ΔΙΑΤΜΗΜΑΤΙΚΟ ΠΡΟΓΡΑΜΜΑ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
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ΔΙΠΛΩΜΑΤΙΚΗ ΕΡΓΑΣΙΑ

THE ROLE OF ESG METRICS IN INVESTMENTS

του:

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Υποβλήθηκε ως απαιτούμενο για την απόκτηση του μεταπτυχιακού
διπλώματος στη Διοίκηση Επιχειρήσεων

ΦΕΒΡΟΥΑΡΙΟΣ 2024

Acknowledgments

I would like to thank my current employer, company Elval Colour, for their support during my MBA studies, as well as my parents, as I reached where I am now because "I am standing on the shoulders of giants". Also, I would like to thank my friends from MQN.gr, as they helped me stay on track through the years.

Dedications

This thesis is dedicated to my wife and "comrade" Amalia, for all her patience and support and for believing in me.

Abstract

In this thesis we examine ESG metrics as the most elementary part of ESG regarding decision making in investments, and we do this by examining the available literature. In general, it is considered beneficial for a company to measure ESG metrics, to disclose them, to use ESG as a strategy and to improve individual ESG metrics, as well as the composite ESG rating. From the investor's perspective, we see that there is potential in utilizing ESG metrics and scores in investments strategies. Research on how ESG in general affects investments is abundant, although the focus seems to be on stock returns, with the research community not having consensus about the relationship between ESG ratings and returns. We find that the relationship between ESG metrics and investments is very strong. However, while ESG metrics are the foundation of ESG, apart from the issue of materiality, they are hardly mentioned when it comes to investing, with the focus being almost exclusively on ESG ratings. We find also that the research and investment communities have identified several issues that undermine the use of ESG on investments, such as the ESG ratings divergence or the quality of ESG related data. We present a collection of details that the ESG investor should consider, like the differences of ESG performance across countries or the company size bias. We believe that there is a lot of room for further research on this subject, particularly for the effect of individual ESG metrics on investments, ESG data quality improvement, ESG rating methodologies and relationship between ESG metrics and investment products other than stocks.

Keywords: ESG, metrics, investments, ratings

Περίληψη

Σε αυτή την εργασία εξετάζουμε τους δείκτες ESG ως το πιο στοιχειώδες μέρος του πλαισίου ESG όσον αφορά τη λήψη αποφάσεων σχετικά με επενδύσεις, και το κάνουμε αυτό αξιολογώντας τη διαθέσιμη βιβλιογραφία. Γενικά, θεωρείται ωφέλιμο για μια εταιρεία να παρακολουθεί τους δείκτες ESG, να τους κοινοποιεί, να χρησιμοποιεί το πλαίσιο ESG ως εργαλείο στρατηγικής και να βελτιώνει μεμονωμένους δείκτες ESG, καθώς και την συνολική αξιολόγηση ESG. Από την πλευρά του επενδυτή, βλέπουμε ότι υπάρχει δυνατότητα χρήσης μετρήσεων και βαθμολογιών ESG στις επενδυτικές στρατηγικές. Η έρευνα σχετικά με το πώς το πλαίσιο ESG επηρεάζει τις επενδύσεις είναι άφθονη, αν και αυτή εστιάζεται κυρίως στις αποδόσεις των μετοχών, με την ερευνητική κοινότητα να μην έχει καταλήξει σχετικά με τη σχέση μεταξύ των αξιολογήσεων ESG και των αποδόσεων. Η σχέση των δεικτών ESG με τις επενδύσεις είναι προφανής, αφού αποτελούν την βαση για το πιο σύνηθες μέτρο ESG, δηλαδή την βαθμολογία ESG. Διαπιστώνουμε ότι, ενώ οι δείκτες ESG αποτελούν βασικό στοιχείο του πλαισίου ESG, εκτός από το θέμα της ουσιαστικότητας (materiality), δεν αναφέρονται σχεδόν καθόλου σε σχέση με τις επενδύσεις, με το την προσοχή να έχει στραφεί αποκλειστικά στην συνολική βαθμολογία ESG. Διαπιστώνουμε επίσης ότι η ερευνητική και η επενδυτική κοινότητα έχουν εντοπίσει πολλά ζητήματα που υπονομεύουν τη χρήση του πλαισίου ESG στις επενδύσεις, όπως η απόκλιση αξιολογήσεων ESG ή η ποιότητα των δεδομένων που σχετίζονται με το ESG. Παρουσιάζουμε μια συλλογή λεπτομερειών που πρέπει να λάβει υπόψη ο επενδυτής ESG, όπως οι διαφορές στην απόδοση ESG μεταξύ των χωρών ή η προκατάληψη βαθμολογήσεων σε σχέση με το μέγέθος της εταιρείας. Πιστεύουμε ότι υπάρχει μεγάλο περιθώριο για περαιτέρω έρευνα σχετικά με αυτό το θέμα, ιδιαίτερα για την επίδραση των επιμέρους μετρήσεων ESG στις επενδύσεις, τη βελτίωση της ποιότητας δεδομένων ESG, τις μεθοδολογίες αξιολόγησης ESG και τη σχέση μεταξύ των μετρήσεων ESG και των άλλων επενδυτικών προϊοντων εκτός των ιδίων μετοχών.

Λέξεις κλειδιά: ESG, δείκτες, επενδύσεις, βαθμολογία ESG

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Chapter 1: Introduction

During the last decades, we have experienced extreme events that affected not only our daily life but also the progress of humankind. Environmental accidents, climate change, economic depression, health crises, corporate scandals of international importance to name a few. While all those affect us as citizens of the world, it was inevitable to also affect the corporations but also people that are involved in investments. Furthermore, it was understood that while there are accounting and reporting standards that are used to communicate what businesses are doing, it was not enough as a lot of information was not easy to report.

This led eventually to the movement of "doing well by doing good", where companies not only try to maximize the profits of the shareholders but also to take into consideration the benefit of the stakeholders and the creation of value for them. While this movement started from simple principles, initially led by religious motives, it was infused with the principles of corporate responsibility, and it is now fully fledged as a reporting tool in the form of ESG – which stands for Environmental, Social, and Governance. Through the ESG framework a company tracks and evaluates several issues that refer to the above areas, that it is considered to have an impact on the company and on its corporate environment. To better track the impact, companies calculate and disclose certain metrics relating to ESG topics, which we consider to be the basis of the ESG framework.

When we refer to the ESG metrics, we refer to several metrics that a company publishes, which reflect certain pillars of the company itself in non-financial terms. Environmental, Social and Governance aspects are evaluated, usually using a certain framework, to help stakeholders understand the quality of the company, the potential risks and possible areas that could be improved. By using ESG metrics, companies can track and improve their performance, external agencies can produce ESG ratings, and investors can better support their decisions, while a new set of investment opportunities is being developed.

The importance of ESG in the business world is becoming more evident day by day, however the relevant education is falling behind. The average investor is overburdened

with information, the quality, clarity, and completeness of which is questionable. For that reason, in this thesis, we want to investigate the role of ESG metrics in investments. We will do that by evaluating and combining the available literature. To prepare the reader for the subject and to better understand the ESG perspective, we will present why a company should use and disclose ESG data and how is ESG investing materialized. Then we will present typical ESG metrics and how they are integrated in several ESG investing strategies. We will also see the available ESG related investment products. Next, we will present the challenges in ESG investing and in the end, we will present a conclusion about the aforementioned issues, and we will propose several topics that need further investigation in the future.

Chapter 2: Basic ESG terms and topics

2.1 Introduction

While ESG is often mentioned along with terms such as Corporate Social Responsibility and corporate sustainability, it is a mistake to consider those terms as interchangeable. Corporate sustainability is a broad term that describes a long-term creation of value for the stakeholders by identifying opportunities and managing risks, that stems from developments in the company's environment. For many, this just means "doing good" without any specific limits or terms. Eventually, ESG refers to the issues on Environment, Social and Governance topics and metrics, on which companies must measure, evaluate, report and if needed, act. Therefore, the primary role of the ESG framework is reporting, with all the additional functions (rating, management, strategy, investment, stakeholder engagement) acting based on ESG metrics.

Corporate social responsibility is a management philosophy where the higher management considers the concerns of the key stakeholders and incorporates them in the operations and activities. When comparing this with ESG, ESG evaluates ESG areas along with more traditional metrics (Bradley, 2021). At the end of the day, ESG is incorporated into the strategy of the company, as during the journey to identify what is important and what is not for evaluation and reporting, higher management must identify risks, threats, and opportunities, inside the company and in the company's environment. Furthermore, to make ESG work, management must commit to acting for the ESG goals. Therefore, ESG starts as a reporting duty and becomes a strategy tool.

Furthermore, as we will see also later, ESG related data is very important for stakeholders outside of the company (for investments, compliance, public image and more). Consequently, it is important (and in some cases required by authorities) to publish company's ESG information for further evaluation.

2.2 ESG terms

When reporting ESG issues, a company is actually monitoring and reporting on three basic pillars: the Environment issues, the Social issues, and the Governance issues. The idea here is the company is not isolated from the world; therefore, the company's

actions will affect the environment, and the society, while the third pillar gives some indications about the way the company is governed.

How the ESG metrics are reported and which of the ESG metrics are reported, is usually dictated by frameworks, while some companies select which metrics they will disclose (and which they will not). For example, there is a guide regarding ESG reporting for the companies of the Athens Stock Exchange (*ESG REPORTING GUIDE*, 2022), which we will later see in detail.

The ESG ecosystem consists mainly of 4 bodies, as presented by Li (2022). First, we have the ESG facilitators (who advocate the concept development and formulate guidance framework), then we have the ESG evaluators (who establish and develop ESG rating systems in a rather formal way), then we have ESG investors (who practice ESG investments), and finally we have ESG practitioners (who are committed to carrying out business activities according to ESG standards and act upon the metrics). There are more participants in the ESG system, nevertheless we will consider the above to play the most active role.

Of great importance when evaluating the ESG metrics that matter, is Materiality. As we will understand later, not all ESG issues and metrics are equally important for a company, even though some companies might try to present otherwise for their own reasons (like for greenwashing, to show progress when there is none or to show that they are doing something, while it does not add value). Practice shows that certain companies are affected more by certain threats or face certain difficulties in their operations. This is known as Materiality, at it is used several times in the literature but also in practice. Companies or groups mentioned above, evaluate the company, in particular the type of business and its environment, and identify the metrics that can affect the performance of the company or the threats and opportunities that it will face. They evaluate the companies also on the issues that are most material to their business, their sector, and their stakeholders. This can help the interested parties to navigate through non-essential metrics and purge the plethora of information that can add noise in the company's analysis. Furthermore, it can help stir efforts towards areas that might increase risk or provide space for improvement. As a result, material metrics are deemed fundamental to the long-term success of a company's ESG strategy.

2.3 Benefits of ESG

In the following, we will see some of the benefits for companies apply ESG frameworks and disclose ESG information, as these are mentioned in several studies in the literature. In general, it is accepted that the application of ESG practices in a company has a positive effect in the company results, especially when the company is willing to act on the ESG measured metrics. According to Clark et al. (Clark et al., 2014) 88% of the research shows that solid ESG practices result in better operational performance of firms and 80% of the studies show that stock price performance of companies is positively influenced by good sustainability practices. By examining more than 2000 empirical studies, Friede et al. (Friede et al., 2015) have found that the business case for ESG investing is empirically very well founded, as almost 90% of the studies find a nonnegative ESG – corporate financial performance relation. Nevertheless, the actual effect that ESG practices have, or which parts matter, is yet under discussion. It is quite interesting that there are several researchers that raise concerns about the hype that comes with ESG application and the increased complexity of the issue, something that we will examine in another chapter.

Regarding the benefits from ESG, first we have the value creation for the company. This can be done by achieving higher margins and profitability, exploitation of growth opportunities, lower cost of capital and better risk management. Those are explained in detail in the work of Odell & Ali (Odell & Ali, 2016), as seen below:

Regarding higher margins and profitability, resource scarcity and infrastructure bottlenecks in certain markets mean that costs can be relatively high. In order to maximize returns on invested capital, the operations must be run efficiently. Thus, a sustainable approach (that can be substantiated by ESG metrics measurement and evaluation) can result in lower operating expenses and higher margins overall. The effect of efficiency on profitability is applicable also on the management of human resources. Properly designed and applied health and safety policies lead to higher productivity and fewer shutdowns. Also, proper training and development, can lead to higher productivity.

Concerning growth opportunities, companies with stronger sustainability strategy and performance are expected to capture new growth opportunities more efficiently.

Additionally, in the case where the company operates in an environment without strong institutions and regulatory oversight, brand strength is a powerful driver of customer demand. Therefore, companies with a reputation for quality, consistency, and safety, have gained a "social license" to operate and distinguish themselves from the rest. The same, if combined with sound corporate governance, can give an advantage to a company for large contracts and partnerships with multinational companies. Proof of the improved performance is found also by Hübel & Scholz (Hübel & Scholz, 2020) especially for crisis periods, during which highly social firms outperform less social firms.

As for lower cost of capital and access to financing, they are considered as some of the most significant barriers to business growth. If a company can reduce its risk profile, it will become more attractive to creditors and equity investors, and it will increase its probability to succeed, with Apergis et al. showing that good ESG scores reduce the cost of debt (Apergis et al., 2022), while Maaloul et al (Maaloul et al., 2023) attributes that reduction to better company reputation through ESG. Another related positive effect stemming from the incorporation of ESG principles, according to Giese et al., (Giese et al., 2019a), is the integration of ESG ratings in the financial analysis of a company in order to improve the company's valuation. There are several ways that ESG can affect our investment decisions, and this can be done as ESG can affect the company's valuation through increased returns and higher dividends (thus better cashflows). Also, as it presented by Ioannou & Serafeim (Ioannou & Serafeim, 2011) "increases in sustainability disclosure driven by the regulation are associated with increases in firm valuations".

Finally, a factor that can enhance the company's capability of value creation, is efficient risk management. ESG principles incorporated in the company's strategy, can give an advantage to the management team to identify threats, prepare and deal with them proactively. The list of areas where things might need special attention is rather extensive; community relations, product quality, corruption, accounting issues, environmental risks, compliance with current regulations and preparation for future regulatory changes, country risk and more. All those, if not properly handled, can increase not only the associated costs (legal, fines, operational) but can also damage the reputation of the company, the relationships with suppliers and partners, employee morale and turnover and access to capital. Actually, Cheng et al. found that efforts to

improve ESG performance as better CSR performance, lead to lower capital constraints (Cheng et al., 2011). Therefore, efficient risk management can be perhaps the most important of all the above reasons regarding corporate value creation (or protection) through ESG. An indirect result of better risk management through incorporation of ESG practices is shown in the work of Chen et al. (Chen et al., 2022) where good ESG performance is connected to decreased stock return volatility during COVID-19 crisis. Giese et al., (Giese et al., 2019a) show that ESG improves management of idiosyncratic risk and leads to better company valuation due to lower exposure to systematic risks. Another important find in the same study is that ESG ratings can act as a long-term predictor for future tail risks (rarely occurring risks). The reduction of idiosyncratic risk is also found by (Horn, 2023), with bigger reduction for companies with higher ESG score, while companies with low ESG score have lower idiosyncratic risk when compared to companies that have no ESG score at all.

Another benefit is that ESG facilitates symmetric interaction with stakeholders. This helps enhancing corporate reputation and stakeholder engagement (ESG REPORTING GUIDE, 2022). The importance of stakeholder engagement is stressed particularly for public sector companies by Bonetti et al. (Bonetti et al., 2023), as value creation is connected to public trust.

There are several studies that try to verify the claims mentioned above. For example according to Clark et al. (Clark et al., 2014) 88% of the research shows that solid ESG practices result in better operational performance of firms and 80% of the studies show that stock price performance of companies is positively influenced by good sustainability practices. As it presented by Ioannou & Serafeim (Ioannou & Serafeim, 2011) "increases in sustainability disclosure driven by the regulation are associated with increases in firm valuations".

Earlier, we mentioned the principle of materiality in ESG. Seeing the benefits of ESG through the prism of material issues, Witold (Witold, 2023) suggests that the journey towards the materiality of ESG factors goes through the following pathways:

1. Better ESG performance that can attract or repel customers and can make them willing to pay more (or less).

2. ESG performance that can function as a social license to operate when it comes to permits that enable growth in operations.

3. Costs, as power consumption or waste disposal that can strongly affect the results of the company.

4. Employee productivity. This is translated into attraction and retention of quality employees, increase in employee motivation and employee satisfaction.

5. Better management of assets overtime, with capital allocation on more sustainable opportunities.

Some additionally strong points for ESG materiality are the following:

- Greater attention to ESG factors can make companies more attractive as M&A targets.
- ESG weaknesses might make certain investors walk away (or attract others, like short sellers).
- Investments in technologies with negative environmental or social externalities are more likely to be abandoned (risk of stranded assets).

Following on the topic of materiality, Khan et al. (Khan et al., 2015) found that firms with good performance on material sustainability issues (not all sustainability issues, but rather those who affect the company) outperform firms with poor performance on the same issues. This suggests that investments in sustainability issues (from the side of the company and not from the investor in general) are enhancing the value for shareholder. On the other hand, the same authors found that companies with good performance on non-material sustainability issues do not underperform firms with poor performance on these same issues. The conclusion from this is that investments in sustainability issues are at a minimum not value-destroying. The authors conclude their finding by stating that firms with good performance on material issues and poor performance at the same time on non-material issues, perform the best. This is not further explained, nevertheless it might be a result of optimization of allocation of resources. This is important for smaller companies that do not have the luxury of doing everything perfect, and as we will see later, this is not the only thing that is affected from the size of the company.

2.4 ESG metrics

As mentioned above, in ESG reporting framework we monitor and report metrics on 3 different pillars, Environmental, Social and Governance, taking into consideration themes that are considered important for businesses. Of course, those themes reflect the current issues of interest in society and in business and might be modified in the future. The factors are the following:

Environmental Factors

• Climate change: As climate change, extreme events might happen that can damage company property, or it can alter the demand for products and services.

• Pollution and policy changes: Pollution can be caused by a company or a company in a sector that the company is somehow involved. Furthermore, the current or expected change in the related regulations might limit the company's operations, forbid the use of certain materials or outlaw the company's operations altogether.

• Resource scarcity: Many resources are not renewable, while some others are controlled by certain countries or companies that can adjust supply and thus cause obstacles to another company's operations. Additionally, for certain materials the demand might increase without corresponding demand in supply, due to changes in technology or consumer habits.

• Innovation: Changes in technology can make the properties of a company absolute or can cause the company to lose certain advantages.

Social Factors

• Employees: Various issues are reported in the literature that have to do with Employees. Gender equality, employee turnover, employee training to name a few. The Social pillar can produce a lot of traction regarding threats and opportunities for a business, something that is made quite clear during and after the COVID-19 pandemic. Employee shortage can be a hurdle for a company while unequal treatment of employees can have legal or social repercussions.

• Stakeholders: the relationship with the stakeholders can also include several challenges for a company. A partner that is not applying sustainable practices or a local community that is neglected during an important project for the company, can cause future problems.

Governance Factors

All the issues mentioned below are related to good management practices. It is not at random that the Governance pillar, while not connected directly to environmental issues that are considered important at that time, is considered to be the pillar that it is more connected to better corporate performance. That is why rating agencies evaluate and grade it separately when calculating the composite ESG score.

• Corruption
• Accounting and disclosure
• Ownership and alignment of interests
• Board composition and independence
• Shareholder rights and enforcement mechanisms

The ESG metrics (quantitative or qualitative) associated with all the aforementioned factors, are later used by institutions to calculate and assign a certain ESG score to a company, called ESG rating, using a proprietary rating system that is usually not disclosed to the public. The goal is to help investors or stakeholders to take decisions on ESG related issues, without having expertise or the needed resources to calculate a rating themselves. However, there is the option for stakeholders to use individual metrics, to create composite scores and ratings or to create new metrics based on customized targets and interests. Companies report ESG metrics following reporting standards or guidelines such the Global Reporting Initiative (GRI), that of the Sustainability Accounting Standards Board (SASB), or the Climate Disclosure Standards Board (CDSB). In the Greek Stock Exchange (ATHEX), companies can use the Athens Exchange ESG reporting guide (ESG REPORTING GUIDE, 2022).

In this guideline, one can find core metrics, advanced metrics, but also sector specific metrics. Those sector specific metrics are considered material for this specific industry. We will use the ATHEX ESG reporting guide as an example to see how indicative ESG metrics look like. Below we present a compact list of those metrics.

ESG Classification	ID	Metric Title
Environmental	C-E1	Scope 1 emissions
	C-E2	Scope 2 emissions
	C-E3	Energy consumption and production
Social	C-S1	Stakeholder engagement
	C-S2	Female employees
	C-S3	Female employees in management positions
	C-S4	Employee turnover
	C-S5	Employee training
	C-S6	Human rights policy
	C-S7	Collective bargaining agreements
	C-S8	Supplier assessment
Governance	C-G1	Board composition
	C-G2	Sustainability oversight
	C-G3	Materiality
	C-G4	Sustainability policy
	C-G5	Business ethics policy
	C-G6	Data security policy

Table 1: Core ESG metrics (ESG REPORTING GUIDE, *2022)*

ESG Classification	ID	Metric Title
Environmental	A-E1	Scope 3 emissions
	A-E2	Climate change risks and opportunities
	A-E3	Waste management
	A-E4	Effluent discharge
	A-E5	Biodiversity sensitive areas
Social	A-S1	Sustainable economic activity
	A-S2	Employee training expenditure
	A-S3	Gender pay gap
	A-S4	CEO pay ratio
Governance	A-G1	Business model
	A-G2	Business ethics violations
	A-G3	ESG targets
	A-G4	Variable pay
	A-G5	External assurance

Table 2: Advanced ESG metrics (ESG REPORTING GUIDE, *2022)*

ESG Classification	ID	Metric Title
Environmental	SS-E1	Emission strategy
	SS-E2	Air pollutant emissions
	SS-E3	Water consumption
	SS-E4	Water management
	SS-E5	Environmental impact of packaging
	SS-E6	Backlog cancellations
	SS-E7	Critical materials
	SS-E8	Chemicals in products
Social	SS-S1	Product quality and safety
	SS-S2	Customer privacy
	SS-S3	Legal requests of user data
	SS-S4	Labour law violations
	SS-S5	Data security and privacy fines
	SS-S6	Health and safety performance
	SS-S7	Marketing practices
	SS-S8	Customer satisfaction
	SS-S9	Customer grievance mechanism
	SS-S10	ESG integration in business activity
Governance	SS-G1	Whistleblower policy
	SS-G2	Critical risk management
	SS-G3	Systematic risk management

Table 3: Sector specific ESG metrics (ESG REPORTING GUIDE, *2022)*

For each metric there is a definition that explains what is measured, directions are given on what to measure and how, as well as the frameworks, the standards and the legislations that are related to each metric. Due to the particularities of each sector, special metrics are given that are considered more material. The related sectors mentioned in this guide are the following: Consumer Goods, Extractives and minerals processing, Financials, Food and Beverage, Health Care, Infrastructure, Renewable Resources and Alternative Energy, Resource Transformation, Services, Technology and Communication, and Transportation.

Regarding the topic that we are going to further examine in this thesis, there are several reasons that support the use of ESG metrics in the investment process instead of the use of just the ESG ratings. For example the disagreement of ratings between different agencies, the homogenization of results where different pillars cancel each other’s effect or even the loss of the predictive nature for future ESG events, as seen also in (Serafeim & Yoon, 2021). And above all there is the sense of materiality. Different institutions, such as SASB and GRI, focus on the assessment of materiality for different industries to

determine the importance of each factor in the final ESG rating. This is affected by the type of the business, the business model, and the external environment. Regardless of the importance of this issue and the focus of the stakeholders, the discussion remains on the perspective on which metric is material (Boffo & Patalano, 2020). According to Matos (Matos, 2020) there is no consensus on the exact list of ESG issues and their materiality. And that is one of the reasons why the investor might want to target and monitor specific issues, that are not identifiable though a generic ESG rating. As a result, an investor should be able to evaluate the investments based on clearer data, leading inevitably to the evaluation of specific ESG metrics. However, as this field is complicated, we will examine it in further detail in another chapter.

2.5 Summary

In this chapter we saw some introductory concepts regarding ESG reporting, with a focus on ESG metrics. We reviewed some popular advantages for companies that function under the framework of ESG, while we learned about the concept of materiality, which is used a lot when connecting corporate performance to ESG performance and metrics. We also gave some basic elements on which we will further develop later the topic of ESG investments.

Chapter 3: ESG investing

3.1 Introduction

In order to understand the role of ESG metrics in the ESG investment process, we need first to get a better understanding of the ESG investment process overall. In the following, we will see the origins of ESG investing, some of the main investment strategies, the effect of ESG on corporate performance, the challenges of the ESG investing process, some common pitfalls, and how ESG is integrated in the investment process. The role of ESG metrics in investments. due to its significance for this thesis, will be examined in the next chapter in more detail.

It is generally accepted that the primordial case of investing that eventually led to the development of ESG investing is that of ethical investing, with its first expression through Quakers in 1750 regarding the trade of slaves. Ever since several things have changed, including the adaptation of sustainable investing in business practices, the passage from shareholder to stakeholder value and the increase in computational and storage capabilities that allow the registration, handling, and evaluation of massive business data. ESG investing is a distinct type of responsible investing that stems from socially responsible investment philosophy. As stated also by Boffo and Patalano, (Boffo & Patalano, 2020), earlier approaches used exclusionary screening and value judgments to shape their investment decisions, while ESG investing was initiated by shifts in demand from across the finance ecosystem, with a search for better long-term financial value, and better alignment with values. Fulton et al. initially (Fulton et al., 2012) and then Li (Li, 2022), present in the following figures the development of Sustainable investing and ESG investing correspondingly.

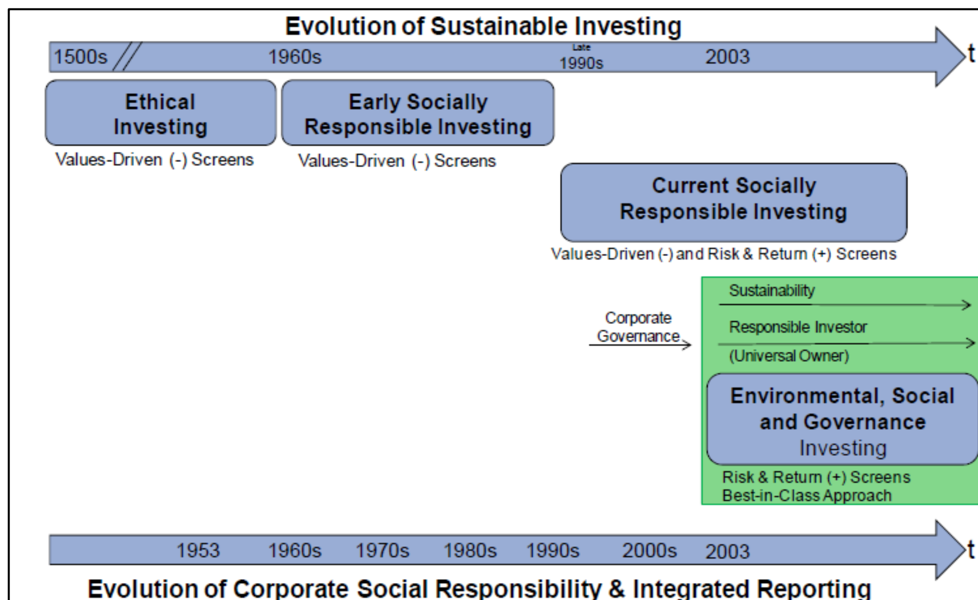

Figure 1: Timeline of Evolution of sustainable investing (Fulton et al., 2012)

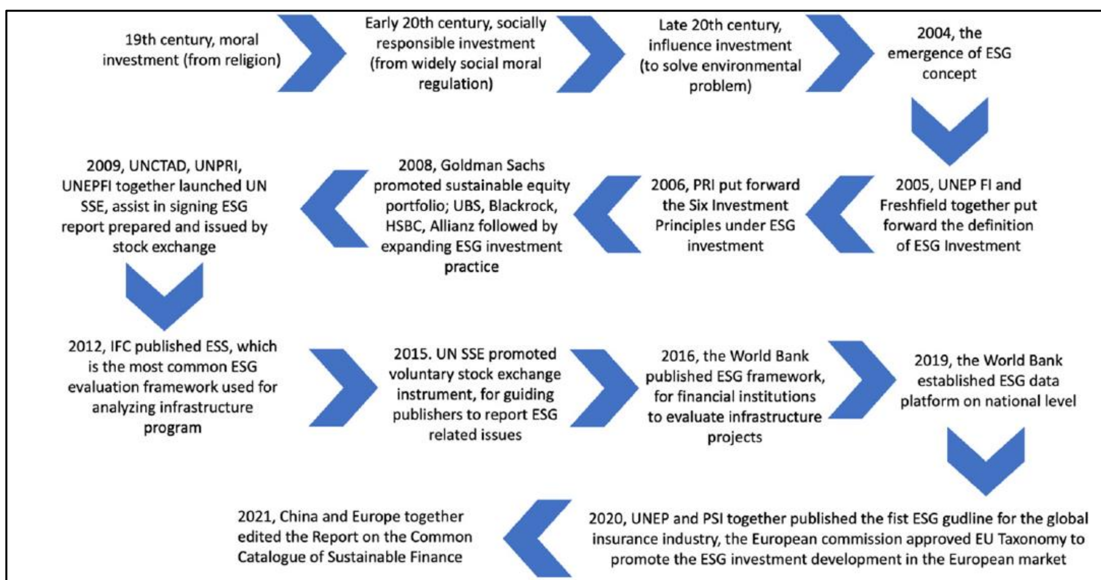

Figure 2:Development of ESG investment (Li, 2022)

Li presents the structure of the ESG investment procedure quite detailed (Li, 2022), as he considers it to have already become "*relatively transparent and standardized*". The main stages of the process are the following:

In the first stage, companies disclose ESG information, the structure of which is based on certain standards (though not always, with this presenting a challenge as we will see later). The main sources of those standards are international organization regulations (like the Global Reporting Initiative), bourse requirements (like HKEx's 2021 ESG Reporting Guidelines Index), and government policies (like EU TEG Final Report on

EU Taxonomy in 2020). Most formulations regarding international ESG disclosures are of mandatory disclosure.

In the second stage, rating firms use the disclosed ESG data to rate the ESG performance of a company according to ESG rating criteria, which can be of their choosing. The same companies can further process ESG-based index data based on the above calculated rating. As we will see later, some investors might choose to skip this part.

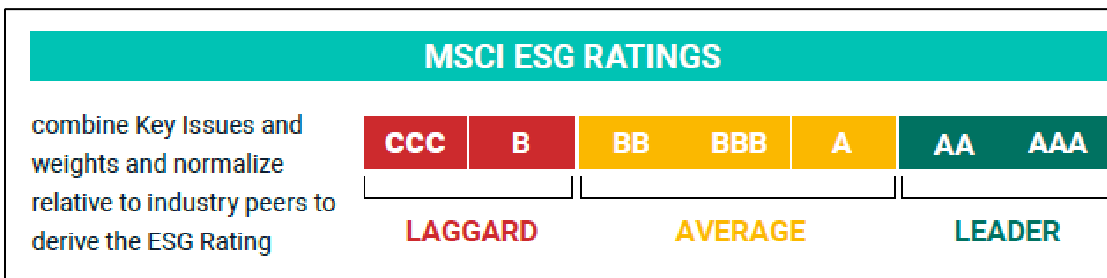

Figure 3: Ratings as presented by MSCI (MSCI ESG Ratings, n.d.)

This evaluation at this stage presents certain problems: the reporting and evaluation standards are not unified; Second, the rating process is not transparent (rating companies do not disclose their full methodology). Furthermore, several studies have shown low correlations among major rating agencies (Berg et al., 2019). There are several explanations, which we will see in another part of this thesis.

In the third stage, Index preparation companies such as Sustainalytics compile the ESG indexes (such as S&P 500 ESG Index) based on rating results.

In the fourth and final stage, the investors will use the ratings, the index results, or individual ESG metrics in their investment strategy to make an investment decision.

Figure 4: Suggestion of ESG ratings usage by investors (MSCI ESG Ratings, n.d.)

Generally speaking, ESG investing presents several topics for discussion. For example, ESG is used during the recent years by fund managers for red flagging and to manage risk (Van Duuren et al., 2016), although in the same study the argument is made that ESG investing is similar to fundamental investing. Of particular interest is the fact that US based and EU fund managers take different approaches when it comes to ESG investing. Nevertheless, the same study cannot find concrete evidence that supports the theory that ESG can enhance investment performance. The authors note that the issue here is the limited timeframe of the study, something which is noted also in other studies. Another interesting find is that ESG principles are not used exclusively by fund managers that market themselves as practicing SRI (socially responsible investing). This means that ESG practices are spreading beyond a niche market. From one point of view this is useful as it increases awareness, and awareness increases the need for structural changes. On the other hand, this introduces to the ESG investment ecosystem players that market themselves as ESG-related while they are not, and this can weaken the positive effects of ESG overall. Furthermore, we see that commercial investors are more interested in the Governance pillar as opposed to retail investors that are interested more for the other two (social and environmental). The difference regarding approaches in US and EU might stem from the difference in regulatory agenda (Matos, 2020). Finally, it is important to mention that the ESG issue that gets the most attention from institutional investors is climate change, in particular their portfolio companies' exposure to carbon risk and "stranded assets".

Speaking of institutional investors, Giese et al. (Giese et al., 2019b) have shown that, most institutional investors are focused on integrating ESG for financial reasons and not for ethical reasons. They seek better risk-adjusted returns over the long term without upsetting the investment strategy and factor allocation of their existing portfolios. Until recently, certain institutions were not allowed to undermine performance, therefore ESG criteria were not promoted (as for certain researchers, reduction of the investment universe can lead to reduction of diversification possibilities or downgrading of the efficient frontier, and as a result to lower returns). Furthermore, except for some leading asset owners who have integrated ESG across most of their assets, most investors currently do not integrate ESG across all their portfolios or have a consistent strategy.

As we have seen in the previous chapter, the essence of materiality is important for all companies. What can be interpreted from the suggestions of the relative guidelines, is that not all sectors are affected equally by the same factors. As Iazzolino et al. also state (Iazzolino et al., 2023) "*ESG has a different impact depending on the sector being considered, and this shows that there are sectors that are more sensitive and others less sensitive to ESG factors"*. According to Matos (Matos, 2020) responsible investors will seek two things: either to avoid or reduce exposure to investments with greater ESG risks or to influence companies to make them more ESG-friendly, which eventually is expected to produce more positive benefits for society.

Now that we got a basic idea about ESG investing, we will delve into the specifics of ESG investing.

3.2 Reasons behind ESG investing

ESG reporting, which is the basis for ESG investing, was introduced as a set of actions that increase transparency, accountability and create a unified way of reporting and measurement of corporate performance, beyond traditional accounting (financial metrics as opposed to non-financial metrics). ESG investing builds on this new set of information, and this is done for several reasons. As mentioned above, investors basically either want to increase their returns, or to reduce risks (which can lead to better risk-adjusted returns), while some remain that wish to have some impact on society. Of course, the incorporation of ESG in investing might have even more detailed targets. Some believe that they can predict ESG related events (which will affect company performance), while others might want to find a way to identify opportunities, or to avoid companies with precarious externalities (the effect that the company's actions have on the environment), while some might be guided purely by certain values (like religious values or certain values for society and the environment). In parallel there is a trend for promotion of more sustainable practices in companies and brands and this creates a further demand for companies that are reporting good ESG metrics, and of course apply actual business practices that lead to those good results, or act to improve them.

For investors that believe in value creation, there are certain ways through which ESG practices can create value for a company (Odell & Ali, 2016): First by increasing

efficiency and profitability, which can lead to higher returns on invested capital. Second by increasing the company's ability to capture and maintain growth opportunities, and finally by improving a company's risk management, which reduces further its cost of capital. However, we can add one more reason, which is the fact that a company, while applying ESG principles, is given the opportunity to identify potential threats and act against them, which will strengthen its sustainability on the long term. This is considered more as a strategy tool and not a business process tool, and it is expected to be regarded as such, especially in a time where sustainability is actually considered being a business strategy.

As Matos recently noted (Matos, 2020), one driving force behind the incorporation of ESG issues in the modern business and investment world is societal change. Transfer of wealth from baby boomers to the next generations, and wealthy individuals who want to know how they create wealth, sometime because they care for society and the environment or because they seek a long-term, sustainable way of creating value. As this demand for different criteria grows, it also pushes for institutional changes, like the establishment of mandatory reporting (like ESG) for better supervision and evaluation.

According to a study conducted by Ashwin Kumar et al. (Ashwin Kumar et al., 2016), companies that incorporate Environmental, Social and Fair Governance (ESG) into their business strategy, show lower volatility in their stock performances than their peers in the same industry. The authors conclude that this leads to increased risk-adjusted returns. Lower volatility is identified also by Czerwińska & Kaźmierkiewicz (Czerwińska & Kaźmierkiewicz, 2015) after studying the Polish market.

Speaking of stocks, another interesting find in the work of Hvidkjær (Hvidkjær, 2017) is that the stock market does not respond positively to certain types of ESG/CSR initiatives taken by firms. The explanation here is that the market understands that there might be a problem that led to those initiatives, so it reacts accordingly.

Serafeim & Yoon (Serafeim & Yoon, 2021) find that the ESG rating can predict future news, which eventually can be used for investment decisions. Yet the predictability is lost for firms that have ratings with large disagreement between raters. This is important issue and already identified several times in the literature. Nevertheless, if there is a

consensus rating among different agencies, the relation between news and market reaction is somehow moderated.

Boffo & Patalano show (Boffo & Patalano, 2020) that in the case of asset concentration associated with tilting portfolios toward high scoring ESG companies can, depending on the conditions, affect volatility, risk-adjusted returns, and drawdown risk. Regarding volatility, the explanation lies in portfolio theory, where greater concentration of exposures in a given portfolio can increase volatility. Actually, in many of their constructed ESG portfolios in their study, the returns were equal or lower from the performance of the benchmarks. On the other hand, asset concentration on high scoring ESG companies, gives smaller drawdown risk when compared to non-ESG portfolios. So, we understand that is not only about the reduction of risk, but also the characteristics of it.

Again on the topic of risk reduction or the aversion of it, Reber et al. (Reber et al., 2022) show that ESG disclosure reduces idiosyncratic volatility and downside tail risk and that higher ESG ratings have lower associated firm-specific volatility and downside tail risk during the first year of trading in the aftermarket. The authors suggest the ESG efforts function as a proxy declaring compliance with sustainability-related norms, that leads to a societal license to operate. In a similar manner, the ESG disclosure can replace more traditional measures as an indicator of aftermarket risk, such as firm age. The reduction of risk through ESG investment integration is supported also by Giese at al. (Giese et al., 2019b) who claim that, ESG integration in the investment process led to a reduction in risk and showed a slight positive performance impact, at a global level. The effect of ESG on risk is evaluated also by Sassen et al. (Sassen et al., 2016), who suggest that a higher corporate social performance (CSP) and in particular a higher performance regarding the social pillar (S) can increase firm value through lower firm risk. In further detail, the authors find that a higher corporate social performance decreases total and idiosyncratic risk. Social performance has a significantly negative effect on all three risk measures (systematic, idiosyncratic, and total risk), with environmental performance decreasing idiosyncratic risk, whereas total risk and systematic risk are only affected in environmentally sensitive industries. On the other hand, the authors cannot detect a significant effect of corporate governance performance on firm risk.

Hvidkjær (Hvidkjær, 2017) explains the mechanism behind better returns, as again we see the idea of late identification by the market of the benefits that a good ESG metric means. The benefits of ESG related information are initially intangible, and as a result the abnormal returns for an investor that identifies the opportunity early on, might appear because the rest of the market might fail to fully incorporate intangible information in time. In the following investing periods, prices might be corrected as the intangible information eventually become tangible through higher earnings for the company (something which is disclosed to the public). This of course means that the underpricing will not continue, unless a completely unrelated issue is positively reported later.

Another reason for using ESG in investment is identified in the strategy of active ownership by ESG investors, which can create value, both for shareholders and other stakeholders. The idea here is that investors will identify companies that based on their ESG metrics, present room for improvement. The improvement can come through active ownership, meaning that the investors will start acting in the management of the company, especially by pushing for improvements on the lagging ESG areas (that matter).

Sometimes it is not useful to know only the strict mathematic relations between different parameters, but also what the other players of the game believe about it. McCahery et al (McCahery et al., 2022) have found in their study that limited partners (LPs) are motivated to incorporate ESG because they believe that the application of ESG principles is more strongly correlated with financial performance. On the other side, general partners (GPs) are motivated to integrate ESG factors into their investment strategies in response to increased client demand for sustainable products. We see here again that the demand from the retail users can make the institutional investors change strategies, or even offer new products. Finally, when evaluating individual components of ESG scores, the investors consider the G pillars the most important component, followed by E, and then S. In the same manner (perception of the market) Hvidkjær (Hvidkjær, 2017) is more interested whether any value created by ESG is properly recognized by the stock market and not into the actual value creation.

According to the finding of Wang et al. (Wang et al., 2023) stock price fragility can be reduced by improving ESG performance which is weakening investors' sensitivity to stock performance.

Of particular interest is the application of ESG strategies for emerging and frontier markets (Odell & Ali, 2016). Due to uneven governance, weak institutions, and a lack of regulatory oversight—it becomes necessary for investors to consider ESG factors in their due diligence and engage with portfolio companies on such issues. We understand that ESG metrics evaluation becomes an extra tool in an environment that is not properly regulated, is unclear and with increased volatility. Nevertheless, the difficulty of getting proper and correct ESG data, increases.

Eccles et al. (Eccles et al., 2017) show that the institutional investors want to incorporate ESG in their investment strategies in order to foster a long-term mindset (62%), to cultivate better investment practices (48%), due to demand from beneficiaries, due to personal beliefs of senior executives (35%), while 18% is attributed to regulatory requirements and 10% from peer pressure.

Closing this part, we must note that there is another reason to take investment decisions based on ESG related information, and it is not so scientific, or evidence based. The reason is that everybody else is doing it. Yes, ESG is a buzzword and consequently it attracts all kind of investors, mainly retail investors. On the other side there are products that might only remotely relate to ESG or apply and promote its principles. This seems to have various results. From the one point of view, it attracts attention and increases demand and pressure to various sides (the companies, the regulatory bodies, the investment institutions). Therefore, the positive changes that relate to ESG gain more momentum and can be realized easier (mandatory reporting, identification of externalities that need remedy, etc.). On the other hand, many investors might be deceived, believing that they invest into something that does not actually delivers. This calls for better ESG education and a stricter regulatory framework.

3.3 Impact of ESG on Financial Returns

Despite stating above that we will not try to dispute the positive impact of ESG on a company's financial performance, we need to understand where the research community

stands on this topic and how the various investors perceive ESG effect on performance and financial returns. This will help us better understand the strategies and decisions of the investors.

First, the ESG guide of the Athens Stock exchange (*ESG REPORTING GUIDE*, 2022) mentions repeatedly the superiority of companies that have good material ESG metrics ("Taking into consideration that companies with strong performance on material ESG topics outperform companies with poor performance on material topics", page 19), however this perception is not common across all researchers.

On the same side, according to MSCI ESG Ratings (*MSCI ESG Ratings*, n.d.) the ESG factor in MSCI Indexes has actually contributed to improved corporate performance. Nevertheless, such statements must be evaluated with caution by the investor, as the same institutions benefit from the promotion of ESG investing, regardless of the results. Therefore, there are incentives to overestimate the relative contribution. It is interesting here to note that the outperformance mentioned above, refers to a specific time-period with very special characteristics, that of the CORONA virus crisis (Nagy & Giese, 2020). In this study, there is actual evidence that the systematic tilt of indexes towards companies with better ESG ratings, contributed to better performance. One interpretation here is that the companies with better ESG risks were better prepared for a crisis like this, and this support the idea that ESG reporting is a proxy for better strategy. However, the fact that the results refer to a certain period, is considered by certain researchers as a limitation of the study's validity.

Actually, Matos (Matos, 2020) clearly claims that there is no clear empirical evidence that firms that "do good, do well", as everything depends on the context. In a similar way, he states that there no consistent evidence that SRI strategies lead to enhanced returns. Studying stocks of Eurostoxx50, La Torre et al. (La Torre et al., 2020) arrive to similar results, suggesting the stock returns are low, are associated with few firms, and they are identified in the energy and utilities sectors, rendering them non-universally applicable.

Desclée et al (Desclée et al., 2016) study the effect of ESG to bond investments and claim that the effect of ESG factors on financial performance is stronger for the Governance pillar, followed by Environment, while Social scores had the weakest link

to performance. The explanation here might be that Governance may indeed reflect management quality that can lead on the long run to benefits for the holders of the related investments. In the same study, after noticing that there is a relationship between ESG scores and credit ratings, they reach to the conclusion that investors should be careful when integrating ESG data in portfolio construction, as they might create unintentional bias through overweighting better ESG companies. The issue is that this bias can lead to lower yields and lower returns, something that we might not want to avoid as our target might be to reduce risk, but in certain cases might be strictly forbidden by certain laws (like in US pension funds).

Another study that doubts the importance of sustainability reporting in affecting the financial performance of a company, is that of Oprean-Stan et al. (Oprean-Stan et al., 2020). One of the explanations given is that there might be a 2-year lag between the disclosure of the ESG information and the actual effect on financial performance of a company. In fact, they claim that "an organization that discloses information on sustainability aspects can decrease its market performance". Furthermore, they explain that the reporting has less meaning, nevertheless can demonstrate the capacity of the firm to achieve sustainable development goals. The same authors suggest that bad management of sustainability issues can harm the financial performance of the company, with the 3 pillars of ESG not being equal applicable to financial performance.

On the contrary, while Kim & Li (Kim & Li, 2021) admit that it is difficult to generalize the positive impact of ESG factors on corporate finance performance, they suggest that certain ESG variables positively impact financial performance (this actually support the case that we will see later, that it might be preferable to evaluate each material metric separately and not rely on a single ESG rating). For example, the total ESG score has a positive impact on corporate profitability. Furthermore, they claim that corporate governance has the most significant impact on corporate profitability. Additionally, the authors find that all ESG pillars have a significant impact on credit rating. The interesting thing here is that while social, governance and total ESG score have a positive impact on credit rating, environmental score has a negative effect on the credit rating. We also keep the suggestion of the authors that the investor should understand the limitations or the underlying trends that can affect the relationships between certain metrics.

Jain et al. (Jain et al., 2019) compare the performance of traditional indices versus ESG indices and suggest that during the observed period of time, the two indices did differ regarding performance.

Boffo and Patalano further undermine the importance of ESG scores as a predictive tool (Boffo & Patalano, 2020) due to its inconsistency. They present evidence that outperformance can be achieved, both with high-ESG indices and portfolios but the same can be achieved also with low-ESG portfolios, while many high-scoring ESG portfolios underperform the traditional market. Furthermore, they claim that the OECD secretariat found an inconsistent correlation between high ESG scores and returns, such that different providers lead to different results. The same authors suggest that ESG portfolios have a lower drawdown risk when compared to non-ESG portfolios.

To the same conclusion seem to have arrived also other researchers. Although previous empirical literature suggests a positive link between ESG rating levels and returns, (Halbritter & Dorfleitner, 2015) provide a critical review due to a number of concerns. The ESG portfolios do not show significant return differences between companies featuring high and low ESG rating levels. This applies both to the overall scores and to the individual pillars (Environmental - Social - Governance). A best-in-class approach using sector-specific ESG scores does not generate abnormal returns either. These results strongly argue against previous studies suggesting abnormal returns of ESG portfolio strategy. The results also provide evidence of a decreasing influence of ESG variables on the returns. In summary, this study strongly questions whether there is an actual relationship between ESG ratings and returns which can be exploitable through a trading strategy.

The effect of ESG on bond investments (particularly a ESG tilt strategy) was studied also in the article ("Does an ESG Tilt Improve Corporate Bond Portfolio Outcomes? A Systematic Back-Test of MSCI ESG Ratings," 2019). The unknown author suggests that an ESG overlay can enhance portfolio returns, although under special conditions. Nevertheless, the author notes that real world transaction costs do matter for returns. The author concludes that ESG scores can be utilized to enhance portfolio outcomes, via lower drawdowns, reduced portfolio volatility and, in some cases, marginally increased risk-adjusted returns. We notice here that the author refers to ESG scores and not ESG metrics. This is typical in most literature, as the focus is placed on ratings and not on

individual ESG metrics. As will see further down the road, it is better to understand what is going on "under the hood" if we really want to incorporate ESG in our investments.

Something that is quite common as an investment product is the investment in indexes, and perhaps it is of particular importance for retail investors as it typically minimizes the investment costs, which as we have seen already, can affect the expected returns. In the work of Giese et al (Giese et al., 2019b) we see that excluding companies with low ESG ratings is not a guarantee for outperformance. In fact, when focusing in the US tech sector, this approach would have led to underperformance in a certain period of observation (this seems to be important also). However, the authors suggest that Index ESG methodologies, whether used on a global or regional basis, can add downside protection, which can be also a target for an investor.

There are studies that evaluate the relationship between ESG and company value, for example Ionescu et al. (Ionescu et al., 2019) studied companies from the travel and tourism sector, finding that ESG can be used as a predictor for economic performance and that Governance is the most important of the 3 pillars (a recuring conclusion, mentioned also by other researchers). Another interesting research (Eng et al., 2022) suggests that ESG disclosure if done in detailed manner it will increase the company's value, while if done in a boilerplate manner it will damage it.

Hübel & Scholz (Hübel & Scholz, 2020) suggest that the addition of ESG factors significantly enhances the standard asset pricing models. However, there is no evidence for a systematic ESG-related return premium or discount. The authors suggest that investors can create portfolios with lower ESG risk exposures while keeping risk-adjusted returns without undermining performance.

Regarding the superiority of ESG strategies on other investment products, Rompotis (Rompotis, 2022) finds that no significant alpha is achieved by ESG ETFs in the UK, while some empirical evidence indicates that ESG ETFs outperform the FTSE 100 Index.

Hvidkjær (Hvidkjær, 2017) notes the reduction of diversification, which theoretically can lead to lower performance. Diversification provides risk reduction without a

reduction in expected returns (Markowitz, 1959). Investment in a broad portfolio of assets results in the optimal risk-return trade-off, and the theory suggests that any restriction in the investable universe will undermine performance. Therefore, it is expected that ESG investment strategies that exclude even whole sectors, we will have lower returns.

Again according to Hvidkjær (Hvidkjær, 2017), the explanation behind the claim for outperformance of ESG-based strategies is that the stock market underreacts to ESG information. It is expected that the value effects of a positive ESG event is not sufficiently identified by the other investors, therefore, firms that are related to such events tend to be undervalued. As a result, a strategy investing in these firms can obtain abnormally high returns. Furthermore, demand effects are also an important reason that explains why high ESG stocks might exhibit underperformance relative to low ESG stocks, as more people want to invest in them, increasing abnormally their price. Thus, if the investor who wants to profit from the future ESG events, must clarify if the ESG information is already priced into the stock. Only if the stock market systematically undervalues such information, will the ESG investor obtain high returns.

As a conclusion regarding the effect of ESG on financial returns, we will keep that of Boffo and Patalano (Boffo & Patalano, 2020) who have found in their study that there was little differentiation in the performance of funds with higher-scoring and lower-scoring ESG securities. Instead, they conclude that the wide range of performance of funds across both categories dictates that a set of other factors, including particular investment strategies and their implementation, drive results. This dignifies the importance of investor education related to retail ESG funds, as in ESG investing in general, and the concept that while ESG is important, is not the only factor that drives performance.

Finally, we see that the research community is not sharing the same views regarding the better financial performance of companies that have better ESG metrics. While nobody doubts the positive impact that ESG practice will have on a company in general, like in operations or strategy, many researchers claim that performance can vary, and that it is affected by many other parameters as well.

3.4 ESG investment strategies and products

3.4.1 ESG investment strategies

Now that we have a better understanding about the reasons behind ESG investing, we will see in detail the related investment strategies and the products that are currently available. Starting with the ESG investing strategies, Li has presented them already in a very structured manner (Li, 2022). There are seven ESG investment strategies in total that could be divided into two subcategories according to market level. Regarding their popularity in the global market, first comes ESG integration, then we have negative screening, and finally there is shareholder engagement. ESG integration is growing more rapidly, yet it seems to be the most complicated and the most demanding regarding expertise and resources.

ESG Investment Strategy	Definition
Type 1: Primary Market Investment Strategy	
Impact/Community Investing	Through investment, to achieve a positive influence on society and the environment, focus on the ESG impact and positive benefits generated by the investment. This method is the latest to be applied.
Type 2: Secondary Market Investment Strategy	
ESG Integration	Environmental, social, and governance factors are systematically and explicitly incorporated into the investment analysis. ESG integration is the addition of ESG aspects into the original investment framework. ESG integrated strategy's drawback is not banning investment in a certain scope.
Negative/Exclusionary Screening	This strategy is based on ethical values, internationally accepted norms, and the legal requirements of the host country of the institution to eliminate the relatively poor ESG performance companies of a range of potential targets. This method was first applied and can help avoid the negative impact of regulation and accidents on company performance.
Norms-based Screening	According to the relevant ESG standards formulated by international organizations, companies with adverse effects of business activities are excluded from investment.
Sustainability Themed Investing	Investing into sustainable solutions that contribute to environmental and social aspects, such as green buildings, sustainable agriculture, and low-carbon portfolios. Focus on forecasting long-term trends and identifying ESG investment opportunities and tracks.
Positive/Best-in-Class Screening	Invest in an industry, company, or project that has positive ESG performance. The method is often used in ESG index development.
Corporate Engagement and Shareholder Action	Leverage shareholder rights to influence corporate behavior, communicate with companies on ESG issues, submit shareholder proposals (jointly), and vote by proxy under comprehensive ESG guidelines.

Table 4: ESG Investment strategy (Li, 2022)

There is another classification of the investment strategies, as adopted by the Global Sustainable Investment Alliance (GSIA) in the Global Sustainable Investment Review. There, the ESG investment strategies are divided into four categories: screening (including negative, positive, and norms-based screening), integration (including ESG integration), participation (including corporate engagement and shareholder action, impact/community investing), and theme (including sustainability themed investing). As we see though, the main idea remains the same. Overlay of strategies is possible, for example the investor can limit the investment universe by excluding certain sectors (weapons or fossil fuels) and then use ESG integration to calculate weighting in the portfolio. The above strategies can be applied to most of the available investment products, with some limitations.

Regarding the complexity of the ESG investing strategies, Boffo & Patalano (Boffo & Patalano, 2020) explain that on the one side with the least amount of complexity is the exclusion of certain firms categorically (e.g. moral considerations), and on the other side is the full ESG integration into the preceding methodologies of investing. Approaches such as ESG rebalancing, thematic focus and ESG impact investing have medium complexity. They clarify though that the choice of the strategy will greatly influence the final performance of the investment, without giving examples of the related difference in scale.

One of the easiest strategies to apply is that of screening, meaning not getting associated with investments that satisfy certain criteria, like tobacco or alcohol companies, or companies with high environmental risks. This approach might be a result of personal or religious moral standards. Some suggest that this approach might increase risk (due to reduction of diversification) or reduce returns, as certain sectors might have higher returns overall. However, there are researchers who prove otherwise. Verheyden et al (Verheyden et al., 2016) show that screening not only does not hurt performance, but actually improves risk-adjusted returns. ESG screening appears reducing tail risks, and as a consequence lowers the probability of a severely negative daily return. The researchers suggest that a 10% ESG screen in the initial stage of the process, can help the portfolio performance, regardless of the intentions of the investor to be more sustainable, as an ESG filter can effectively create a universe of stocks with improved risk-return characteristics and diversification.

Of course, those strategies can be used as a basis for the development of other strategies. For example, according to Zopounidis and Eskantar (Ζοπουνίδης & Εσκαντάρ, 2022)(p.29), the best-in-class approach can be further developed as a best-in-universe strategy, where we have the companies with the best ratings in all categories, and best effort screen, where we have the companies that have the best improvement of their ESG situation over the years.

Bradley (Bradley, 2021) suggests that the holding period, the size of the investment universe and the scope of the investment strategy are additional factors that an investor should consider when making ESG investment decisions.

Horn (Horn, 2023) suggests that ESG scores and negative screens should be used separately, as companies subject to negative screens show lower idiosyncratic risk as compared to ESG rated companies not subject to negative screens.

Regarding the preference of institutional investors to certain strategies, (Eccles et al., 2017) show that they prefer easier to apply strategies despite having the resources to use more complicated or effort-demanding strategies.

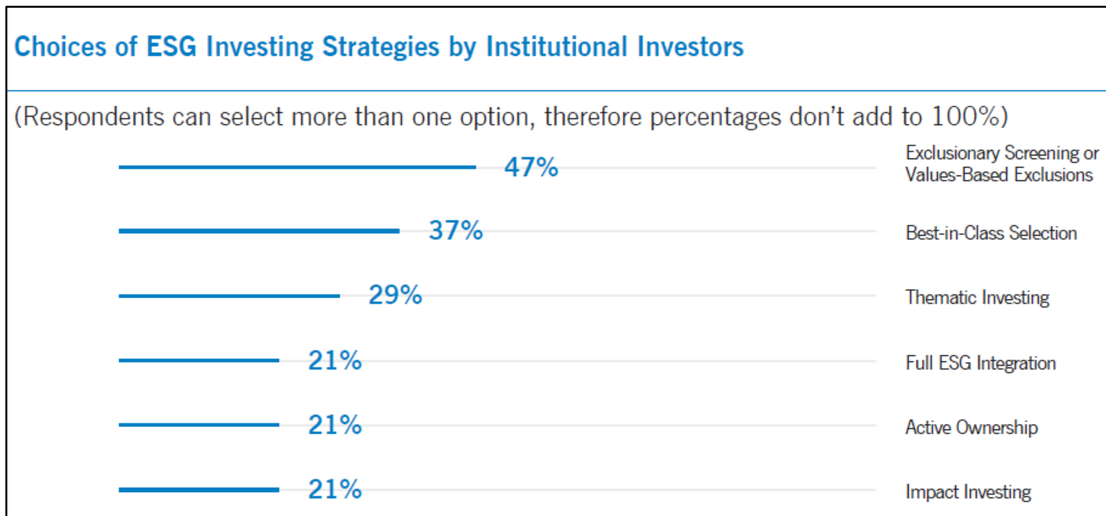

Figure 5: Choices of ESG investing strategies by Institutional investors (Eccles et al., 2017)

The decision on which strategy to choose, is affected by several factors. The investor must take into consideration the available amount for investment, the available resources, the expected return, the timeframe, if the management will be active or

passive, the access to information and the quality of it, willingness to put extra effort in the case of shareholder engagement, knowledge of certain industries or equity classes, regulatory limitations (especially for institutional investors) and personal or institutional guidelines, particularly for exclusion strategies. There is no best practice, but there is more suitable based on each investor's profile.

3.4.2 ESG investment products

In this section we are going to see the investment products that are currently available in the market. We will not dive into the details of each one of them, nevertheless it is useful to know which they are, and we will give some hints regarding their relationship with ESG investing. It is understandable that as long as the demand is growing, more products will become available.

First, we have equity investments, which are shares of companies. In this case we need to consider the style of management we want to apply. In the case of active management, we can focus on a set of stocks (satisfying certain ESG criteria), on which the decisions are made. However, the known issues with active management remain; the manager is not always outperforming the market, and active management entails higher fees. If we prefer a passive approach, then we should follow an ESG-related index. From the composition of this index certain stocks may be excluded (such as fossil fuel companies), and the selection of the included stocks is made from the index company, with the fund manager following the index. Unfortunately, ESG funds are expected to have higher expenses, with the expenses being attributed to the additional due diligence or screening, and as in all similar cases, expenses can affect returns.

Regarding fixed income instruments we have bonds, which lack certain investment characteristics as compared to equities, as they do not give voting rights, therefore they do not give the opportunity to the investor to apply certain ESG strategies. Another major difference from equities is that ESG is related to bonds through the effects that an ESG event (for example an environmental accident that affects the company) can have on a company's credit risk. So, the analysis of ESG factors is vital in the due diligence process that takes place when evaluating the bond. It seems that for bonds, the most important pillar is that of Governance. It is possible that an event related to E (as seen above) can lead to grave economic consequences, but it is most common to have a

company collapse due to poor governance, hence the connection to the Governance pillar.

There are also derivative and alternative instruments. There are many ESG related products in the area, but to avoid complexity, we will mention only index funds and ETF (exchange traded fund) products, for the sake of simplicity. While growing in popularity for the passive investor, reducing costs and providing easier access, those products don't fully disclose how they apply ESG strategies and unfortunately many of them rely on a single provider for the ESG data. Therefore, the products can have inherently several issues, such as market capitalization bias, as well incorporation of companies that do not actually satisfy the investor's beliefs. As we will see later, the single ESG data provider, is undermining performance as it incorporates biases and there is not clarity about ESG rating calculations.

3.4.3 ESG integration

From the aforementioned ESG investment strategies, ESG integration is considered as the most complex and resource demanding. According to Ailman et al. (Ailman et al., 2017), while the importance of ESG integration is already acknowledged, we are still learning how to do it. It is accepted that ESG investing is evolving, and consequently ESG implementation has not been defined consistently (Matos, 2020). Furthermore, the rest of the ESG investing strategies, seem self-explanatory. For those reasons, we will give some more details about ESG integration in this part.

Most investors will integrate ESG into their investments by applying four simple steps (Bradley, 2021). This applies mainly to equity investment products:

- Qualitative analysis: The investor will collect intelligence from different sources and will determine which factors are material to the company under evaluation.

- Quantitative analysis: The investor will measure the effect of material factors on equities, and then they will modify their valuation models.

- Investment decisions: With the results of the previous steps, the investor will buy (or increase weighting), hold (or maintain weighting), or sell (decrease

weighting) of a certain equity. The decision is made based on certain ESG metrics, or individual pillar rating or total ESG score or a combination of the above.

- Active ownership: With the same analysis, the investor can strengthen company engagement, proxy voting decisions as well as support monitoring and future investment decisions.

Furthermore, the investor can apply for the portfolio construction an exclusionary or inclusionary screening, based on unacceptable, controversial, or unethical sectors, on thematic filters, or on norm-based exclusions, in the form of an overlay as mentioned above. Additionally, the approach of the third step can be somehow regarded as a "best-in-class" approach or when excluding a company, as "worst-in-class". However, it is not best-in-class in a strict manner, as certain areas and relationships between metrics remain unclear. For example, one interesting tactic in ESG integration is the ESG "momentum", which is the preference towards companies that show improved ESG ratings, rather than focusing solely on the ESG rating itself. Particularly for stock level integration, the investor needs to adjust financial statement forecasts and valuation discount rates in their models to reflect the effect of ESG factors. Portfolios can be formed to underweight or overweight certain securities, for an optimized (ESG) tilt (Bradley, 2021).

ESG integration according to Witold (Witold, 2023), can also be done for:

- Fundamental analysis
- Value-based investing
- Growth investing
- Short – selling (especially when evaluating exposure to potential risks)
- Asset classes beyond public equities
- Quant-based strategies

Smart Beta strategies can be combined with ESG in the following ways:

- Extension of negative screening into smart beta strategies.
- Use of ESG metrics for improvement of risk or return of smart beta indexes.

- Blending of smart beta strategies with ESG information, which is translated into portfolio tilts based on specific ESG metrics.

Actual implementation looks like the ESG integration, as it will require either overweighting companies with improving ESG scores (ESG momentum) or underweighting companies with lower ESG scores.

As ESG integration can be done for fundamental analysis, it is interesting to note that Cohen (Cohen, 2023) finds that the traditional Capital Asset Pricing Model (CAPM) "Beta" carries environmental and corporate governance risks for the S & P500 stocks but at the same time it totally neglects social risks. As a result, it cannot be used nowadays where social risks have increased importance to all participants of the economic environment.

An integration proposal based on Index investing, comes from Giese et al. (Giese et al., 2019b). ESG integration can be achieved through index-based allocations in portfolios that seek to replicate ESG indexes. Index-based approaches offer consistency, transparency, and replicability and are generally considered cost-effective (Bogle, 2007).

Regarding actual integration of the ESG information in the investment procedure there are actual efforts in the literature (Pedersen et al., 2019) for the creation of an ESG efficient frontier. This is important, because due to the limitation of the available investment options under ESG criteria, the diversification is reduced, and the returns are expected to follow. Hence, the need for finding the efficient frontier. It is interesting to note the find of the authors from this study, that information related to Governance lead to better returns as compared to those resulting from better Social or Environmental metrics, rendering good Governance more important for returns.

Chen et al. (Chen et al., 2022) suggest a model through which the investor can capture the returns' dynamic patterns during stock downturns. However, as the authors suggest, this model has still limited applicability due to the properties of the initial set used for the development of the model. Agosto et al. (Agosto et al., 2023) propose a method incorporating ESG scores, that predicts a company's credit rating. We understand that the potential investor will have to use different models, depending on what is the

parameter under investigation, and this must be done with caution, taking into consideration the characteristics of the data sets that were used in the first place.

Shanaev & Ghimire (Shanaev & Ghimire, 2022) show the importance of ESG rating changes (and not the ESG ratings) and how they affect stock performance, with ESG rating upgrades leading to small and insignificant positive abnormal returns, while ESG rating downgrades can lead to negative and significant abnormal returns of 1.0% to 1.4% per month. Those results are more prominent for ESG leaders rather than ESG laggards, and the possible explanation is that this might be affected by application of best-in-class strategy by investors.

Due to the complexity of the task, there is a lot of room for external support. For example, the ESG investor can use the services of MSCI (*MSCI ESG Investing* Brochure, n.d.) by taking advantage of the following options:

- MSCI ESG Research, which includes ratings of companies and mutual funds that gives greater transparency and scrutiny of corporate practices for institutional investors seeking to avoid controversies and mitigate risk. This includes also ESG and climate metrics.

- MSCI ESG Indexes, that are intended for exposure reduction to systematic and stock-specific risks, and benchmark setting for integrating ESG into active and passive portfolios, with over 1,500 equity and fixed income ESG and climate indexes available.

- MSCI ESG & Analytics that enables investors to handle ESG data and indexes to support portfolio construction, risk, and performance evaluation. The same institution provides special tools for the real estate sector. Again, we see here the application of an overlay (thematic approach – sustainable real estate).

However, Odell & Ali (Odell & Ali, 2016) show the major flaw in the quantitative approach in ESG investing. Many ESG investors use a quantitative scoring methodology to evaluate a company’s sustainability, nevertheless there are weak points. First, in several markets there is limited disclosure of data, and it is difficult to evaluate

and compare companies in absolute or relative terms. Second, the reality is that many ESG factors are qualitative; and no matter the effort to incorporate them in model assumptions and decision-making, it is not easy to transform them into abstract quantitative score for better investment decisions. Lastly, scoring with ESG is almost by definition backward-looking. This means that when the changes become visible, perhaps it is too late to take advantage of the value creation process as an investor.

3.5 Special topics in ESG investing

In this part, we will review some special topics that are associated with ESG investments. We will note some that are quite known, like greenwashing, and we will see some more obscure, like the importance of time or the company size affect ESG investments.

We will start with perhaps the most known pitfall of ESG, which is greenwashing. Greenwashing is a situation in which the company is presenting selected factors or manipulates the results of ESG reporting in order to make the company look better in the eyes of the stakeholders (Ding et al., 2023), particularly regarding the environmental pillar, thus the term "Greenwashing". As Li suggests (Li, 2022), the policies that prohibit greenwashing had potentially an effect on European ESG investments, with a decline of European ESG investments from 66% in 2012 to 34% in 2020, meaning that it helped clear the products that were not actually green. The Sustainable Finance Disclosure Regulation (SFDR) policy tightens the behaviours related to greenwashing, by requiring all financial market participants in the EU to disclose ESG situations, and by raising ESG disclosure standards. Regarding the same issue, Serafeim (Serafeim, 2020) claims that investors are becoming sophisticated enough to tell the difference between greenwashing and actual value creation. It is an indirect conclusion stemming from the fact that companies that outperformed on immaterial ESG issues slightly underperformed their competitors, a conclusion produced under the hypothesis that companies report immaterial issues on purpose, to distort the ESG material reflection to stakeholders. However, with the increase of available investment options, the complexity of information, and the limited resources that several investors possess, we expect that greenwashing should be controlled on an institutional level and not left for the individual investor to judge.

The importance of honest disclosure and the quality of it is mentioned also in other sources. Oprean-Stan et al (Oprean-Stan et al., 2020) stress the importance of honest, clear and systematic disclosure of information through ESG reporting that will demonstrate how any company activities affect the 3 pillars. This means that companies should not provide typical information for the sake of doing it, but rather give useful information that it has a meaning for the company's performance, meaning it is actual material. The ESG reporting guide of ATHEX (*ESG REPORTING GUIDE*, 2022) stresses even more several issues regarding ESG reporting, such as potential concealment of information that might not be beneficial for the company, the scope of the reported information and its ramifications to the parent organization, the quality assurance of the reported information as well as the accessibility of the information to the interested parts. In more detail, companies should provide information that is balanced, meaning that it does not only report information that on which they perform well. This is called balance, and it does not only ask for transparency but also for explanations for poor performance as well as the plans and intentions for future improvement. Furthermore, companies are advised to report on data covering the whole spectrum of their operations and be clear about which operations are not reported. This is called scope, and it is encouraged to provide data covering the whole organisation, i.e., both the parent company and the subsidiaries. Of course, all this information is useless if it does not reach its intended audiences which are the various stakeholders. This refers to format and accessibility. Last but not least, it is suggested that companies should obtain external assurance for their ESG disclosures, to ensure the credibility of their reports. Giese et al. (Giese et al., 2021) notes the danger of missing the important things that actually affect the company's performance, just because the company might be interested to show that is doing "something" for ESG.

Next, we have biases. Matos notes that there are potential biases in ESG ratings (Matos, 2020) that undermine the advantages and the meaning of ESG ratings. There is size bias, where larger companies may receive better ESG reviews because they can dedicate greater resources to prepare and publish ESG disclosures, while controlling reputational risk. There is geography bias, as companies located in regions with greater reporting requirements can get higher ESG assessments. Finally, Matos presents the industry bias, where the normalization of ESG ratings by industry can oversimplify the rating (and obfuscate important issues inherent in certain industries). Boffo and Patalano add another bias, as they find evidence for ESG rating bias against SMEs, with firms with

much higher market capitalization and revenues consistently receiving higher ESG scores than those with very low market capitalisations (Boffo & Patalano, 2020). This bias is identified also by (Dobrick et al., 2023) who focused on a specific provider, showing that bias remains even after remedial action was taken due to previous concerns.

We saw already that size matters and it might lead to bias, however it is also related to the awareness of the company for certain ESG issues. Cohen (Cohen, 2023) notes that the larger the firm, the more concerned it is with the environmental aspects of its operations. As a result, it is expected to have more environmental initiatives or collect and report more information on that topic. Certain authors suggest that the better ESG metrics or the most transparent or complete metrics will be available from large cap companies, thus the rest (mid and small cap companies) will be screened indirectly out the of available investment universe. As this reduces diversification, it is expected to reduce the potential portfolio returns, and it indirectly penalizes smaller companies, as it prevents them from being candidates for ESG investing. In a similar manner Hvidkjær questions the causality of ESG rating and high profitability as it is not clear if the high profitability of a company might be driving the ability to invest in ESG rather than the ESG investments causing high profitability (Hvidkjær, 2017). Adding to the topic of company size in ESG investments, Sabbaghi (Sabbaghi, 2022) finds evidence that show that the increase of volatility due to bad news is larger for large and mid-cap companies as compared to small-cap companies.

The importance of the time frame is identified by several authors. Hvidkjær, while trying to evaluate the claim of better returns for companies with better ESG performance, suggests that the observation period is important, as it can alter the conclusion (Hvidkjær, 2017). The author suggests that the evidence for better ESG and higher returns is strong in 1991-2004, while the returns of stocks with high ESG ratings do not appear to differ from benchmarks in 2005-2012. Some evidence suggests that returns have been once again high since 2012. This is a strong indication that the reference period can affect the benchmark performance but can also create false expectations. The differences due to the observation time window are mentioned also in other studies (Di Tommaso & Mazzuca, 2023). In their study, Serafeim & Yoon (Serafeim & Yoon, 2021) present another interesting finding related to time. By evaluating investments under different time frames, they realize that it takes three years

for the ratings to be integrated into prices. Their explanation is that the acquisition of ESG information and their integration happens slowly over time. This is considered to be a barrier for ESG integration and it is noted also by Eccles et al. (Eccles et al., 2017). This is very interesting, as many investors and researchers are fixated with short-term performance, despite the fact that the target of ESG is long-term value creation. Giese et al. (Giese et al., 2021) stresses the importance of time horizon when it comes to ESG. On the short terms Governance appears to affect the performance (as it is related to the company's operations), while on the long run environmental and social metrics seems to be more important, as their results are accumulative. The authors suggest also that there should be a balanced, industry-specific weighting of the 3 pillars, although the exact analogies remain to be found.

It is interesting to know that some sectors are directly penalized, and some others are indirectly favoured, like the Technology sector. Cohen has identified that investors underestimate the impact on environment by the activities of technology companies (Cohen, 2023), while the activities of industrial firms are considered more damaging. For that reason, Cohen recommends better environmental education for investors and other financial industry participants, that will help them understand that companies doing something for reducing their environmental burden should not be penalized as opposed to those that do nothing to reduce it. The environment pillar seems to have attracted a lot of attention, that is why some authors insist on using separate pillar rating. Hübel & Scholz (Hübel & Scholz, 2020) show the importance of the use of separate pillar ratings, as companies with high environmental ratings, are expected to be overvaluated due to a rising awareness of environmental risks among investors and consequently underperform similar companies with lowest environmental ratings, which are expected to outperform them. On the contrary, this does not seem to be the case for social and governance ratings.

Regarding the important issue of reduced portfolio diversification when utilizing ESG strategies that we mentioned in previous parts, Boffo and Patalano suggest the investor should not be worried (Boffo & Patalano, 2020) as the size of the ESG investable universe and the number of companies that utilize ESG scores is not big yet, but in terms of market size described by the capitalization of companies that incorporate ESG, it remains quite big. Therefore, there is ample room for investing using exclusion and tilting approaches while maintaining a sufficient level of diversification.

Management costs should be taken into consideration as they may affect the resulting returns. This is particularly important in the case of active management, but in general for ESG investments, as they are expected to have increased management costs due to the higher complexity of the evaluation procedure. While many studies suggest that ESG leads to better returns, not all of them clarify if increased management costs are taken into account.

Regarding particularities of certain sectors, we have seen already that this is handled through the identification of Key Issues and certain material metrics. Nevertheless, the sophisticated investor should be able to see the whole picture of each sector. For example Egarova et al. (Egorova et al., 2022) give many interesting information regarding the IT industry. The authors find that IT companies are not leaders regarding ESG factors, and that certainly there is room for improvement. ESG does not seem to be the sole parameter for superior corporate performance, as IT companies are already performing way better as compared to other sectors (with results of S&P500 during 2023). Finally, the authors note that the best size to measure against ESG factors is the market value of the company. Additionally, Chodnicka-Jaworska (Chodnicka-Jaworska, 2021) has shown that the Technology sector is very sensitive to the G pillar.

The potential investor should be also aware that ESG ratings do not have the same effect across all regions. For example Martynova & Lukina (Martynova & Lukina, 2023) while investigating the effect of ESG on financial performance of companies, they found out that ESG ratings can have positive effect in one area (South-West Asia) while negative in another (South-East Asia). Also, the former area is affected by the individual pillars (E S or G) while the latter region is not. The explanation given is that the differences noticed might be attributed to differences in historical and cultural development of ESG issues. This is already mentioned by Khan (Khan, 2019) as cross-country variation on governance. The reasons mentioned are: significant variation in ownership structure, variation in shareholder orientation across countries, and assessment of company-level governance in isolation from the institutional setting that envelops the company.

Regarding materiality, while we understand that it is important for the ESG process, that it is related to the issues that matter, and that greenwashing is a result of distortion of

topics that matter and presentation of those who don't (in an effort to hide the important issues), there is no generally accepted methodology in the literature regarding the identification of material issues. Consequently, this is left for judgement to rating agencies, authorities and to the very experienced investor.

As the field of ESG investing is developing, several controversies are identified. (Katsantonis et al., 2016) try to debunk certain myths surrounding ESG investing. The ESG should be able to understand the limitations of the available tools and methods, and the ramification of the investment decisions. Here again we stress the need for better education on ESG issues for investors.

Myth	Reality
1. The net financial effect of corporate efforts to address environmental and social issues is to reduce corporate returns on operating capital and, along with them, long-run shareholder value	• Only a relatively small subset of ESG issues is what might be described as "material" and hence "value-relevant" for each industry • Initiatives and investments designed to manage material ESG issues will produce results, in terms of increases in profits as well as stock returns
2. ESG is well on its way to being integrated into mainstream investment management and capital markets with over $60 trillion in assets now subscribed to the Principles for Responsible Investment established by the UN (UNPRI)	• Only a small percentage of those assets are taking into account ESG data in a systematic way. • The overwhelming percentage is just using ESG screens
3. Companies have little if any ability to influence the kinds of investors who buy their company's shares	• Companies can and have influenced their investor base. A real example is the case of Shire, which managed to significantly change their share-holder base within 5 years by using sustainability strategy and inte-grated reporting to resist excessive pressure for short-term performance
4. It is nearly impossible to do good fundamental analysis taking into account ESG data because the data infrastructure is really lacking	• Progress on data availability and quality has been made over the last few years. Companies, investors, stock exchanges, data providers and NGOs have all played a key role in advancing ESG data infrastructure
5. ESG is only about managing risk	• There are numerous examples of companies that have used ESG integration as an enabler to achieve long term value and grow their top line: Dow Chemical, General Electric, Unilever
6. Consideration of ESG factors in investment portfolio construction is contrary to fiduciary duty	• Policy makers and multi-stakeholder initiatives are now working to pro-mote reforms in the legal interpretation of fiduciary duty. Changes are already happening (Department of Labor, October 2015 new statement to acknowledge the relevance of ESG issues on economic value)

Table 5: Myths and reality of ESG investing (Katsantonis et al., 2016)

Finally, we have the case of "sin stocks" (companies dealing with weapons, alcohol, gambling, fossil fuel). In a previous paragraph we saw the strong claim that ESG can be beneficial for a company and consequently that it can lead to higher gains for the ESG oriented investor. However there are equal claims that the application of ESG related criteria, like screening can lead to loss of potential gains, as there is considerable evidence that so-called sin stocks exhibit outperformance relative to various benchmarks (Hvidkjær, 2017).

3.6 Conclusion

By closing this chapter, we see that as in traditional investments, there are certain strategies for ESG investments, challenges and above all, products for the investor. The way that those are utilized is a product of resources, knowledge, opportunities, expected performance, available information, and personal motives. However, there are sceptics about the efficacy of the endeavor, which should not disappoint the investor and the researcher, but rather present opportunities for further improvement.

Chapter 4. ESG metrics and investments

4.1 Introduction

In the previous chapters we mentioned the importance of ESG metrics in the investment process, therefore in this chapter we are going to dive into further detail in the ESG metrics and how they related with investments.

The core role of the ESG metrics is that they are used for the calculation of the overall ESG score for a company (called also ESG rating or composite ESG score), and in the following we will see how this is done. Due to the complexity of the procedure and the resources needed to calculate the ESG scores, certain agencies provide them, adding to some credibility to the end result. However, as we will see below, the readily available ESG scores might not be sufficient for some ESG investors, and the actual ESG metrics must be used instead.

In the following paragraphs, we will see how an ESG score is typically calculated, in order to better understand what is “under the hood” but also to be able to replicate and test the process on our own, if needed. We will see how individual ESG metrics can be incorporated in the investment process, what is the relationship between ESG metrics and risk, as well as certain issues that arise with the use of ESG metrics and the ESG ratings.

4.2 ESG rating calculation

The first thing that an investor can use, is the ESG rating of an investment product, provided by certain providers, with the first 3 being the most known:

1. S&P Global ESG
2. MSCI ESG Research
3. Sustainalytics
4. EcoVadis
5. FTSE4Good
6. Sustainable Fitch

Using ESG ratings is considered to be the easiest way to get an ESG perspective on a certain opportunity, as there is no need for analytical skills or extensive knowledge and information manipulation techniques. ESG scores are considered to be a more accurate forecaster of long-term performance, while the changes of an ESG score should be used differently as they are guided by short-term events that affect more short-term performance (Bradley, 2021). One other use of ESG ratings is for the identification of stocks with not so good ESG rating. Stocks of companies with better ESG metrics have already priced in their superiority in their price. Therefore, the investor can target the stocks that do not have so good ESG ratings at the time but have some growth potential and can improve their ESG rates in the future (unrealized financial and ESG potential). Other uses of ESG ratings have already been mentioned in the previous chapters, as ESG ratings are the preferred ESG-related data for mainstream investors, and as a consequence, researchers turn their efforts towards this number.

The MSCI's ESG Ratings Methodology (MSCI ESG Research LLC, 2023) describes the procedure that leads to the calculation of the ESG score, and it can be used as an example for understanding or replication of the underlying methodology. Blank et al. (Blank et al., 2016) show another methodology (Thomson Reuters corporate responsibility ratings - TRCRR) to calculate the composite ESG rating. In the following we will see the description of MSCI's ESG Ratings Methodology, as well as other metrics and definitions that are provided by MSCI on the subject.

- Each company is evaluated on a selection of 2 to 7 environmental and social key issues (out of 33 in total), which belong to certain themes. The selection here is made based on each company's exposure to potential material ESG risks, as dictated by the industry and the market of the company. All companies are evaluated on the same six key issues of Governance (as Governance is deemed of universal importance across all companies).

  The pillars, the themes and the Key Issues can be seen in the following table:

3 Pillars	10 Themes	33 ESG Key Issues
Environmental	Climate Change	Carbon Emissions
		Climate Change Vulnerability
		Financing Environmental Impact
		Product Carbon Footprint
	Natural Capital	Biodiversity & Land Use
		Raw Material Sourcing
		Water Stress
	Pollution & Waste	Electronic Waste
		Packaging Material & Waste
		Toxic Emissions & Waste
	Environmental Opportunities	Opportunities in Clean Tech
		Opportunities in Green Building
		Opportunities in Renewable Energy
Social	Human Capital	Health & Safety
		Human Capital Development
		Labor Management
		Supply Chain Labor Standards
	Product Liability	Chemical Safety
		Consumer Financial Protection
		Privacy & Data Security
		Product Safety & Quality
		Responsible Investment
	Stakeholder Opposition	Community Relations
		Controversial Sourcing
	Social Opportunities	Access to Finance
		Access to Health Care
		Opportunities in Nutrition & Health
Governance	Corporate Governance	Board
		Pay
		Ownership & Control
		Accounting
	Corporate Behavior	Business Ethics
		Tax Transparency

Table 6: MSCI ESG Ratings Key Issue hierarchy (MSCI ESG Research LLC, 2023)

- When applicable, the rating considers the company's role to provide products and services with positive environmental or social contribution.

- Management measures of the company which are relative to the ESG risks and opportunities are taken into consideration. This is done through evaluation of governance structures, policies, targets, quantitative or qualitative metrics, and relevant controversies.

- The resulting ESG rating is industry-relative, with the assessment not being absolute, but intended to be interpreted relative to a company's industry peers.

- The score that results directly from the ESG data is industry-adjusted, by normalizing the weighted average key issue score relative to the ESG rating industry peer group, based on score ranges set by the benchmark values in the peer set.

- Weighted Average Key Issue Score (WAKIS): This score is calculated for each company based on the weighted average of the scores received on the individual environmental and social key issues, that contribute to the rating of this company, and the governance pillar score.

- The Governance Pillar score is an absolute assessment of a company's governance, measured on a universally applied 0-10 scale. It is based on the sum of deductions derived from key metrics found in the Corporate Governance (Ownership and Control, Board, Pay and Accounting) and corporate Behaviour (Business Ethics and Tax transparency) themes.

- Key Issue Scores (environmental and social themes): The company receives a score on each Key Issue ranging from 0 to 10. This evaluates the company's exposure to risks of opportunities and the ability to handle that exposure. They are calculated with the Key Issue exposure score and the Key Issue management score.

There are also supplementary scores, that do not contribute directly to the overall ESG rating but can be very useful.

- Pillar scores are calculated for Environmental and Social parts, each one being a normalized weighted average of the Key Issues of each pillar.

- Theme scores are calculated for environmental and social pillars, based on the weighted average of Key Issue scores underlying each Theme, normalized by the total sum of weights. The same applies for the Governance themes.

- The score range is 0-10, with lower scores indicating more severe risk.

- Governance Theme and Key Issue percentiles are also calculated in order to demonstrate the relative performance of the company in focus, against the other companies. This is done for the Home Market and for the Global Market separately. The interpretation of the rankings is shown below:

Percentile Rankings	Description
96 - 100	Best in class
76 - 95	Above average
26 - 75	Average
6 - 25	Below average
0 - 5	Worst in class

Table 7: Interpreting percentile rankings (MSCI ESG Research LLC, 2023)

As we see, the weights per metric play an important role in the calculation of the scores. The Key Issue weights used for the Weighted Average Key Issue score are published for the Environmental and Social key issues, while the governance related such weights are not available due to the nature of the deduction-based scoring model in the Pillar level. The pillar level weight is floored at 33% for Governance, while for the other 2 pillars, each pillar weight represents the sum of the weights of all Key Issues that fall under each pillar. In following diagram, we see the hierarchy of ESG scores. In figure No. 6 we see the hierarchy of ESG scores and the relationship between them.

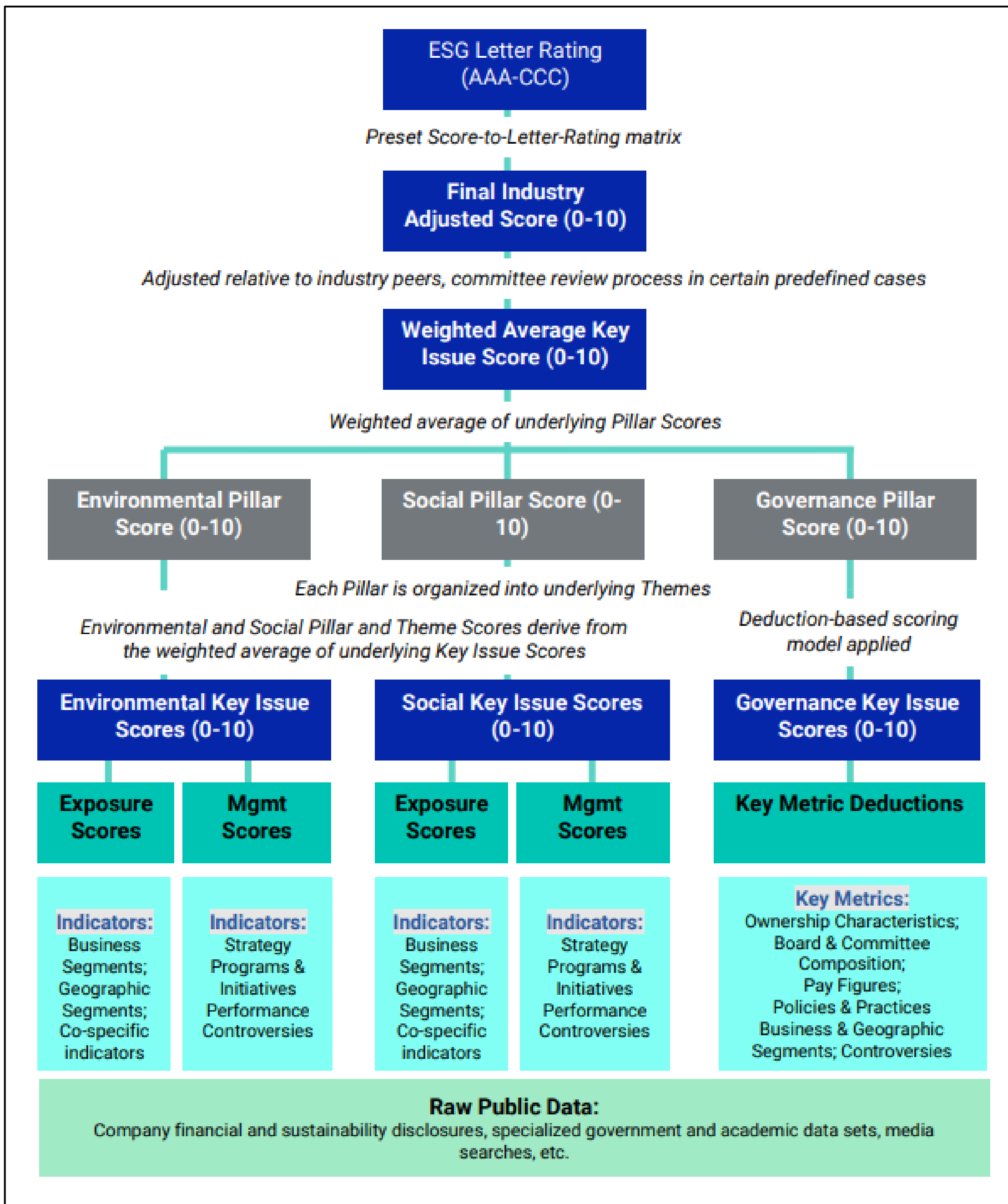

Figure 6: Hierarchy of ESG scores (MSCI ESG Research LLC, 2023)

As we see above, the calculation of the weights is one of the most crucial factors in the whole process. Regarding this, as well as the definition of Key issues universally, per industry and per company, MSCI gives further information in the same document. We will show below the methodology followed for evaluating the Key Issues, as it might be used by the experienced investor as a guideline to evaluate the Key Issues when evaluating a company by utilizing raw public data or ESG metrics already available.

All companies are evaluated with six Key Issues, under two separate Governance themes: Corporate Governance and Corporate Behaviour; this happens because Governance should be considered universally important. The other Key Issues regarding Industry are selected based on the extent to which the business activities of the companies in each industry generate externalities. An externality is an outcome (positive or negative) of a given activity that affects a third party that is not directly related to that activity. The steps of the procedure are the following:

- For each company, reported business segments are mapped to a standard business activity.

- Each business activity is assessed on the level of externality generated for each ESG Key Issue to derive a Business Segment Exposure Score.

- Each company's overall Business Exposure Score is the weighted average of the segment exposure scores of a company's business segments, weighted by the percentage of sales, percentage of assets or percentage of operations. This constitutes the company's Business Segment Exposure score.

- In the end, all 163 sub-industries are ranked on each Key Issue based on the average ESG Business Segment Risk Exposure score of the underlying companies.

Based on the above, MSCI will propose the addition of an ESG Key Issue for a GICS sub-industry when the size of the externality is at or exceeds the 80th percentile of all sub-industries and the average Business Exposure Segment Risk Exposure score is greater than or equal to 5.0, while suggest the removal of an ESG Key Issue when the size of the externality is at or below the 70th percentile of all sub-industries and the average Business Exposure Score is less than or equal to 3.3. When it comes to Company Key Issues, the company must be studied to identify particularities that will lead to the inclusion of certain Key Issues. This however presents a caveat, as in order to be able to evaluate a company Key Issue, the investor must have very good knowledge for the company and this can be done only if the investor is already in the company, or was in the company, or is using inside information. All the above are either difficult, or borderline legal.

Finally, when it comes to weights, the selection takes into consideration the pillar, the type of the industry, the expected time frame for the materialization of the risk/opportunity, and the level of contribution to each of the 2 pillars (with Governance remaining a separate case).

Realizing the complexity of the procedure and the difficulties to collect, evaluate, process, and interpret all this information, several investors are making their decisions based only on the overall ESG score. It is suggested from Leite & Uysal (Leite & Uysal, 2023) that only the overall representation of high ESG performance seems to matter, with the information underlying the rating, such as the individual environmental, social, or governance components being irrelevant. However, as we will see in other publications but also as it is implied by the details of the MSCI's procedures, this should not be universally accepted by the more experienced or sophisticated ESG investors.

In the case that the investor wants to resort to available ESG ratings for the investment decisions, he or she cannot rely on a single provider as several researchers, including Boffo and Patalano (Boffo & Patalano, 2020), have shown that ESG ratings can vary greatly from one ESG provider to another. This difference is attributed to the different handling of raw ESG data, different weighting, different criteria and qualitative judgement, use of different key indicators or even use of reweighting to ensure best in class distinction in certain industries. Furthermore, there are claims that rating agencies fail to identify risks in their ratings. According to Hübel & Scholz (Hübel & Scholz, 2020) the differences between ratings and exposures to risk may be attributed to the fact that ESG rating agencies do not assign risks through their methodology and to the industry benchmarking of ESG. In the case of MSCI ESG ratings however, risk is taken into account, as we will see later on, but this is not the case with all rating agencies.

The need to evaluate separately the 3 pillars is further supported from the fact that certain industries are affected differently from each one of them. This is shown in the research of Iazzolino et al. (Iazzolino et al., 2023) where they present the particularities of each sector. Energy, Materials, Consumer and Technology sectors appear to be very sensitive to ESG factors in total, while the Energy sector (composed by Oil & Gas, Renewable Energy and Coal Companies) is highly sensitive especially the E pillar. The

latter are under intense social and environmental scrutiny due to their activities. The Materials sector is particularly sensitive to the E pillar, while it can be also sensitive to the S pillar. This is explained easily if we consider the fact that their operations affect the local communities directly through the exploitation of the natural resources and the environment, while they can occupy a large part of the local workforce which can be devasted if the operations stop. The Consumer sector is sensitive to all three pillars with some differences, with the S pillar score being the most important.

All the above reasons lead us to the conclusion that the investor might have to use ESG metrics instead of ESG ratings. We see a detailed collection of reasons below:

- There is evidence that ratings vary in results even for the same company but also differ in identified risks.

- Some metrics might be industry or company relevant, and this be affected by the investor based on personal experience on the matter.

- Results in individual pillars might be more important, and through the total rating approach, the effect of the pillars is reduced.

- The investor might want to apply a strategy that requires the use of certain ESG metrics or different weighting.

- Better understanding of the procedure and what is “hidden” in the rating.

- Inclusion of metrics that are associated with particularities of a certain company.

4.3 Direct use of ESG metrics in the investment process

Typically, when investing to stocks, we use traditional metrics such as Price to Earnings ratios (P/E) and Earnings Before Interest, Taxes, Depreciation and Amortization (EBIDTA). With the use of ESG metrics, we can evaluate our investments through an additional lens. Unfortunately, unlike the traditional metrics, there is still no suggestion of what good E S and G metrics look like. Furthermore, as explained in the previous

part, the investor might have to resort to ESG metrics instead of ESG ratings, due to a series of factors. The way that the investor will utilize the ESG metrics is a product of the desired investment strategy, the resources of the investor, the availability of data and the investor's capabilities.

Clément et al. (Clément et al., 2023) cautions that ESG ratings can be used for finance and disclosure issues, however they are not designed to be used interchangeably for CSR or sustainability as there are several limitations. The authors notice that ESG scores are marketed to stakeholders in a way that does not allow them to understand what lies behind those scores. This is an indirect suggestion for better understanding of ESG metrics.

Serafeim (Serafeim, 2020) identifies that ESG metrics are not sufficient for investors to integrate ESG considerations into their business analysis, valuation, and modeling. Unfortunately, investors face difficulties to embed ESG metrics in financial models because it's not clear how they can affect the financials or what they mean. Serafeim suggests that the solution would be the creation of a system of impact-weighted accounting that could measure a firm's ESG impacts, convert them to monetary terms, and then reflect them in financial statements. This would translate ESG effects into units of measurement that business managers and investors understand; it would allow for the use of financial and business analysis tools to consider those impacts; and it would enable an aggregation and comparison of analyses of results.

The typical procedure that an ESG metrics investor would apply with the incorporation of ESG metrics, would be the following:

- Identify Relevant Metrics: Investors need to identify the ESG metrics that are most relevant to the industry and company they are evaluating. We have seen already that in the form of Materiality, and exposure to externalities like in the MSCI methodology. As mentioned already, there is not commonly accepted methodology for this part.

- Data collection, analysis and interpretation: Investors collect data relevant to ESG metrics (or even the ESG metrics themselves) for the target company. This can involve company reports, third-party ESG ratings evaluation, and other

sources of information (like knowledge from inside the company, if available). Data can show risks and opportunities and potential areas for improvement.

- Comparative Analysis: Investors often compare a company's ESG performance with that of its peers or industry benchmarks. This helps understand the position of the company and its relative performance. Benchmarking remains a sensitive issue, as will see later in this chapter.

- Integration into the investment process: ESG metric related indicators can suggest investment, divestment, or neutral positions.

Regarding the sources of ESG metrics, or ESG related data, the investor can resort to the following (list not exhaustive):

- Company ESG reports
- Corporate Sustainability reports
- Public sources (like the Ministry of Labour)
- Bourse portals
- NGO websites
- Private providers like Bloomberg
- More advanced tools like NLP (natural language processing) algorithms for public media evaluation

Regarding the direct use of ESG metrics, we will present some ways in which the investor can utilize them.

- Formulation of the investment universe. ESG metrics can help exclude companies from the investment pool, by identifying which do not satisfy certain values for ESG metrics that are considered important.

- Identification of companies with ESG momentum potential. Companies that are improving their material ESG metrics are expected to perform better, as shown earlier.

- Choosing best-in-class companies. The best based on certain ESG metrics or set of metrics, can be identified easily. Also, the worst-in-class can be identified, for shorting, further improvement, or with the hope that they are undervalued as compared to their fundamental analysis value.

- Identification of risks or opportunities. By evaluating the materiality and the exposure of a company, the investor can identify certain risks and opportunities and act accordingly. For example, by suggesting corrective measures when the active ownership is chosen as a strategy, with hedging against risks or with divestment when no other solution is available.

- Creation of custom ESG ratings. The investor who understands the procedure that leads to the ESG rating calculation, might opt for the creation of an ESG rating methodology, with custom weights or use of Key Issue metrics, and even different focus on certain pillars.

- Supportive tool for investments in developed and emerging markets. As in several cases, there is not enough transparency (poor institutional control, corruption, obscure regulations etc.), the validity of financial reports is under judgement, or it is not clear what are the externalities that affect the company, ESG metrics can be used as an additional tool to create a clearer picture of the company under evaluation. Again, the quality of this data is not expected to be immaculate, however it is expected to be helpful.

- Incorporation in new financial models. Already we can find in the literature efforts to incorporate ESG metrics along with other metrics into models that predict financial performance (Ζοπουνίδης & Εσκαντάρ, 2022). If we take into consideration the varying opinions regarding the relationship between financial performance and ESG performance, the success of such models remains to be proven.

Of course, we cannot exclude the case where the investor wants to create custom ESG metrics that are not currently available, or to apply a new strategy, like the best-in-universe proposed by Zopounidis & Eskantar (2022) . Actually Khan (Khan, 2019) has done this by creating 3 new metrics; free float scaled by shares outstanding (as a proxy

for ownership dispersion), shareholder protection through law (as a proxy for shareholder orientation), and political risk score from Bloomberg (as a proxy for country-level institutional strength). All these were needed to take into consideration the effect of cross-country variation on Governance, an issue that will be explained later. In another paper Brounen et al. (Brounen et al., 2021) create another 2 metrics for a specific industry (real estate) which are ESG completeness - a measure of ESG transparency and ESG performance.

4.4 ESG metrics and risk

One of the issues of ESG that researchers have no doubt, is the positive contribution to risk management. Regarding risk in ESG, we have 2 vectors, one being risk exposure and the other being risk management. As we have seen above, the analysis that precedes the calculation of ESG rating, produces also valuable information regarding the potential risks faced by a company, as well as an evaluation about the management capacity to mitigate those risks. The ESG metrics are part of this procedure, and they are used to identify if a Key Issue is material, and where the company stands compared to its competitors, the market or even a benchmark. ESG metrics if integrated in the investment strategy can help incorporate risk as well, and they seem to be more important for fixed income strategies, as in those strategies we are more interested in avoiding default of the investment product.

There are efforts to incorporate ESG into risk management like in the case of Capelli et al. (Capelli et al., 2023) and all the others that are already mentioned in previous chapters, however all those methods use ESG ratings rather than individual ESG metrics, and as a result we will not mention them again here as we focus on metrics.

4.5 ESG metrics and investments inside the company

In this thesis we have discussed extensively about investments in the traditional sense of the term, having in mind the investor as not being related directly to the source of the investment (the company, the sector, or the project on which the investment products rely). However, companies can themselves make investments internally, meaning they can change machinery, develop new methodologies, create new materials etc. with sole

purpose of improving their ESG metrics and consequently their total ESG score, provided that the affected metrics are related to material issues. Consequently, ESG metrics and the subsequent reduction of exposure to risks, become criteria on which the company can decide if an investment is meaningful or not. Serafeim (Serafeim, 2015) suggests that firms should focus on material ESG issues, as companies that invest on material ESG issues outperform their peers in the future in terms of risk-adjusted stock price performance, sales growth, and profitability margin growth. On the contrary, firms that invest on immaterial ESG issues (either because they do not know what is important or because they want to obfuscate their poor performance on other issues) have very similar performance to their peers suggesting that such investments are not value relevant.

4.6 Quality of ESG data and other issues

As we have seen already, raw data is the foundation on which the ESG metrics are developed and there is a lot of processing until we reach the final composite ESG rating. However, it has been identified that this is also the one of the weak points of the whole process, as the quality is not consistent among sources (Eccles et al., 2017) with Kim and Li suggesting that this is one field of ESG asking for improvement in the future (Kim & Li, 2021). Furthermore, the information is sometimes of qualitative nature and inevitably difficult to express in numerical and relatable figures. This is already recognized by the community and efforts are made to create tools that will overcome that obstacle (Bassen & Kovacs, 2008)**.** For that reason, Bradley (Bradley, 2021) suggests that ESG investors should not rely only on one source of ESG data and that the assessment of materiality should be done by themselves.

Amel-Zadeh & Serafeim (Amel-Zadeh & Serafeim, 2017) identify in their study that important impediments to the use of ESG information are the lack of reporting standards. This consequently results in lack of comparability, reliability, quantifiability and timeliness, making it more difficult for the investor to use the collected data.

According to many researchers (Berg et al., 2019; Dorfleitner et al., 2015; Widyawati, 2020) another reason is ESG ratings divergence. It is interesting that Berg et al. detect a rater effect where a rater’s overall view of a firm influences the measurement of specific categories. Regarding the consistency of results among different rating providers,

Halbritter & Dorfleitner (Halbritter & Dorfleitner, 2015) demonstrate the influence of ESG rating provider on the financial returns of certain ESG, while Billio et al. (Billio et al., 2021) add that the rating disagreement affects also the benchmarks, with the latter being crucial as all returns are compared to the benchmarks. Matos (Matos, 2020) notes again the data quality issues, the ESG rating dispersion among data providers and places some concerns over the growing influence of proxy advisory firms. The same author notes that asset classes beyond public equities are underresearched regarding ESG issues. Capizzi et al. (Capizzi et al., 2021) try also to interpret the divergence of agency ratings, and they find that the weights used rather the initial values are contributing to the divergence. Also, they find that the differences on the Environmental pillar are the smallest, with the largest for the Social pillar. For the Governance pillar it seems that both values and weights are contributing to the differences, with the explanation being that of subjectivity in the governance evaluations.

Boffo and Patalano (Boffo & Patalano, 2020) claim that another reason that has caused problem on this subject is the generation of a wide array of investment terminology and disclosure frameworks which lead to metric inconsistencies and hinder comparability for investors. On the same track Bonetti et al. (Bonetti et al., 2023) note that differences in the way that information is disclosed. For example, the use of highly descriptive terms in some reports and schematic descriptions in other, prevent comparison.

In order to evaluate and better understand the quality of ESG data, In et al. (In et al., 2019) suggest the use of 6 dimensions of ESG data quality, which have been identified and realized thanks to the advancement in data analytics (i.e. reliability, granularity, freshness, comprehensiveness, actionability, and scarcity), as well as six dominant variables that are used by investors in their decision-making (i.e. conventional risk, unconventional risks, cost, commitment, influence, and construction).

However, the simplest solution, seems to use several different sources for the same topics, try to cross-check them and to have good understanding of the topic and the industry, or even better try to combine the ESG scores from different agencies for better results (Berg et al., 2023). In the case of model development, it is crucial to understand the limitations inherited by the data set on which the model was developed.

4.7 Conclusion

In this chapter we have seen the importance of ESG metrics in the investment process. The individual ESG metric is the constituent element for composing the total ESG rate, while it can be used on its own. It can be incorporated into all investment strategies, and it can be used also for investment evaluation inside a company or as a flagging tool. The combination of metrics or their importance can be decided by the ESG investor to serve his or her investment strategies. However. there are limitations, such as accessibility, quality, complexity, and resource requirements that can limit their utility for the mainstream investor. Even though ESG metrics are important and fundamental for the investment process, we find that the literature places limited focus on them as single entities and that some parties (like the rating agencies and most of the investors) shift focus on the total or the pillar ratings, with the researchers following on the same track. However, the knowledgeable investor and the companies that want to improve their performance, will still have to focus on separate ESG metrics.

Chapter 5: Conclusions and suggestions

In the previous chapters we learned a lot about the basic concepts of ESG reporting, what are the ESG metrics and how ESG can be used as a strategy to benefit a company. We learned what is ESG investing, which are the ESG strategies and the ESG-related investment products, what are the motives for applying an ESG investment strategy, and how one can integrate ESG in their investment decisions. Additionally, we learned about particularities of ESG in investing. Due to their importance in ESG investing, we examined ESG metrics in further detail, and we examined how they are used for the calculation of the most notable measure in ESG investing which is the ESG rating. We learned how ESG metrics are used in the investment process, how they are associated to risk management, how companies can use them for internal investments, and what are the common problems with ESG metrics. In this final chapter we will recapitulate on the most important points and issues, and we will suggest some proposals for future research.

First, it is evident that there is a strong relationship between ESG metrics and investments. ESG metrics is the first thing that companies publish when disclosing ESG information and they are the basis upon which ESG scores are calculated, either for pillar scores calculation or total (composite) ESG rating calculation. Due to the importance of the ESG rating in ESG investing, it is self-explanatory that the metrics are important as well.

Additionally, ESG metrics can be used directly for investments, without the use of the total ESG rating. The metrics can be used to identify best in class (or worse in class) candidates, to create custom ESG ratings, to apply screens, or to create investment universes. Moreover, they can be used for comparison between companies, or to enhance fundamental analysis, while it can be used to track ESG momentum. Regarding risk, ESG metrics can be used to identify risks, evaluate investment performance inside the company, or to enhance the due diligence of companies in emerging markets.

Also, several issues can modify the utility of the metrics. The scarcity and the quality of usable information upon which the metrics are calculated, the disclosure (or

concealment) of material ESG metrics and the asymmetric promotion of non-material ESG metrics, can clear or distort the image of the company towards the ESG investor.

Despite the importance of ESG metrics on investments, we realize that research on ESG investment is focused on ESG ratings, almost neglecting the role of individual ESG metrics. This can be attributed to the vast availability of ESG metrics, which when combined with materiality and lack of universal standardization, can lead to a high complexity of the subject. Therefore, in order to reduce complexity, researchers might opt for simpler approaches, such as the use of total ESG score or the pillar scores. Nevertheless, the divergence of ESG scores across raters, show the necessity for further research on the effect of individual ESG metrics on investments.

Particularly for the subject of ESG metrics and the relationship with investments, we notice and suggest the following:

1. As we mentioned already, the current research is focused on ESG rating relationship with investments. We propose that future research should evaluate the relationship between individual ESG metrics and investments.

2. As we reviewed the available literature, we realized the complexity of the subject. We deem important that the potential investor should be educated also on ESG issues in order to be in the position to evaluate the validity of the available products, the available services and of the limits of the ESG strategies.

3. The vast majority of the literature that we reviewed, is examining the effect of ESG on stocks (returns, risk profile, etc.). We suggest that future research should be done also for other types of investment products.

4. The ESG financial ecosystem is evolving, therefore future research could examine the usage of custom ESG metrics or suggest the modification or abolition of outdated metrics.

5. During our research we understood that the conclusion about the benefits of ESG on returns remains unclear. We suggest that future research should try to evaluate the limitations under which ESG is positive for returns.

6. The persistence of investors and certain parties (like ESG researchers) in material ESG issues, and consequently in financial results stemming from ESG, contains the possibility of abandonment of certain metrics, that might seem non-material from the financial perspective, but can be very important for the creation of value for parties other than the companies and the investors. Such ESG metrics can be related to social issues, or it can be indirectly relevant to certain companies, like publicly owned companies, where the performance is not measured only on financial terms. Therefore, future research can focus on the financial quantification of results related to non-material ESG metrics.

7. Following the issue of materiality, research can suggest a framework for identifying materiality on ESG.

8. We saw the issue of ratings divergence, and the efforts to identify the why and how that happens. Nevertheless, researchers fail to understand that raters might want to appear different in the eyes of the investors, as this is just another one of their products. We suggest that future research can suggest a simple, transparent method for total ESG rating and for pillar ESG ratings, open and easy to use for public usage. There are recent efforts for prediction of ESG ratings based on AI methodologies (perhaps with the hope of speculating on ESG momentum), however we strongly argue against that, as it is just an effort to reproduce practices that lead in questionable results in the first place.

9. Finally, future research can evaluate the use of artificial intelligence and machine learning methodologies on sentiment analysis on ESG issues, to predict ESG events or use natural language processing to improve ESG related raw data, just to name a few issues.

Regarding the improvement of ESG investing as a whole, I would like to close this thesis with some suggestions from Boffo & Patalano (Boffo & Patalano, 2020):

«Future developments in the field should ensure consistency, comparability, and quality of core metrics in reporting frameworks for ESG disclosure. They should ensure relevance of reporting through financial materiality over the medium and long-term, while the bias due to company size, should be somehow compensated. Transparency

and comparability of scoring and weighting methodologies of established ESG ratings providers and indices should be strengthened. Furthermore, appropriate labelling and disclosure of ESG products to adequately inform investors of how ESG is used in the investment process and asset selection, to protect investors, but also to promote fair business practices.»

After all these, we understand that the ESG universe is constantly evolving, and so is the interest on ESG investing, the available knowledge, and the related research. We wish however that in the end, all this will lead to actual value creation for the stakeholders and that ESG investing will not end being another overused trend or a practice for the few, but rather a useful tool that helps realize sustainability in the business and the investment world.

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