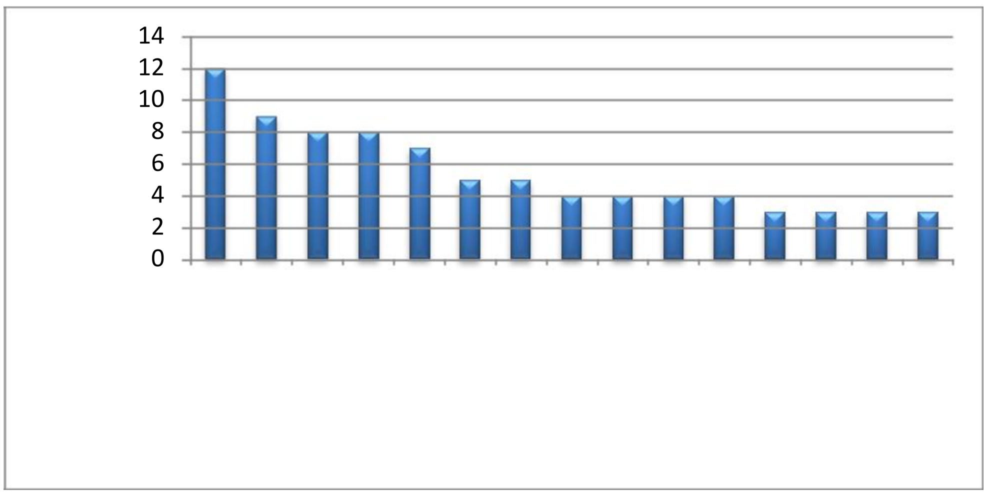

Figure 6: Governance criteria used by ESG raters

4.3 What is materiality?

During the last 20 years it has become clear that the bonds between business success and sustainability are powerful. However, there are still second thoughts about the importance of sustainability value for corporate performance.

The question that arises is how non-financial performance can be evaluated. Materiality defines the importance of each of the ESG pillars for the financial performance of a company or the performance of an investment. As it is obvious, the lack of a common framework for ESG evaluations, affects the materiality of ESG factors. ESG aspects may have positive or negative effects on revenue growth, margins, required capital, and risk.

Based on credit risk the materiality of ESG issues is inextricably linked with the financial profile of an entity, its sector, and geographical location. It is important to answer to how ESG criteria could be transformed into material information for credit risk assessment. Actually, (Principles for Responsible Investing (PRI), 2018) studied how often investors believe that ESG aspects affect credit risk. What they discovered was that as for the environment 50% of investors believe that it often has effect on credit ratings, 41% of them noted that it rarely impacts ratings, and only 8% supported that it is always important, something which is also applicable to the social aspect. Regarding the social factor, most of the investors (63%) noted that it rarely impacts credit ratings, whereas another 27% argued that its integration in credit ratings often plays important role. Finally, as for the governance factor, a significant number of investors (41%) believe that it always affects credit ratings, whereas 47% noted that it often has an impact and the remaining 12% noted that it rarely affects credit ratings. (Rogers & Serafeim, 2019) created a framework in order not only to help organisations and investors to build strong future financial performance but also to assist NGOs and policy makers to better evaluate the data. That comprises a big step to face the elusive criteria which are either material or not. Large institutional investors, for example Blackrock and Vanguard, enhanced the board of directors and senior management to completely understand their wildlings regarding corporate performance on ESG issues. A new regulation by the European Union describes the way and opportunities in investors' process, so as to promote the usefulness of material ESG factors in the investment industry. The meaning of materiality is not a theoretical one. Seeing how companies operate to the detriment of environment on employees, mainly during the last ten years, materiality of sustainable issues has gained incredibly growth and firms are becoming more sensitive in protecting social interest issues. In parallel, after noticing the need of studying the ESG factors that are material for companies a report (UNEP Finance Initiative, 2004) took place to help investors. The results regarding the criteria which exercise most financially influence were climate change, occupational and public health issues/diseases, human labor and political rights, as well as issues related to corporate trust and corporate governance.

Furthermore, it is important to distinguish through the research of (Principles for Responsible Investing (PRI), 2017) which of the ESG aspects could possibly born risk and affect an issuer's financial performance, its risk of default and stock performance. This is a difficult process due to lacking information. The report of PRI examined how activities regarding the environment and climate risk affect credit ratings, ending up that it is difficult for a company to be upgraded rather than to be downgraded, as only 2% of actions about environmental and climate factors has to do with positive outlook revised and 14% with upgrades. On the other hand, changes regarding credit ratings are mainly connected with downgrades, specially the 40% of references which has to do with negative ratings and the 34% which is relative with downgrades, include environmental and climate factors. These results are analytically referred in figure 7.

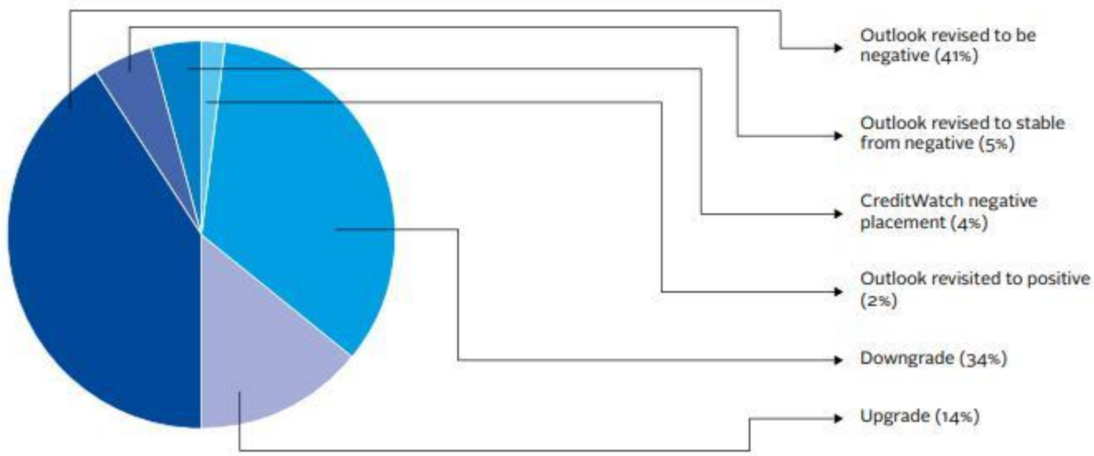

Figure 7: Rating actions related to environmental and climate risk (Source: Principles for Responsible Investing, 2017)

Moreover, figure 8 presents how often factors regarding environmental and climate references are referred in each industry. Most of the references have to do with Oil Ref. and Marketing, Regulated Utilities and Unreg. Power & Gas.

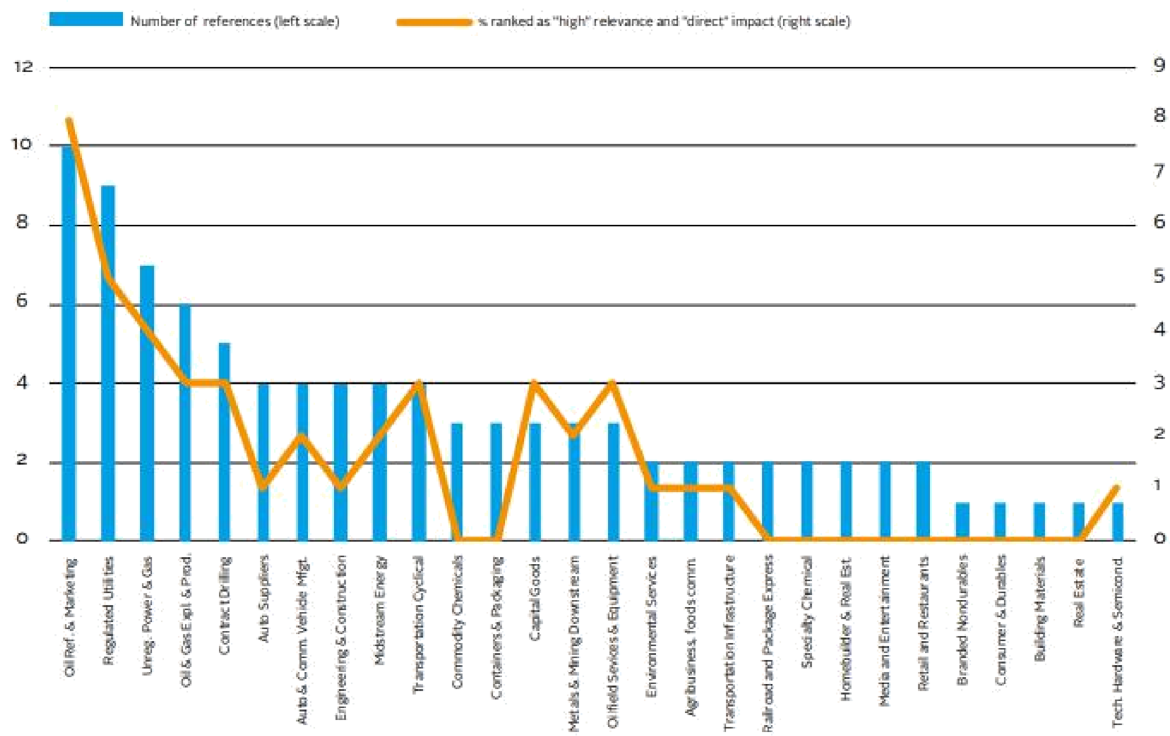

Figure 8: Number of environment and climate references in Key Credit Article Factors and their impact and relevance per industry (Source: Principles for Responsible Investing, 2017)

Another interesting study was made to investigate the topics that Sustainability Reporting must have and the transparency between stakeholders which build the foundations for sustainable development. (Global Reporting Initiative, 2014) notes that sustainability reports refer to a firm's ESG impacts. Materiality in sustainability reports checks the ability of ESG impacts to meet the needs of the present without causing harm in future generations.

But what happens with the impact of ESG materiality factors on stock performance of firms? (Heijningen, 2019) supports that it is difficult to know which ESG aspects are material for firms. Stakeholders define something as material if that factor could impinge on their decisions or if it is significant for investment performance (Amel-Zadeh & Serafeim, 2018). The end result was that materiality is important, and investors, assets managers, as well as firms must be aware of the materiality issues. It helps them to improve their economic decisions and to better predict the financial performance. At this point, it is interesting to mention that ESG materiality is different between companies and from industry to industry as for example polluted industries are more affected by material ESG performance. For example, the (Principles for Responsible Investing (PRI), 2018) report describes the impact of social factors in credit risk across the different industries. The report shows the most common environmental and climate risks and opportunities which enter into corporate ratings. Figure 9 presents that in the first six industries, where the social factors play material role, the references are more often. Sectors like commercial vehicle manufacturing, metals and mining upstream, as well as containers and packaging are not only gathering a large number of references but also a satisfactory number of material references. Three more groups of industries regarding how important the social aspect is, are following. Companies must disclose their performance and publicly offer relevant data to investors. To this end, the guide of the (Athens Stock Exchange, 2019) tried to help issuers to focus on materiality issues, to better understand their importance and achieve more transparency.

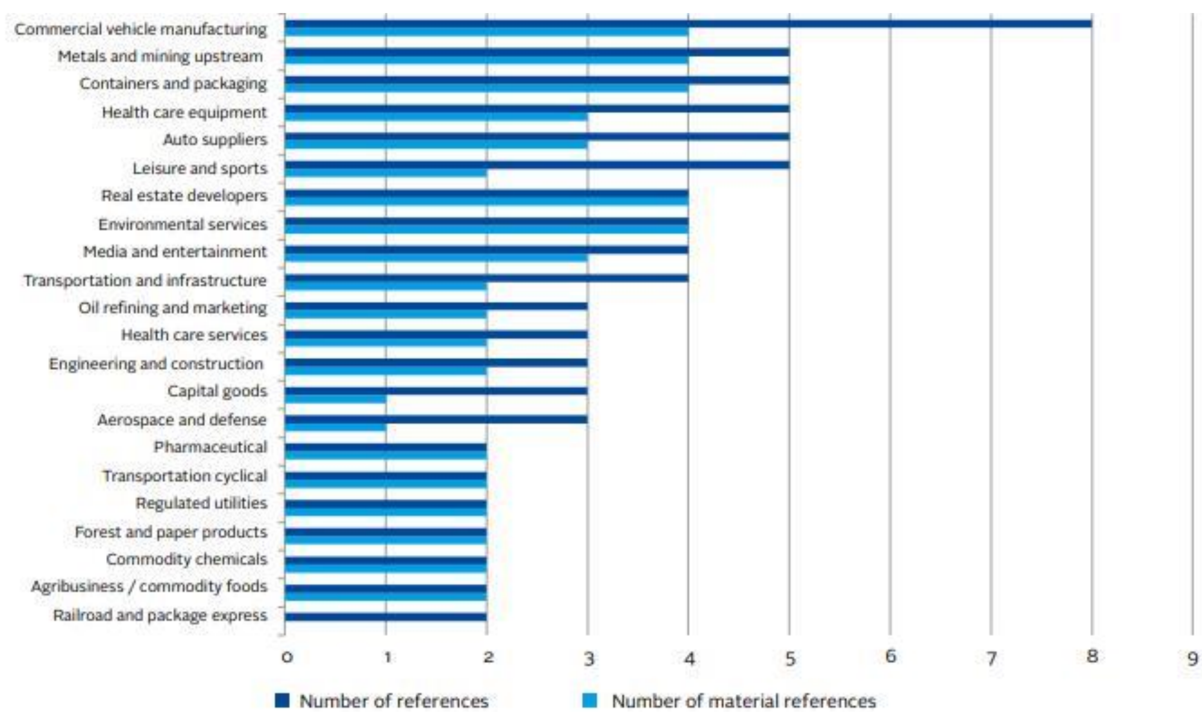

Figure 9: The relevance of social factors to credit risk also varies across industries. How environmental and climate risks and opportunities factor into corporate ratings (Source: Principles for Responsible Investing, 2018)

4.4 Measuring, estimating, and validating the significance and materiality of ESG metrics

Multiple studies have been made regarding ESG and many more fields investigate its effectiveness in improving the financial performance of firms. ESG scoring has similarities with credit analysis, so bonds with high ESG scores are more likely to have a high credit quality and therefore trade at a lower yield spread to government bonds. To explore if ESG is fairly considered as the correct way to evaluate firms' performance, (Desclée, Hyman, Dynkin, & Polbennikov, 2016) examined a variety of bonds, divided according their ESG scores. The study was based on bonds with scores from MSCI and Sustainalytics. The results of the study showed that during the period 2009 – 2016 , the average spread of bonds with low ESG scores was 172bp compared to 134bp for bonds with high ESG scores. Moreover, the study found significant differences in the credit ratings of the bonds with respect to the social dimension of ESG, whereas not significant differences were with respect to the environmental and governance aspects. Continuing the study on the contribution of ESG ratings in corporate bond performance, the same analysis makes a reference to another study, of (Friede, Busch , & Bassen, 2015) who indicated ESG as a broad spectrum. It is difficult to conclude in a result but as they collected data from many published studies they finally talked about the positive link between CSR and corporate financial performance. However, less than 10% of these studies present a negative relation. Except for the credit ratings of corporate bonds, the same study also examined the impact of ESG performance on corporate bond portfolios. The comparison of high ESG versus low ESG portfolios showed that the latter achieved higher returns. Among the ESG pillars, governance was the most material factor for achieving high performance while social was the least important one.

Another research, (Kiesel & Lücke, ESG in credit ratings and the impact on financial markets, 2019) also analysed how ESG contributes towards creating the long-term value for investors and companies. The literature review in that study, shows that the most common arguments in existing research are that ESG eliminates a company's future risk, increases its opportunities, leads to high returns, and helps in mitigating the cost of capital. Moreover, almost all studies show a positive relation between corporate governance and credit ratings. More specifically, (Bhojraj & Sengupta, 2003) argued that good corporate governance reduces the issue of data asymmetries. This is based on a higher transparency and disclosures by the firm's management. Crucial role to that plays that businesses are led to publish transparent information. (Weber, Scholz, & Michalik, 2010) studied the effect of ESG and social risks on sustainability and explained that ESG criteria are useful to estimate the financial performance of a company. Others, as for example (Desclée, Hyman, Dynkin, & Polbennikov, 2016) supported the positive link between ESG scores and credit ratings and also found that environmental issues are the most important in ratings. The relation between materiality and ESG has extensively been studied and (Hörter, 2018) showed that ESG risks are material for the ratings.

Another study, (Henisz & McGlinch, 2019) in the area of ESG and credit risk took place to investigate the materiality of ESG criteria from investors' and creditors' point of view and its effects on the cost of capital. Using data from Germany, they noted that credit losses were occurred due to environmental risks and banks which based their risk loan assessments on ESG criteria, ended up in reducing the loan losses. It is important to mention the finding that good ESG ratings lead companies to have lower loan and credit default swap spreads. Although there is negative relation between measures of ESG performance and other measures regarding the cost of capital, there are still not specified those material risks which are connected with the weak ESG performance and are linked with the credit risk. However, an interesting issue examined in the report of (UNEP Finance Initiative, 2004) involved the significance of ESG for equity pricing and the financial materiality of ESG criteria. The report focused on criteria such as climate change, occupational and public issues and diseases, human labor and political rights, issues of corporate trust and corporate governance. The results showed that ESG affects long-term investors' decisions

Corporate financial investors pay attention to three basic dimensions of social responsibility which are mainly the firm's three different targets in their SR policy and they linked them with financial performance. The first one has to do with the direct non-financial stakeholders, the second one with the indirect stakeholders and the last one with the financial stakeholders. (Girerd-Potin, Jimenez-Garcès, & Louvet, 2012) examined the link between the dimensions and their effect on stock returns. The results showed that investors want additional risk premium when they decide to invest in non-sustainable stocks as the cost of equity is lower for sustainable organisations which include more risks. The issue about whether all dimensions influence risk premium has not been answered. Financial investors first focused their SR concern on the way firms manage their relationship with direct stakeholders. Another research issue is how the ESG risk factors affect sovereign bond portfolios and how the material ESG factors interlace with developing countries. (Hörter, 2018) noted that investors mainly integrate ESG in the credit analysis of corporate bonds, but ESG aspects become involved in sovereign bonds which concerns a large part of global financial assets. Eventually, investors through their strategy enhance the credit risk analysis of sovereign bond issuers, they help decrease risk, and take responsible investment decisions. This study ends up in three results. The first one is that country credit ratings are not completely engaged with sovereign issuers' ESG risk aspects. The second one is that higher ESG risks are linked with lower sovereign CDS spread. The last one has to do with poor sovereign governance which leads to social risks.

In the paper of (Khan, Serafeim, & Yoon , 2015) it is also mentioned that firms with strong ESG performance but in no material criteria do not have better financial results in comparison with firms with poor performance. But companies which perform well on material issues, received high credit ratings and have good stock performance. Finally, many companies recognise the importance of sustainability in their strategy and they are trying to publish useful ESG information. Simultaneously firms are focusing on material ESG criteria to optimise their results. So, both firms and investors should be careful to integrate material issues in their methodologies.

4.5 ESG/Sustainability Linked Loans

Sustainability Linked Loans (SLL) is a kind of loans whose interest rate is linked to the performance of the borrower on ESG criteria. Therefore, borrowers with a stronger ESG character and rating have access to finance with lower cost, compared to borrowers with poor ESG performance. Banks also benefit from granting SLL, as they can expand their loan portfolios and they can improve their sustainability credentials. SLLs are a new area which has gained a lot of interest during the last few years. Specially, in 2019 it gained great recognition in Europe. It is important to make a reference in the profits that SLL bring about. According to Reuters, the global value of SLL loans in 2019 was $71.3 billion compared to of $32 billion in 2018.

Through principles which came out in May 2020 from the Loan Market Association, borrowers must follow a guideline regarding the essential characteristics of SLL which also act as a motivation to follow the ESG factors (Loan Market Association, 2020). The introduction of these principles defines a path for borrowers to follow in order to have cheaper access to finance. Of course, in order for the SLL market to expand, transparency is important. To this end, the information provided by ESG rating agencies is crucial for both borrowers and lenders.

4.6 ESG Ratings and International Financial Institutions

An international financial institution (IFI)[9] is a financial institution which has been created from more than one country. In most cases, they are owned by national governments of the countries they serve. Well-known IFIs have been established from multiple nations. While only the minority of them has been created from two countries, all of their actions interact with the worldwide needs and they actually base their operation on the international law. Most of these institutions were established after the World War II, when Europe's reconstruction was mandatory. Their integration in social and economic development is the key tool for developed and developing countries to build a stable strategy closer to sustainability principles. They aim at eliminating global poverty, improving living conditions and life standards. They also connect different regions and offer their services with a view to manage the global financial system. IFIs have a consulting role about implementing development projects, funding them and monitoring them during their implementation.

A special type of an IFI involves Multilateral Development Banks (MDBs). Their actions are related with providing financing and professional advices in organisations, companies and poor countries to promote their development. They assume projects in the form of long-term loans.

IFIs (including MDBs) have an important role towards achieving sustainable development and meeting Sustainable Development Goals (SDGs)[10]. Before analysing the most important MDBs, it is important to say that their function also first started after the World War II when the contribution of banks was vital for the disaster recovery. Since then, MDBs have supported the economic development of many nations and they have succeeded in controlling trillions of dollars in assets. They target to lay the foundation in education, to face environmental issues and generally to apply and drive forward to sustainability.

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[9] https://en.wikipedia.org/wiki/International_financial_institutions

[10] https://www.undp.org/content/undp/en/home/partners/international_financialinstitutions.html

The main MDBs are referred below:

- **World Bank:** The World Bank, which was founded in 1944, in Washington (USA), is one of the major MDBs that seek ways to help developing countries in all around the world that suffer from poverty and economic issues. The World Bank has 189 member states, while the largest borrowers are China, India and Indonesia (World Bank, 2017). Their employees are from more than 170 countries and they have established offices in 130 locations. Their subscribed capital is $268.9 billion. The World Bank is composed by five institutions which provide advisory services, financing and technical advocacy. The organisation has already recognised the importance of ESG factors, which have been integrated in its recommendations and services provided to client countries. Actually, one of the World Bank's primary goals is to promote sustainable growth and development in order to face global poverty. Thus, the World Bank integrates activities based on sustainability, such as paying attention to equal treatment independent of the gender, building strong health systems in affected areas and implementing actions which lead to support the 2030 development agenda, achieving the sustainable development goals and helping each country to increase its sustainable performance. World Bank provides annually reports on its activities and policies and in that way helps in the transparent information.

- **European Investment Bank:** The European Investment Bank (EIB) was founded in 1958, in Luxembourg, and it is the world's largest multilateral leader and provider of climate finance. The EIB works with other EU institutions and they assume projects in more than 160 countries worldwide. Its structure is composed of stakeholders who are the 27 Member States[11] of the EU, while its funding capacity comes to €200 billion, while having personnel of more than 3,450 employees. EIB has taken projects which are closely connected to sustainable actions and considers ESG factors to achieve its goals. Activities which do not follow ESG principles cannot be assumed by the EIB. To enhance its actions, the EIB evaluates both financial and non-financial projects, by considering all the resources which were used. The EIB publishes various sustainability reports, environmental statements, and carbon footprint reports, which provide details on their actions towards promoting sustainability[12].

11 https://rb.gy/vqes6y

12 https://cutt.ly/LgqlJyx

- **Islamic Development Bank:** The Islamic Development Bank (IsDB) was established in 1973 in Saudi Arabia, and is focused on Islamic finance. They have 57 member countries and offices in 9 countries, while having about 500-1,000 employees. The IsDB is completely engaged with the goals referred in the 2030 Agenda and by extension with the Sustainable Development Goals (SDGs). The IsDB aims to improve social welfare in all social and environmental aspects. More specifically, it adapts the needs of each country and its main goal is to assist in implementing sustainability policies. The IsDB is firmly committed with eliminating poverty, diversity, inequality and mitigating climate change[13]. To this end, IsDB takes actions to promote science, technology, innovations, infrastructure, education, and health. Finally, IsDB assumes actions about humanitarian relief. It is also important to mention the participation of the IsDB in green projects. In 2019, it declared the Sustainable Finance Framework to launch the first green bond (Islamic Development Bank, 2019).[14]

- **Asian Development Bank:** The Asian Development Bank (ADB) is a regional development bank founded in 1966, in Philippines. That bank has 68 member countries, including 49 from Asia and the Pacific, as well as 19 other members. These countries constitute the ADB's shareholders, while 40 countries are borrowing shareholders (e.g., China, India, Indonesia, Malaysia, Philippines, Pakistan, Thailand, and Bangladesh). ADB's total subscribed capital is 100,000 (Asian Development Bank, 2018) and has approximately 1,000-5,000 employees from 60 different countries. The organisation has a social and economic development character, aiming at eliminating poverty in Asia and the Pacific. The ADB is closely committed with actions related to economic and environmentally sustainable growth. In that direction, the ADB evaluates how ESG performance contributes to sovereign funding costs, and they recognises that it is more and more common for investors to integrate ESG criteria in their invest decisions. ADB's operational priorities include the reduction of poverty and gender equality, the mitigation of climate change, the creation of livable cities, as well as food protection, corporate governance and the strengthening of regional cooperation.

- **European Bank for Reconstruction and Development:** The European Bank for Reconstruction and Development (EBRD) was founded in 1991, in London, UK. EBRD is owned by 69 countries from five continents and also by the European Union and the EIB. The bank's their authorised capital is €30 billion, while is personnel is approximately 2,700 employees. The bank was established to support development with emphasis on economies from the Eastern Block. The EBRD supports sustainable

13 https://www.isdb.org/what-we-do/sustainable-development-goals

14 https://www.isdb.org/news/isdb-announces-plans-to-launch-first-green-bond

development and it has an active role in climate finance and in the area of green economy. The EBRD publishes an annual Sustainability Statement and a Sustainability Report[15].

- **The Development Bank of Latin America:** The Development Bank of Latin America (CAF) is a multilateral bank which was established in 1968, in Venezuela, it is owned by 19 countries (Development Bank of Latin America, 2020), 14 private banks and its size is 500-1,000 employees. Moreover, in 2019 CAF's total assets came to $ 42.2 billion.[16] The Bank aims at financing projects in Latin America, promoting sustainable growth and corporation in the region. In 2019 CAF also published the Green Bond Framework (Sustainalytics, 2019)[17], in which the CAF Group is based in order to implement its sustainability actions.

- **Inter-American Development Bank Group:** The Inter-American Development Bank Group (IDB) was founded in 1959 in Washington-USA. It consists of 48 member countries and employs almost 1,900 staff. IDB's capital reaches $105 billion, while the capital from non-borrowing members is $101 billion. It is known as the largest source of development financing for Latin America and the Caribbean and its main concern is to improve living conditions, to ensure equal rights for all, and to eliminate poverty. The IDB has adopted sustainability for all of its actions and policies[18].

- **African Development Bank:** The African Development Bank (AfDB) is a leading multilateral development finance institution, which was established in 1964 in Abidjan (Côte d'Ivoire). It is owned by 81 member countries which also constitute its shareholders and has approximately 2,700 employees. The largest shareholder of AfDB is Nigeria with a participation share of 9%. The bank's capital is $208 billion. It is made up from the African Development Bank, the African Development Fund and the Nigeria Trust Fund. The goal of the AfDB is to eliminate poverty and to improve living conditions in Africa. In order to support its goal of sustainable development and eliminating negative social and environmental impacts, the AfDB announced a Ten Year Strategy (2013-2022) which is still under implementation.

- **New Development Bank:** The New Development Bank (NDB) was founded in 2014, in Shanghai, China and its size is 50-200 employees. NDB's initial authorised capital is $50 billion. In contrast to the other organisations described above, participation to the NDB is open to all countries. The bank

15 https://www.ebrd.com/work-with-us/sri/funding.html

16 https://www.caf.com/en/investors/caf-in-figures

17 https://www.caf.com/media/2244126/caf-green-bond-second-party-opinion.pdf

18 https://www.iadb.org/en/about-us/sustainability-and-safeguards

aims at supporting and financing projects in the public and private sector. Projects with a sustainable character are preferred, as they can increase the benefits for the society and the environment. The NDB also implements actions related to renewable energy sources, gender equality, and the cooperation with other multilateral financial institutions and agencies.[19] The organisation's role for sustainable development in analysed in its Environmental and Social Framework (New Development Bank, 2016).

- **Asian Infrastructure Investment Bank:** The Asian Infrastructure Investment Bank (AIIB) was established in 2015, in Beijing, China. The AIIB has 103 approved members [20] from all over the world and it employs 200-500 people. Their starting capital was US$ 100 billion. The mission of AIIB is to increase financial and non-financial outcomes in Asia through supporting the infrastructure development in the continent. The AIIB is interested in sustainable investing by supporting actions related to climate change mitigation, environmental protection, while also promoting the principles of corporate governance. The ESG Framework (Asian Infrastructure Investment Bank, 2019) of AIIB presents the way ESG factors are related to its operation.

4.7 The future of ESG ratings

Despite the progress made up to date on ESG ratings, the area is still evolving and future developments are expected to be rapid. As (Hill, 2020) noted, it is expected that more and more companies will be engaged with ESG and will also publish corporate responsibility reports. Simultaneously as the issue of the lack of transparent information has been so intensive and the need for original data increases, the quality of these reports is expected to improve. The improvement of ESG data will facilitate the better understanding of the impact that ESG has on firms and the society. With more ESG data net analytical technologies could be used (e.g., machine learning), for descriptive, predictive, and prescriptive purposes.

Moreover the continuous usage of ESG information will make investors to incorporate sustainability reporting in their function as their main strategy. At the same time, the role of third parties for data provision and business analytics services in EGS is expected to grow (Donnelley Financial

19 https://www.ndb.int/about-us/strategy/environmental-social-sustainability/

20 https://www.aiib.org/en/about-aiib/governance/members-of-bank/index.html

Solutions,Governance & Accountability Institute,SimpleLogic Inc., 2018). (Wong, Brackley, & Petroy, 2019) also note that the future of ESG is characterised by greater consistency through rating methodologies and by improvement of disclosure methodologies. It is important to make the rating process easier for companies, which means that through data and systemic conditions transparency it will be much easier to invest in worthy initial research of ESG information. Finally, some investors would like to set the analysis in more qualitative base rather than quantitative.

Chapter 5 Questionnaire Analysis

This chapter section analyses the survey that was conducted in the context of the present thesis for the assessment of the importance of ESG factors in banking, finance, insurance, and investment.

5.1 Survey design

The survey was based on an electronic questionnaire distributed to a wide range of organisations (banks, ESG raters, insurance companies, etc.) in Greece and abroad, taken from the database of Global Sustain Group a leading international consulting company specialized in ESG Research, Modeling and Advisory (www.globalsustaingroup.com). In total 21 responses were obtained, including 9 from finance companies, 7 from investment companies, 3 from banks, 2 from insurance companies, and 2 from consultancy firms. Almost half of the answers, actually 11, came from Greek companies and the rest of them from foreign companies. The outcomes were used to better understand the integration of ESG into the organisations and to estimate the relative importance that these organisations assign to the most common ESG criteria. These criteria were collected through detailed research seeking information through rating agencies' reports. The tables below show these criteria.

Table 4: Environmental criteria

E1	Greenhouse Gases
E2	Waste Management
E3	Water
E4	Biodiversity, Biocapacity and Ecosystem Quality
E5	Environmental Strategy
E6	Environmental Reporting and Transparency
E7	Operational Eco-efficiency in Facilities
E8	Climate Strategy/Climate Change
E9	Energy
E10	Materials Management
E11	Renewable (natural) Resources Management
E12	Non Renewable (natural) Resources Management
E13	Air Quality
E14	Environmental Legislation Compliance
E15	Management of Environmental Impacts from the Use and Disposal of Products/Services
E16	Packaging Material and Waste
E17	Risk Management & Environmental Resilience, Impact on Organisation
E18	Product Safety
E19	Supply Chain
E20	Pollution Prevention and Control

Table 5: Social criteria

S1	Employment
S2	Diversity and Equal Opportunities
S3	Child and Compulsory Labour
S4	Human Rights
S5	Non-Discrimination
S6	Local Communities
S7	Product Responsibility
S8	Responsible Marketing and Communication
S9	Health, Safety and Wellbeing
S10	Training and Development
S11	Social Responsibility
S12	Exposure and Resilience to Social Issues
S13	Corporate Affairs
S14	Relations with Employees
S15	Responsibility to Customers
S16	Responsible Supply Chain Management
S17	Responsible Pricing
S18	Labor Practices
G19	Freedom of Association and Collective Bargaining

Table 6: Governance criteria

G1	Board Independence
G2	Board Diversity
G3	Corruption and Bribery
G4	Transparency and Reporting
G5	Purpose, Values, Business Ethics & Integrity
G6	Codes of Conduct, Policies & Compliance
G7	Risk Management
G8	Anti-competitive Practices
G9	Executive Compensation
G10	Board Size
G11	Rights and Duties of Shareholders
G12	Shareholders Engagement
G13	Audit Practices, Internal Control
G14	Strategy Implementation, Operational Execution, Leadership and Management
G15	CSR Strategy
G16	GDPR and Data Privacy

5.2 Descriptive analysis of results

Firstly, the questionnaire contains some introductory questions about the respondent's organisation (questions 1-8, as seen in Appendix 2). Figure 10 presents information about the respondents' departments within their organisation (Question 11). It is evident that most of the respondents work in departments that are concerned about the social, environmental, governance, risk management, and reporting issues. Moreover, as figure 11 indicates, 73% of the respondents noted that they assess the materiality of ESG issues through a combination of analytical statistical models, expert judgment from market participants, benchmarking, and also from similar reviews (Question 14). Another important issue is the actions regarding the confirmation of the accuracy of ESG ratings. Almost the 60% of the responders turn to external benchmarking (figure 12, Question 16) while for checking the credibility of the data they receive, they mainly turn to sustainability/ESG reports (figure 13, Question 17). Figure 14 distinguishes the main problems the organisations face during ESG assessments, which are the lack of relatively information and common ESG criteria for evaluation (Question 20). Thus this study pays more attention to the criteria assessment.

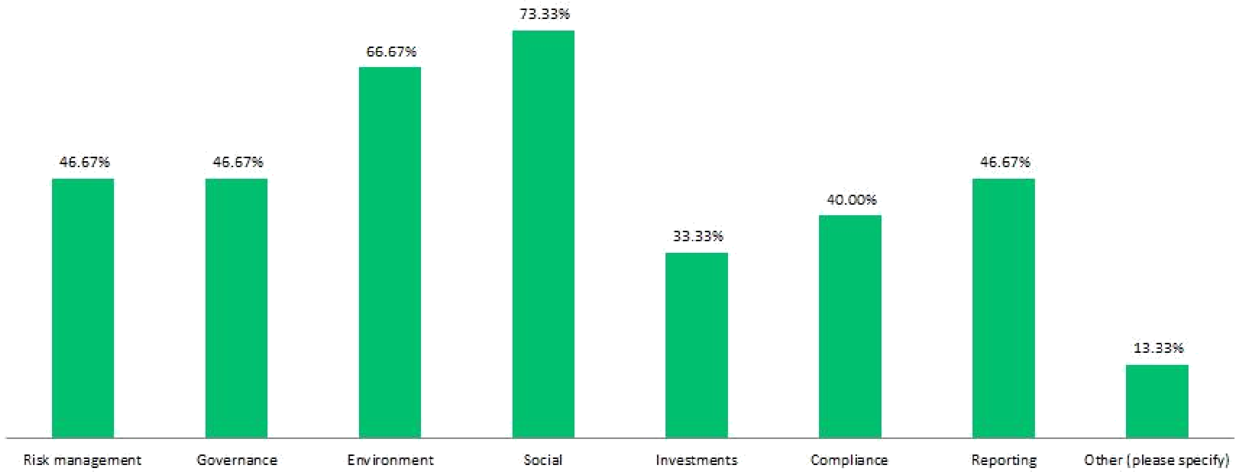


Figure 10: The respondents' department within their organisations (frequencies)

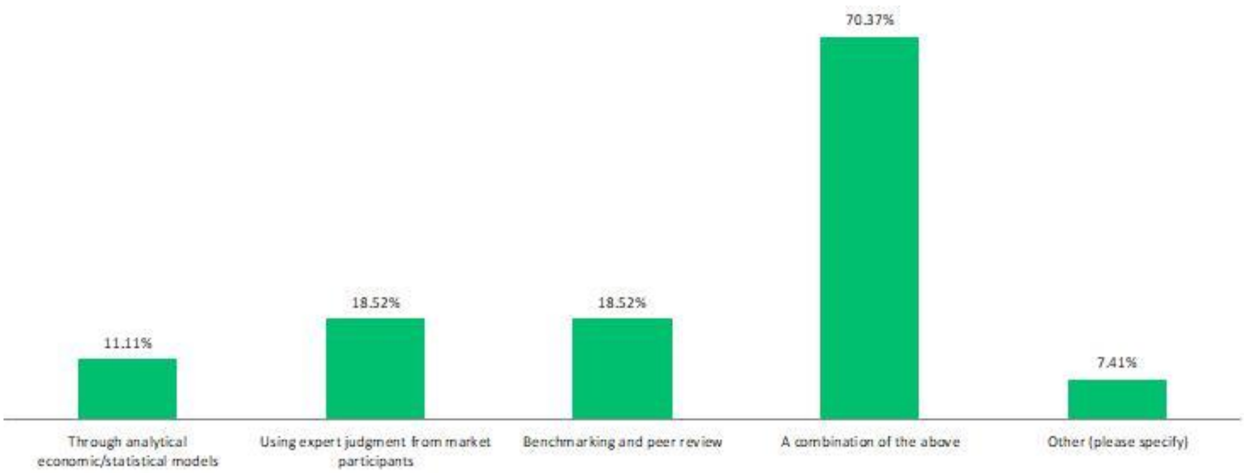


Figure 11: How does your organisation define the importance (materiality) of the ESG issues?

Finally, considering the discrepancies regarding the material criteria, it was studied how significant each ESG pillar is, by assigning a numerical rating, ranging from 1 to 3, with 1 corresponding to the least important factors. The final answers (figure 15, Question 24) show that companies account the environmental and social factor just as important with an average rating of 2.44 (out of 3), while the governance aspect is a bit more vital for them, with a rating of 2.52.

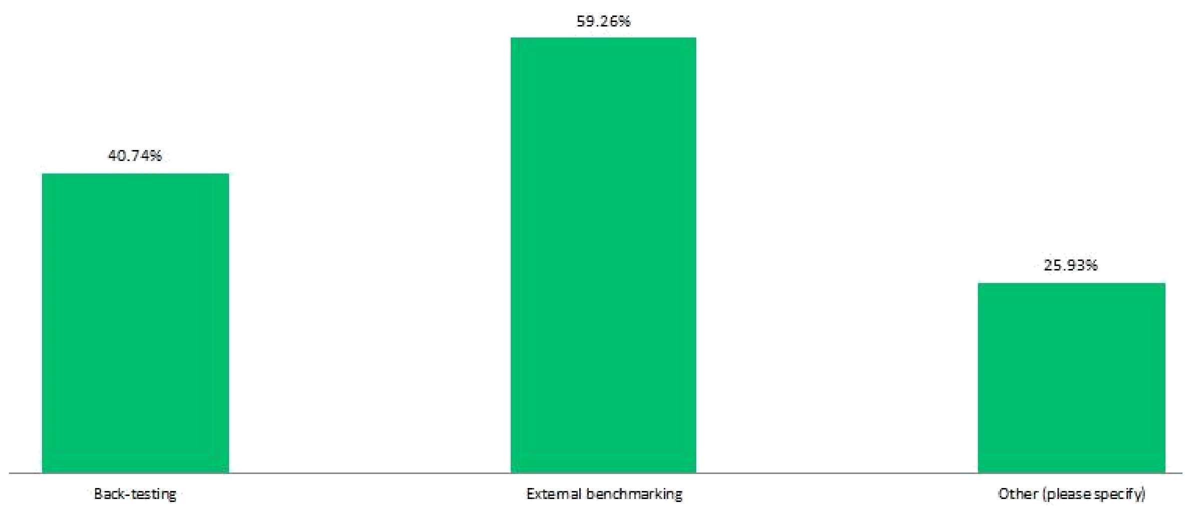


Figure 12: What procedures does your organisation follow for validating the accuracy of each ESG assessment/score/ratings ?

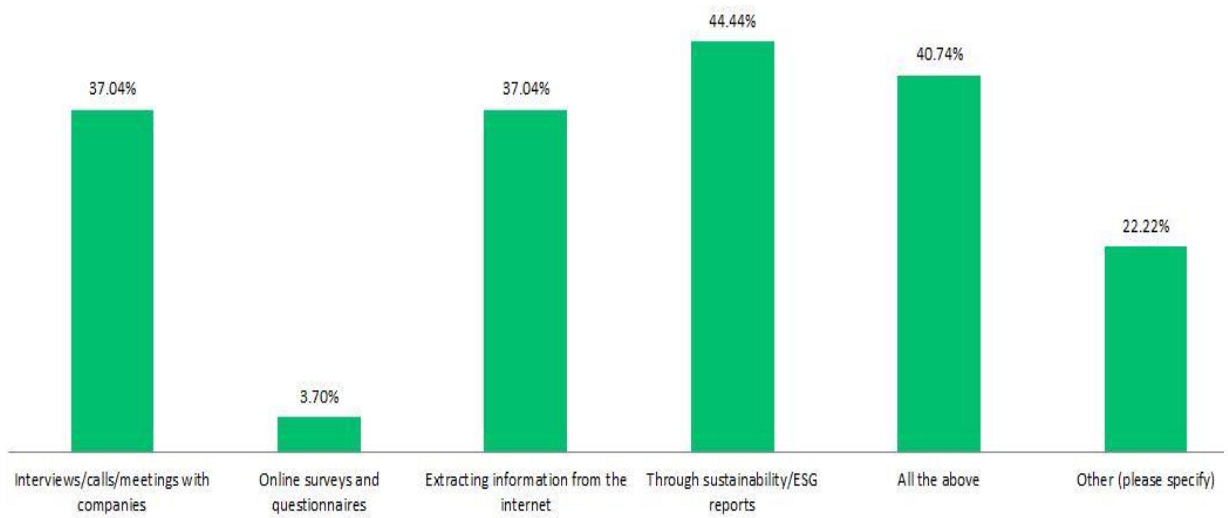


Figure 13: How do you check the credibility of the information you receive from the companies under evaluation?

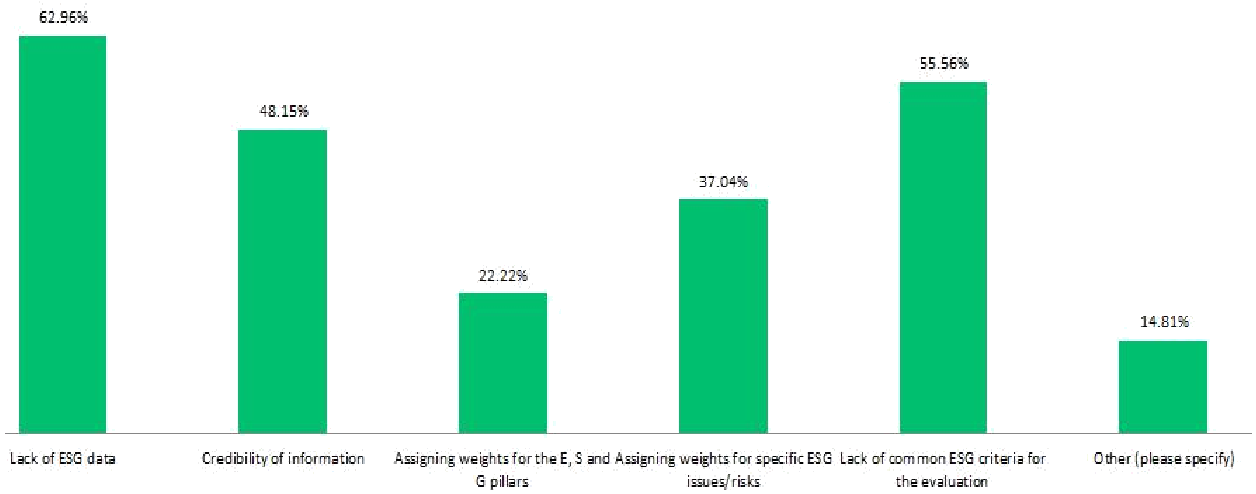


Figure 14: What are the most significant challenges you face when deriving ESG assessments/scores/ratings?

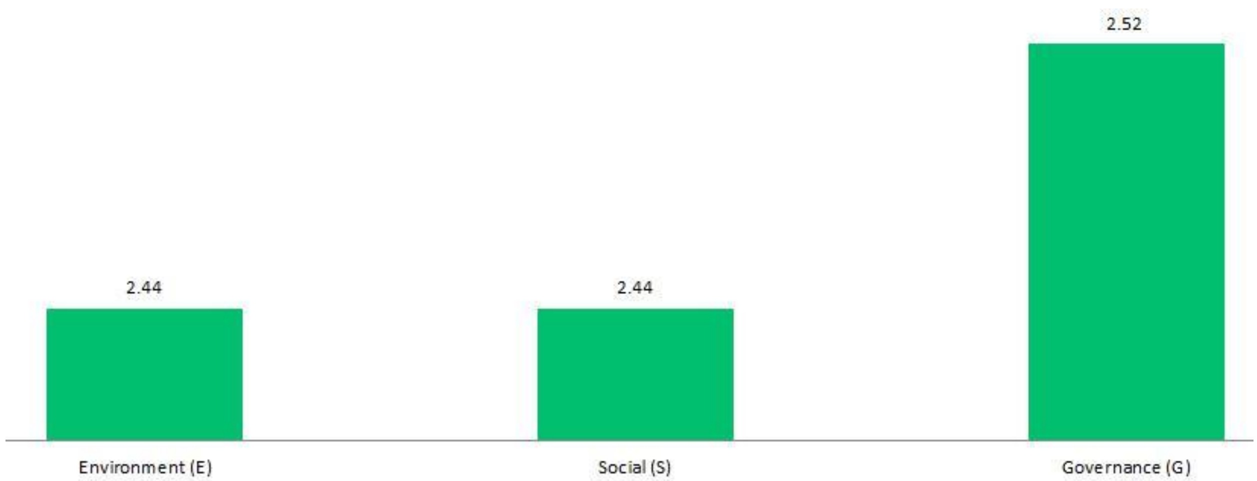


Figure 15: The average importance of ESG pillars by taking into account organisation's ESG activity and industry/sector.

After the collection of the most important criteria for every ESG pillar, organisations rated every criterion, each time separately for the environment, social and governance factor, on a scale from 1 to 10, with 1 indicating the least important criteria. Their ratings were based on how important these criteria are regarding the organisations' operation. Firstly, as for the environmental issues (Table 7), the results show that the organisations pay more attention to environmental legislation compliance and environmental strategy. It is observed that all the criteria have as a rating almost at least 5 (out of 10), which means that all criteria are at least important.

Table 7: Importance of environmental issues

Environmental issues	Weight
Environmental Legislation Compliance	6.37
Environmental Strategy (policy, management system, governance, targets & KPIs)	6.11
Risk Management & Environmental Resilience, Impact on Organisation	5.96
Environmental Reporting and Transparency	5.81
Energy (efficiency, management, measurment, access)	5.74
Greenhouse Gases	5.44
Climate Strategy/Climate Change	5.41
Waste Management (solid & liquid)	5.30
Pollution Prevention and Control	5.15
Management of Env. Impacts from the Use and Disposal of Products/Services	5.07
Water (use, discharged, conservation, management, security, risk and impact)	5.00
Operational Eco-efficiency in Facilities	5.00
Product Safety	4.93
Renewable (natural) Resources Management	4.89
Air Quality	4.81
Supply Chain (impact, supplier environmental assessment)	4.74
Packaging Material and Waste	4.59
Non Renewable (natural) Resources Management	4.33
Materials Management (hazardous & non hazardous)	4.30
Biodiversity, Biocapacity and Ecosystem Quality	4.19

As for the social issues (Table 8), non-discrimination, employment, responsibility to costumers and social responsibility have the higher importance ratings. Finally, on the governance pillar (Table 9), corruption and bribery, transparency and reporting, as well as risk management are the most popular elements. (For more details regarding the questionnaire see Appendix A).

Table 8: Importance of social issues

Social issues	Weight
Non-Discrimination	7.67
Employment	7.59
Responsibility to Customers	7.52
Social Responsibility	7.41
Human Rights	7.37
Relations with Employees	7.37
Health, Safety and Wellbeing	7.26
Diversity and Equal Opportunities	7.22
Training and Development	7.00
Exposure and Resilience to Social Issues	6.85
Labor Practices	6.81
Local Communities	6.33
Responsible Pricing	6.33
Corporate Affairs (external grievance mechanism)	6.07
Responsible Supply Chain Management	5.74
Responsible Marketing and Communication	5.59
Child and Compulsory Labour	5.48
Product Responsibility	5.22
Freedom of Association and Collective Bergaining	5.19

Table 9: Importance of governance issues

Governance issues	Weight
Corruption and Bribery (extortion, money laundering, fraud)	8.38
Transparency and Reporting	8.08
Risk Management	8.04
Codes of Conduct, Policies & Compliance	7.96
Strategy Implementation, Operational Execution, Leadership and Management	7.96
Board Independence	7.92
CSR Strategy	7.92
Executive Compensation	7.77
Purpose, Values, Business Ethics & Integrity	7.62
Audit Practices, Internal Control	7.58
Rights and Duties of Shareholders	7.54
Anti-competitive Practices	7.46
GDPR and Data Privacy	7.46
Shareholders Engagement	7.35
Board Diversity (age, expertise, other)	7.23
Board Size	6.35

5.3 Estimation of the relative importance of the ESG pillars and criteria

Although the above descriptive statistics provide some first indications about the relative importance of the ESG pillars and the corresponding criteria, a more detailed analysis was conducted to derive more reliable and robust estimates. To this end, the Borda rule was used to aggregate the opinions of the respondents (Emerson, 2013). According to the Borda rule, each respondent provides a ranking of a set of items (i.e., the ESG pillars or the criteria in each pillar), from the most important to the least important one. Then, for each item the number of times that it ranked in every position in the ranking (1^{st}, 2^{nd}, etc.) is counted. These frequencies are then weighted by rating points, defined in reverse order compared to the ranking position of the items. The sum of the rating points weighted by their frequencies defined the Borda count for each item. In this study, the Borda count is used as a proxy of the relative importance of the ESG pillars and criteria, such that higher the Borda count indicates higher importance. Moreover, in order to have a common importance scale across all pillars, the Borda counts are normalised by their total, so that the derived importance estimates sum up to 1.

However, to the small number of available responses raises some issues regarding the validity and robustness of the derived importance estimates. To overcome this limitation, the bootstrap resampling procedure was employed (Efron & Tibshirani, 1993). The bootstrap is a sampling procedure for making statistical inferences. The process is based on creating multiple random samples by sampling (with replacement) from an original data set. Each bootstrap sample has the same number of observations as the original data set. The statistic of interest is calculated for each one of the bootstrap samples and the final estimates are derived from the measurements of all bootstrap runs. For the purposes of this study, the analysis was based on 10000 random bootstrap samples, constructed by sampling (with replacement) from the initial set of the 21 respondents. Each bootstrap sample also has 21 sets of responses, not necessarily corresponding to unique respondents (i.e., a bootstrap sample may have repetitions of the same respondent, while excluding other respondents). The Borda aggregation procedure was applied to each bootstrap sample to derive the corresponding importance estimates from that sample, and the final results were obtained by averaging all the estimates from the 10000 replications.

The above described procedure was applied separately for the three ESG pillars, and then repeated for the criteria in each pillar (i.e., four times, overall). Regarding the main pillars, the most important factor is governance with an average weight of 33.99%, closely followed by the environmental and social factors whose mean weights are 33.02% and 32.99%, respectively. Figure 16 presents the weight distribution for all ESG factors, across the 10000 bootstrap replications, whereas Figure 17 presents the corresponding box plots. It is evident that the weights of the governance and the social pillars present lower variability compared to the environmental dimension. The 95% confidence intervals are [30.16%, 35.91%] for the environmental pillar, [31.03%, 34.94%] for the social pillar, and [31.94%, 36.05%] for governance. It is also interesting to note that all three weight distributions are approximately normal and symmetric around the means. As for the environmental weight, in 25% of the 10000 scenarios that were examined, it was lower than 32.03% while in the 50% of the bootstrap replication it was lower than 33.02% and in 75% of the cases was lower than 34.01%. The corresponding 1st, 2nd, and 3rd quartiles for the weight of the social pillar are 32.34%, 32.99%, and 33.66%, respectively. Finally, for the governance dimension, the quartiles of the weight distribution are 33.33% (1st quartile), 33.98% (2nd quartile; i.e., the median), and 34.72% (3rd quartile).

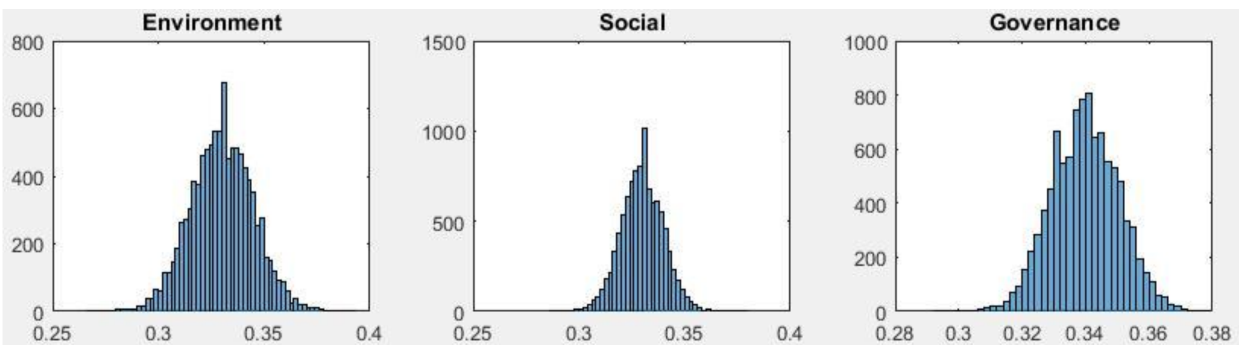


Figure 16: Importance of the ESG pillars taking account the ESG activity and industry/sector

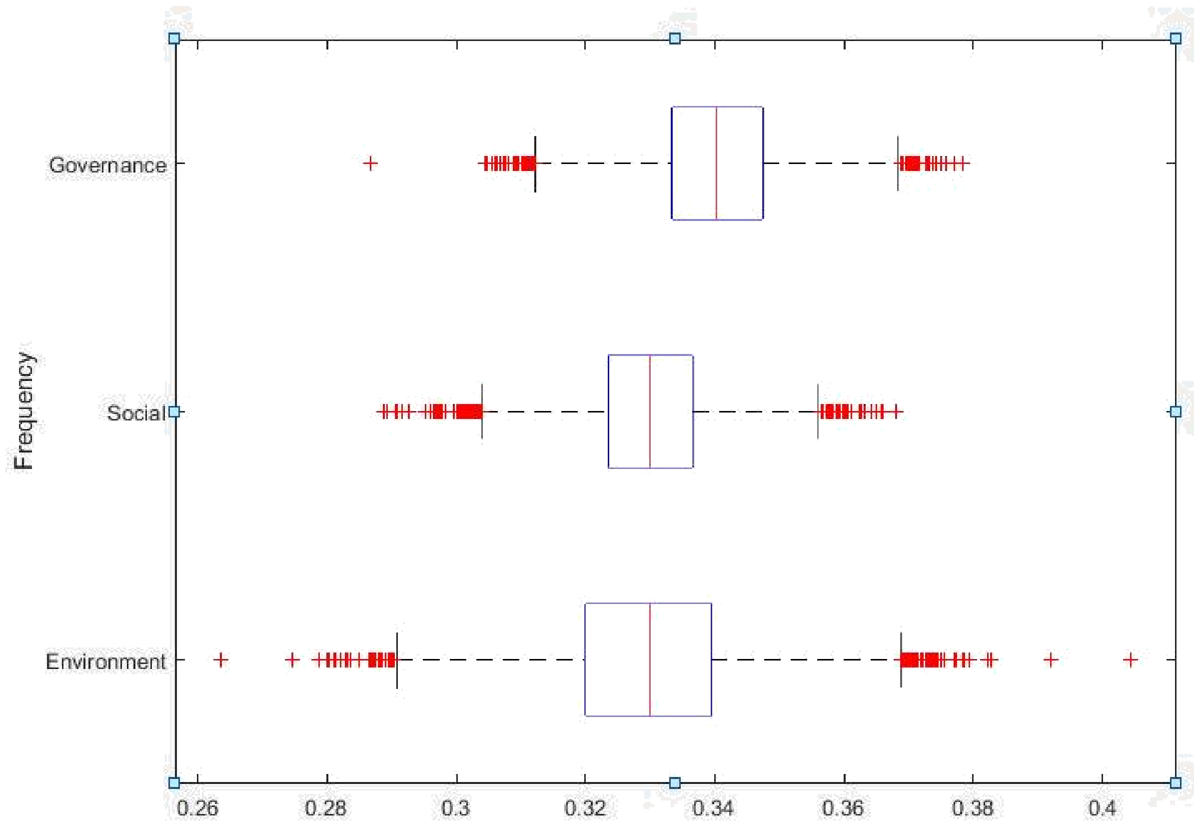


Figure 17: Box plot for the distribution of the weights of the three ESG pillars

The rest of the results involve the importance of environmental, social and governance criteria. From figure 18 it can be seen that for environmental pillar, criteria such as Environmental Legislation Compliance (E14), Environmental Strategy (E5), Risk Management and Environmental Resilience, Impact on Organisation (E17), Environmental Reporting and Transparency (E6), as well as Energy (E9) are the most important. However, as shown in the detailed results of table 10, the differences in the weights of the criteria are not striking.

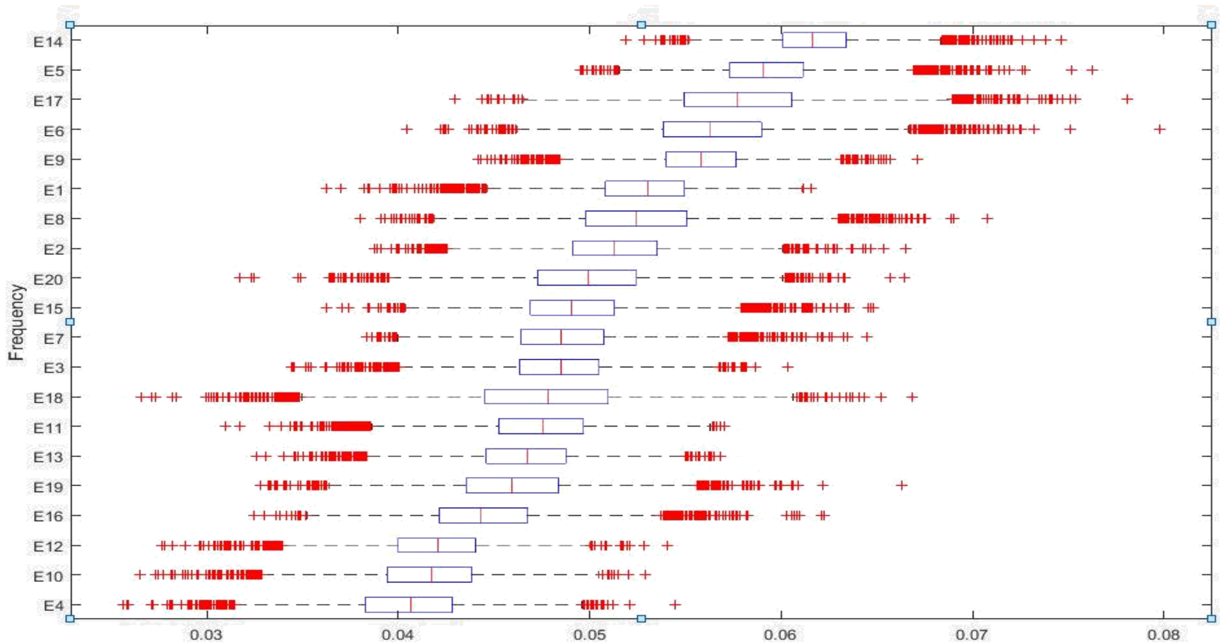


Figure 18: Box plot for the weights of the environmental criteria

Table 10: Statistics for the weights of the environmental criteria

	Mean	Std. deviation	1st quartile	Median	3rd quartile	95% conf. interval
E1	0.053	0.003	0.051	0.053	0.055	[0.046,0.058]
E2	0.051	0.003	0.049	0.051	0.054	[0.045,0.058]
E3	0.048	0.003	0.046	0.048	0.050	[0.042,0.054]
E4	0.041	0.003	0.038	0.041	0.043	[0.034,0.047]
E5	0.059	0.003	0.057	0.059	0.061	[0.054,0.066]
E6	0.056	0.004	0.054	0.056	0.059	[0.049,0.065]
E7	0.049	0.003	0.046	0.049	0.051	[0.043,0.056]
E8	0.053	0.004	0.050	0.052	0.055	[0.045,0.061]
E9	0.056	0.003	0.054	0.056	0.058	[0.050,0.061]
E10	0.042	0.003	0.039	0.042	0.044	[0.035,0.048]
E11	0.047	0.003	0.045	0.048	0.050	[0.040,0.053]
E12	0.042	0.003	0.040	0.042	0.044	[0.036,0.047]
E13	0.047	0.003	0.045	0.047	0.049	[0.040,0.052]
E14	0.062	0.003	0.060	0.062	0.063	[0.057,0.067]
E15	0.049	0.003	0.047	0.049	0.051	[0.043,0.056]
E16	0.045	0.004	0.042	0.044	0.047	[0.038,0.052]
E17	0.058	0.004	0.055	0.058	0.061	[0.050,0.067]
E18	0.048	0.005	0.045	0.048	0.051	[0.038,0.057]
E19	0.046	0.004	0.044	0.046	0.048	[0.039,0.053]
E20	0.050	0.004	0.047	0.050	0.052	[0.042,0.058]

Regarding the social factor, organisations pay more attention to the first 5 out of 19 criteria. Specifically, they consider as important the Non-Discrimination (S5), Employment (S1), Responsibility to Customers (S15), Social Responsibility (S11), and Human Rights (S4). In figure 19 the boxplot presents these results, whereas table 11 presents more detailed information.

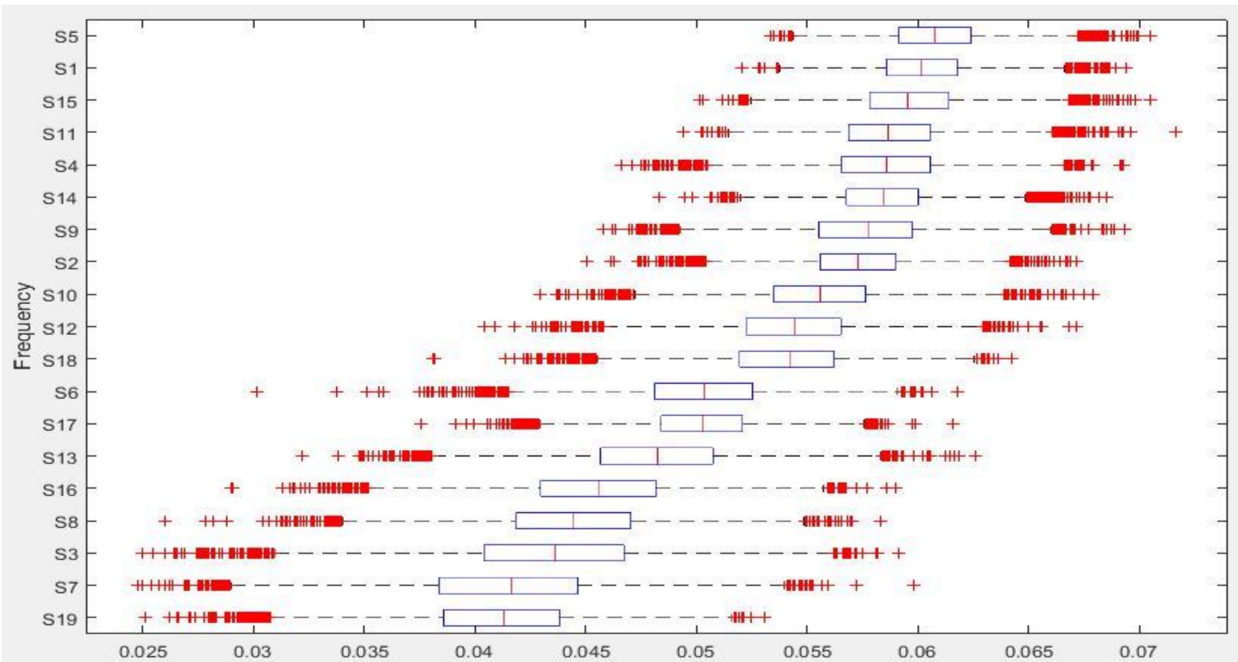


Figure 19: Box plot for the weights of the social criteria

Table 11: Statistics for the weights of the social criteria

	Mean	Std. deviation	1st quartile	Median	3rd quartile	95% conf. interval
S1	0.060	0.002	0.059	0.060	0.062	[0.056,0.065]
S2	0.057	0.003	0.056	0.057	0.059	[0.052,0.062]
S3	0.043	0.005	0.040	0.044	0.047	[0.033,0.052]
S4	0.059	0.003	0.057	0.059	0.061	[0.052,0.064]
S5	0.061	0.002	0.059	0.061	0.062	[0.056,0.066]
S6	0.050	0.003	0.048	0.050	0.053	[0.043,0.056]
S7	0.041	0.005	0.038	0.042	0.045	[0.032,0.050]
S8	0.044	0.004	0.042	0.044	0.047	[0.036,0.052]
S9	0.058	0.003	0.056	0.058	0.060	[0.051,0.064]
S10	0.056	0.003	0.053	0.056	0.058	[0.049,0.062]
S11	0.059	0.003	0.057	0.059	0.061	[0.054,0.065]
S12	0.054	0.003	0.052	0.054	0.057	[0.048,0.061]
S13	0.048	0.004	0.046	0.048	0.051	[0.040,0.056]
S14	0.058	0.002	0.057	0.058	0.060	[0.054,0.064]
S15	0.060	0.003	0.058	0.060	0.061	[0.055,0.065]

S16	0.046	0.004	0.043	0.046	0.048	[0.038,0.053]
S17	0.050	0.003	0.048	0.050	0.052	[0.044,0.055]
S18	0.054	0.003	0.052	0.054	0.056	[0.047,0.060]
S19	0.041	0.004	0.039	0.041	0.044	[0.033,0.048]

Finally, regarding the governance criteria, respondents assume as most important, the Corruption and Bribery (G3), the Transparency and Reporting (G4), the Risk Management (G7), the Codes of Conduct, Policies and Compliance (G6) and the Strategy Implementation, Operational Execution, Leadership and Management (G14). Figure 20 and table 12 show the results.

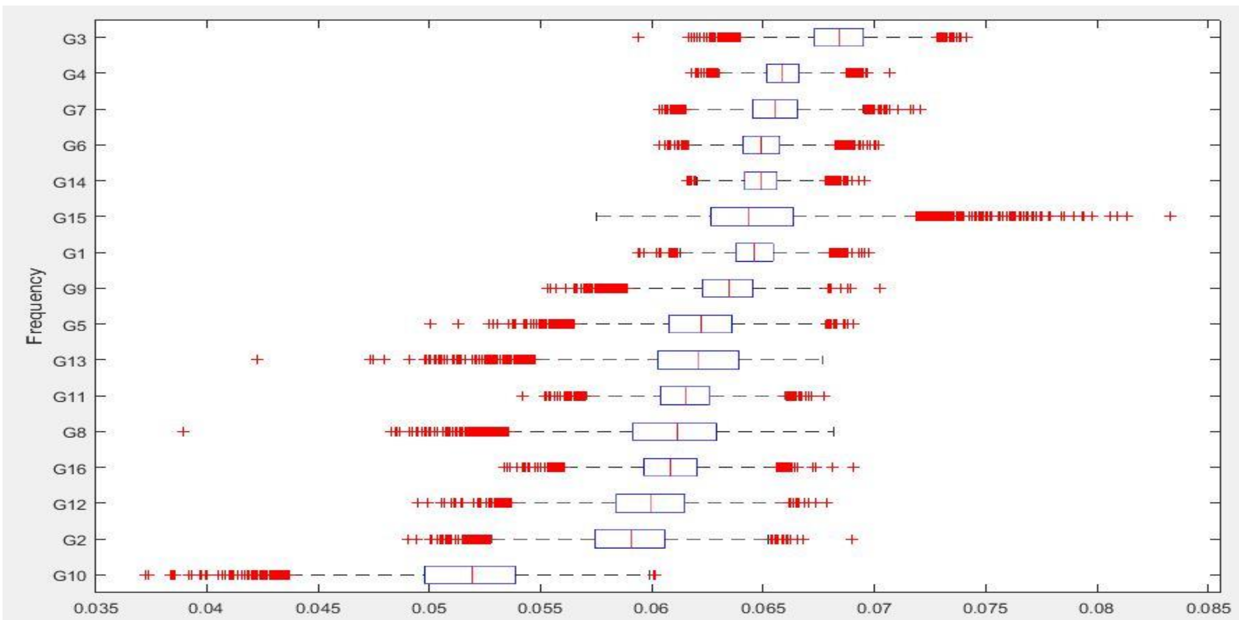


Figure 20: Governance Criteria Weights

Table 12: Statistics for the weights of the governance criteria

	Mean	Std. deviation	1st quartile	Median	3rd quartile	95% conf. interval
G1	0.065	0.001	0.064	0.065	0.065	[0.062,0.067]
G2	0.059	0.002	0.057	0.059	0.061	[0.054,0.063]
G3	0.068	0.002	0.067	0.068	0.070	[0.065,0.072]
G4	0.066	0.001	0.065	0.066	0.067	[0.064,0.068]
G5	0.062	0.002	0.061	0.062	0.064	[0.058,0.066]
G6	0.065	0.001	0.064	0.065	0.066	[0.063,0.067]
G7	0.066	0.001	0.065	0.066	0.067	[0.063,0.069]
G8	0.061	0.003	0.059	0.061	0.063	[0.055,0.065]
G9	0.063	0.002	0.062	0.063	0.065	[0.060,0.066]
G10	0.052	0.003	0.050	0.052	0.054	[0.045,0.057]
G11	0.061	0.002	0.060	0.062	0.063	[0.058,0.065]
G12	0.060	0.002	0.058	0.060	0.061	[0.055,0.064]
G13	0.062	0.003	0.060	0.062	0.064	[0.055,0.066]
G14	0.065	0.001	0.064	0.065	0.066	[0.063,0.067]
G15	0.065	0.003	0.063	0.064	0.066	[0.060,0.071]
G16	0.061	0.002	0.060	0.061	0.062	[0.057,0.064]

Chapter 6 Conclusions and recommendations for further research

In this thesis extensive research on ESG was conducted, focusing on the integration of environmental, social, and governance factors in credit ratings and investment decision making.

The literature on this area was reviewed and the findings indicate a widespread use of ESG in the financial and banking field, especially in investment decisions and credit risk. However, the literature is not conclusive on the role of ESG in these areas, as some researchers have reported negative effects. Namely, it was found that some portfolios do not present the strong relation between ESG and corporate financial performance. These discrepancies in the findings of the literature indicate that the issue of the materiality of ESG factors is important.

Moreover, a survey was conducted among managers and executives involved in ESG. The survey was based on a questionnaire and gave some basic information about the assessments of ESG risks in many different fields, such as banking, finance, insurance, and investments. These results helped in the derivation of estimates for the relative importance of environmental, social, and governance factors.

During the last years there has been incredible development in ESG and sustainability issues. Everything that concerns that field is under progress. A lot of academic studies, reports, and projects have taken part to support it but many questions have not been answered yet. The field of ESG is expected to grow, with more actions and policies taken to promote the adoption of ESG among companies, organisations, and investors.

To this end, the coverage and availability of high quality ESG data is a critical issue. This is something which must be combined with deeper analysis of the lack of comparability of the reported information across firms and the enhancement of the transparency of this information.

Simultaneously, extended academic research is useful for deciding which ESG factors play a material role and which have important impacts on firms for the long-run. Although a huge amount of reports have analysed the ESG criteria, there is no final conclusion about which are the most important and also which sustainability issues are financially material. Another issue which is crucial is the confusion regarding what the ESG ratings measure and how well they predict risks.

Finally, to help the analysis of ESG development further adoption of analytical models and decision support systems could be considered, which could offer the information companies and investors need. But this requires more information to be collected and an exhaustive analysis of how ESG works in practice. Namely how companies react to ESG ratings and scores and how they are affected from them.

Appendix A: Survey Questions

TECHNICAL UNIVERSITY OF CRETE

Global Sustain
People | Planet | Profit

On the Assessment of ESG Risks in Banking, Finance, Insurance and Investments

Part A

Please complete the following information:

1. First Name

2. Last Name

* 3. Organisation Name

* 4. Industry

5. Department

6. Capacity/Role

* 7. Would you like to receive an executive summary of the Survey?

- Yes
- No

Prev Next

TECHNICAL UNIVERSITY OF CRETE

Global Sustain
People | Planet | Profit

On the Assessment of ESG Risks
in Banking, Finance, Insurance and Investments

Part A

* 8. Email Address:

Prev Next

On the Assessment of ESG Risks
in Banking, Finance, Insurance and Investments

Part B

* 9. Does your organisation have a dedicated department responsible for ESG issues?

- ◯ Yes
- ◯ No

Prev Next

On the Assessment of ESG Risks
in Banking, Finance, Insurance and Investments

Part B

* 10. How does your organisation define the importance (materiality) of the ESG issues? Select all that apply.

- ☐ Through analytical economic/statistical models
- ☐ Using expert judgment from market participants
- ☐ Benchmarking and peer review
- ☐ A combination of the above
- ☐ Other (please specify)

* 11. How does your organisation use ESG assessments/scores/ratings? Select all that apply.

- [ ] Developing and providing specific financial products and services
- [ ] Pricing a product (i.e. financial, banking, investment, insurance, etc.)
- [ ] Executive pay incentives
- [ ] Benchmark against peers
- [ ] Research
- [ ] Other (please specify)

* 12. What procedures does your organisation follow for validating the accuracy of each ESG assessment/score/ratings? Select all that apply.

- [ ] Back-testing
- [ ] External benchmarking
- [ ] Other (please specify)

* 13. How do you check the credibility of the information you receive from the companies under evaluation? Select all that apply.

- [ ] Interviews/calls/meetings with companies
- [ ] Online surveys and questionnaires
- [ ] Extracting information from the internet
- [ ] Through sustainability/ESG reports
- [ ] All the above
- [ ] Other (please specify)

* 14. How often does your organisation update its ESG assessment/scores/ratings framework and methodology?

- ◯ Annually
- ◯ Biannually
- ◯ Other (please specify)

* 15. How often does your organisation monitor and update individual ESG assessment/scores/ratings?

- ◯ Biannually
- ◯ Annually
- ◯ Every 2 years
- ◯ When requested
- ◯ When material issues arise
- ◯ Other (please specify)

* 16. What are the most significant challenges you face when deriving ESG assessments/scores/ratings? Select all that apply.

- ☐ Lack of ESG data
- ☐ Credibility of information
- ☐ Assigning weights for the E, S and G pillars
- ☐ Assigning weights for specific ESG issues/risks
- ☐ Lack of common ESG criteria for the evaluation
- ☐ Other (please specify)

* 17. What type of companies do your ESG assessments/scores/ratings cover? Select all that apply.

- ☐ Listed companies (non-financial)
- ☐ Private companies (non-financial)
- ☐ Public sector companies (non-financial)
- ☐ Multinationals companies (non-financial)
- ☐ SMEs (non-financial)
- ☐ Financial Institutions (FIs)
- ☐ Other (please specify)

* 18. Please provide the coverage of your ESG assessments/ scores/ ratings regarding economic status.

- ◯ Developed economies/markets
- ◯ Developing/Emerging economies/markets
- ◯ Both

* 19. Please provide the geographical coverage of your ESG assessments/scores/ratings. Select all that apply.

- ☐ Americas
- ☐ Europe
- ☐ Asia
- ☐ Africa
- ☐ Oceania/Pacific

* 20. Please rate the importance of the ESG pillars taking into account your ESG activity and industry/ sector (1-least important, 3-most important). Assign the same rating to pillars of equal importance, if any.

	1 - Least Important	2	3 - Most important
Environment (E)	◯	◯	◯
Social (S)	◯	◯	◯
Governance (G)	◯	◯	◯

Prev Next

Part C

Evaluation of Environmental Issues

* 21. Please rate the importance of the following environmental issues. Meaning, which of these issues are most prevalent in your industry sector, which issues happen most and need most addressing. Use 1 to indicate the least important issues up to 10 for the most important ones. Assign the same rating to issues of equal importance, if any.

	Not Applicable	1 - Least Important	2	3	4	5	6	7	8	9	10 - Most Important
Greenhouse Gases (measurement, management, own operations / products & services, carbon reserves, emissions, reduction)	○	○	○	○	○	○	○	○	○	○	○
Waste Management (solid & liquid)	○	○	○	○	○	○	○	○	○	○	○
Water (use, discharged, conservation, management, security, risk and impact)	○	○	○	○	○	○	○	○	○	○	○
Biodiversity, Biocapacity and Ecosystem Quality	○	○	○	○	○	○	○	○	○	○	○
Environmental Strategy (policy, management system, governance, targets & KPIs)	○	○	○	○	○	○	○	○	○	○	○
Environmental Reporting and Transparency	○	○	○	○	○	○	○	○	○	○	○
Operational Eco-efficiency in Facilities	○	○	○	○	○	○	○	○	○	○	○
Climate Strategy/Climate Change	○	○	○	○	○	○	○	○	○	○	○

Energy (efficiency, management, measurment, access)
Materials Management (hazardous & non hazardous)
Renewable (natural) Resources Management
Non Renewable (natural) Resources Management
Air Quality
Environmental Legislation Compliance

Management of Environmental Impacts from the Use and Disposal of Products/Services (life cycle environmental impact)
Packaging Material and Waste
Risk Management & Environmental Resilience, Impact on Organisation
Product Safety
Supply Chain (impact, supplier environmental assessment)
Pollution Prevention and Control

Prev Next

* 22. Please rate the importance of the following social issues. Use 1 to indicate the least important issues up to 10 for the most important ones. Assign the same rating to issues of equal importance, if any.

	Not Applicable	1 - Least Important	2	3	4	5	6	7	8	9	10 - Most Important
Employment	○	○	○	○	○	○	○	○	○	○	○
Diversity and Equal Opportunities	○	○	○	○	○	○	○	○	○	○	○
Child and Compulsory Labour	○	○	○	○	○	○	○	○	○	○	○
Human Rights	○	○	○	○	○	○	○	○	○	○	○
Non-Discrimination	○	○	○	○	○	○	○	○	○	○	○
Local Communities	○	○	○	○	○	○	○	○	○	○	○
Product Responsibility (safe and environmental friendly packaging, labelling, compliance with sectoral standards)	○	○	○	○	○	○	○	○	○	○	○
Responsible Marketing and Communication	○	○	○	○	○	○	○	○	○	○	○
Health, Safety and Wellbeing	○	○	○	○	○	○	○	○	○	○	○
Training and Development	○	○	○	○	○	○	○	○	○	○	○
Social Responsibility	○	○	○	○	○	○	○	○	○	○	○
Exposure and Resilience to Social Issues	○	○	○	○	○	○	○	○	○	○	○
Corporate Affairs (external grievance mechanism)	○	○	○	○	○	○	○	○	○	○	○
Relations with Employees	○	○	○	○	○	○	○	○	○	○	○
Responsibility to Customers	○	○	○	○	○	○	○	○	○	○	○
Responsible Supply Chain Management	○	○	○	○	○	○	○	○	○	○	○
Responsible Pricing	○	○	○	○	○	○	○	○	○	○	○
Labor Practices	○	○	○	○	○	○	○	○	○	○	○
Freedom of Association and Collective	○	○	○	○	○	○	○	○	○	○	○

23. Please rate the importance of the following governance issues. Use 1 to indicate the least important issues up to 10 for the most important ones. Assign the same rating to issues of equal importance, if any.

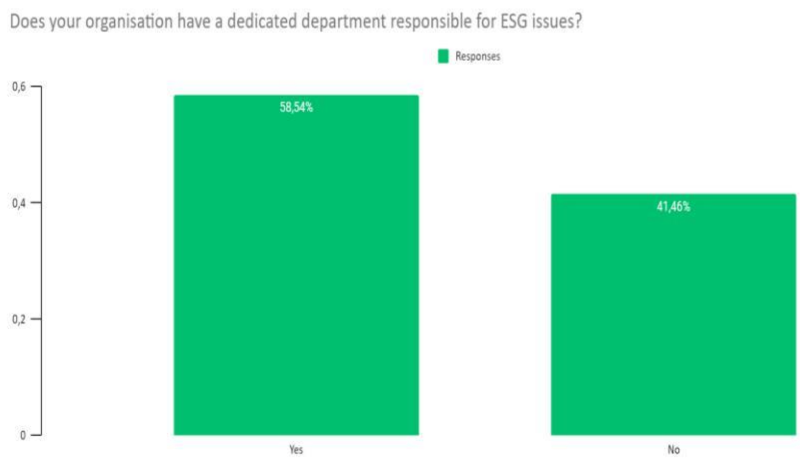
	Not Applicable	1 - Least Important	2	3	4	5	6	7	8	9	10 - Most Important
Board Independence	○	○	○	○	○	○	○	○	○	○	○
Board Diversity (age, expertise, other)	○	○	○	○	○	○	○	○	○	○	○
Corruption and Bribery (extortion, money laundering, fraud)	○	○	○	○	○	○	○	○	○	○	○
Transparency and Reporting (operations, financial, tax strategy, sustainability, ESG)	○	○	○	○	○	○	○	○	○	○	○
Purpose, Values, Business Ethics & Integrity	○	○	○	○	○	○	○	○	○	○	○
Codes of Conduct, Policies & Compliance (ESG, financial, HR, H&S, product responsibility)	○	○	○	○	○	○	○	○	○	○	○
Risk Management (cyber risks, systems, reputation, crisis, resilience, financial stability, business continuity)	○	○	○	○	○	○	○	○	○	○	○
Anti-competitive Practices (corporate actions for the prevention and/or reduction of unfair market competition)	○	○	○	○	○	○	○	○	○	○	○
Executive Compensation (audit, policy, board and executives, incentives structure, transparency, sanctions deductions)	○	○	○	○	○	○	○	○	○	○	○

Board Size	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Rights and Duties of Shareholders	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Shareholders Engagement	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Audit Practices, Internal Control	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Strategy Implementation, Operational Execution, Leadership and Management	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
CSR Strategy	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
GDPR and Data Privacy	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

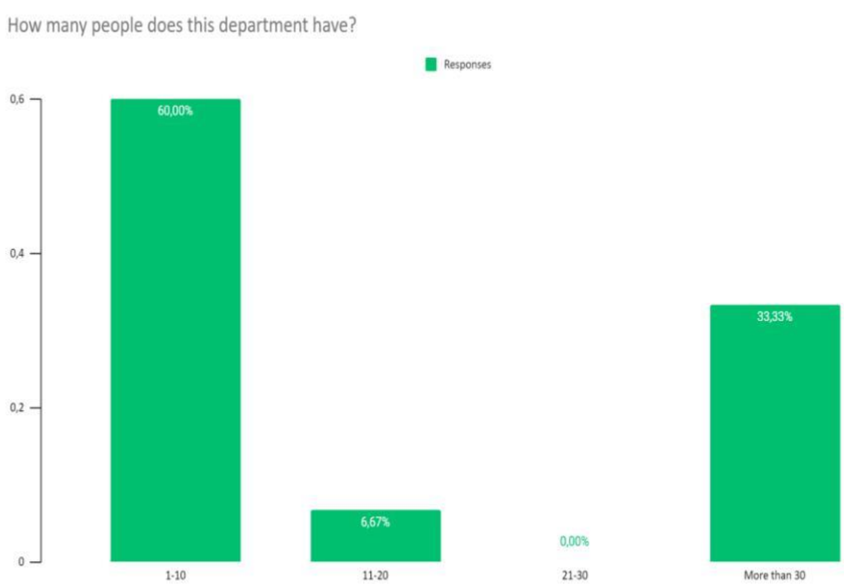
Prev Done

Appendix B: Survey Graphs

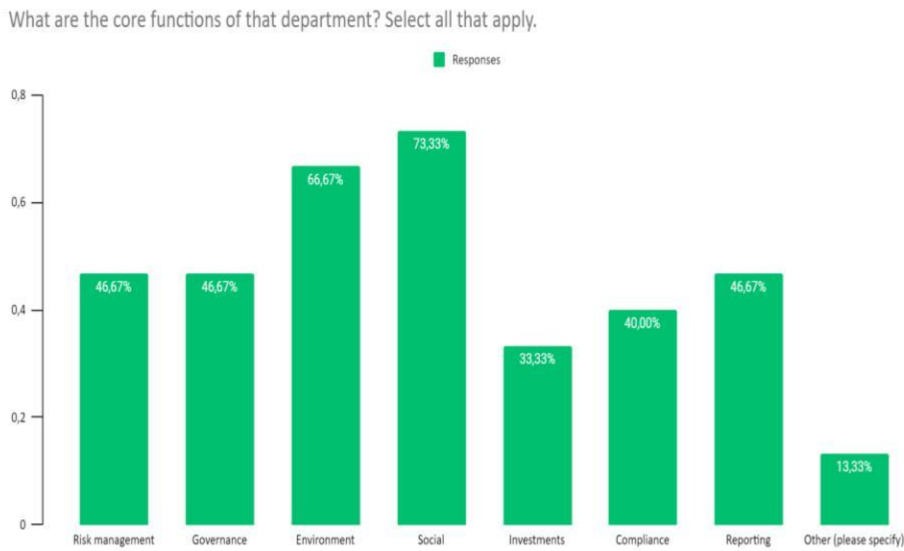
Question 9



Question 10



Question 11



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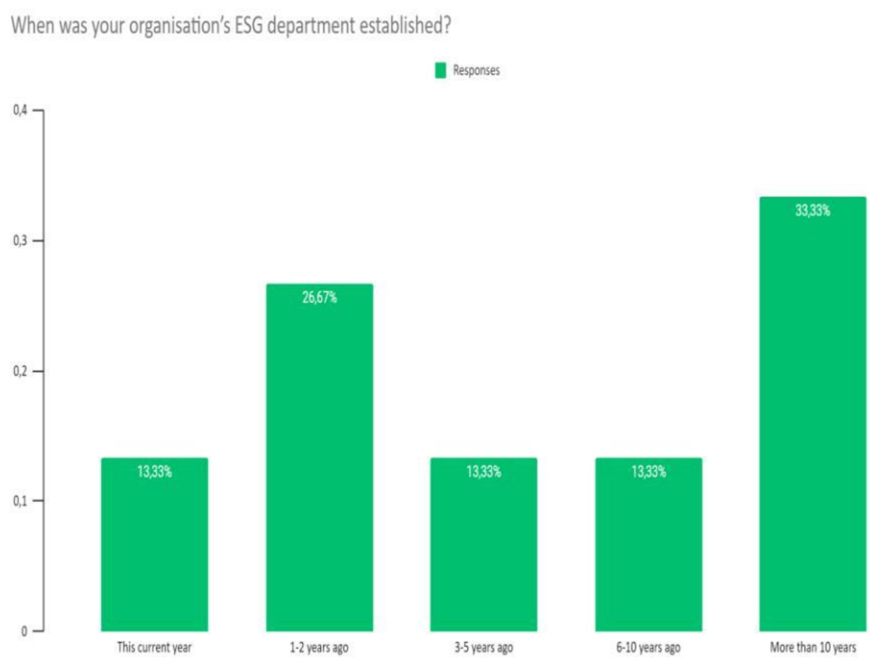

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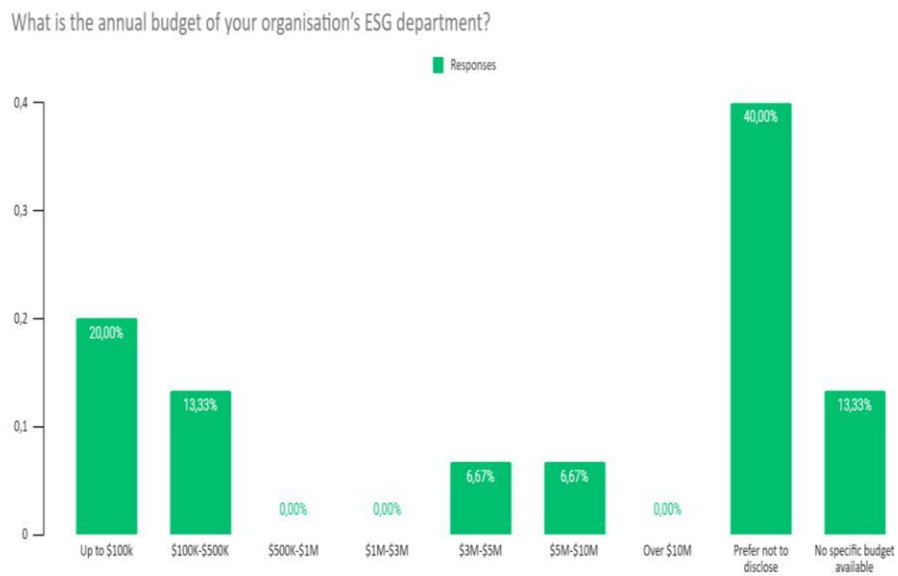

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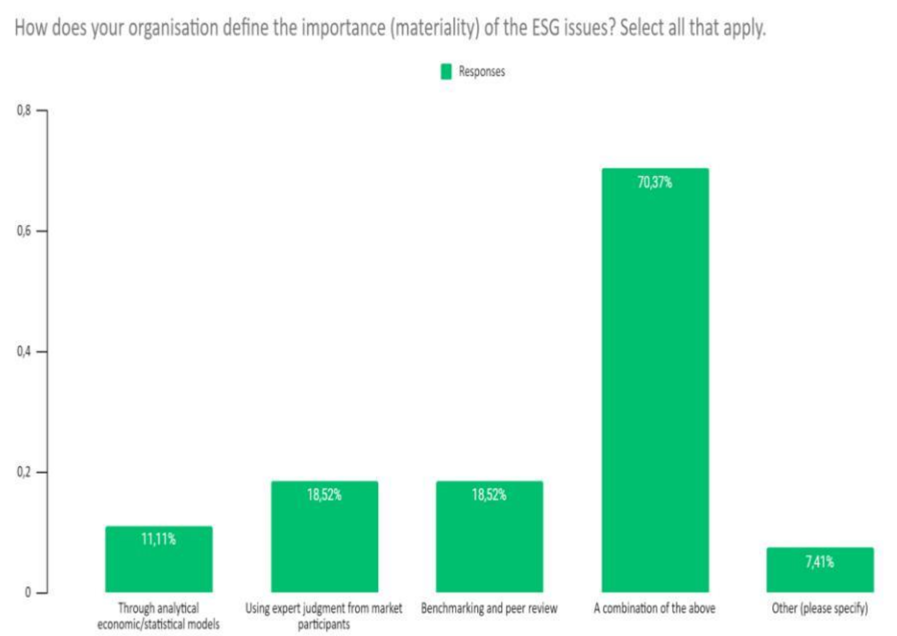

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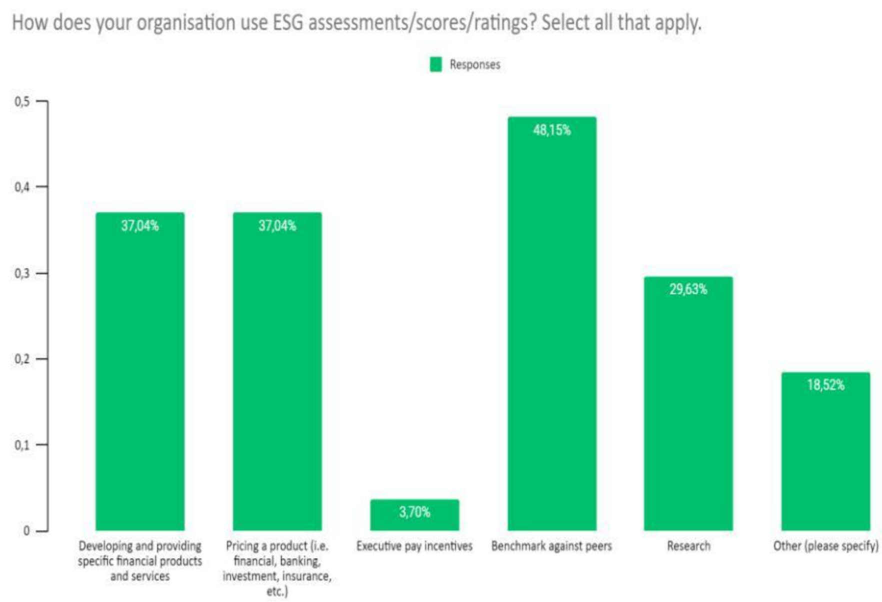

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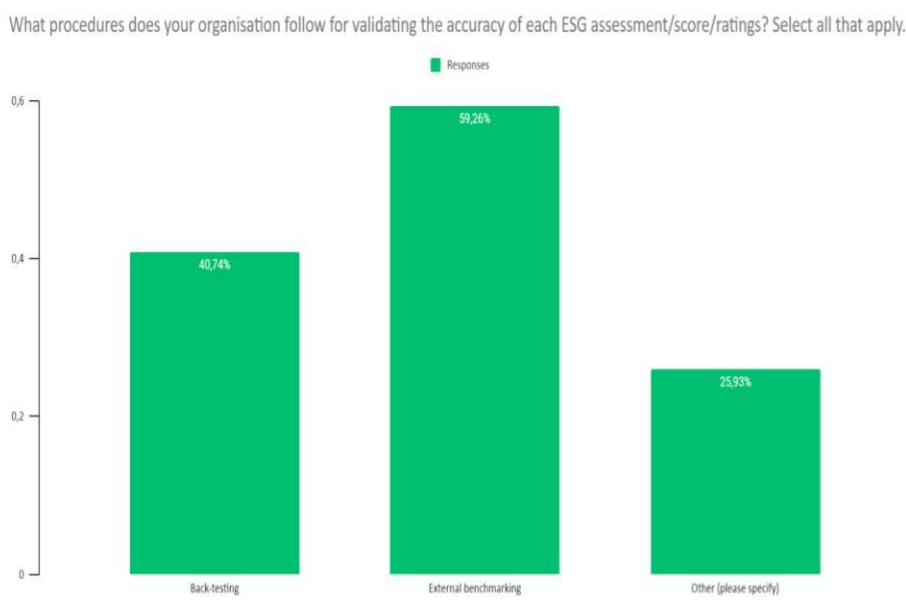

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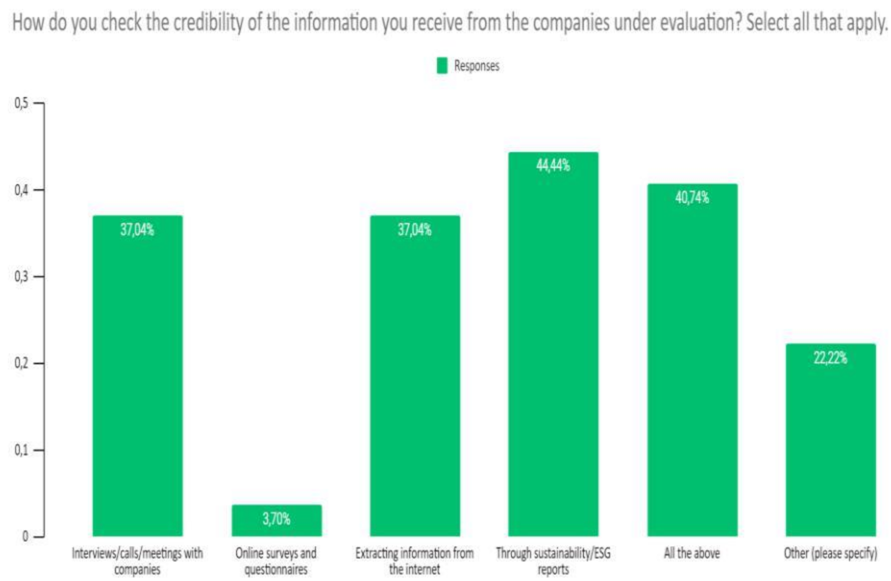
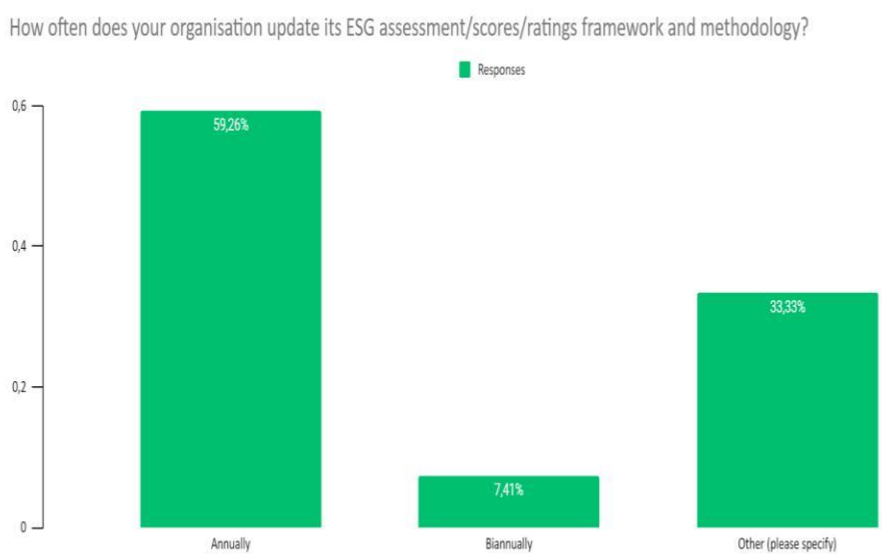


Question 18



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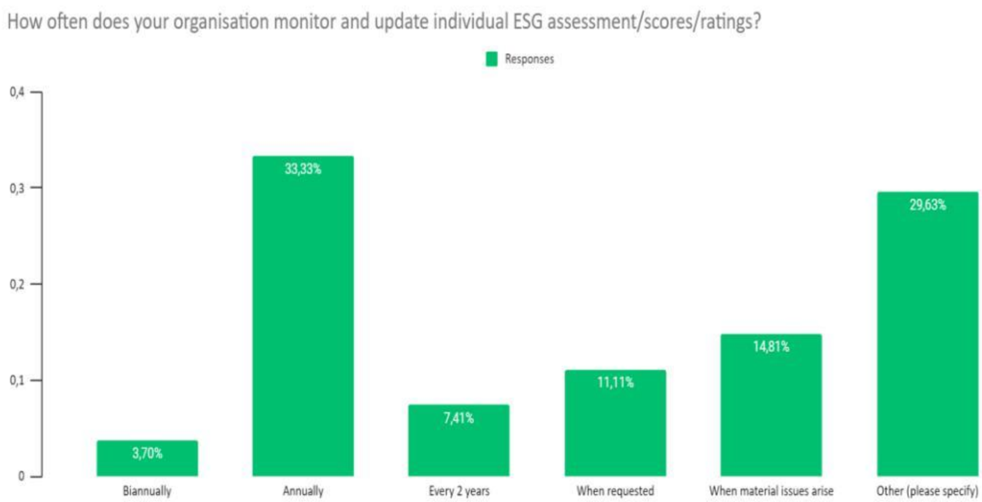

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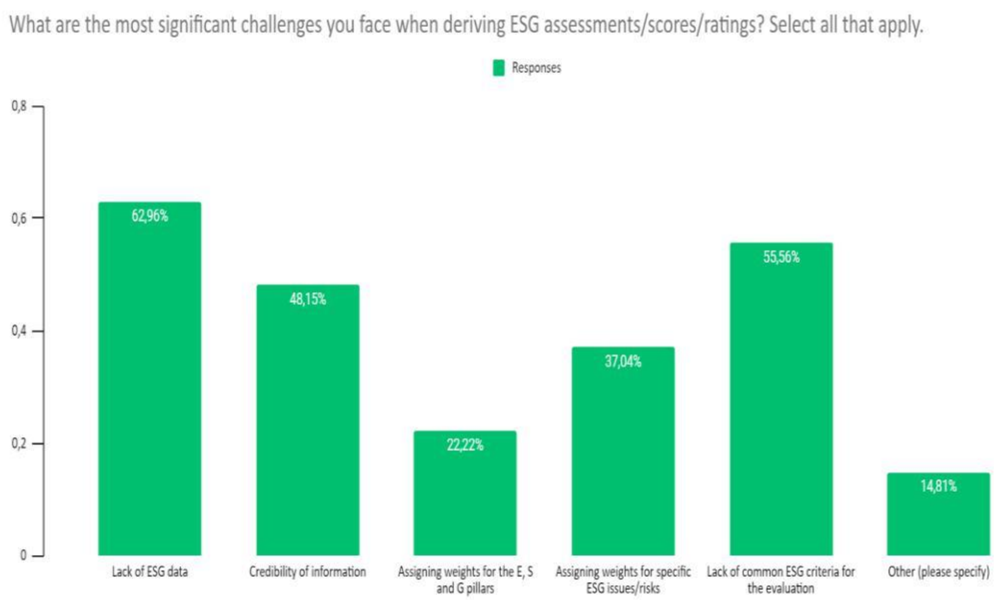

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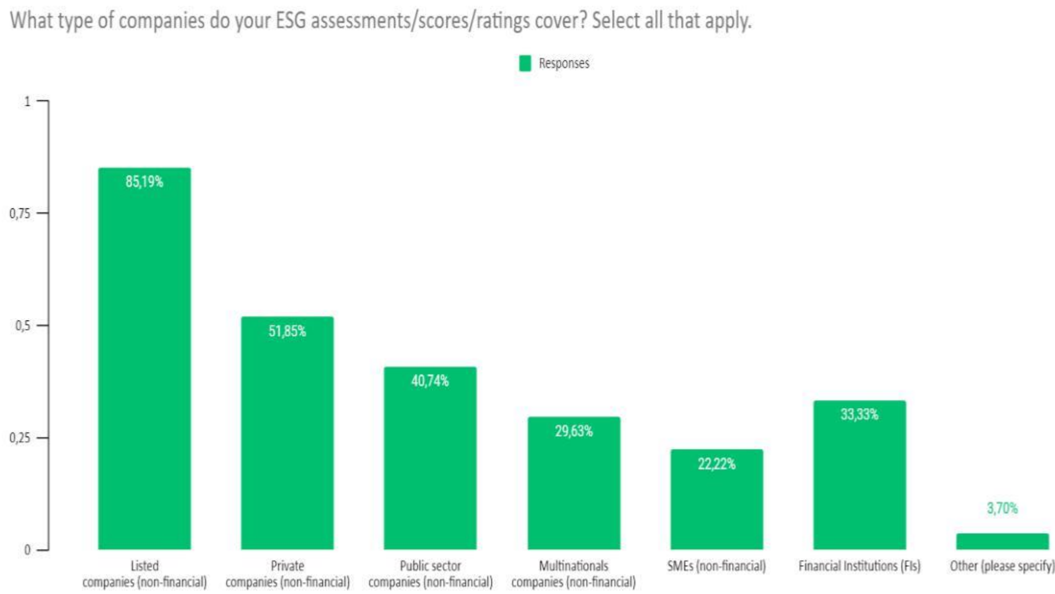

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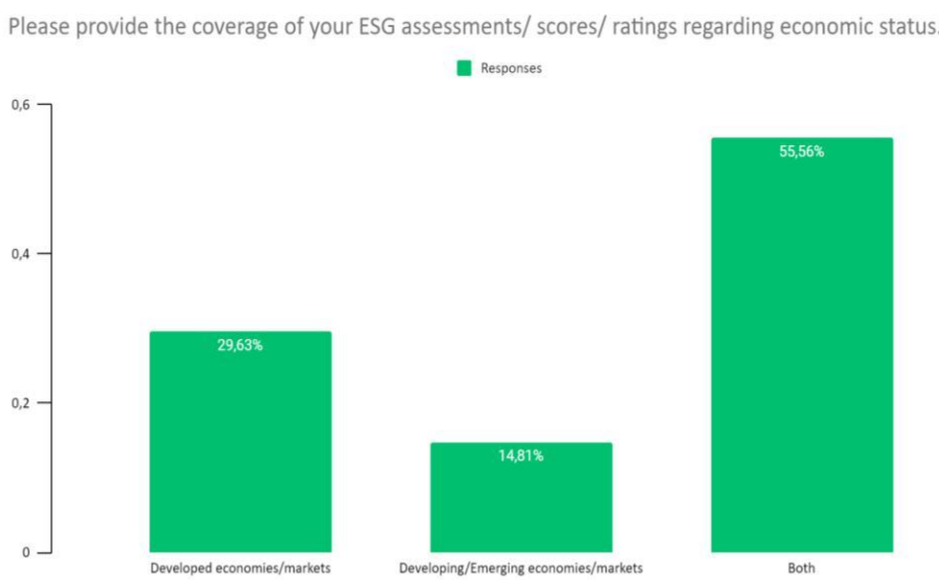

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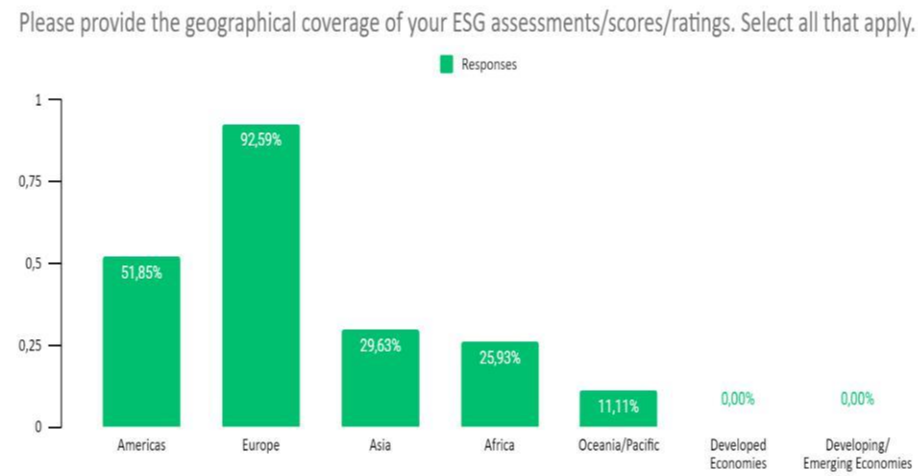

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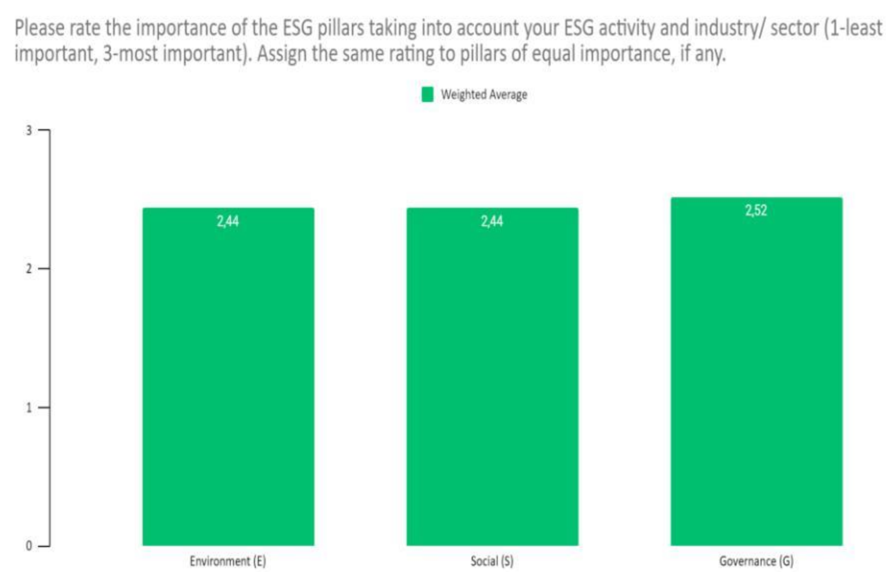

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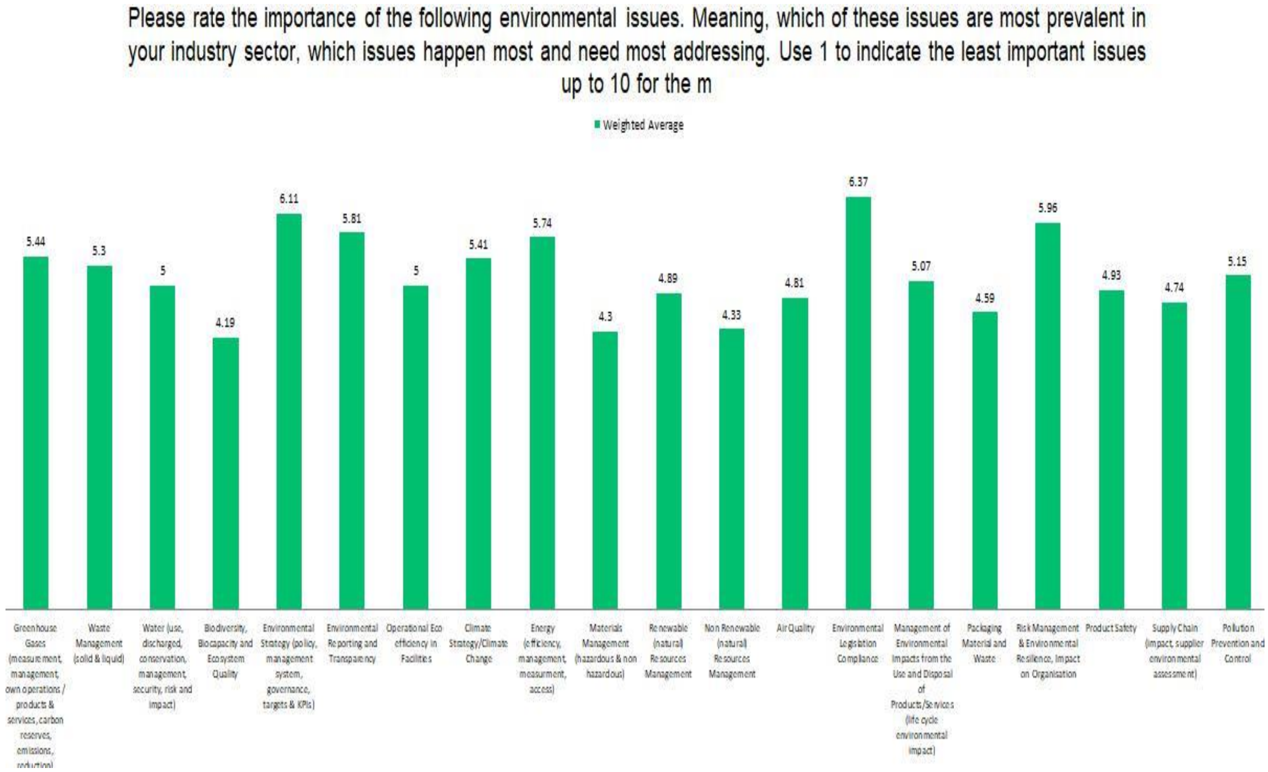

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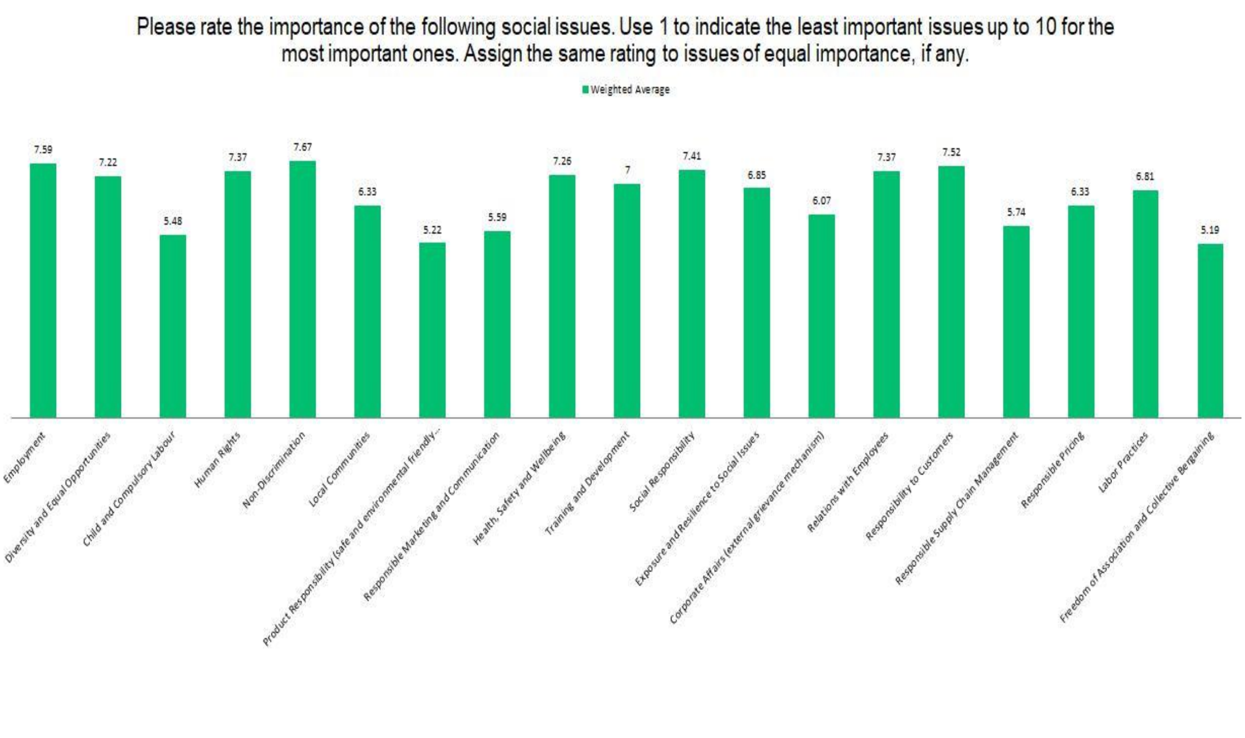
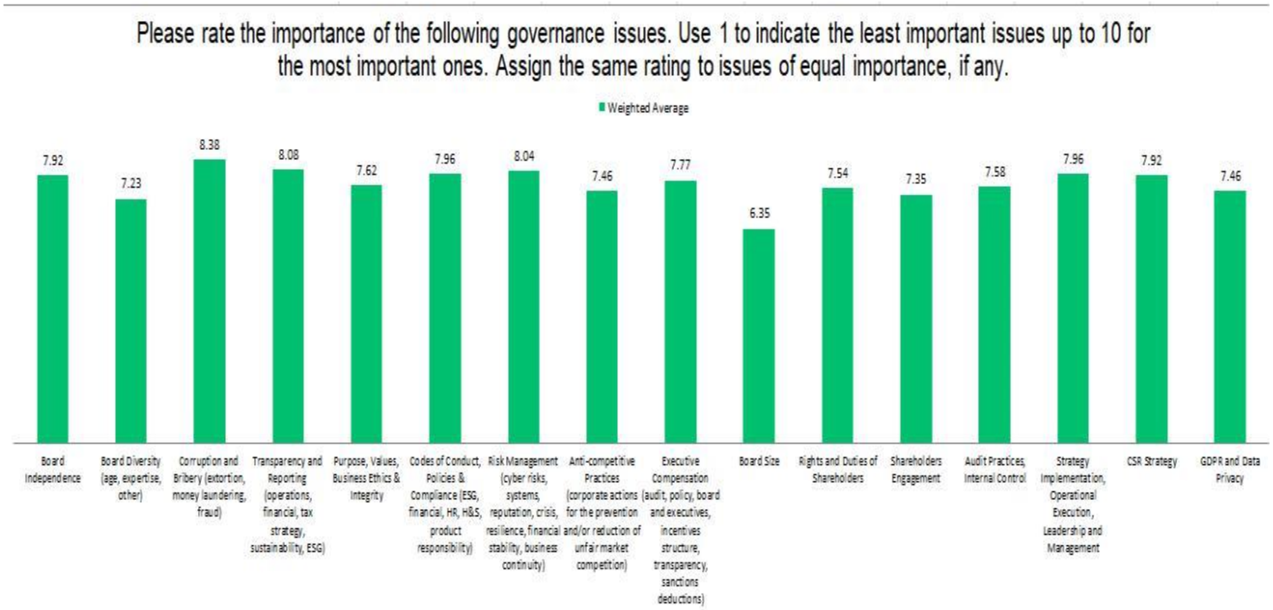


Question 27



Please rate the importance of the following governance issues. Use 1 to indicate the least important issues up to 10 for the most important ones. Assign the same rating to issues of equal importance, if any.
Weighted Average
7.92
7.23
8.38
8.08
7.62
7.96
8.04
7.46
7.77
6.35
7.54
7.35
7.58
7.96
7.92
7.46
Board Independence
Board Diversity (age, expertise, other)
Corruption and Bribery (extortion, money laundering, fraud)
Transparency and Reporting (operations, financial, tax strategy, sustainability, ESG)
Purpose, Values, Business Ethics & Integrity
Codes of Conduct, Policies & Compliance (ESG, financial, HR, H&S, product responsibility)
Risk Management (cyber risks, systems, reputation, crisis, resilience, financial stability, business continuity)
Anti-competitive Practices (corporate actions for the prevention and/or reduction of unfair market competition)
Executive Compensation (audit, policy, board and executives, incentives structure, transparency, sanctions deductions)
Board Size
Rights and Duties of Shareholders
Shareholders Engagement
Audit Practices, Internal Control
Strategy Implementation, Operational Execution, Leadership and Management
CSR Strategy
GDPR and Data Privacy

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