



Department of Economics and Finance
Course of Advanced Corporate Finance

**Responsible Investment and ESG vis-à-vis corporate
financial performance. A comparative perspective.**

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Abstract

Traditional finance bases the investment decisions on the analysis of risk and return only.

In recent years Socially Responsible Investments (SRI) and Environmental, Social and Governance (ESG) sustainability have increasingly attracted the attention of investors, who are interested in ethical issues and incorporate ESG factors in their investment decisions.

This dissertation poses the question of whether incorporating ESG factors in constructing a portfolio may have a positive impact on the performance of an investment.

This question is investigated through the empirical analysis of a sample of SP500 stocks during the year 2020, which was a period of recession, through the application of the Capital Asset Pricing Model. The performance of these stocks is analysed and compared based on the MSCI ESG ratings. Also case studies are employed to investigate the materiality of ESG issues on the financial performance of a company.

Introduction

In recent years Socially Responsible Investments (SRI) and Environmental, Social and Governance (ESG) sustainability have increasingly attracted the attention of investors, as opposed to the past years, when traditional models were followed that pursued only one goal, profit, and neglected ethical issues.

Today, the integration of ESG factors into the investment decision is an accepted strategy.

Socially Responsible Investment does not solely focus on the traditional factors of risk and return to decide how to allocate investments, but also concerns about social, environmental, and corporate governance issues when constructing a portfolio.

Such factors are sometimes neglected by investors and not considered crucial for the purpose of making profit, but can have a significant impact on the financial performance of an investment.

In 2006 the United Nations launched the Principles for Responsible Investment (UNPRI), an international network of investors committed to contribute to a sustainable financial system.

The PRI has gathered thousands of signatories (UNPRI, 2020).

This dissertation is organized into four chapters: in the first chapters the concepts of SRI and ESG are defined and analysed, when they started to be considered by the public and their development, together with the concept of Corporate Social Responsibility (CSR).

Often times sustainability is considered only in its environmental dimension; on the contrary a responsible investment has mainly three dimensions of sustainability: environmental, social and corporate governance.

Companies can have a severe impact in the environment through their contributions to pollution and greenhouse gas emissions, but they can also have a meaningful impact on the community where they are based. The governance dimension of ESG regards the sustainability of the boards of a company and its behaviour towards its employees and stakeholders in general.

All three dimensions of ESG are thoroughly explored in Chapter I.

After having illustrated the concepts of SRI, ESG and CSR, Chapter II moves to the question that we ask in this dissertation: whether the integration of ESG factors in investment decisions has a positive or negative impact on the financial performance of investments.

In chapter II there is a review of the literature where theoretical and empirical analysis was used to answer to this question.

In the first part of the chapter, there are papers from scholars who supported the idea that integrating sustainability issues into one's portfolio brings benefits in terms of risk and returns to one's investments, in the second part of the chapter there are papers from other scholars who confuted this idea.

In Chapter III I have tried to answer to the question, through an empirical model.

I have gathered data for a sample of companies from the SP500 and I have divided them into 11 sectors. For each sector there are two categories of companies, based on their ESG rating by MSCI: companies with a good ESG profile and companies with a poor ESG profile.

The period of analysis is the year 2020. I have gathered the daily prices of each stock from 1 January 2020 to 31 December 2020. This specific period was chosen because it suffered from a recession, following the breakout of COVID-19.

Hence the data gathered were useful to investigate on whether during a period of crisis, companies with a good ESG profile have had a relatively good financial performance in terms of risk and return.

The model applied to the data is the CAPM, so I have performed a series of regressions in order to retrieve the Jensen, the beta and their respective t-statistics.

In Chapter IV there are three case studies of companies that have been at the center of attention for their unsustainable behavior; these cases are real life examples of the materiality of ESG factors for companies and the severe effects that they can have on financial performance.

Chapter I

1 ABOUT SRI AND ESG

1.1 Socially Responsible Investment (SRI)

Socially Responsible Investing (SRI) refers in general to a socially conscious investment. It is indeed also known as ethical investing.

Socially responsible investment is an investment discipline that takes into consideration not only the traditional factors of risk and return as determinants of portfolio construction, but also concerns about social or environmental issues.

Renneboog, Ter Horst, and Zhang (2008) define SRI as an investment process that consists in identifying companies with a high profile of corporate social responsibility (CSR). Such profile is evaluated based on environmental, social and corporate governance (ESG) criteria.

Hence SRI involves also other concepts, as CSR and ESG, which are going to be defined in the following paragraphs.

SRI can be implemented in portfolio construction through three strategies: exclusion, activism, and dialogue or engagement.

Exclusion consists in excluding from one's investments those companies that have despicable behaviours towards the above issues, while activism involves using one's position of share owner to advocate sustainable objectives.

Barriers to SRI strategies include concerns from investors about the impact on investment performance, and perceived legal restrictions (Sparkes, 2008).

SRI may involve investing in a company or in a mutual fund that has positive social impacts.

A socially responsible investment keeps its goal of maximizing monetary return, as any other investment. However, another reason motivates this kind of investment, is the impact that the investment can have on the community.

Thus, together with financial gain, an additional aim of an ethical investment is to tend towards sustainability and community improvement.

Hence when making a decision about where to invest their money, investors must assess the financial outlook of the investment while trying to gauge its social value at the same time.

Companies with good social value are engaged in social justice, environmental sustainability, and alternative energy/clean technology efforts.

If we were to summarize SRI in a mantra, we could say “Don’t invest in a company that conflicts with your values.”

1.1.1 History and development

Although in recent years SRI has become a popular topic in finance, it is a recurring theme in the history of economics.

Traditional SRI has its roots in 1960s and 1970s, with the rise of the anti-war movement, and values like racial equality, women’s rights, consumer protection, and the environment. In fact, it was a fusion of the faith-based values with these distinct American progressive values that based socially responsible investing.

It is indeed in the early 1970s that the first mutual funds reflecting faith-based values, civil-rights-era sensibilities, and environmental concerns were created.

At that time, using any “social” criteria in investing went against the conventional principles of portfolio theory, and traditional socially responsible investing had many critics. The basic idea of finance was that the only goal is to make as much money as possible. Externalities and negative impacts on the community were ignored.

By the 1980s, socially responsible investment in North America consisted in building a portfolio that behaved like the broad market without investing in alcohol, tobacco, weapons, gambling, and nuclear energy. The idea was to avoid companies with a despicable behaviour

around workplace, governance, environment, social justice. This kind of strategy is called values-based avoidance screen and is one of the pillars of modern SRI. It was coupled with a commitment to shareholder activism or engagement.

By the mid-2000s in Europe, there were three main catalyst aspects that created the demand for ESG issues by large investors: fiduciary duty, climate change and corporate governance.

As for fiduciary duty, the United Nations Environmental Program (UNEP) had as a goal “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (“UNEP FI Statement” 2020).

Climate change has become increasingly an urgent topic due to global warming.

Many large investors have realised their exposure to longer-term risks like climate change and the higher input costs for affected companies. As their returns were heavily correlated to the overall returns of the broad capital markets, they started to take seriously these previously underexplored risks, like climate, but also water, access to health care, and other pressing issues. To institutional investors, ESG data helped to identify long-term risk factors and spot investment opportunities based on these risks.

Litterman, the creator of the Black-Litterman asset allocation model asserted that “Climate risk is not being priced right by society. It is a global problem; it requires a global solution” (Blythe 2012).

As for corporate governance, the Great recession showed that it is a central issue in financial markets: a lack of disclosure, transparency, checks and balances, and ethical behaviour in the financial sector contributed to the crisis of the subprime mortgages.

It became hence clear that separation of board CEO and chair, board independence, oversight committees on sustainability issues, transparency, political giving were important issues influencing the long-term performance of a stock.

In 2005, then UN decided to create the United Nations Principles for Responsible Investment (PRI) to create a sustainable financial system, with the premise of creating a network of asset

owners around the principle of integrating ESG into investments: “we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time)” (What Are the Principles 2017)”.

Responding to the growing popularity in financial markets of ESG, different agencies introduced ESG ratings, like Morningstar, MSCI, Bloomberg, Sustainalytics.

So today investors are more informed and have the necessary tools to analyse ESG data and integrate them in their portfolio choices.

Moreover, in 2015, the 2030 Agenda for Sustainable Development was adopted by the United Nations. It calls all countries for action to implement strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve the planet through 17 Sustainable Development Goals (United Nations, 2001).



SUSTAINABLE DEVELOPMENT GOALS



Thus we can say that SRI has grown from a niche within the North American financial service industry to a global phenomenon. (Townsend, 2017).

1.2 Corporate Social Responsibility (CSR)

Another key word when discussing SRI is Corporate Social Responsibility (CSR). It refers to the fact that business does not only have economic impacts, but it also impacts other dimensions, like the society, the environment and all the stakeholders of a corporation, that can be employees, customers, investors, suppliers or communities in general.

Another dimension, according to Dalhsrud (2007) is the “voluntariness dimension”, meaning that the law and regulations set the minimum performance level that a company should comply to. But a socially responsible corporation should perform above these standards.

Indeed, the regulations usually set a level playing field, when referring to SRI. However, in some countries regulations on sustainability do not exist at all or are a “controversial” issue. This is why the companies should perform above the standards of sustainability set by the regulations.

In other countries instead, regulations are putting high sustainability standards. Hence companies are bound to adapt to these law and advance in this field.

However, a successful CSR strategy, according to Van Marrewijk (2003), depends on the context that each individual business lives in. Each business has CSR issues to be addressed and different demands from their stakeholders.

In 2003 the International Business Leaders Forum (IBLF) defined CSR as “Open and transparent business practices based on ethical values and respect for employees, communities and the environment, which will contribute to sustainable business success”.

Below are the five dimensions of CSR according to Dalhsrud (2007), what they are referred to, and example phrases in order to define them.

Dimensions	The definition is coded to the dimension if it refers to	Example phrases
The environmental dimension	The natural environment	'a cleaner environment' 'environmental stewardship' 'environmental concerns in business operations'
The social dimension	The relationship between business and society	'contribute to a better society' 'integrate social concerns in their business operations' 'consider the full scope of their impact on communities'
The economic dimension	Socio-economic or financial aspects, including describing CSR in terms of a business operation	'contribute to economic development' 'preserving the profitability' 'business operations'
The stakeholder dimension	Stakeholders or stakeholder groups	'interaction with their stakeholders' 'how organizations interact with their employees, suppliers, customers and communities' 'treating the stakeholders of the firm'
The voluntariness dimension	Actions not prescribed by law	'based on ethical values' 'beyond legal obligations' 'voluntary'

According to the United Nations Global compact (2014) Corporate sustainability is “essential to long-term corporate success” and for markets to deliver value, as the well-being of the society and the planet is tied to the health of the business. Businesses do so in a number of ways: by connecting societal and economic return when creating their business models, products and services; by using their image to raise awareness on critical issues; by supporting and advocating for government policies and regulations that favour sustainability; through strategic philanthropy; by developing initiatives that tackle these issues; by joining forces on common objectives like poverty alleviation, peace, disaster relief, environmental protection, gender equality or education. Moreover, these can all be marketable and strategic solutions.

Advancing sustainability practices can also be a way to strengthen the market. “Strong markets and strong societies go hand in hand” (United Nations Global compact, 2014).

Indeed, a society with economic instability, lack of skilled labour due to inadequate education, or marked by disasters stemming from climate change is not an easy field for a business.

Crucial in the effort to implement CRS are Board of Directors, as they are the ones who can set a company’s long-term goals and lay out strategies of sustainable investments.

1.3 ESG

1.3.1 The UNPRI

In April 2006 the United Nations (UN) launched the PRI, an international organization with over 2,300 participants and responsible for over \$80 trillion in assets worldwide, as of January 2020. It includes also some of the world's largest and most influential investors (Fernando, 2020).

These are financial institutions that support the idea that environmental and social considerations should be included in investment decision-making and considered by responsible investors. They believe that, when assessing the merits of a company, it is both financially and ethically responsible to consider the environmental and social impact of its investments.

This philosophy is counter-current with respect to mainstream investing, that has historically ignored such issues when making investment decisions.

The mission of PRI signatories is to achieve an economically efficient and sustainable global financial system that will reward long-term, responsible investment and benefit the environment and society as a whole. Hence such financial system would pursue two ends: rewards its users financially and benefits the environment and society (UNPRI, 2020).

The PRI signatories have committed to follow the below six principles.

- 1** We will incorporate ESG issues into investment analysis and decision-making processes.
- 2** We will be active owners and incorporate ESG issues into our ownership policies and practices.
- 3** We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- 4** We will promote acceptance and implementation of the Principles within the investment industry.
- 5** We will work together to enhance our effectiveness in implementing the Principles.
- 6** We will each report on our activities and progress towards implementing the Principles.

The starting point for all the six principles is the idea that environmental, social, and corporate governance (ESG) issues can affect risk and return, and consequently the performance of investment portfolios, to varying degrees. Hence ESG are relevant factors to incorporate in investment decisions and active ownership.

The fact that ESG factors influence company value, returns and reputation is being growingly recognised by investors and academia.

Moreover, beneficiaries and clients are increasingly calling for greater transparency about how and where their money is invested. Especially younger generations, for example “Millennials” are particularly sensitive to the issues of sustainability.

Finally, also responsible investment regulation has increased significantly in the last years, especially after the 2008 financial crisis. Regulatory change has also been driven by a realisation among regulators that the financial sector can have a relevant impact on global challenges.

1.3.2 ESG definition

Sustainable finance refers to the process of taking into account environmental, social and governance (ESG) considerations in making investment decisions. The aim of this process is to make long-term investments in sustainable economic activities and projects (European Commission, 2021).

Responsible investing (SRI) practically consists in Accounting for ESG in the investment process.

Environmental, social, and governance (ESG) criteria are a set of standards that socially conscious investors look at when analysing companies in order to screen potential investments. These investors look for companies with values that match their own.

ESG integration takes into account ESG factors in making investment decisions.

However, traditional risk and return factors are not neglected, but are integrated together with ESG factors and assessed together in the investment decision process.

ESG investing focuses on three non financial dimensions of a stock's performance: the environmental, social and governance dimension. Information on the firm's behaviour with respect to each dimension is gathered and analyzed by portfolio managers in making their decision for a diversified portfolio. In this way, ESG integration can uncover some risks that might be neglected otherwise and hence convey some value added to an investment decision (van Duuren, E., Plantinga, A. & Scholtens, B., 2016).

A low ESG profile for a company can have a negative impact on performance as it could lead to large losses, hindering risk and return. Cash-flows arising from this kind of firms are more exposed to extreme volatility events. Hence their cash-flows will have a higher discount rate: a higher risk-premium and a lower 'fair price'. This is an example of how portfolio managers can use ESG integration in their investment considerations.

ESG data can be used by portfolio managers in several ways: Negative screening consists in excluding particular firms because they do not meet minimum ESG standards; positive screening consists in concentrating on particular industries where ESG criteria are met; best-in-class investing selects the best 33 or 25 % companies on the basis of ESG); activism can be carried out by bringing out initiatives like petitions and using voting rights on annual general meetings of shareholders to address ESG challenges; engagement means for investors to work together with the board of the corporate to try and convince them to perform better on ESG; Norm-based screening includes only companies that meet certain minimum standards; Impact/thematic investing targets specific investments or sectors that are sustainable (IMF, 2019).

The ESG integration process typically articulates itself in three steps: Research; Security and portfolio analysis; Investment decision.

The first step consists in gathering ESG information from multiple sources and in identifying those ESG factors that materially affect a company or sector. In this step there can also be active engagement and exchange with the companies themselves.

In the second step an investor assesses the impact of financial and ESG factors on the investment performance of a company and uses the data gathered to adjust financial forecast or valuation models or multiples used to assess the value of an investment.

Finally, both traditional financial factors and ESG factors are used in making the decision to either buy an asset, hold it, sell it, or do nothing/not invest (CFA Institute, 2018).

In the following sections we are going to dig deeper into the three dimensions of ESG: the environmental, the social and the governance dimension.

1.3.3 The Environment dimension

An investor that takes into account Environmental considerations in making investment decisions in the financial sector, might pay particular attention to issues like climate change

mitigation and adaptation, resource depletion, waste, the preservation of biodiversity, deforestation, pollution prevention.

The general objective of the investor, other than making profit, will be to reduce the pressure on the environment.

Indeed, sustainable finance tries to move investments towards the goal of a low-carbon, more resource-efficient and sustainable economy.

The environment is prominent among ESG issues, being a very discussed topic in recent years. Consequently, awareness that financial risks can be impacted by climate change has increased among investors. Risks related to climate change come in two forms: physical and transition risk.

The former refers for example to physical damage to property, land, and infrastructure due to catastrophic events related to the weather and broader climate trends.

The latter is less tangible, as it arises from changes in the price of stranded assets and broader economic disruption because of evolving climate policy, technology, regulation and market sentiment through the transition to a climate neutral economy (IMF, 2019).

There are different concepts that have been popular in finance in recent years and are all linked to the environmental sustainability.

For example the UNEP (2011) defines a green economy as an economy that is efficient, but also fair: hence able to achieve sustainable development without degrading the environment.

Companies can contribute to green economy through the implementation of cleantech - short for clean technology - or green tech - short for green technology. These terms, often used interchangeably, refer to companies and technologies that aim to improve environmental sustainability, adopting various environmentally-friendly practices and technologies that reduce the negative environmental impact of otherwise conventional technologies. (Fernando, 2020).

A Green economy may be incentivised by the government through the imposition of a “green levy”, also known as ecotax, that is a tax on sources of pollution or carbon emissions. This kind of tax is aimed at discouraging the use of damaging sources and encouraging companies to use renewable energies and alternative sources.

Critics of the Green levy argue that it may hurt the poorer fraction of consumers, that will have to pay more for vehicles, petroleum, and home heating.

Critics also argue that the green levy may be an instrument for the richer to buy their way out of any responsibility and not contribute to reduce pollution (Kenton, 2020).

1.3.3.1 International organizations

International organizations like the European Union have played a key role in advocating such a transition, through a series of initiatives, like the already mentioned UN 2030 agenda and sustainable development goals.

It is also worth to mention the Paris Agreement: a legally binding international treaty on climate change, signed in 2016, with the goal of avoiding dangerous climate changes and combat global warming.

It sets out a limit to the rise in global average temperature to well below 2 °C above pre-industrial levels, pursues efforts to limit the increase to 1.5 °C.

In order to reach this goal, countries must reduce their greenhouse gas emissions and move towards a climate neutral world (United Nations Climate Change, 2021).

The Paris Agreement was carried out within the United Nations Framework Convention on Climate Change (UNFCCC), an international environmental treaty addressing climate change, signed at the United Nations Conference on Environment and Development (UNCED), popularly known as the Earth Summit, held in Rio de Janeiro in 1992. The Kyoto Protocol, which was signed in 1997 and which entered into force in 2005, was the first implementation of measures under the UNFCCC.

On 11 December 2019, the Commission presented the European Green Deal, a growth strategy, to overcome climate change and environmental degradation: specifically, its targets are to eliminate net emissions of greenhouse gases by 2050, to decouple economic growth from resource depletion and not to leave behind any people or place. The expected result of these efforts would be an efficient and circular economy, able to turn climate and environmental threats into opportunities (European Commission, 2021).

Indeed, a circular economy is a closed-loop economic system aimed at reducing resource depletion and waste, pollution and carbon emissions through reusing, sharing, repairing, and recycling. This approach aims to keep products, equipment and infrastructure in use for longer, thus improving the productivity of these resources. The output remained at the end of the life of a process, instead of being wasted, can become input for other processes.

The opposite of this regenerative approach is the traditional linear economy, where the life of every process has a beginning and an end (Geissdoerfer, M; Savaget, P; Bocken, N; Hultink, E, 2017).

1.3.3.2 Green bonds

A relatively new and increasingly popular instrument in sustainable finance is Green Bonds.

A green bond is a type of fixed-income financial instrument that is specifically designed to raise money for environmental and climate-friendly projects, such as renewable energy, green buildings, or resource conservation.

They are relatively recent, as they date back to the early 2000s: the World Bank issued the first official green bond in 2009.

Green bonds typically come with tax incentives to make them more attractive to investors compared to conventional bonds.

According to Flammer (2021), companies are willing to issue green bonds mainly for a signalling strategy: green bonds may represent a credible signal of the company's commitment toward environmental issue, which are at the centre of many debates in recent years. Such a signal can be valuable for a company's reputation. As this commitment materializes, companies improve their environmental performance, achieve higher environmental ratings, and become attractive for environmentally conscious investors.

1.3.4 The Social dimension

The second dimension of ESG is the social one. Responsible investments involve considerations about the impact that an investment can have on the society.

Social considerations comprise issues as inequality, inclusiveness, working conditions, employee relations, investment in human capital and communities, as well as human rights issues like modern slavery or child labour.

The modern business world is becoming more and more aware of the importance of these issues and expects companies' operations to be consistent with the morals and values of society. Socially conscious investors expect companies not only to deliver profits to their shareholders, but also to support activities such as philanthropic donations, health care, childcare, and educational opportunities (Carroll, 1991).

In general, social sustainability advocates social justice and tries to enhance the lives and status of susceptible or marginalized people.

The scope of social sustainability is broad and may involve democracy, basic needs of a community, end of extreme poverty and food uncertainty, universal primary education, promoting gender equality and empowerment of women, reduced child mortality, improved maternal health, security, fighting diseases, quality of life, cultural diversity, and overall welfare.

In general, an equitable society does not exclude or prejudice people from participating economically and socially.

Within the business context, social equity regards job opportunities, health and safety, training and learning, and professional growth.

At community level, sustainability involves social interaction among community members, civic contribution, the existence of formal organizations, security. Crucial elements in this context are Education and health care (Mian M. Ajmal, Mehmood Khan, Matloub Hussain & Petri Helo, 2018).

1.3.4.1 Neocolonialism

An example of socially unsustainable behaviour of a company is Neocolonialism. This term was coined after World War II; at the time it referred to the continuing dependence of former colonies on foreign countries. Today the term, however, is not out of date: it refers to developing countries undergoing colonial-like exploitation, perpetrated by multinational corporations and global institutions. In this way they practically dominate subject nations not by means of direct rule, which was instead prerogative of traditional Colonialism, but through indirect forms of control like financial operations and trade.

Neocolonialism hinders the economic and social growth of developing countries and exploits them as sources of cheap raw materials and cheap labour.

Multinational corporations are often accused of enriching a few people in underdeveloped countries, while keeping those countries as a whole in a situation of dependency (Halperin, 2020).

Using a metaphor, we could say that multinational corporations are “Trojan Horses” for developing countries: they settle in such countries presenting themselves as helpful to their development, but in the end their effect is detrimental from a social sustainability perspective.

1.3.5 The Governance dimension

Sustainability also involves another dimension, that is the governance of public and private institutions. Indeed including management structures, employee relations and remuneration contribute to the creation of a sustainable economy, that is both efficient and fair. Corporate governance is about what a business is for, how and in whose interests companies should be run, what is the appropriate balance between owners and other stakeholders.

As issues like business ethics through value chains, human rights, bribery and corruption become very relevant to investors, they have to be talked by corporate boardrooms (Elkington, 2006).

Corporate governance has gained importance in recent years. The reason for this increased interest can be found in the economic liberalisation and deregulation of business, the demand for new corporate ethos and stricter compliance with the law.

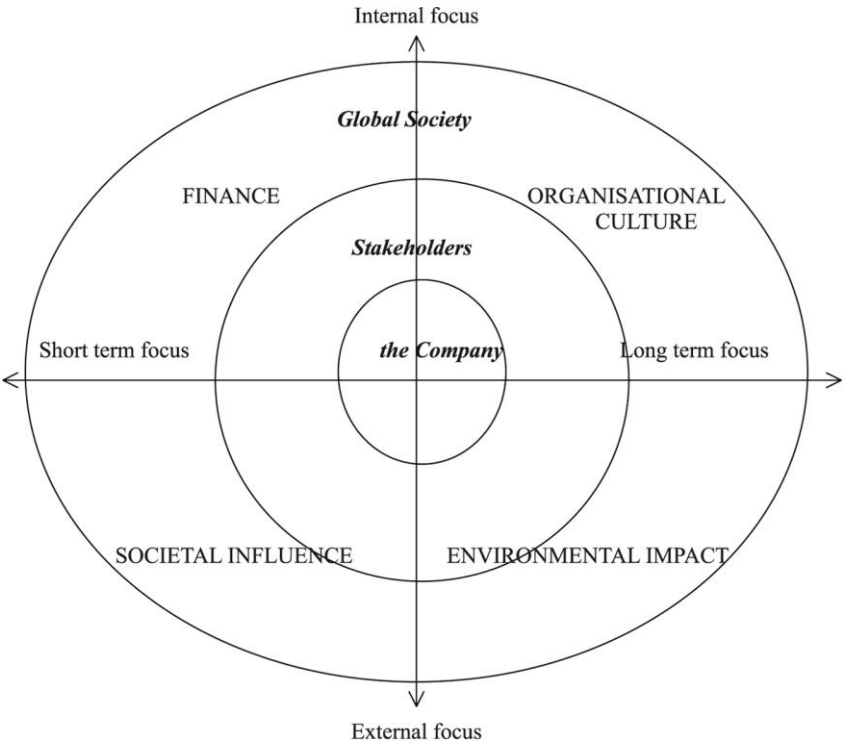
Moreover there is demand for greater accountability and transparency of companies to their stakeholder. This is due to the growing awareness that owners are not the only one affected by the actions of an organization: the behaviour of a company can have a big impact on the society as a whole, hence all its stakeholders are concerned with its decisions.

An organisation is thus seen as part of a wider social and economic system and as such, it has to assess costs and value created not only in the present but also for the future.

Boards of directors can play a crucial role in sustainability as their role is to ensure that management is making decisions that are consistent with the principles of the company. Traditionally, the objectives that the management pursues follow the interests of shareholders first. A sustainable corporate governance considers also the interests of nonshareholding stakeholders, such as employees and customers, in performing its monitoring and advisory role. Hence it reflects the joint interests of all stakeholders of the corporation (Eccles, Ioannou, and Serafeim 2012).

Companies with a sustainable corporate governance can be described by a team production model of the firm (Blair and Stout 1999), that revolves around constructive horizontal relationships among stakeholders rather than the principal–agent model, based on the vertical and rigid relationship between a principal (shareholders) and an agent (executives).

As shown in the graph below, the focus of a good corporate governance should have four dimensions. On the one hand it has to look both at the short-term and long-term; on the other hand, it has to be both internal and external, as the action of a company influence not only its own employees, investors and in general stakeholders but also the community as a whole: the financial markets, the society and the environment.



Investors expect companies to implement rigorous corporate governance principles, which strongly affect their reputation and credibility and eventually firm performance. Indeed a company's corporate governance report is an important for investor' decisions. So companies

receive pressure for good governance from their shareholders, potential investors and other markets actors.

Also a company's credit evaluations depends, inter alia, on corporate governance principles, as transparency, accountability, responsibility and fairness.

So a firm that aspires to a high credit rating score needs to have a good governance (Aras, Crowther, 2008).

Chapter II

2 ESG VS FINANCIAL PERFORMANCE: LITERATURE REVIEW

There is a lot of literature concerning the effects that ESG criteria and SRI can have on the risk and return profile of an investment.

Indeed there is an ongoing debate around whether integrating ESG criteria in one's portfolio can enhance return or whether there is a trade-off between responsible investments and return.

The debate concerns also the risk of an investment: whether a responsible investment is safer or riskier than a traditional investment.

The traditional investor considers a good investment one that brings a good profit, irrespective of its consequences on the community.

However, in recent years other demands have been required by investors, who are concerned about the consequence of their investments on the society and the planet.

The literature presents opposing views and evidence about whether ESG has a positive or negative impact on risk and returns.

In the following we are going to go through different approaches around the effects of ESG criteria and SRI on corporate financial performance. This is done through a review of different papers that express a diverse range of opinions and evidence on the matter, in order to offer a comprehensive view that is not unilateral. There is a lot of literature concerning the effects that ESG criteria and SRI can have on the risk and return profile of an investment.

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2.1 Literature supporting a positive impact of ESG on risk and return

“ESG factors and risk-adjusted performance: a new quantitative model” is a paper written by Ashwin Kumar, N. C., Smith, C., Badis, L., Wang, N., Ambrosy, P., & Tavares, R. (2016). This paper compares companies with a positive ESG profile vis-à-vis those with a negative ESG profile in order to assess whether there are differences in the average standard deviation of stocks prices and thus in the risk that these stocks bear.

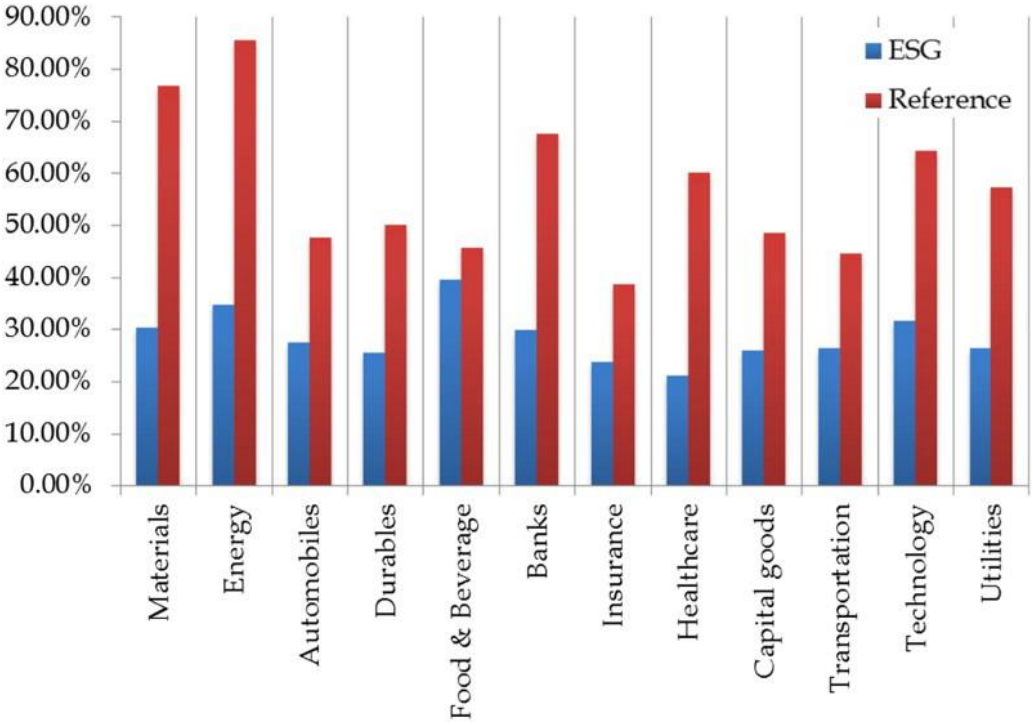
As investors’ sentiment, government policies and regulations are increasingly advocating a sustainable financial market, the integration of Environmental, Social and Fair Governance (ESG) practices into one’s investment reduces the exposure of a company to reputation, political and regulatory risk in the long run. Such reduced risk, according to the authors translates into reduced volatility of cash flows, which in turn enhances profitability.

Ashwin Kumar, N. C., Smith, C., Badis, L., Wang, N., Ambrosy, P., & Tavares, R. carry out a quantitative analysis, relying on the Dow Jones Sustainability Index, which includes companies with a good ESG performance. Hence the authors study a sample of companies that belong to

this index and compare them with a sample of companies that do not belong to the index and are thus representative of the average market.

In the model the degree of risk in the equity stocks is represented by the volatilities of their returns. The results show that volatility is lower for companies listed in the Dow Jones Sustainability Index, compared with the other companies for the same industry.

For each industry, the volatility differentials vary, depending on the characteristics specific to the industry itself.



According to conventional finance in order to have higher returns, an investor should be willing to bear a higher risk. Hence less risk should lead to lower returns. However, the results of the paper show that, for some industries, ESG companies achieve better results compared to the reference companies. Hence the authors conclude that the lower risk brought by good ESG companies does not imply lower returns. In other words companies with a good ESG

performance would achieve higher *risk-adjusted returns*, that is, the same return for lower risk or higher return for the same risk, when compared to the average market investment. Indeed, for a few of the industries studied companies belonging to the Dow Jones Sustainability Index show high Sharpe Ratios, that a measure of efficient investments, calculated as the expected return per unit volatility.

Hence the model shows evidence in support of the idea that ESG factors have a positive impact on stock performance.

However, in order to make a critical review of the paper, it is necessary to point out its pitfalls too.

From a statistical point of view, the analysed period is short, just 2 years: this makes to subject to bias. Moreover, there is no information on the significance of the data nor on the characteristics of the selected sample, e.g. geographical exposure of revenues, average market cap, and other factors that affect securities performance and should be taken into account.

As for the criteria used to select the companies with a good ESG profile, the Dow Jones Sustainability Index was used to select those companies, which applies ESG score by RobecoSAM. However there are several other agencies that rate companies based on their ESG performance. Hence there is the possibility that, with another rater, the results would be different.

A similar study was conducted by Eccles, Ioannou, and Serafeim (2012), who take a sample of 180 US companies and divide it into two groups, high sustainability and low sustainability companies, in order to study the differences in the organization and performance of the two groups.

In a nutshell, high sustainability companies appear to be more proactive, more transparent, and more accountable, with respect to their counterparts.

Hence companies are identified as highly sustainable when they have explicitly placed a high level of emphasis on corporate policies that actively support the environment, employees, community, products, and customers.

These companies adopt a series of formal processes in order to implement sustainability, for example they set up separate board committees for sustainability, they use executive compensation as an incentive, and they measure and report information related to their employees, customers, and suppliers. Sustainable companies also consider a longer time horizon when it comes to decision making, pondering the consequences on their decision in the long run.

The low sustainability companies correspond to the traditional idea of a company that merely focuses on the objective of profit maximization and regard ESG issues as externalities.

They argue that to integrate social and environmental issues into a company's strategy and processes represents an alternative way of being competitive, characterised by a long-term approach that aims at maximizing intertemporal profits, an active stakeholder engagement, and more structured systems of measurement and disclosure of non financial information related to the company's stakeholders.

In fact, stakeholder engagement, according to Hillman and Keim (2001) can be source of competitive advantage, as it enables companies to develop intangible assets in the form of long term relationships: mutual trust and cooperation with stakeholders may translate into reduced agency costs and transactions costs. This is contrast with the view that high sustainability companies face higher costs, due to the greater benefits they provide to their employees and the valuable business opportunities that may be foregone because not in line with the principles of sustainability.

Eccles, Ioannou, and Serafeim (2012) study the corporate performance of the 180 companies sampled for 18 years, which is a long and comprehensive time interval, that allows to study the effects of sustainability on performance in the long term.

They find that high sustainability companies show a higher annual abnormal performance compared to the low sustainability companies and outperform them also when it comes to accounting rates of returns, such as return-on-equity (ROE) and return-on assets (ROA).

These results, again, depend on the industry considered.

The outperformance is explained by the authors as a function of the better human capital, the reliable supply chains established, the long-term relationships with communities.

Sustainable companies are able to create value by focusing also on non shareholding stakeholders. Companies that do not commit to sustainability are exposed to risks like consumer boycotts, fines by the governments that are increasingly bringing on restrictive regulations and foregone talented human capital.

Moreover, innovation can be the solution to overcome social and environmental constraints, giving to these companies another competitive advantage.

Khan et al. (2016) analyse a sample 2,300 US companies over the period 1991-2012, using the materiality map methodology of the Sustainability Accounting Standards Board (SASB). The authors study the materiality of ESG factors for the sample and find that the best performing portfolios are composed of firms scoring high on ESG materiality and low on immaterial factors.

By making a distinction between material and immaterial ESG dimensions, the authors find that firms scoring high on material ESG issues significantly outperform firms scoring low on these issues. On the other hand, when only immaterial ESG factors are considered firms with good scores on those do not significantly outperform firms with low scores.

Finally, companies that excel only in material ESG factors perform better than firms with a high score both on material and immaterial ESG factors.

This implies that in order to create the best shareholder value companies need to identify those ESG dimension that are material and immaterial and base on this distinction their investment

decisions. Similarly, such distinctions also have implications on the capital allocations decisions of asset managers.

It is worth to mention another study, by Ferriani and Natoli (2020), that focuses its attention on a particular time: the initial phase of the financial crisis related to Covid-19, a period characterised by economic uncertainty. The period of time they study is rather short: from January to May 2020; however it is also representative of a very peculiar time for financial markets. The authors analyse investment into equity funds during that period, and investigate whether ESG factors can contribute to explain the variations in fund flows and where hence determining considerations in investors' decision making. In order to do so, rather than using traditional ESG ratings, they focus their attention on Morningstar's ESG risk scores, that measure firms' exposure to risks that are related to ESG factors.

They find that ESG-related risk has been significantly taken into account by investors during the first phase of the Covid-19 crisis. Investors are interested in low-ESG risk funds and tend to exclude the high-risk ones. This kind of behaviour could be defined as "flight-to-safety" into low-ESG risk funds. However, the three dimensions of ESG, Environmental, Social and Governance, are valued differently by such investors: during the financial crisis related to the pandemic, investors look for investment with a low risk related to the environmental and governance dimension. However the opposite holds for the social dimension: it appears that social risk positively affects investors' demand. This may probably be explained by the fact that, to the eyes of investors, low social risk may hurt profitability. For example, a socially responsible company would support strong employees' which can translate into higher cost for the company itself.

In terms of performance, low-ESG-risk funds were better compared to the high-risk ones, but also compared to the average and such difference is statistically significant.

The interesting aspect of the study carried out by Ferriani and Natoli (2020) is that it focuses its attention on the risk results of sustainable companies rather than the returns, which are the usual point of attention in literature. They find that sustainability is represented to investors as a valuable hedge during times of crisis.

2.2 Literature refuting a positive impact of ESG on risk and return

“Do socially (ir)responsible investments pay? New evidence from international ESG data” by Auer and Schuhmachern (2016) supports the idea that active selection of stocks based on their ESG ratings does not provide superior risk-adjusted performance compared to a passive stock market strategy.

They argue that sustainability screens in investments impose a constraint on the possibilities of investments and hence constitute a limit to diversification. This may offer a mean–variance frontier shifted towards less favourable risk-return trade-offs compared to non-sustainable investing.

Indeed, according to modern portfolio theory a screening of assets that is extra-financial hinders portfolio diversification (Lagoarde-Segot 2011).

The authors take a rather diverse sample ranging from 2004 to 2012 and covering large, mid and small capitalisation companies from different geographic regions.

The ESG data is taken from Sustainalytics and is used to construct multiple portfolios with different ESG profiles, geographical area and industry, which are then compared with typical passive benchmarks.

The results of their analysis differ based on the geographic and industry focus and the ESG criteria used.

In the Asia-Pacific region and the United States, no consistent effect is found of ESG stocks selection on investment performance relative to the benchmarks.

As for Europe, investors tend to pay a price for picking stocks based on SRI, in terms of lower risk-adjusted returns compared to the passive benchmarks. However this results depend on the industry and ESG criteria selected, they are not universal. So in Europe, investors should be careful to avoid some combinations of ESG-criteria and industries so as not to encounter financial disadvantages.

The authors conclude that ESG investing satisfy ‘Value-driven investors’ (VDI), who are willing to accept a relatively poor financial performance in order to make an investment that is in line with their personal and societal principles.

However, SRI does not provide a superior performance, but at best a performance similar to the average market to ‘Responsible profit-seekers’ (RPS), who are interested in companies with a good sustainability profile but have as a priority also financial profits from their investment. They would not invest in regions or industries, where SRI does not provide financial benefits. in Europe some combinations of ESG-criteria and industries should be avoided so as not to cause financial disadvantages.

Overall, the authors find that ESG can offer ‘socially filtered’ market performance, but it is not a criterion for picking stocks with superior performance, neither when the stocks selected have a high ESG score nor when they have a low one.

The question of whether it is possible in finance to “do well while doing good” has been investigated also by S. Hamilton, H. Jo, M. Statman (1993). They start their study from the hypothesis that there is no difference in the risk-adjusted expected returns of SRI and conventional portfolios, as social responsibility of stocks is not priced and is not a risk factors and hence, in the standard framework of finance, does not affect expected returns or company’s cost of capital.

The authors test such hypothesis by analysing the performance of a number of mutual funds that are considered socially responsible and compare them to a benchmark for conventional

mutual fund. They build this empirical model using data from Lipper Analytical Services and tracking the Jensen alpha for each fund as an indicator of excess return.

They find that the excess return of socially responsible mutual funds are not statistically significant and their performance is not statistically different from the performance of conventional mutual funds.

Aupperle, K., Carroll, A., & Hatfield, J. (1985) used a different approach to test the effects of SRI on corporate performance: a survey to assess social-responsibility orientation of corporate respondents. The survey was sent to the 818 chief executive officers (CEOs) listed in Forbes 1981 Annual Directory.

The survey model was based on Carroll's (1979) construct of corporate social responsibility having four components: economic, legal, ethical, and discretionary (or philanthropic) concerns. In this way the survey would allow to assess the orientations of corporate executives toward social responsibility.

The results of the survey show an inverse relationship between the economic and ethical dimensions, implying that corporate executives perceive a trade-off between the two components and feel that an emphasis on one of the two is at the expense of the other.

It appears that those corporate executives that are more concerned with their economic responsibilities, are also the ones that care less about their ethical responsibilities.

Actually, there is a negative correlation between the economic factor and all three of its non-economic counterparts.

In order to investigate the relationship between corporate social responsibility and performance, the authors correlate a firm's concern for society score found through the survey with its profitability, measured in terms of return on assets (ROA).

The results show that a strong orientation toward social responsibility has no statistically significant relationship with financial performance, neither positive nor negative. They

conclude that it is neither beneficial nor harmful for a firm to have a good SRI orientation, since this has no implications on profitability.

Another point of view that is worth mentioning comes from the Nobel laureate Milton Friedman (1970). In his article “The social responsibility of business is to increase its profits” he argues that “social responsibilities” do not belong to the business, but rather to the individual, who can freely choose to devote part of his money to social causes or to refuse to work for particular companies he deems unsustainable.

A businessman, on the other hand, who focuses on social responsibility, in Friedman’s opinion sacrificed the interest of his employers, by restraining some choices that are socially responsible, but not in the best interest of his corporation. These actions may reduce the profits and value conveyed to stakeholders.

In practice, a corporate executive that pursues socially responsible objectives is indirectly giving up the money of his stakeholders, who should be free to devote their money to social causes as individual if they wish. Friedman compares such behaviour to the imposition of a tax on the profits of the shareholders, which should be a responsibility of the government and not of private enterprises.

By employers, Friedman means the shareholders. Indeed in his view, a manager in a free-enterprise system, is an employee of the owners of the business and should pursue their interest.

In conclusion, Friedman, being a strong defender of the free market does not approve what we call today SRI. Indeed, he considers “social responsibility” a “fundamentally subversive doctrine” in a free society, where the only responsibility of a firm is increase its profits for its shareholders.

This article expresses a strong view in opposition to SRI. However, it must be taken into consideration that the article was written more than fifty years ago, and thus it reflects a different mentality and situation.

Moreover the idea of “social responsibility” here is rather vague, while today socially responsible investments have a clear definition and are supported by specific data like ESG ratings.

The article of Friedman simply reflects the theory of the economist but does not show evidence against the profitability of SRI.

It may be argued that the literature reported and discussed in this session is mostly not very recent. As a matter of fact it has been difficult to find recent sources that refute a positive impact of a good ESG profile on financial performance. In researching the sources of literature that tackle the topic of ESG one finds a wider range of contemporary papers that show evidence in support of such positive correlation.

One possible explanation may be that the economic context and investors’ sentiment about SRI have consistently changed in the last years and ESG practices are not anymore for the niche investors and are not incompatible with profitability. Moreover, today, there is a greater availability of accurate ESG data, that allow researchers to develop more precise and reliable statistical models.

Finally, the evidence and conclusions found by the authors in this section do not show consistent detrimental effects of ESG integration on performance; rather they find no significant effect.

Chapter III

3 EMPIRICAL MODEL

After having reviewed the literature, we can say that it yields contradictory results.

For this reason, I have decided to develop an empirical model in order to investigate the question of whether ESG integration has a positive or negative effect on corporate financial performance.

3.1 Data

As the objective of this study is to investigate the effects of ESG on corporate financial performance, I have taken my sample of companies from the SP500, that is a stock market index comprising 500 of the largest companies listed on stock exchanges in the United States. This index was chosen as a starting point for my research because it is one of the most commonly followed equity indices and is thus representative of what is going on in the world financial market.

As my intention was to categorize the 500 stocks from the index based on their ESG profile, I choose to use the ESG ratings provided by MSCI (2021).

MSCI is an American finance company that serves as a global provider of equity, fixed income, hedge fund stock market indexes, portfolio analysis tools and also ESG scores.

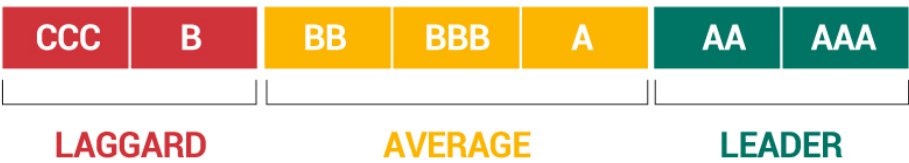
MSCI collects data from multiple sources and assigns ESG scores to companies by assessing their exposure to long-term and material environmental, social and governance (ESG) risks their ability to tackle those issues relative to peers.

The ESG score assigned to a company ranges from ‘AAA’ to ‘CCC’ and serves to divide companies in three categories according to their ESG profile.

A “laggard” is a company with a low ESG rating, that lags its industry in the exposure and management of ESG risks.

A company with an average ESG score is defined “average”, having an approach to the management of ESG risks and opportunities that is mixed or not exceptional relative to its peers.

Finally, a “leader” is a company with a high ESG rating, due to its leading role in managing the ESG risks and opportunities relative to industry peers.



I used the MSCI ESG ratings to identify those stocks in the SP500 with a high ESG profile and those with a low one.

Then I divided the 500 stocks into 11 sectors:

- Communication Services
- Consumer Discretionary
- Consumer Staples
- Energy
- Financials
- Health Care
- Industrials
- Information Technology
- Materials
- Real Estate
- Utilities

Such classification was based on the Global Industry Classification Standard (GICS) developed in 1999 by MSCI (2021) and Standard & Poor's, which categorize all major public companies into of 11 sectors .

For each industry I picked 6 stocks: 3 among the ones with the highest ESG scores and 3 among the ones with the lowest ESG score.

In this way I could compare the performance of those companies that are more committed to sustainability issues and those that are less committed to study whether there are differences in the performance of companies following these two different approaches toward sustainability.

The division among industry served to grasp the industry specific effects of ESG integration.

Indeed there are some industries that are more exposed to the issues of pollution, for example, compared to others.

Hence the final sample I have come up with is constituted of 66 stocks, all belonging to the SP500 index.

For each of these 66 stocks I gathered the daily prices from Yahoo Finance, for a period that goes from 1 January 2020 to 31 December 2020, that is one year.

I chose this time span because it would be representative of a turbulent period in financial markets, due to the crisis that started after the COVID-19 breakout. So the objective of my research is to investigate whether ESG assets could represent a good investment during a time of crisis, when most investments show a poor performance.

Then I collected, for this time period, the return on the market portfolio and the risk free rate, which would serve me to build the model, as explained in the following. These data were taken from Kenneth French's website (Kenneth R. French – Data Library, 2021).

3.2 Methodology: the CAPM

The model that I decided to apply on my data is the CAPM model as it is a simple and effective tool to evaluate the performance of stocks compared to the rest of the market.

The capital asset pricing model (CAPM) was developed by William Sharpe and John Lintner and represents the foundation of asset pricing theory and is widely used in research to estimate the cost of capital for firms and assess the performance of managed portfolios.

In practice, the CAPM describes the relationship between systematic risk and expected return for assets (Fama E. and French K. 2004).

Systematic risk is that kind of market risk that cannot be eliminated through diversification, as opposed to idiosyncratic risk, which is specific to individual stocks and is not related to market moves and, as such, cannot be diversified away.

The CAPM is described by the following equation:

$$R_j = R_f + \beta_j(R_m - R_f)$$

which can also be written in terms of excess return as

$$R_j - R_f = \beta_j(R_m - R_f)$$

where:

R_j is the expected return on a stock

R_f is the risk-free rate

R_m is the expected return on the market

$R_m - R_f$ is the market risk premium

$R_j - R_f$ is the excess return on the stock

β_j is the beta of the investment

The beta can be estimated by regressing the excess return on the investment against the excess return on the market:

$$\hat{R}_j = \alpha + \beta_j \hat{R}_m + \varepsilon$$

Where:

$$\hat{R}_j = R_j - R_f$$

$$\hat{R}_m = R_m - R_f$$

α , the intercept of the regression, is a measure of stock price performance.

It is called “Jensen alpha” and measures the abnormal return of a stock over the expected return, that is the market return (Jensen, 1968).

$\alpha = 0$ if the stock yielded the same return of the market. In fact the expected value of alpha is zero.

$\alpha > 0$ if the stock outperformed the market, hence doing better than expected.

$\alpha < 0$ if the stock underperformed the market, hence doing worse than expected.

It is a useful indicator for investors, as it can indicate whether the stock is outperforming or underperforming compared to the market, in terms of risk-adjusted returns.

β_j , the slope of the regression, is a measure of risk: it measures how much risk the investment will add to a portfolio that bears a risk equal to the market. Equivalently, β_j is a measure of a stock's relative volatility: that is, it shows how much the price of a stock moves up and down with respect to the market. $\beta_j = 1$ if the price of the stock moves exactly in line with the market, that is, it bears exactly the same risk of the market.

$\beta_j > 1$ if the risk of a stock is higher than the market risk. Hence the stock will move more than the market in either direction: it will have a higher volatility.

$\beta_j < 1$ if the stock is less risky compared to the market. The stock will move less than the market.

Beta is an important indicator for investors, who can use it to build a portfolio that suits their attitude towards risk. In particular, when the market is falling, as was the case in 2020, the period we are focusing on, investors will be willing to hold low-beta stocks, which are

considered safer investments; on the other hand, when the market is rising, investors may be willing to hold high-beta stocks, that is to bear more risk in exchange for an higher expected return (McClure, 2020).

Since the sample is divided into 11 sub-samples based on sectors, I have also compared the betas found for each company to the sector-specific beta, retrieved on Damodaran's website (Damodaran online, 2021).

In order to apply the CAPM to the data that I had collected, first of all I had to transform the prices of the stocks into returns:

$$R = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Then I subtracted the risk free rate from such returns, in this way I obtained the excess return on stock j: $R_j - R_f$

Finally, I regressed these excess returns against the excess returns of the market as by standard procedure of the CAPM explained above.

As mentioned above, my data were divided into 11 industries. For each industry 6 stocks were analysed, 3 of them with a high ESG rating and the other 3 with a low score. So for each of these stocks, 66 in total, I obtained the alpha and beta by applying the CAPM.

This allowed me to study the level of abnormal return and risk of stocks with a good ESG profile, compared to stocks with a bad ESG profile.

In order to make an accurate statistical analysis of the data gathered and make my empirical model reliable I calculated for each stock the t-statistics relative to the alpha and the beta, in order to test the significance of my results. Given the degrees of freedom of the data analysed, i.e. 250, the absolute value of the t-test has to be compared with the value 1.969498393: if the t-test is higher than such value the results are statistically significant, otherwise they are not.

All the data collected for each industry (prices, returns, excess returns, market risk premium and risk free rate) are reported in the appendix.

3.3 Results

The division in industries that I made with the data allowed me to make an analysis that is specific to each industry. In fact the effects of ESG integration on financial performance may differ among industries, based on the characteristics that are specific to each industry: for example there are some industries that, by construction, are more exposed to environmental risks, like pollution or gas emissions.

Hence, in the following I am going to report the results of my research for each of the 11 industries analysed and in the end I am also going to draw the results for the overall sample studied.

Each of the 11 industrial sectors analysed contains 6 stocks. Hence the final sample contains 66 stocks from the SP500.

Each of these 66 stocks is analysed for a period of time that goes from 1 January 2020 to 31 December 2020, that is one year.

I chose 2020 as the period of interest because it was the year of the COVID-19 breakout, that has had very serious consequences on the world economy. Hence it is a particular period of a strong financial crisis, and is representative of a turbulent moment in financial markets.

The analysis of such period allows us to investigate whether ESG assets could represent a good investment during a time of crisis, when most investments show a poor performance and high volatility.

3.3.1 Communication Services

The sector of communication services includes providers of telecommunication services and companies working in the field of media and entertainment, that provide advertising, marketing or public relations services (MSCI, 2021).

For the communication services sector, I picked 6 companies: 3 of them are laggards, having CCC or B as ESG rating, the other 3 are considered average for their approach towards ESG issues. I haven't found leaders in the SP500 sample, that is companies with a high ESG score or exceptional profiles in the management of ESG risks and opportunities.

The mentioned companies are listed below, together with the ticker they are identified with and the corresponding ESG rating.

For each company I also reported the alpha and the beta retrieved by applying the CAPM model onto the data. I have also found the t-statistic for each company's alpha and beta in order to study the significance of the results.

The "sustainable" companies, that is the ones with a relatively high ESG rating are reported in green colour, while the "unsustainable" companies, the laggards are reported in grey, both in the tables and the graphs.

company	ticker	rating	alpha	beta	apha t-test	beta t-test
Verizon Communications	VZ	BBB	-0.041424	0.513600	-0.610660	16.456741
Discovery, Inc. (Class A)	DISCA	BBB	-0.071658	0.915321	-0.444855	12.350778
Alphabet Inc. (Class A)	GOOGL	BBB	0.026978	0.950046	0.336805	25.780158
Dish Network	DISH	CCC	-0.112321	1.452764	-0.723820	20.348590
News Corporation	FOXA	B	-0.141404	0.939600	-0.965307	13.941618
QUALCOMM Inc.	FB	B	0.041879	0.990730	0.343029	17.638203

Alpha, being an indicator of stock performance allows to understand whether these stocks outperformed or underperformed the market.

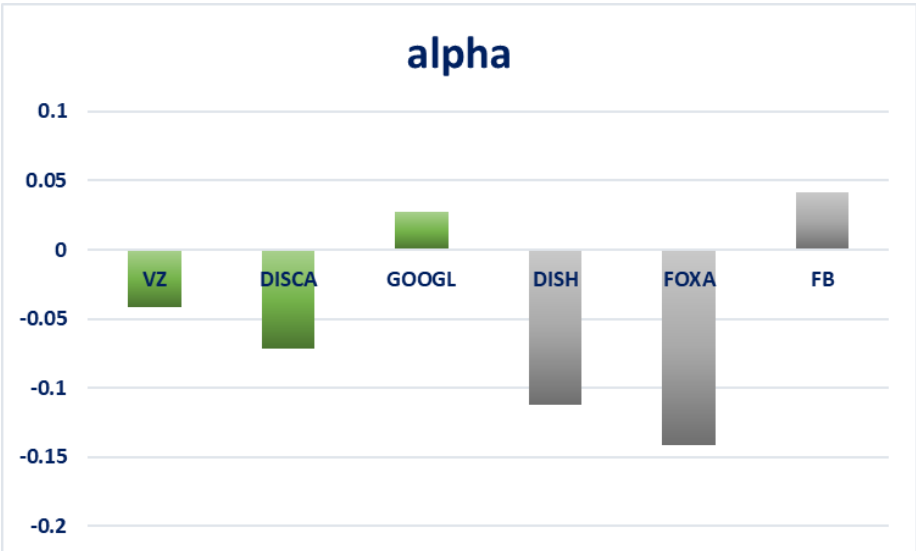
The results, as reported in the graph below are diverse, for both sustainable and unsustainable companies there are positive and negative alphas.

Nevertheless, the green companies have on average a higher alpha (-0.028701) relative to the grey ones (-0.070615), even though this mean is negative.

So it appears that in the communication services sectors, all the companies analysed have underperformed the market, but companies with a good ESG profile have performed slightly better relative with companies with a poor ESG profile.

All the alphas, though, are very close to zero, their expected value, probably because the communication services sector is not one of the sectors that were most hardly hit by the crisis following the COVID-19 outbreak.

However the t-test for the alpha found are all close to zero, meaning that these results are not statistically significant.



As for the betas, that measure risk, they are all lower than 1, meaning that they are less risky compared to the market, apart from Dish Network, which is the company with the highest beta, and it is also the company with the worst ESG rating.

The sustainable companies show a beta that is not only lower than 1 but also lower compared to the betas of the unsustainable companies. Verizon Communications is the company with the lowest beta, and it belongs to the stocks with a relatively higher ESG score.

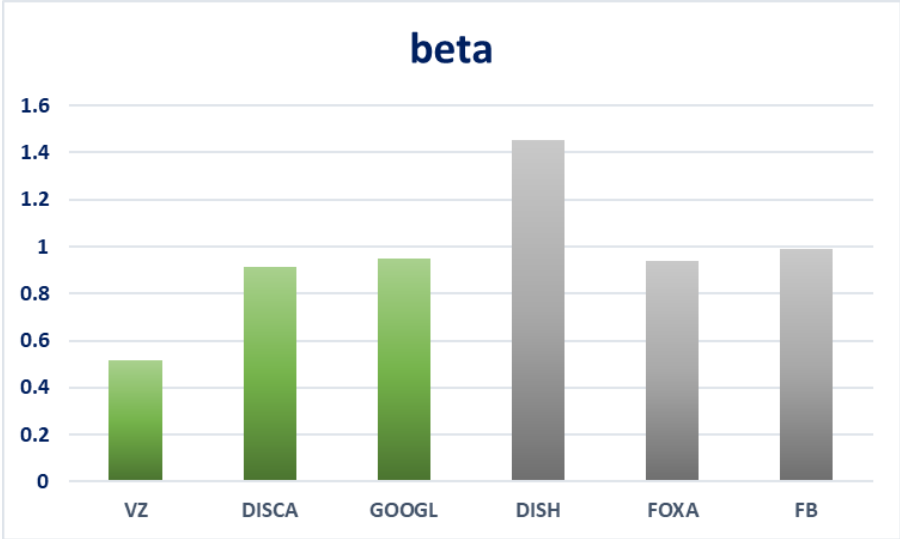
However, one must be cautious in comparing the betas of firms, that may depend on structural differences among them, as for example the leverage, that is the level of debt that a firm uses.

On the other hand we can safely compare the betas found with the market benchmark, that is 1, as this is the sense of the CAPM.

The communication services sector is vast and includes different subsectors that have diverse exposure to market risk. In fact, Damodaran reports the Advertising and Broadcasting sector to have a Beta higher than 1 (respectively 1.08 and 1.13) while the entertainment sector to have a relatively low beta (0.88) like also the Telecom. Services (0.66) (Damodaran online, 2021).

This is due to the fact that on the one hand many tv programmes were conditioned by the pandemic situation and had to suspend broadcasting or rely on distance connections. On the other hand the entertainment subsector has a relatively lower risk, as entertainment platforms were largely used due to the fact that people could not do other leisure activities.

As the t-statistics for the betas are all very high, meaning that the results are statistically significant, we can conclude that, for the sample analysed of communication services sector, sustainable companies are safer investments compared to their counterparts.



This sector is not highly exposed to ESG risks. In fact environmental exposures are low as the industry does not make a great contribution to greenhouse gas emissions, waste, pollution, and toxicity. Also governance exposure is low. The most meaningful ESG-related risk for this industry is the social exposure stemming social cohesion and safety management risks.

3.3.2 Consumer Discretionary

The consumer discretionary sector is vast and includes all manufacturers of automobiles and motorcycles and all the components for these, consumer durables and apparel, manufacturers of consumer electronics products, home furniture, Residential construction companies, household products, leisure products and sports equipment, luxury goods. The sector also includes the subsector of consumer services like casinos and gaming facilities, hotels, resorts, cruise-ships, travel agencies, sport and fitness centres, restaurants, bars, wedding & funeral services and even educational services.

Another sub-sector of consumer discretionary is retailing, including also distributors and stores (MSCI, 2021).

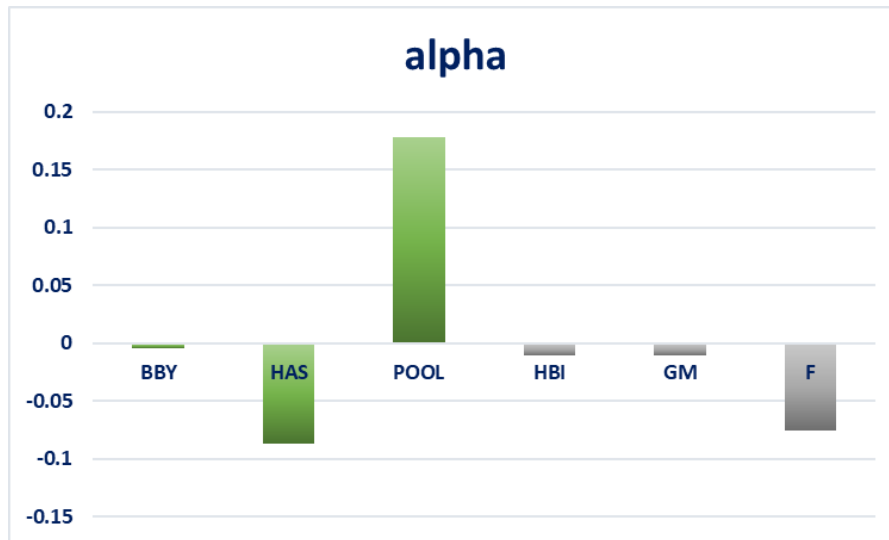
Below are the results of the regression for the six companies analysed. For this sector there are 3 ESG leaders and 3 laggards.

company	ticker	rating	alpha	beta	alpha t-test	beta t-test
Best Buy Co. Inc.	BBY	AAA	-0.004582	1.145021	-0.034566	18.774442
Hasbro Inc.	HAS	AA	-0.086769	1.059429	-0.538896	14.301520
Pool Corporation	POOL	AA	0.178027	0.863893	1.221453	12.883067
Hanesbrands Inc	HBI	CCC	-0.010239	1.064413	-0.048529	10.965801
General Motors	GM	B	-0.010958	1.258903	-0.064073	15.999706
Ford Motor Company	F	B	-0.075573	1.104871	-0.455484	14.473983

The alphas are all close to zero and all negative, apart from Pool Corporation.

Hence, within our sample, the only company able to outperform the market in the consumer discretionary sector is a sustainable company, that is a leader of ESG integration.

However, these results are not statistically significant.



As for the beta, the laggards all have betas higher than 1, while the leaders have on average lower betas, and one of them, Pool Corporation has a beta lower than 1, hence bearing a risk lower than the market risk.

The company with the highest beta, General Motors, is classified as a laggard in the management of ESG risks and opportunities.

The t-statistics for the beta are all very high, making these results statistically significant.

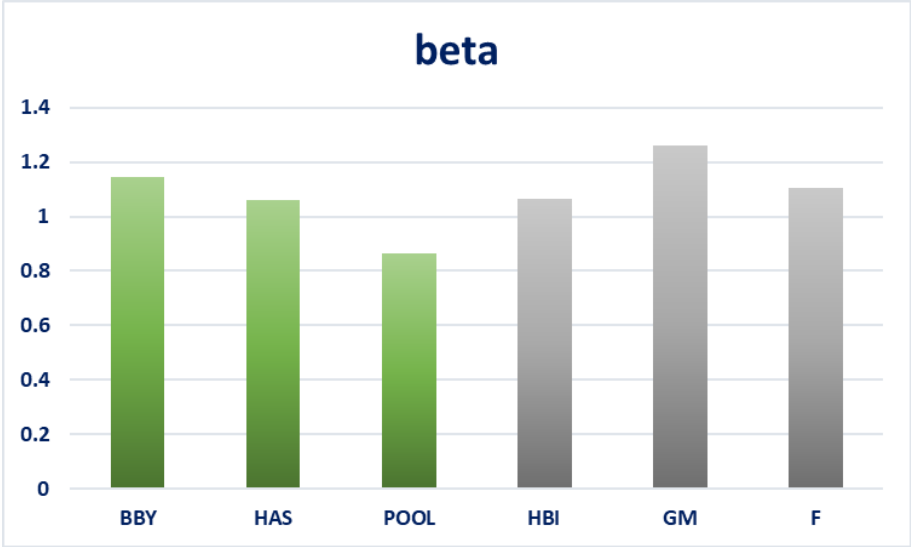
It is worth focusing our attention on a particular company, Pool Corporation, as it is the company with the highest alpha and the lower beta, among the ones in the sample.

Its beta lower than 1 indicates that the company is less risky compared to the market. We would expect a lower risk to be accompanied by a lower return. However, Pool Corporation is the only company in this sample with a positive alpha.

The company is classified by MSCI as a leader in the management of ESG risks and opportunities and indeed it has committed to the production of eco-sustainable products and it is also a member of the U.S. Environmental Protection Agency's WaterSense program, a program that aims at water and energy saving (POOLCORP, 2021).

It can be said that the consumer discretionary sector was highly exposed to the crisis following the pandemic, as during the lockdown most consumer discretionary activities were limited (like restaurants and bars) or even suspended (like travel agencies) in order to prevent contagion.

However, the sector is very diverse, so some activities were more exposed to the recession, while other activities that are more essential were not. This is confirmed by the values of the sector-specific betas found on Damodaran website: some subsectors show a very high beta, like Hotel/Gaming (1.56), or Homebuilding (1.46), others show a relatively lower beta, like Business & Consumer Services (0.93) or Furn/Home Furnishings (0.88) (Damodaran online, 2021).



The consumer discretionary sector is rather exposed to ESG risks, especially environmental risk, given the use of plastic in packaging and the contribution in waste generation and energy use. Also the exposure to social factors is meaningful for this sector, because of issues like consumer behavior (consumers are increasingly focused on their health), safety management, social diversity in the workplace, and demographics, but also data privacy in social media marketing. The governance factor is not prominent compared to the other sectors.

Also for the consumer discretionary we can conclude, from the data, that sustainable companies are a safer investment, compared to unsustainable companies.

3.3.3 Consumer Staples

The Consumer Staples sector includes foods and staples retailing, that is pharmacies, food stores and hypermarkets. It also includes the producers of alcoholic beverages and tobacco,

household and personal products like cosmetics. Also agricultural products belong to this sector (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
Kellogg Co.	K	AAA	-0.047922	0.453470	-0.437850	9.005515
Molson Coors Beverage Company	TAP	AAA	-0.112520	0.868786	-0.804412	13.499877
Coca-Cola Company	KO	AA	-0.047689	0.790327	-0.559510	20.154243
Monster Beverage	MNST	CCC	0.079916	0.882044	1.055335	25.317187
Kraft Heinz Co	KHC	BB	-0.004491	0.931033	-0.039083	17.612556
Walmart	WMT	BB	0.048408	0.502330	0.461206	10.402518

For the Consumer Staple sector the alphas of sustainable stocks are all negative and they are on average lower than the alphas of unsustainable stocks.

Moreover, Monster Beverage, the company with the worst ESG score, is the one with the highest alpha.

So it seems that, for the consumer staples sector, non sustainable companies tend to outperform the market, while sustainable companeis underperform.

However the alpha results are not statistically significant.



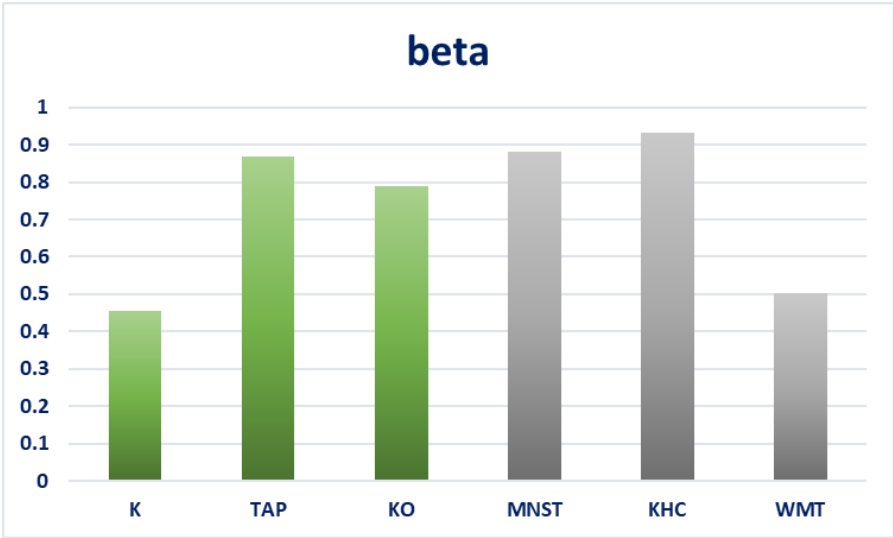
As for the beta, they are all lower than one. However, if we compute the average of the betas for the sustainable stocks (0.704194) and for the unsustainable stocks (0.771802), we find that the former is slightly lower, but very close, compared to the latter.

Moreover, the company with the lowest beta, hence the safest one, that is Kellogg Co. also has an exceptional ESG profile, while the company with the highest beta, Kraft Heinz Co, has a relatively low ESG score.

This sector is not among the most hit by the crisis following the pandemic, as its products are essential to consumers so have kept being sold also during lockdown.

This is the reason why the betas found are all lower than 1. In fact, the sector-specific betas are lower than 1 too: 0.79 for soft drinks, 0.64 for food, 0.72 for Tobacco and 0.73 for Household Products (Damodaran online, 2021).

These results are statistically significant, as the t-statistics are all very high.



The exposure to ESG risks for the Consumer Staple sector is similar to the exposure of the Consumer Discretionary: environmental risks are related to the anti-plastic movement and waste treatment, while social exposure relates to the attention of consumer to their wellness and the avoidance of additives, preservatives, and chemicals in food for example, or the awareness

of health-problems caused by tobacco. The governance factor plays a role in the interaction of food and tobacco companies, for example, with regulators and restrictions.

3.3.4 Energy

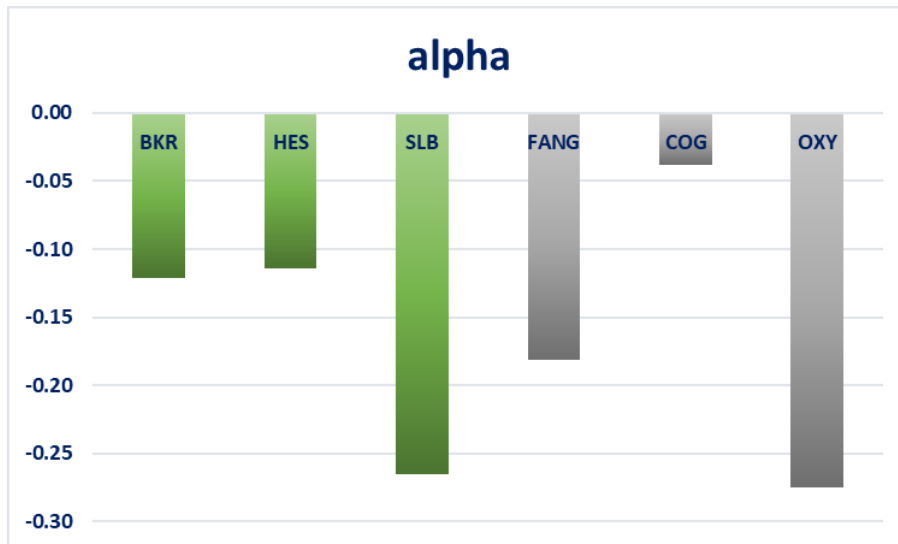
The energy sector includes all the activities related to oil and gas drilling, as Equipment and Services, Equipment and Services, marketing, storage and transportation. The sector also includes products and activities related to coal mining and consumable fuels (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
Baker Hughes Co	BKR	AA	-0.121160	1.468015	-0.622071	16.382510
Hess Corporation	HES	AA	-0.114410	1.467142	-0.466447	13.000994
Schlumberger Ltd.	SLB	A	-0.265545	1.509364	-1.160427	14.336440
Diamondback Energy	FANG	CCC	-0.181302	1.550030	-0.515079	9.571485
Cabot Oil & Gas	COG	B	-0.038379	0.749422	-0.208745	8.859661
Occidental Petroleum	OXY	BB	-0.274605	1.832974	-0.770723	11.181869

The alphas for this sector were all negative, but very close to zero.

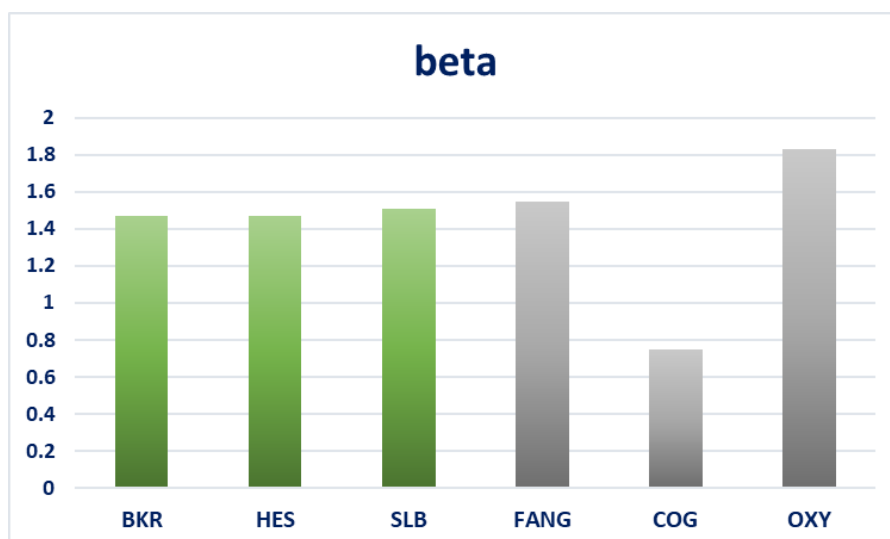
The company with the highest alpha is Cabot Oil & Gas, which is a laggard in the MSCI classification based on ESG criteria.

The results do not allow us to draw conclusions on the performance of the companies based on their ESG profile. Moreover, the results are not statistically significant.



As for the slope of the regression, the sustainable companies all have a beta higher than 1, that is, they are riskier compared to the market. Their average beta (1.481507) is also higher than the average beta of unsustainable companies (1.377475).

However, Occidental Petroleum has an impressively high beta of 1.832974. This is also the company with the lowest alpha. So it has the poorest performance with respect to the market within our sample, and it is also the riskiest stock. The company is one of the less sustainable in the SP500 universe, based on MSCI ESG ratings. In fact in 2017 the company was listed in the Carbon Majors Report among the 100 companies that have been the source of more than 70% of the world's greenhouse gas emissions since 1988 (Riley, 2017).



The energy sector was not among the sectors most harmed by the crisis, as energy is a necessary resource to consumers, also during lockdown.

However the subsector of oil&gas related activities has a relatively high beta (1.26), being exposed to the fluctuances of the oil price, while the coal subsector has lower beta (0.83) (Damodaran online, 2021).

The energy sector is one of the most exposed sectors to ESG-related risks in all of its three dimensions.

Such risks are especially related greenhouse gas emissions and the use of chemicals. It also exposed to high impact, low probability events such as severe oil spills and refinery accidents that may severely hinder the company’s reputation. The energy sector is also highly exposed to social factors related to safety management.

Moreover there is an ongoing transition away from carbon-based fuels, which is encouraged by government policies and regulations but also by consumer behavior.

3.3.5 Financials

The financial sector includes all sorts of banks and other financial services and insurance (MSCI, 2021).

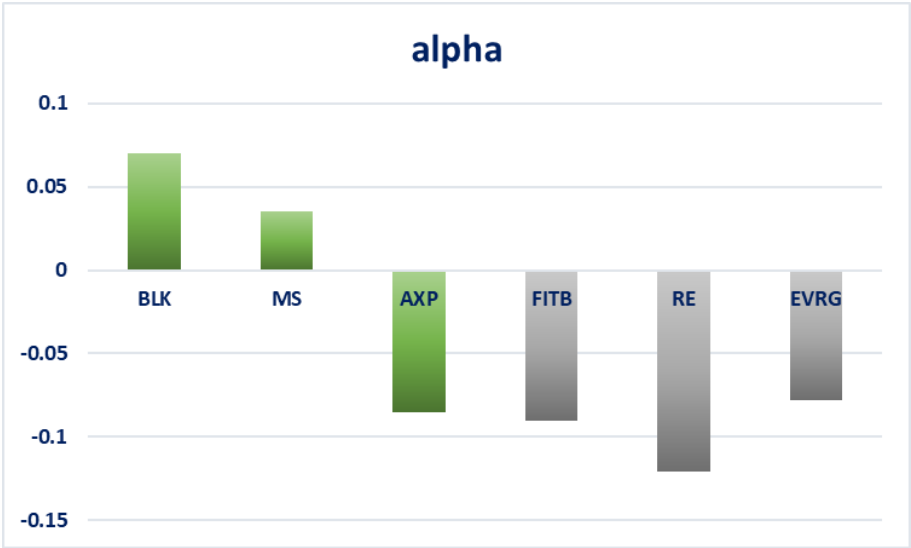
company	ticker	rating	alpha	beta	apha t-test	beta t-test
BlackRock	BLK	AA	0.070365	1.171096	0.690334	24.972477
Morgan Stanley	MS	AA	0.035213	1.429239	0.299438	26.416238
American Express Co	AXP	AA	-0.085165	1.465339	-0.540022	20.195572
Fifth Third Bancorp	FITB	B	-0.090457	1.641629	-0.483499	19.072079
Everest Re Group Ltd.	RE	B	-0.120426	1.058226	-0.907433	17.331645
Capital One Financial	EVRG	B	-0.077596	1.608099	-0.419076	18.877016

The alphas found for the sustainable financial companies were all higher than the alphas of the unsustainable companies. Indeed grey stocks all presented negative alphas, while 2 of the 3 green stocks yielded positive alphas, that is they outperformed the market.

The company with the highest alpha is Blackrock, a multinational investment management company, that is ranked as a leader for its approach to the ESG issues.

The company is openly committed to ESG issues: its CEO Larry Fink every year writes a “letter to CEOs” that is widely read by the general public of investors; in its 2021 letter stresses the importance for companies to focus on the climate change issue, which he considers at the top of the clients’ priorities. He considers climate risk as investment risk but he also believes that climate transition may represent an investment opportunity and should be considered by management. The pandemic has shown the fragility of companies, that can be enormously impacted by global problems. He also shows, though evidence, that during 2020, companies with good environmental, social, and governance (ESG) profiles have outperformed their peers, enjoying a “sustainability premium” (BlackRock, 2021).

However, the t-test values for these alphas are low, so we cannot consider these results statistically significant.

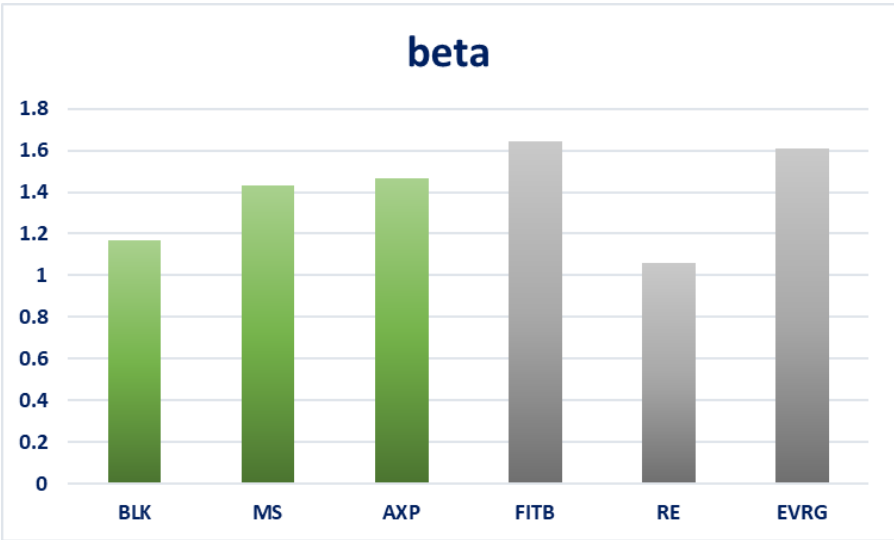


All betas are higher than 1, indicating that all the stocks picked in this sample from the financial sectors are riskier than the market.

However, sustainable stocks are on average (1.355224) less risky than their unsustainable counterparts (1.435985), even though the stock with the lowest beta, Everest Re Group Ltd., belongs to the latter group.

The financial crisis that followed the pandemic trivially affected the financial sector.

Brokerage & Investment Banking firms are riskier by construction, their sector-specific beta is 1.13 (Damodaran online, 2021).



The exposure to ESG risks for the financial sectors are related to the investments financial institutions make. Changing trends increase the need for financial institutions to oversee their operations, from green bonds to mortgage loans for energy-efficient homes. Moreover government policies and voluntary guidelines are increasingly supporting ESG integration.

As for the social risk financial institutions are exposed to, aware investors watch where asset managers invest their money, their attitude towards diversity, equity and inclusion, how they treat their customers and employees.

Governance risks relate to regulations, which are stricter after the Great Recession, and to boards' disclosure of ESG records and sustainable investment plans.

3.3.6 Health Care

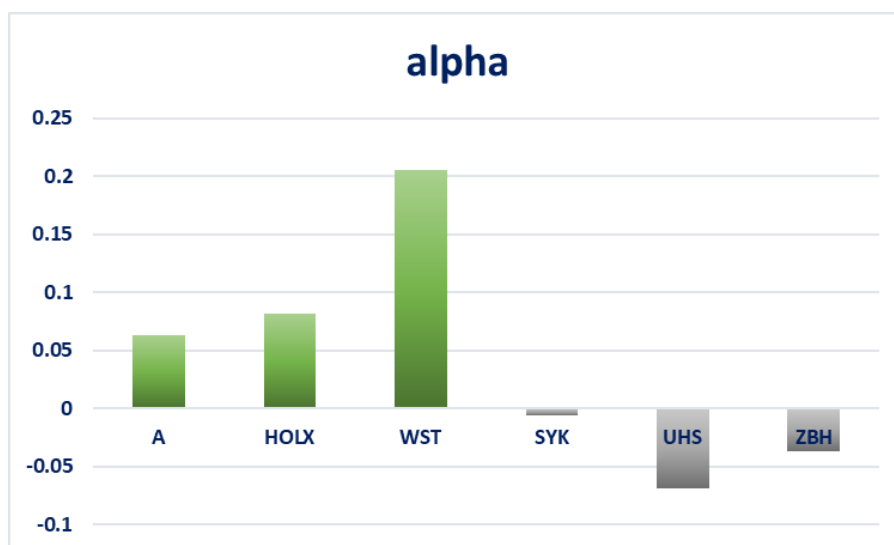
The health care sector includes manufacturers and distributors of health care equipment and devices and medical products and also health care services and facilities, such as hospitals.

This sector includes the biotechnology industries and research, development or production of pharmaceuticals (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
Agilent Technologies Inc	A	AA	0.06362	0.877109	0.77527666	23.2319335
Hologic	HOLX	AA	0.081262	0.907031	0.59205996	14.3636906
West Pharmaceutical Services	WST	AAA	0.20576	0.695946	1.65314887	12.1532827
Stryker Corp.	SYK	B	-0.00545	1.12312	-0.0455271	20.3854657
Universal Health Services	UHS	CCC	-0.06825	1.344201	-0.365045	15.6266218
Zimmer Biomet	ZBH	B	-0.03667	0.962108	-0.2454438	13.9959445

The sustainable health care companies of our sample all have positive alphas, hence they outperformed the market; while the 3 unsustainable all show a negative alpha, implying that they underperformed the market.

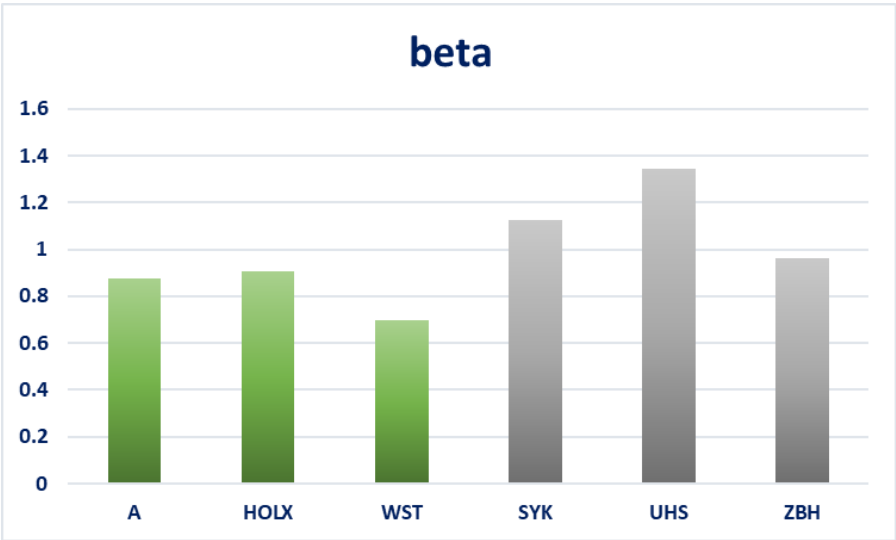
However the t-test for the alphas are lower than the critical value, so these results are not statistically significant.



The betas of the sustainable companies are all lower than 1 and all lower than the betas of the unsustainable companies meaning that the green stocks are safer than the grey ones and safer than the market index. These results are statistically significant.

This low level of risk for the sustainable stocks analysed is not at the expense of the return, as the alphas are all positive and relatively high.

The health care sector was at the centre of attention during the pandemic, because of the emergency of treating patients affected by COVID-19 and the necessity to develop a vaccine and its specific bet is relatively low: 0.83 (Damodaran online, 2021).



The company presenting the highest beta among the ones analysed also has the lowest beta. Such company, West Pharmaceutical Services also has an exceptional ESG profile. Indeed the company has been praised for its sustainability: Newsweek has included West Pharmaceutical Services in its list of America's Most Responsible Companies 2020, based on Leadership Diversity, Employees, Philanthropy & Engagement and role in local communities (Newsweek, 2020). The company was also included in *Investor's Business Daily's* 50 Best ESG Companies

list, which praises companies with top ESG ratings and also strong stock growth (Investor's Business Daily, 2020).

On the other hand, among the 6 companies in our sample for the health care sector, the one with the lowest alpha, Universal Health Services, also presents the highest beta, meaning that this stock underperformed the market and also presented a relatively high level of risk. This company was assigned the lowest ESG rating by MSCI, that is CCC. The company was at the centre of some controversies for its way of treating patients and also received allegations from the US government (The United States Department of Justice, 2020).

Eventually, we can say that the results gathered in this research for the health care sectors are favourable to sustainable companies: the ones analysed show a better performance and a safer risk profile compared to their unsustainable counterparts. The data of companies at the extremes of the ESG score range confirm this tendency.

The health care sector is exposed to ESG factors especially when it comes to Social factors, as health care companies offer products and services that are crucial for the communities often derive a portion of their revenue from the government. Hence ethical values for the sectors cannot be neglected.

There is also an ongoing debate around the accessibility and affordability of health care, especially in the U.S. Safety risks are also a threat for this sector.

The governance dimension concerns, again, regulations, while the environmental dimension has a lower impact on this sector relatively to the others and is mostly related to the hazardous substances that are often involved in the manufacturing of medical products and their potential harm for the environment.

3.3.7 Industrials

The industrial sector is vast and includes the subsector of capital goods: Aerospace & Defence, Building Products, Building Products, producers of electric cables and wires, electrical

components or equipment, Industrial Conglomerates, Construction Machinery & Heavy Trucks, Agricultural & Farm Machinery, Industrial Machinery.

Commercial and professional services constitute another subsector: it includes Companies providing commercial printing services, Environmental & Facilities Services, Office Services & Supplies, Diversified Support Services to businesses and governments (cleaning services, dining & catering services, equipment repair services), Security & Alarm Services, companies providing Human Resource & Employment Services or Research & Consulting Services.

Finally industrials include also all the transportation industry: Air Freight & Logistics, Airlines, Marine, Railroads, Trucking, Airport Services, Highways & Railtracks, Marine Ports & Services (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
3M Company	MMM	AAA	-0.055274	0.808320	-0.557749	17.728266
Grainger (W.W.) Inc.	GWW	AAA	0.004097	1.002685	0.042159	22.425438
Johnson Controls International	JCI	AAA	-0.004547	0.932239	-0.041183	18.351662
AMETEK Inc.	AME	B	-0.006003	1.174768	-0.068818	29.272348
General Electric	GE	BB	-0.089072	1.232449	-0.482031	14.496781
Westinghouse Air Brake Technologies Corp	WAB	BB	-0.095551	1.124561	-0.618598	15.824307

The alphas of the companies in the sample are all very close to their expected value, that is zero. So their performance is very close to the market.

However, sustainable stocks have on average higher alphas compared to unsustainable stocks. Moreover, the only company with a positive alpha, Grainger (W.W.), Inc. has a top ESG rating, AAA.

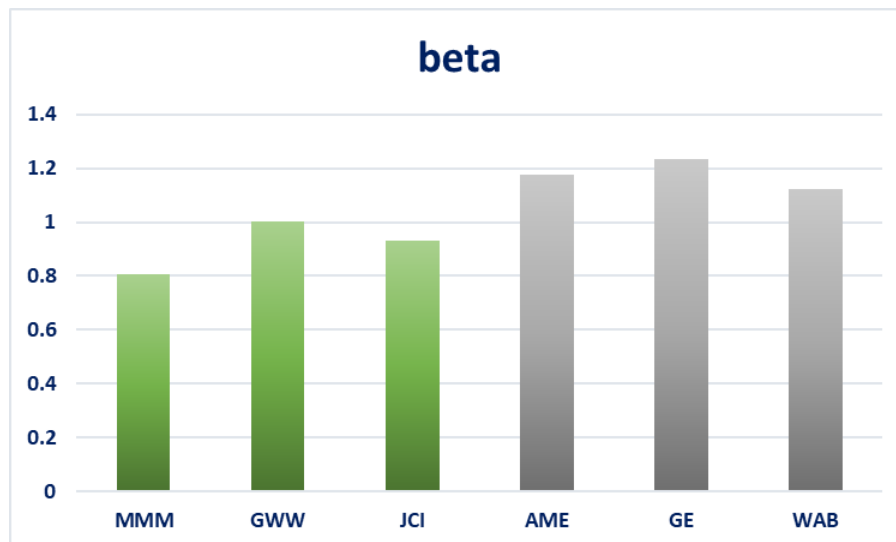
The t-test performed on the alpha value to not allow us to accept the results as statistically significant.



The betas are all close to 1, hence to the market level of risk. However, sustainable stocks have betas that are all roughly equal or lower than 1, while unsustainable stocks have betas that are higher than 1, implying that sustainable stocks are less risky than the market while unsustainable stocks are riskier.

The t-statistics for the betas are all very high, implying that the results are statistically significant.

Because of the width and diversity of this sector, the impact of the crisis was diverse depending on the specific subsector. Some subsectors, however, were harmed like for example the transportation industry, as people suspended travelling and commuting during the lockdown. Indeed, the beta specific to the Air Transport is high (1.61), and other industrials subsectors tend to that a beta slightly higher than the market value, like Aerospace/Defense (1.07), Engineering/Construction (1.06) and Machinery (1.05) (Damodaran online, 2021).



Both the alphas and the betas for the industry sector stocks analysed are very close to the market values. However, on average, the results are in favour of sustainable stocks both in terms of performance and risk.

Additionally, note that the stock with the lowest (negative) alpha, Westinghouse Air Brake Technologies Corp, is also the stock with the highest beta (higher than 1) and it is among the most unsustainable stocks in the SP500.

However, its ESG score is not extremely low (BB), and the company is categorized by MSCI as “average” in the management of ESG issues.

Industrials is a heterogeneous sector, and its subsectors face different ESG risks. Most face high regulation of GHG emissions. Indeed industrial companies are great contributors of pollution and toxic materials emission. Their exposure to environmental risks is high.

As for the social risks, they are mostly related to employees, as industrial companies are usually heavily unionized and strikes can be very costly and disruptive. Another risk is safety of the employees but also of the customers, for example for airlines.

3.3.8 Information Technology

The Information Technology sector includes providers of information technology and systems integration services, information technology consulting, Data Processing, companies providing services and infrastructure for the internet industry, companies providing services and infrastructure for the internet industry, companies who develop and produce software.

Another subsector of the IT is technology hardware and equipment which includes manufacturers of communication equipment, cellular phones, personal computers, servers, data storage components and peripherals, Electronic Equipment & Instruments, Electronic Equipment & Instruments.

Distributors of technology hardware and equipment are also part of the IT sector, together with Manufacturers of semiconductors and related products (MSCI, 2021).

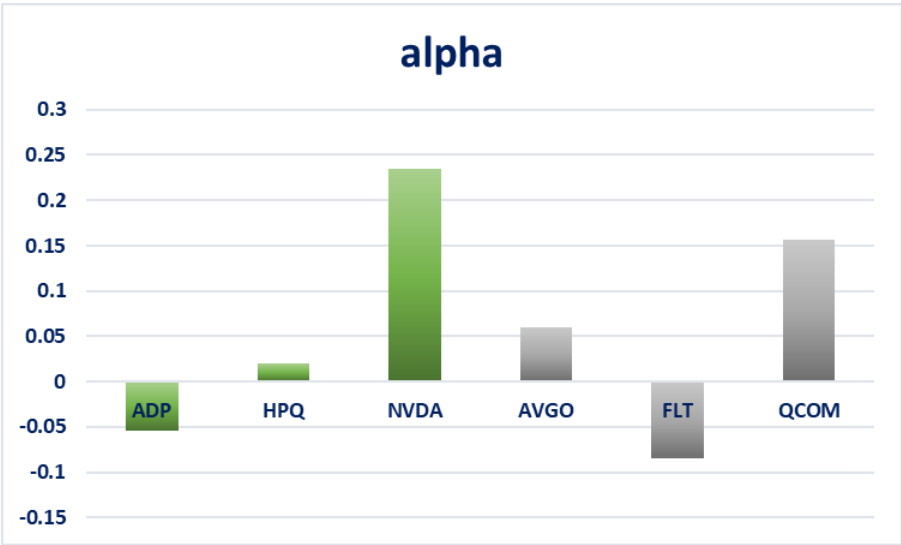
company	ticker	rating	alpha	beta	alpha t-test	beta t-test
Automatic Data Processing	ADP	AAA	-0.053898	1.103041	-0.583871	25.972123
HP Inc.	HPQ	AA	0.019805	1.149362	0.131952	16.644447
Nvidia Corporation	NVDA	AAA	0.234977	1.342249	1.700162	21.108878
Broadcom Inc.	AVGO	B	0.060437	1.252012	0.550693	24.796290
FleetCor Technologies Inc	FLT	B	-0.084551	1.145865	-0.574415	16.920349
QUALCOMM Inc.	QCOM	B	0.156665	1.166647	1.151478	18.637671

The 2020 financial crisis has not hit badly the IT sector. In fact, IT devices as computers and phones were heavily used to work and communicate from home during the lockdown.

This is confirmed by the data gathered, as 4 out of 6 companies analysed present a positive alpha, that is, a performance that is better than the market index and also in those two cases where the alpha is negative, it is actually very close to zero.

The company with the lowest alpha, FleetCor Technologies Inc, is a laggard in the management of ESG issues according to MSCI evaluation, while Nvidia Corporation has the highest alpha and also has an exceptional ESG rating of AAA. However, not that this is also the company with the highest beta.

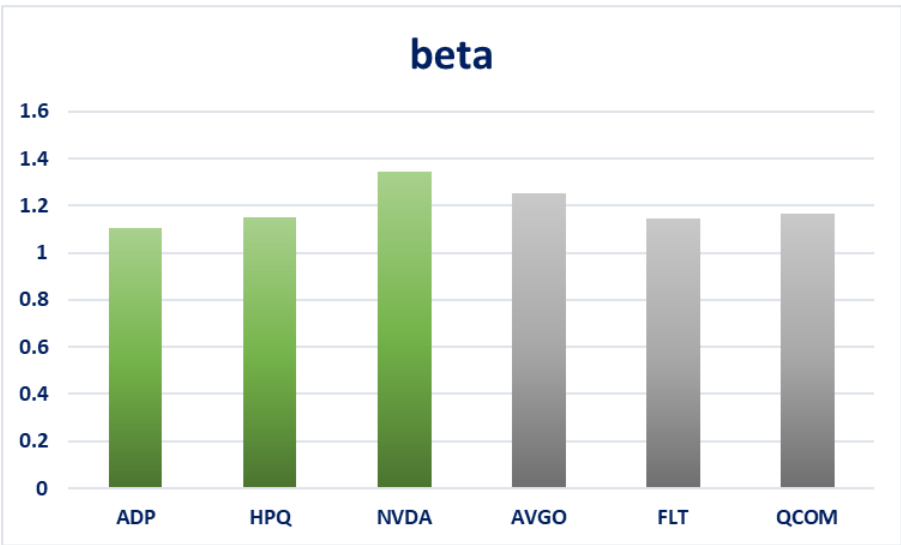
The alpha results are not statistically significant.



The betas of all 6 companies are higher than 1. So it seems from this sample that investing in the IT sector during 2020 was riskier than investing in a broad market index.

On average, sustainable stocks present a higher beta (1.198217) compared to unsustainable stocks (1.188174), making the former on average riskier investments.

Actually for the IT sector, the beta specific to the subsectors tend to be higher than 1: 1.12 for Computer Services, 1 for semiconductor (Damodaran online, 2021).



The Information technology sector is exposed to ESG risks especially for the social dimension: privacy and data security concerns are of paramount importance in this sector, as data security breaches can cause significant reputational and monetary damages to companies.

Other relevant social risk factors are gender inequality and lack of workforce diversity.

As for the environmental dimension, data centers consume large amounts of energy and the production of electronic components requires mining precious metals and rare earth elements.

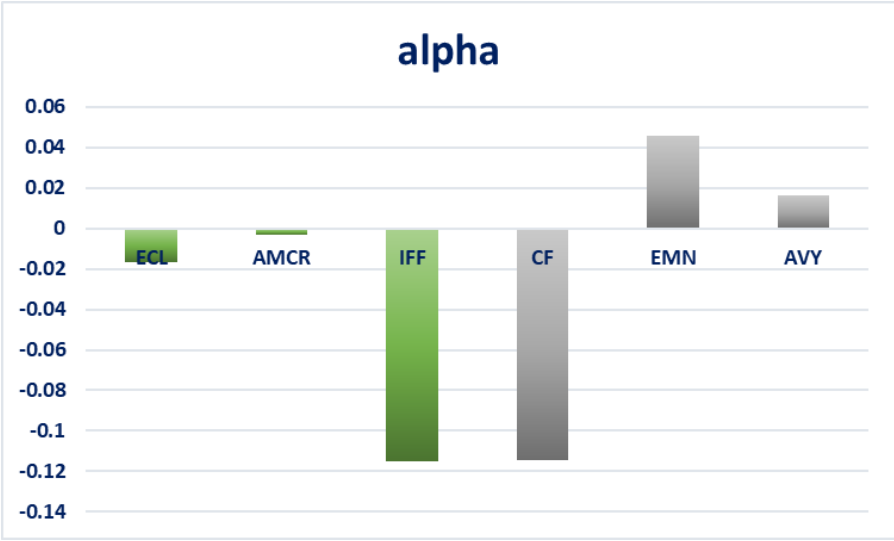
3.3.9 Materials

Companies that belong to the sector of Materials produce chemicals, plastics, synthetic fibers, films, commodity-based paints & pigments, explosives and petrochemicals, fertilizers, pesticides, industrial gases, Construction Materials, Construction Materials, Metal & Glass Containers, Paper Packaging, aluminum and related products, metals and minerals, copper, gold, silver, steel, Precious Metals & Minerals, timber and related wood products and paper manufacturing (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
Ecolab Inc.	ECL	AAA	-0.016728	1.114254	-0.141375	20.468739
Amcor plc	AMCR	AA	-0.003166	1.001552	-0.024327	16.727369
International Flavors & Fragrances	IFF	AA	-0.114761	0.895395	-1.101079	18.672674
CF Industries Holdings Inc	CF	B	-0.114730	1.195365	-0.697289	15.790844
Eastman Chemical	EMN	BB	0.045480	1.133318	0.343522	18.605839
Avery Dennison Corp	AVY	BB	0.016472	1.035796	0.124997	17.084772

The alphas for the companies in the sector are diverse, anyway the two companies showing positive alphas are among the less sustainable in the SP500, even though their MSCI ESG grade is not extremely low (BB).

The t-test show that the alphas found cannot be considered statistically significant.

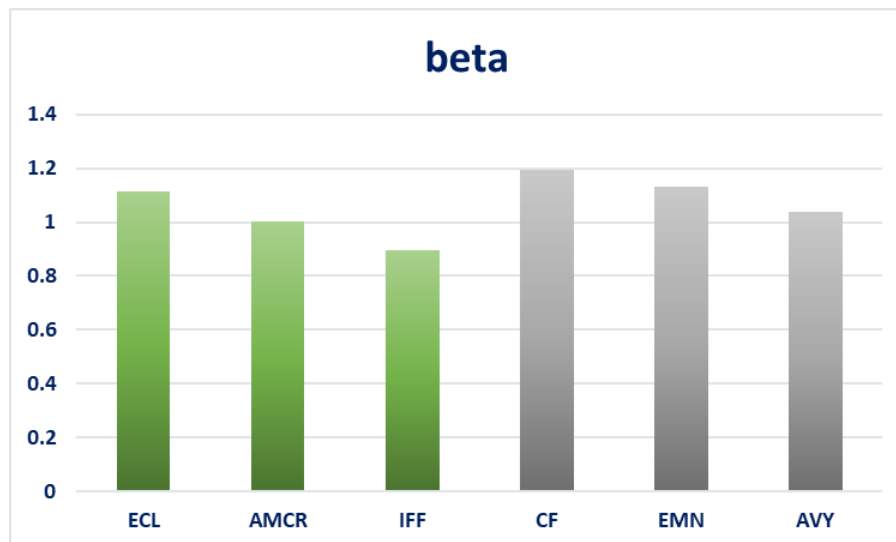


On the other hand the betas, which are statistically significant as their t-statistics are all very high, are more favourable for the sustainable companies, that show on average lower beta, hence a lower-risk profile compared to the unsustainable companies.

The only company with a beta lower than 1, so the only stock that is less volatile than the market, is International Flavors & Fragrances, a company ranked as leader in the ESG management.

The sector specific betas depend on the specific subsector but tend to be higher than 1: 1.36 for chemicals, 1.14 for paper/forest products (Damodaran online, 2021).

The materials sector was not badly hit by the crisis that followed the outbreak of covid-19, as materials are at the basis of production and their use is not correlated to the spread of the disease. However, as global production decreased, also the demand for materials was lower.



The materials sector is highly exposed to ESG issues, especially in its environmental dimension because of the high contribution of the sector to the CO₂ emissions, waste and pollution and the changing consumer behavior that increasingly support innovative and sustainable materials. Social risks involve safety issues for workers who are exposed to accidents, while the global risk is represented by regulation and litigation risks.

3.3.10 Real Estate

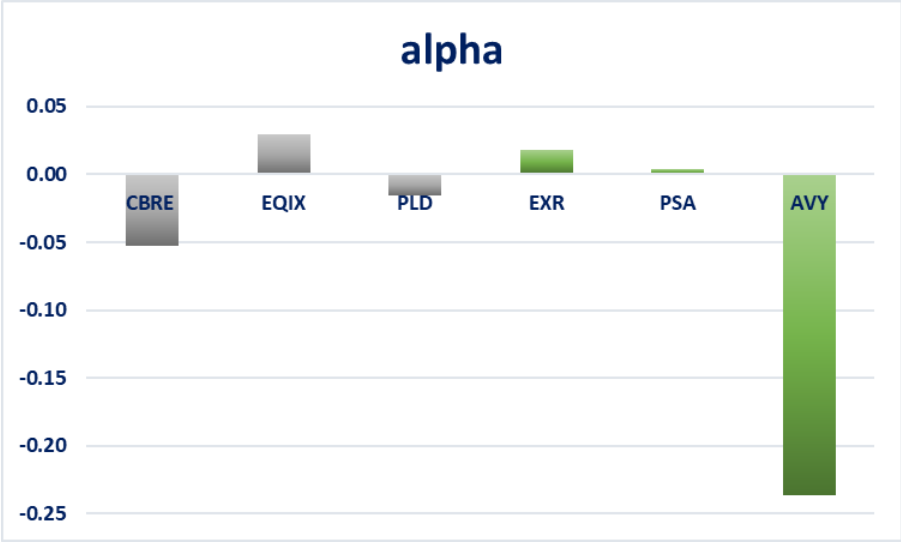
The real estate sector involves all Companies or Trusts engaged in the acquisition, development, ownership, leasing, management and operation of industrial properties, Hotel & Resort, office and health care properties, residential properties, shopping centers (MSCI, 2021).

company	ticker	rating	alpha	beta	alpha t-test	beta t-test
CBRE Group	CBRE	AAA	-0.052420	1.303134	-0.304227	16.438478
Equinix	EQIX	AA	0.029509	0.868863	0.270671	17.322323
Prologis	PLD	AA	-0.015287	1.096474	-0.145129	22.625441
Extra Space Storage	EXR	B	0.017935	0.661268	0.130929	10.492743
Public Storage	PSA	B	0.004039	0.685331	0.036483	13.455357
Avery Dennison Corp	AVY	B	-0.236652	1.290230	-1.085006	12.857530

The values of the alpha found by applying the CAPM are diverse: 3 of them are positive and 3 of them are negative. 2 of the positive alphas belong to unsustainable stocks. However, the

company with the highest alpha, Equinix, is ranked as a leader in the management of ESG issues, while the company with the lowest alpha, is ranked as a laggard by MSCI.

However, again, the t-test do not allow us to consider these results statistically significant.



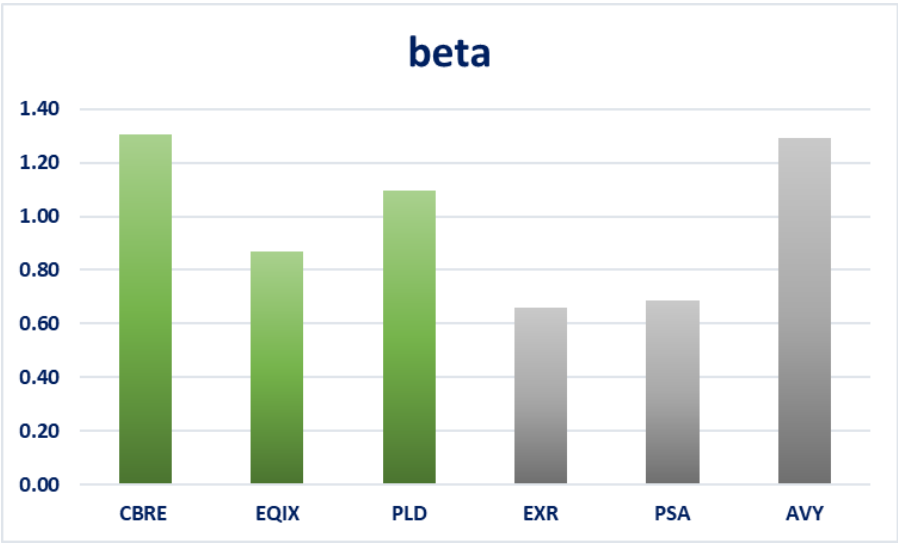
Also the values found for the slope are diverse: 3 of the betas found are higher than 1, while the other 3 are lower than 1. 2 out of the 3 companies with a beta lower than 1 are among the less sustainable stocks of the real estate companies in the SP500.

Moreover, on average, sustainable stocks show a higher beta compared to unsustainable stocks. In fact the average beta of the ESG leaders considered is higher than 1, while for the ESG laggard it is lower than 1, indicating that on average, the sustainable stocks considered for the real estate sector are riskier compared to the market index, while the unsustainable stocks considered are safer.

These results can be considered statistically significant, as the t-statistics for all the beta found are very high.

The real estate sector crashed during the 2008 crisis. However the same did not happen during the 2020 crisis, as the conditions were different: in 2008 there was an oversupply of houses. The pandemic has not slowed home prices even though it raised unemployment, so one would expect most people not to be able anymore to afford mortgages.

In fact, the beta specific to the sector of real estate is relatively low: 0.78 (Damodaran online, 2021).



The real estate sector is particularly exposed to the environmental dimension of ESG due to energy consumption, GHG emissions, water consumption, waste. Regulatory requirements are increasingly stringent and societal preferences for places where to work, live or play are changing. Real estate is also exposed to climate-related events such as flooding, water scarcity, extreme weather conditions, raising sea levels.

3.3.11 Utilities

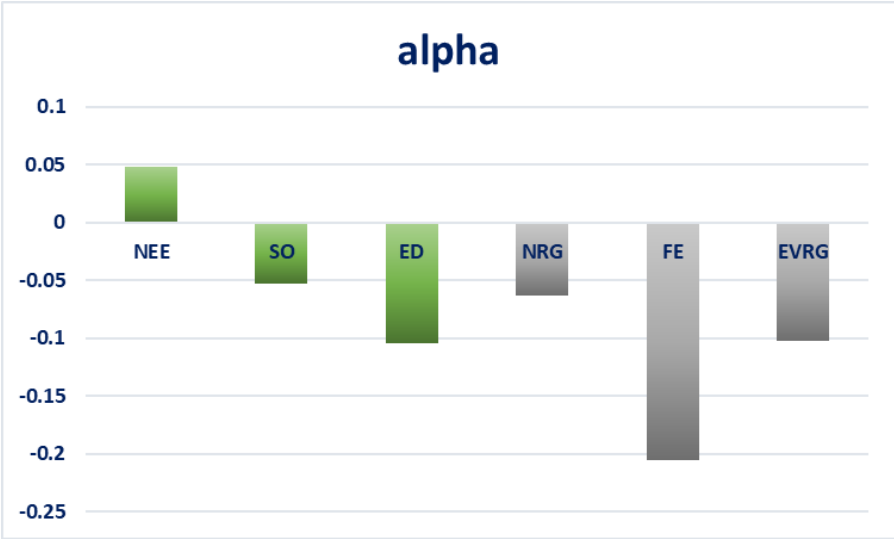
The utilities sector includes companies that produce or distribute electricity, transmit gas, purchase and redistribute water, Independent Power Producers & Energy Traders and companies that generate electricity using renewable sources (MSCI, 2021).

company	ticker	rating	alpha	beta	apha t-test	beta t-test
NextEra Energy	NEE	AAA	0.048128	0.908806	0.442650	18.167765
Southern Company	SO	AA	-0.052499	0.974509	-0.419610	16.929624
Consolidated Edison	ED	AA	-0.104565	0.667799	-0.770815	10.699893
NRG Energy	NRG	B	-0.062705	1.033725	-0.491145	17.598761
FirstEnergy Corp	FE	BB	-0.205536	1.004403	-1.288385	13.684642
Evergy	EVERG	BB	-0.102118	1.054570	-0.771166	17.309649

The alphas found for the sample of Utilities companies are all negative, except for NextEra Energy, which has an exceptional ESG rating; the company with the lowest alpha, FirstEnergy Corp, is among the less sustainable stocks among the ones belonging to the utilities sector in the SP500.

On average, green stocks present a higher alpha compared to the grey ones, indicating that the former performed better during 2020.

However the t-test do not allow to consider such results statistically significant.



The beta obtained through the CAPM model are favourable for the sustainable stocks in terms of risk. In fact the sustainable stocks all show a beta that is lower compared to the betas of the less sustainable stocks.

Moreover the companies with the highest ESG rating all have a beta lower than 1, while the opposite holds for the companies with the lowest ESG scores.

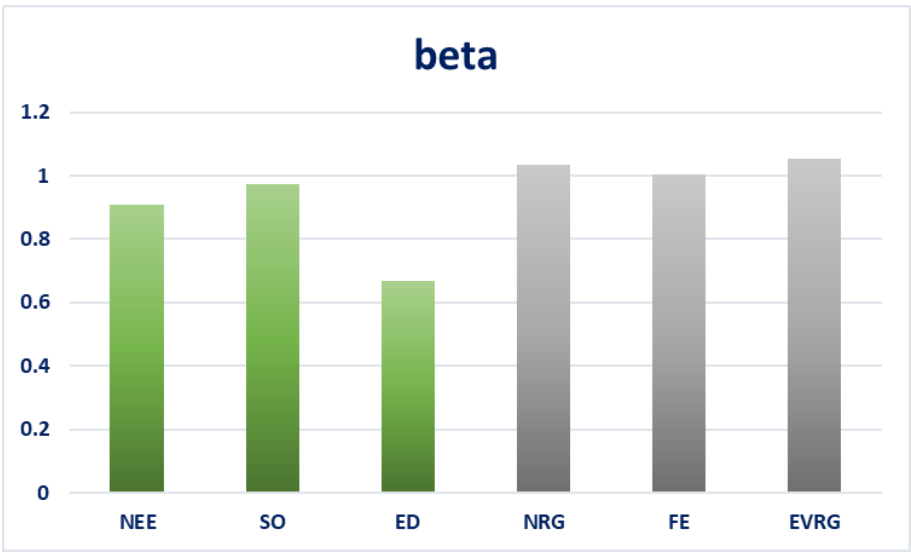
Since the t-statistics are all higher than their critical value, the results are statistically significant and we can conclude that, for the utilities sector sample analysed, sustainable stocks present a safer risk profile compared to their unsustainable counterparts.

This can be further confirmed by the fact that at the extreme values we find Consolidated Edison having the lowest beta and Evergy having the highest beta; the former is ranked as a leader in

the management of ESG issues, the latter is among the least sustainable stocks in the sample of utilities stocks in the SP500.

This sector has not been greatly harmed by the crisis following the pandemic, as the spread of the virus did not severely impact the use of utilities.

In fact the beta specific to the Utilities sector is relatively low: 0.74 (Damodaran online, 2021).



The sector of utilities is highly exposed to environmental issues, because of strict Greenhouse gas regulation and changing public perceptions that supports decarbonization. Fossil fuels have a negative impact on human health and global warming. The social factor comes, again, in the form of safety risks and also community disruption.

3.3.12 Overall

After having done an in-depth analysis of each sector of the SP500, we can draw some overall conclusions.

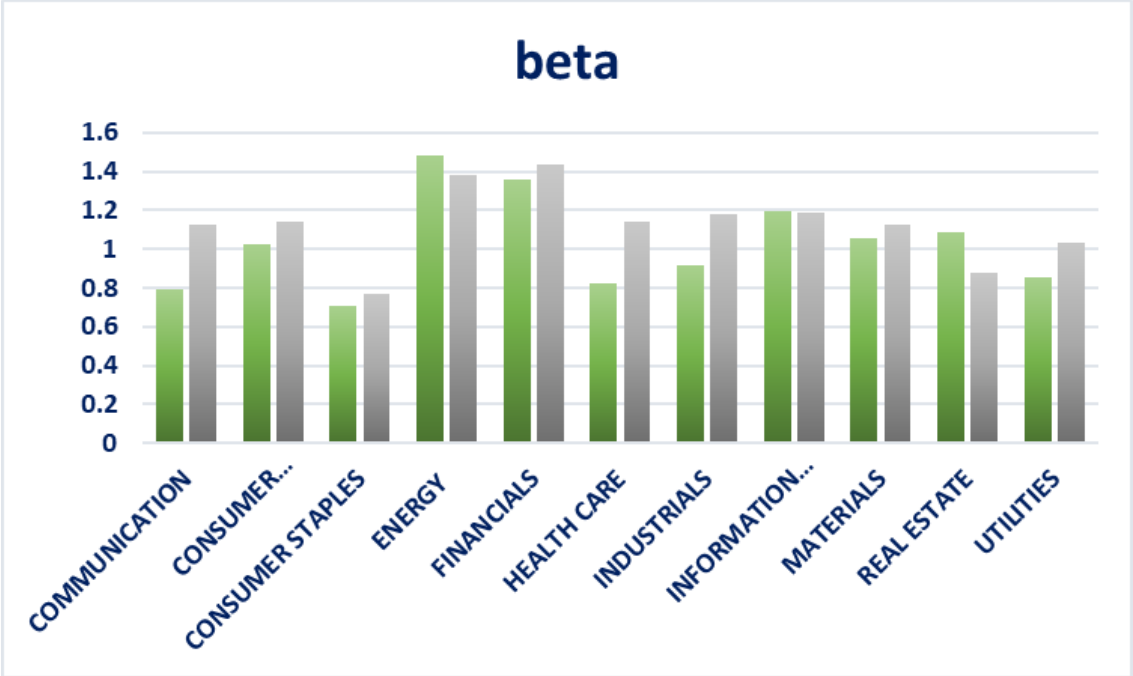
The t-tests performed on each alpha and beta found, showed that the alpha data found are not statistically significant. We looked anyways at the alphas in order to get an idea of the financial performance of the stocks with respect to the market regardless of statistical accuracy.

On the other hand the t-statistics calculated for the betas were all very high, indicating that the data found for the slope of the regressions were always statistically significant. Hence we can safely consider these values reliable from a statistical point of view.

For this reason, I gathered the results of the betas for all stocks, divided by sector, in order to get a comprehensive vision of the level of risk that the stocks bear with respect to the market, based on their ESG rating.

For each sector, I have computed the mean of the betas found for the more sustainable stocks and the mean of the betas from the less sustainable stocks.

The results are reported in the following graph.



For the majority of the sectors, 8 out of 11, the companies with the highest ESG rating in the SP500 present a lower beta, compared with their counterparts with a poorer ESG profile.

In one case, the information technology sector, the two averages are roughly equal.

Only for the remaining two sectors, that are the energy and real estate, the opposite happens: companies with a high ESG profile present on average a higher beta compared to companies with a poor ESG profile.

Hence in the majority of the cases, we can say that, for the sample analysed, stocks with high ESG scores are less risky compared to the less sustainable stocks.

This can be confirmed by the fact that in most cases, the stocks with extremely high or low values for the beta were also the ones with the lowest and highest ESG ratings respectively.

The only two cases where the stocks show an opposite behavior are the energy sector and the real estate sector. In both cases, companies make a great contribution to pollution and have a meaningful negative impact on the environment.

These opposite results can be explained by the fact that companies in these sectors are structurally bound to have an unsustainable behavior, especially when it comes to the environmental factors. However, it must be said that there is an ongoing transition towards renewable sources of energy and sustainable materials for construction in the real estate sector.

If we compared the betas to the market value, that is 1, sustainable stocks present a beta below this value in 5 sectors, while unsustainable stocks present a beta lower than the market only in 2 cases.

So, based on the results gathered in this research by applying the CAPM on a sample of stocks from the SP500, we can accept the hypothesis that, for the period analysed, that is year 2020, in the majority of the cases companies with a good ESG profile bear a lower market risk compared to companies with a poor ESG profile.

The lower risk profile of sustainable companies may be explained by the fact that regulations are increasingly supporting sustainable practices and restraining unsustainable ones and also consumer perception about sustainability is changing and giving more importance to ESG issues.

COVID-19 has highlighted the urgency of facing environmental issues, by decreasing pollution and improving sanitation systems. It has also brought to life the fragility of the economic system, that can be severely impacted by big natural events.

The pandemic has also showed the importance of a good social attitude of companies, as many workers have found themselves in difficulty during 2020 due to the precarity and uncertainty linked to the spread of the virus.

Chapter IV

4 CASE STUDIES

In the last chapter of this dissertation, we are going to go through some real cases of high profile companies that had an unsustainable behaviour, which was cause of scandals that raised a great deal of media attention. In these cases environmental, social or governance incidents had a material effect on the reputation and financial performance of the companies involved. The cases analysed in this chapter are three, and they are mentioned in the United Nations “Principles for responsible investments” website (UNPRI, 2020).

4.1 Deepwater Horizon oil spill

The Deepwater Horizon oil spill is an environmental disaster that happened in April 2010, due to an explosion on the Deepwater Horizon oil rig, located in the Gulf of Mexico, which caused the largest marine oil spill in history.

The Deepwater Horizon rig was owned and operated by offshore-oil-drilling company Transocean and leased by oil company BP. The explosion was caused by a surge of natural gas that blasted through a concrete core which was likely too weak. The gas ignited and the rig sank, and oil began discharging into the sea.

The rig’s blowout preventer (BOP), mechanism designed to close the channel through which oil was drawn, that BP attempted to activate, malfunctioned.

The consequences of the accident were terrible both from an environmental and economic side a great number of wildlife was harmed and killed by the oil leak and most waters in the gulf were closed to fishing, tourism decreased dramatically, a moratorium on offshore drilling was imposed, leaving many workers unemployed (Pallardy, 2021).

BP was judged by the U.S. District Court that considered the company primarily responsible for the oil spill due to its negligence and reckless conduct.

The damages for BP were huge: as of 2018 the companies had to pay more than \$65 billion for cleanup costs, and legal charges and penalties (Bouso, 2018). Also the reputational costs were enormous and the financial performance of the company after the environmental disaster was very poor: the value of its shares fell dramatically reaching a trough in June 2010, as shown in the chart below from Yahoo Finance (2021), representing the value of BP shares from the beginning of 2010 to the end of 2014, a period of 5 years.



The Deepwater Horizon oil spill case is evidence in support of the hypothesis that a poor ESG profile of a company can have very bad consequences on its reputation, costs and ultimately financial performance.

4.2 The Volkswagen emissions scandal

The Volkswagen emissions scandal involves the German automaker Volkswagen Group that in 2015 was found guilty of installing a defeat device in its diesel engines that allowed its cars to pass emission tests in laboratory conditions; but the same cars were discovered to emit 40 times the level of pollution allowed in the United States in normal conditions. This action was performed on 11 million diesel vehicles worldwide. Hence it is considered one of the most serious corporate scandals in the world (Jung, J. C.; Sharon, E. 2019).

The financial consequences on the companies were massive: it had to pay €27.4 billion in penalties and fines (Schwartz, J. 2018).

The reputational consequences were also strong and resulted in a 40% drop in the company's share price in 2 weeks as can be seen in the graph below (Yahoo Finance, 2021).



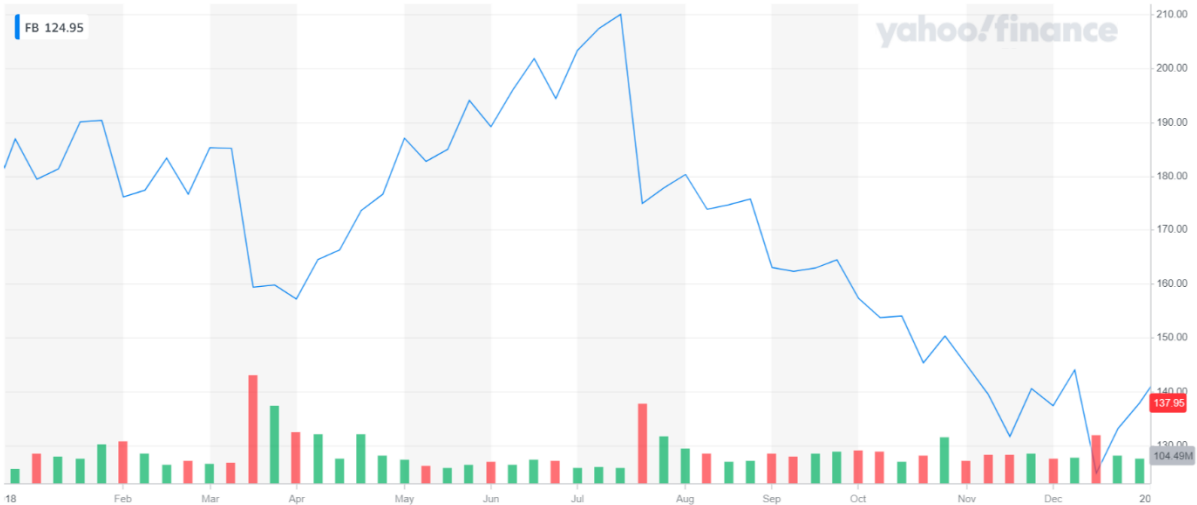
The Volkswagen emissions scandal is another real case that shows how ESG issues can be material for a company and can have very serious consequences on its costs, reputation and financial performance.

4.3 Facebook–Cambridge Analytica data scandal

The Facebook–Cambridge Analytica data scandal came out in 2018, as the personal data of up to 87 million Facebook users were harvested without their consent by British consulting firm Cambridge Analytica. The data were apparently used for the purpose of political advertising: the whistle-blower Christopher Wylie, a co-founder of Cambridge Analytica, claimed the data were sold to Cambridge Analytica and used to develop “psychographic” profiles of people who were then delivered pro-Trump material online (Meredith, 2018).

These exposes create a massive scandal that increase public concern for privacy and data protection.

The consequences for both firms were negative: Cambridge Analytica filed for bankruptcy, Facebook had to face costs in terms of legal fines and saw a drop in the market value of its shares, as a consequence of its reputational damage. This can be seen in the graph below, that represents the value of Facebook shares during 2018 (Yahoo Finance, 2021).



The Facebook–Cambridge Analytica data scandal is another case that show how ESG issues, in this case Social sustainability issues, can have a material impact on companies. Both companies had to face negative financial consequences for their unethical behavior and Cambridge Analytica even had to close its operations.

Conclusion

This dissertation explores the concepts of Socially Responsible Investments, Corporate Social Responsibility and Environmental, Social and Governance sustainability and investigates on whether the consideration of such issues is important to investment decisions and whether the integration of ESG criteria into portfolio construction is beneficial to the performance of an investment.

Chapter I presents and illustrates the concepts of Socially Responsible Investments, Corporate Social Responsibility and Environmental, Social and Governance sustainability, their origins, history and development and their increasing popularity among investors, confirmed by the commitment of international organizations like the United Nations or the use of alternative financial instruments like green bonds.

The first chapter also explores the concept of ESG digging deeper into all of its three dimension: Environmental, Social and corporate Governance.

In fact the actions of a company do not affect exclusively its stakeholders, but they can have a meaningful impact on the environment and communities. Also Boards and management of a company have a crucial role in determining the sustainability of a company.

Chapter II consists in a review of the literature, as it goes through several papers presenting different points of view about the impact of SRI and ESG on corporate performance and investments. These papers show research and evidence supporting their hypothesis.

Some authors support the idea that the integration of Environmental, Social and Fair Governance (ESG) practices into one's investment improves the risk profile of a company, as it reduces its exposure to reputation, political and regulatory risk in the long run. Such reduced risk is not at the expenses of returns: they show that companies with a good ESG performance would achieve higher *risk-adjusted returns* when compared to the average market investment (Ashwin Kumar et al, 2016).

It is argued that the integration of ESG factors into a company's strategy and processes represents an alternative way of being competitive, characterised by a long-term approach that aims at maximizing intertemporal profits, an active stakeholder engagement, and disclosure of non financial information related to the company's stakeholders (Eccles, Ioannou, and Serafeim, 2012).

Ferriani and Natoli (2020) show that during the period surrounding the COVID-19 outbreak, in terms of performance, low-ESG-risk funds were better compared to the high-risk ones, but also compared to the average.

As opposed to these papers that support the idea of the materiality of ESG issues on corporate financial performance, other papers are presented who show evidence contrary to this hypothesis.

For example, Auer and Schuhmachern (2016) argue that selection of stocks based on their ESG ratings does not provide superior risk-adjusted performance compared to a passive stock market strategy, as sustainability screens in investments impose a constraint on the range of possible investments and hence constitutes a limit to diversification.

Other researchers (S. Hamilton, H. Jo, M. Statman, 1993) support the hypothesis that SRI criteria do not improve the risk-adjusted expected returns of investments, as social responsibility of stocks is not priced.

Aupperle, K., et al (1985) Find that that a strong orientation of management toward social responsibility has no statistically significant relationship with financial performance, neither positive nor negative.

Hence the literature contains opposing view about the influence of Sri on financial performance. However, most of the papers that refute the idea of a beneficial effect of ESG integration on the risk and return performance date back to several years ago. Moreover those papers that refute such idea mostly show result of an insignificant effect of ESG integration on corporate social performance, but not detrimental.

Chaper III contains my empirical research: the application of the CAPM to a sample of 66 companies from the SP500, divided into 11 sectors. For each sector the performance of companies with a good ESG profile and companies with a poor ESG profile were compared.

The period of analysis is the year 2020, a financial year that has experienced a global economic crisis following the breakout of COVID-19.

The Jensen alphas found were not statistically significant, while the betas of each company were statistically significant and allowed me to draw conclusions on the level of risk of each company compared to the market and to the specific sector level of risk.

For the majority of the sectors, 8 out of 11, the companies with the highest ESG rating in the SP500 present a lower beta, compared with their counterparts with a poorer ESG profile.

In one case, the information technology sector, the two averages are roughly equal.

Only for the remaining two sectors, that are the energy and real estate, the opposite happens: companies with a high ESG profile present on average a higher beta compared to companies with a poor ESG profile.

For the majority of the sectors, I have found that, for the sample analysed, stocks with high ESG scores are less risky compared to the less sustainable stocks.

This can be confirmed by the fact that in most cases, the stocks with extremely high or low values for the beta were also the ones with the lowest and highest ESG ratings respectively.

Hence, for the stocks analysed, it seems that in a period of financial crisis investors may consider less risky to invest in companies with a good ESG profile.

Finally, Chapter IV analyses three high profile cases that show that ESG issues can have an important impact on the financial profile and performance of a company, as all the companies analysed have been protagonist of scandals for their despicable behaviour in sustainability issues and this has led them to high costs in terms of legal charges and reputational damages.

These cases hence confirm the materiality of ESG factors and the importance for investors of considering also these factors when deciding where to allocate their capital.

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Summary

This dissertation explores the concepts of Socially Responsible Investments, Corporate Social Responsibility and Environmental, Social and Governance sustainability and investigates on whether the consideration of such issues is important to investment decisions and whether the integration of ESG criteria into portfolio construction is beneficial to the performance of an investment.

This dissertation is organized in four chapters.

Chapter I presents and illustrates the concepts of Socially Responsible Investments, Corporate Social Responsibility and Environmental, Social and Governance sustainability, their origins, history and development and their increasing popularity among investors.

In fact in recent years Socially Responsible Investments (SRI) and Environmental, Social and Governance (ESG) sustainability have increasingly attracted the attention of investors, as opposed to the past years, when traditional models were followed that based the investment decision merely on risk and returns factor, neglecting ethical issues.

SRI can be defined as an investment process that consists in identifying companies with a high profile of corporate social responsibility (CSR). Such profile is evaluated based on environmental, social and corporate governance (ESG) criteria (Renneboog, Ter Horst, and Zhang, 2008). Socially Responsible Investment does not solely focus on the traditional factors of risk and return to decide how to allocate investments, but also concerns about social, environmental, and corporate governance issues when constructing a portfolio. Such factors are sometimes neglected by investors and not considered crucial for the purpose of making profit, but can have a significant impact on the financial performance of an investment.

CSR consists in the awareness that the actions of a company do not affect exclusively its stakeholders, but they can have a meaningful impact on the environment and communities. Also Boards and management of a company have a crucial role in determining the sustainability of a company.

In 2006 the United Nations launched the Principles for Responsible Investment (UNPRI), an international network of investors committed to contribute to a sustainable financial system.

The PRI has gathered thousands of signatories (UNPRI, 2020).

The first chapter also explores the concept of ESG digging deeper into all of its three dimensions: Environmental, Social and corporate Governance.

Companies can have a severe impact on the environment through their contributions to pollution and greenhouse gas emissions, but they can also have a meaningful impact on the community where they are based. The governance dimension of ESG regards the sustainability of the boards of a company and its behaviour towards its employees and stakeholders in general.

Chapter II faces the question that we ask in this dissertation: whether the integration of ESG factors in investment decisions has a positive or negative impact on the financial performance of investments.

In chapter II there is a review of the literature, with papers presenting different points of view supported by theoretical and empirical analysis.

Some authors support the idea that the integration of Environmental, Social and Fair Governance (ESG) practices into one's investment improves the risk profile of a company, as it reduces its exposure to reputation, political and regulatory risk in the long run. Such reduced risk is not at the expenses of returns: they show that companies with a good ESG performance would achieve higher *risk-adjusted returns* when compared to the average market investment (Ashwin Kumar et al, 2016).

It is argued that the integration of ESG factors into a company's strategy and processes represents an alternative way of being competitive, characterised by a long-term approach that aims at maximizing intertemporal profits, an active stakeholder engagement, and disclosure of non financial information related to the company's stakeholders (Eccles, Ioannou, and Serafeim, 2012).

Khan et al (2016) find that in order to create the best shareholder value companies need to identify those ESG dimension that are material and immaterial and base on this distinction their investment decisions.

Ferriani and Natoli (2020) show that during the period surrounding the COVID-19 outbreak, in terms of performance, low-ESG-risk funds were better compared to the high-risk ones, but also compared to the average.

As opposed to these papers that support the idea of the materiality of ESG issues on corporate financial performance, other papers are presented who show evidence contrary to this hypothesis.

For example, Auer and Schuhmachern (2016) argue that selection of stocks based on their ESG ratings does not provide superior risk-adjusted performance compared to a passive stock market strategy, as sustainability screens in investments impose a constraint on the range of possible investments and hence constitutes a limit to diversification.

Other researchers (S. Hamilton, H. Jo, M. Statman, 1993) support the hypothesis that SRI criteria do not improve the risk-adjusted expected returns of investments, as social responsibility of stocks is not priced.

Aupperle, K., et al (1985) Find that that a strong orientation of management toward social responsibility has no statistically significant relationship with financial performance, neither positive nor negative.

Finally, the famous economist Friedman (1970) believes that a businessman who focuses on social responsibility, sacrifices the interest of his employers, by restraining some choices that are socially responsible, but not in the best interest of his corporation. These actions may reduce the profits and value conveyed to stakeholders.

Hence the literature contains opposing view about the influence of SRI on financial performance. However, most of the papers that refute the idea of a beneficial effect of ESG integration on the risk and return performance date back to several years ago. Moreover those

papers that refute such idea mostly show result of an insignificant effect of ESG integration on corporate social performance, but not detrimental.

Chaper III contains my empirical research: the application of the CAPM to a sample of 66 companies, chosen from the SP500, based on their ESG MSCI rating. the SP500 was divided into 11 sectors: Communication Services, Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate, Utilities. For each sector the performance of companies with a good ESG profile and companies with a poor ESG profile were compared.

The period of analysis is the year 2020, a financial year that has experienced a global economic crisis following the breakout of COVID-19. This period allowed me to see the effects of ESG integration on financial performance during a period of economic turmoil.

The Jensen alphas found were not statistically significant, while the betas of each company were statistically significant and allowed me to draw conclusions on the level of risk of each company compared to the market and to the specific sector level of risk.

For the majority of the sectors, 8 out of 11, the companies with the highest ESG rating in the SP500 present a lower beta, compared with their counterparts with a poorer ESG profile.

In one case, the information technology sector, the two averages are roughly equal.

Only for the remaining two sectors, that are the energy and real estate, the opposite happens: companies with a high ESG profile present on average a higher beta compared to companies with a poor ESG profile.

For the majority of the sectors, I have found that, for the sample analysed, stocks with high ESG scores are less risky compared to the less sustainable stocks.

This can be confirmed by the fact that in most cases, the stocks with extremely high or low values for the beta were also the ones with the lowest and highest ESG ratings respectively.

Hence, for the stocks analysed, it seems that in a period of financial crisis investors may consider less risky to invest in companies with a good ESG profile.

Finally, Chapter IV analyses three high profile cases that show the materiality of ESG issues on corporate financial performance.

The first case study is The Deepwater Horizon oil spill, an environmental disaster that happened in April 2010, due to an explosion on the Deepwater Horizon oil rig, located in the Gulf of Mexico, which caused the largest marine oil spill in history.

The second case is the Volkswagen emissions scandal where the German automaker Volkswagen Group in 2015 was found guilty of installing a defeat device in its diesel engines that allowed its cars to pass emission tests in laboratory conditions; but the same cars were discovered to emit 40 times the level of pollution allowed in the United States in normal conditions.

The third and last case is the Facebook–Cambridge Analytica data scandal that came out in 2018, as the personal data of up to 87 million Facebook users were harvested without their consent by British consulting firm Cambridge Analytica.

All the companies involved in these scandals had to face high costs in terms of legal charges and reputational damages and experienced a drop in the value of their shares.

These real life cases hence show how ESG issues can have an important impact on the financial profile and performance of a company and confirm the materiality of ESG factors and the importance for investors of considering also these factors when deciding where to allocate their capital.