Masteroppgave

NTNU
Norges teknisk-naturvitenskapelige universitet
Økonomiavdelingen
Institutt for samfunnsøkonomi

Viktoria Irena Fredriksen Jarska

Green Stocks

in the Norwegian and the US stock market

Masteroppgave i Finansiell økonomi
Veileder: Colin Green

September 2020

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Kunnskap for en bedre verden

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MFINØK

Master in financial economics

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Author
Viktoria - Irena Fredriksen Jarska

Main supervisor
Colin Green

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NTNU

Preface

This report is written as an independent work and constitutes last semester of the master's program in Financial economic at the Norwegian University of Science and Technology (NTNU).

The choice of topic of this report comes from my personal curiosity and interest for how increased focus on the environment will have an impact on the financial market. Then it becomes natural for me with green finance as the theme, although this segment is relatively new and there is less research in this area yet. The purpose of this report is to find definitions of green finance related to existing theory and then examine using ESG data on companies that are defined as green actually are green. I will then use these companies to find out if they are overpriced as a result of the esg score.

I want to get a deeper understanding of how environmental investment aimed at companies has an impact on returns compared to companies that are not defined as green, and see how this has an affect on a small Norwegian economy compared to a larger economy such as the USA.

This master thesis is a final result after my two years study, this master's has been conducted at Norwegian University of Science and technology (NTNU) during the spring semester 2020. This master's is part of program "Master of Science in Financial Economic" the topic "green finance" and "green shares" comes after the big focus on green investment was observed in media and between popular shareholders.

I would like to thank my supervisor Colin Green for his guidance throughout the semester.

Trondheim, June 2020
Viktoria Jarska

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I would like to express my gratitude to the following persons for their contribution and support in the process of writing this thesis:

To all my respondents, taking their time to being very helpful answering my emails with some follow-up before the Corona virus. Proffessor Snorre Lindset, who has set aside time to answering questions and has provided input to this thesis. Thank you for being able to help me through Skype calls despite the pandemic situation. Proffessor Colin Green, thank you for following me up regularly with physical encounters before the pandemic and for you to continue to follow me up through email exchanges and Skype calls.Erlend Andenæs, thank you for to spending many hours, by helping me go through the task.

Abstract

Green finance and green stocks is today a relatively new phenomena where we do not have a clear definition of what it is, or includes, attempts have been made to define what green finance is. This master's thesis will focus on what the theory defines as green finance and what it entails. This thesis will question whether companies some move focus to the environment and sustainability will have an impact on the share price. Because when we trade a share, we as an investor will own a part of the company, this means I have to look at whether the company can be considered green or not. This can be done by seeing if the company covers some of the ESG criteria or is within the sectors that are considered "green" sectors in accordance with the literature in the field. I will further use this in the thesis to determine whether a share can be considered green. In the thesis I will go closer into what the theory considers as green shares to see how much of the ESG criteria these cover. In addition to this, I will later look at whether these shares are overpriced in relation to the same shares in the same market, which is in the Norwegian stock market. I will further analyze the share prices between Norway and the USA to see if this green market behaves differently in the USA. I want to take a closer look at whether there is a difference in return between companies that are considered green in the USA and Norway. In this thesis, data sets will be used for a period of five to ten year perspective. Analyzes will then be made on the basis of this and investigations will be carried out into whether investors consider green shares as high or low risk products. I will use data from sectors like renewable energy, technology and banking. Because it is these sectors that are defined as green in relation to the theory. In the conclusion, it has been concluded how a green share can be defined and if they are over priced or under priced. Because the theory and analyzes can provide a basis for this.

Sammendrag

Grønn finans og grønne aksjer er i dag relativt nye fenomener hvor vi ikke har noen klar definisjon på hva det er eller inbefatter, men det er gjort forsøk på å definere hva grønn finans er. Denne masteroppgaven vil gå litt inn på hva teorien definerer som grønn finans og hva det innbefatter. Oppgaven vil sette spørsmålstegn ved om selskaper som går over til å fokusere på miljø og bærekraft vil ha innvirkning på aksjekursen. Fordi når vi handler en aksje så vil vi som investor eie en del av en bedrift, dette vil si at jeg må se på om bedriften kan anses som grønn. Det kan gjøres ved å se om selskapet dekker noen av ESG-criteriene eller er innenfor de sektorene som blir ansett som "grønne" sektorer i hendhold til literaturen på området. Jeg vil videre bruke dette i oppgaven for å avgjøre om en aksje kan anses som grønn.

i oppggaven vil jeg gå inn på det teorien anser som grønne aksjer for å så se på hvor mye av ESG kriteriene disse dekker. Utover dette vil jeg da se nærmere på om disse aksjene er overpriset i forhold til samme aksjer innen for samme marked innad i det norske aksjemarkedet.

Jeg vil videre analysere aksjekursene mellom Norge og USA for å se om det det grønne markedet oppfører seg annerledes i USA. Jeg vil se nærmere på om det er en forskjell på avkastning mellom selskaper som blir ansett som grønn i USA og Norge. I denne oppgaven vil det bli brukt datasasett for et fem til ti års perspektiv. Det vil da bli foretatt analyser på bakgrunn av dette og det vil bli foretatt undersøkelser på hvorvidt investorene anser grønne aksjer som høy eller lav risikoprodukter.

Jeg kommer til å benytte meg av data fra sektorer innen fornybar energi, teknologi og bank virksomhet. Fordi det er disse sektorene som blir definert som grønne i hendhold til teorien.

i konklusjkonen er det kommet frem til hvordan en grønn aksje kan defineres og om de er underpriset eller overpriset. Fordi teorien og analysene kan gi grunnlag for dette.

Contents

1 Introduction

1.1 Motivation

Before I started at my Master's degree in financial economics at NTNU in 2018, there was already an increasing focus on the environmental challenges we are facing today. In the context of these challenges, all countries that signed the Paris Accord of 2015 are obliged to draw up national plans for cutting greenhouse gas emissions. The plans should specify how large emissions each country should cut and must be renewed every five years. [1] The goal is that the average global temperature should not exceed pre-industrial levels by more than 2 degrees, and preferably not more than 1,5. [1] In order to achieve this, the industry must also contribute.

Following the Paris Climate Agreement, companies are trying to figure out how to position themselves to make profits by cutting emissions on current projects and starting new projects that do not affect the environment. This has led to so-called green projects. Companies that invests in green projects are often considered "green" because they are a part of the "green shift". Many companies want to put a "climate stamp" on their projects to get government support for their projects [2]. Based on this, the question of the concept greenwashing has arisen. This is a phenomenon that will be examined more closely during this paper.

Furthermore, this has led to that the assets of these companies that focus on green projects are being regarded as "green". Since the investors have also started to focus more on sustainability investment, it will be natural that the demand for such assets will increase. [3] For investors to be certain that their assets truly are green, the finance companies have started to assess green companies using the so-called ESG-criteria (Environment, Sustainability, Governance).

On the basis that the media lately have talked about record high prices of green stocks, indices, funds, and record high returns, [3] there have been questions related to whether these assets are overpriced. In light of this general challenge, this thesis investigates the following research questions:

- What is the formal definition(s) of green finance?
- Does improving a firm's environmental performance result in a higher

stock price?

- Is there a difference in green investment between Norway and USA?

1.2 Previous work

Little previous research has been conducted on green finance. Green finance and green stocks constitute a new segment in the finance market. Because of this, there is little previous work to refer to today. After many conversations about green finance and green bonds with representatives of the Oslo Stock Exchange, I have been told that the concept of green bonds is very new on the market. Oslo Stock Exchange has a team of specialists working in a project called "what is green" and they also have a team that works within the green bond segment. Since this work is very new, so far, little material has been posted so far on the "what is green" topic. For green bonds, they are actively working to post information about this on their website (oslobors.no).

A master's thesis from 2019 concerns green bonds in the Norwegian and Swedish market. The thesis studied whether there is a yield difference between green bonds and conventional bonds from the same issuer, for the Norwegian and the Swedish market. The study concluded with that green bonds provide considerable benefits to issuers, that could justify the extra cost and reporting, regardless of whether a marginal pricing difference exist.

In order to define green finance, the German Development institute tried to define green finance by literature that try to define it [4]. These definitions are very weak and this thesis conclude that these definitions vary significantly.

Part I

Background

In this chapter I provide an overview of the impact the environmental challenges have on the financial market. The term "green finance" provides a

description of how the environment, investment and the companies' green project initiative, are connected to finance. The term and the understanding of green finance will be the backdrop for the green sectors I will use in this analysis. Furthermore, I will consider proposals for definitions of green finance based on literature and studies around the term to propose my own definition of the therm. I will briefly explain the political impact of the green industry upheaval. Further I will mention a little about the climate challenges and future measurements associated with the USA and Norway.

2 Introduction to the green financial market

The finance sector forms the backbone of an economy. It has a direct impact on the country's economic growth and development. However, in order to achieve sustainability in economic growth the philosophy of environmentalism plays a very crucial role. Therefore, with increasing environmental concerns both at the national and global level, it has become important for the finance sector to be responsive to these environmental issues. This gave rise to the concept of green finance, which is an innovation in the field of finance. [5] The goal of green finance is to combine the world of finance and business with environmentally friendly behavior. It is an arena for participants including individual and business consumers, producers, investors and financial lenders. A difficulty is that, there does not currently exist a commonly accepted definition of green finance. Green finance can be expressed differently depending on the participant's perspective, which may, in turn be influenced by financial incentives. Green finance emphasizes ecological environmental benefits and pays attention to the environmental protection industry. [6]

Green finance involves making investments in environmentally sustainable products and projects which aim to reduce or avoid greenhouse gas emissions, controlling industrial pollution, water sanitation, waste management and overall biodiversity protection. It also includes green investments in stocks, exchange traded funds and mutual funds of the companies whose operations aim at improving the environment. [5]

To take a closer look at what green finance and investment includes, two figures are provided. Figure 1 gives an insight into how green investment is put together, while Figure 2 examines proposals for investment opportunities in the green sector.

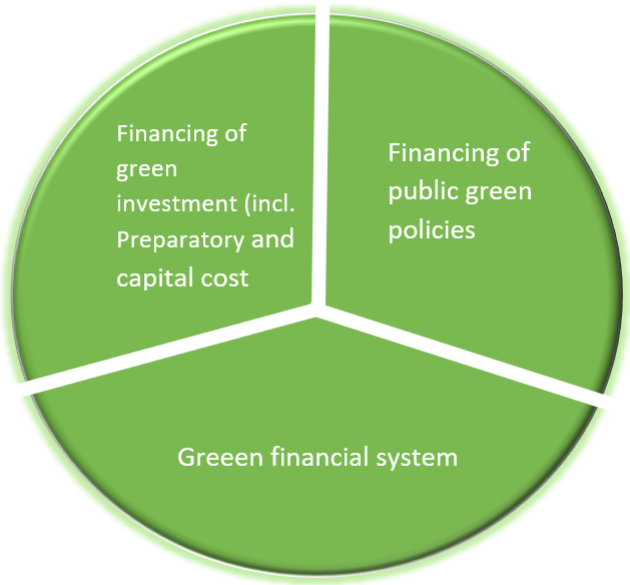


Figure 1: What green finance comprises, figure adapted from Lindenberg [4]

Figure 1: shows that green finance comprise the financing of public and private green investments in the following areas:

- Environmental goods and services such as water management or protection of biodiversity and landscape [4]
- Prevention, minimization and compensation of damage to the environment and to the climate such as energy efficiency or dams [4]
- The financing of public policies, which also includes operating costs, that encourage the implementation of environmental and environmental-damage mitigation and adaptation projects and initiatives such as feed-in-tariffs for renewable energies. [4]
- Components of the financial system that deal specifically with green investments, such as the green climate fund or financial instruments for green investments. including their specific legal, economic and institutional framework conditions. [4]

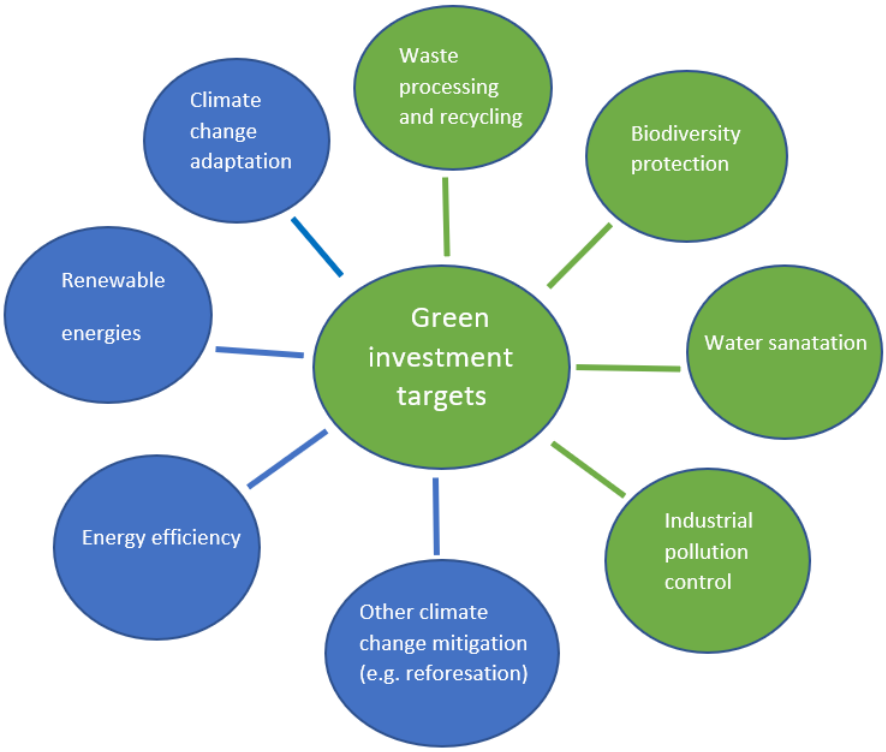


Figure 2: What green investments include investment in, figure adapted from Lindenberg [4]

Figure 2: The circles on the right side show that green investments include investments in water sanitation, industrial pollution control, waste processing and recycling.

Meanwhile, the bubbles on the left side show the climate related investments such as climate change adaptation, renewable energies, energy efficiency and other climate change mitigation. However, the industry is not limited to only these categories. [4]

These investments are related to financial assets such as equities, trading traded funds, bonds, loans, and mutual funds, as mentioned earlier. The bank's role is to enable the development of project financing structures that mobilize institutional investors in collaboration with markets. [7] Some of the sectors in green bonds and loans include banks, energy, healthcare and technology as shown in Figure 3.

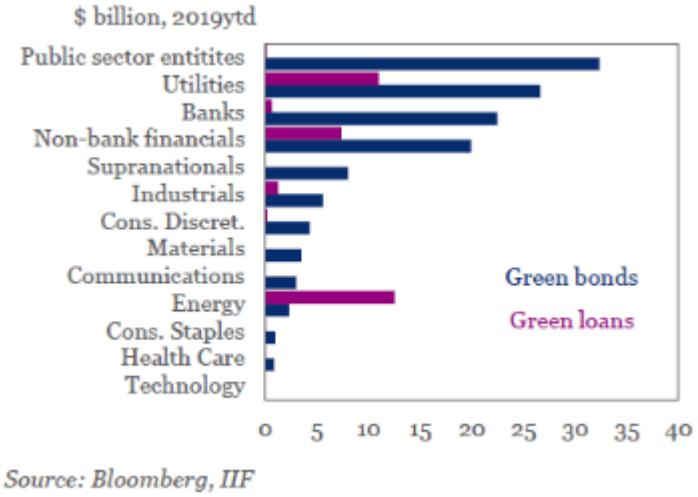


Figure 3: Green bond and loan issuance by sector [8]. Figure from Bloomberg, IIF

Figure 3: This figure shows the biggest issuers of green bonds and loans. These are France, Netherlands, China, U.S and Germany. From this figure it is shown that Green bonds are issued most, followed by loans [8]. As seen, the highest number of green loans is issued in the energy sector while most of the green bonds are within public sector entities followed by utilities, banks and non-bank financial [8]. The ones that are issued least often are technology, health care and cons. Staple for these countries.

It appears that green financial products are more complex compared to other financial products. This is because green assets, contrary to assets that are not considered green, must be measured according to ESG criteria to ensure investors that the assets they are buying are green. Some companies, like for example KLP, have started to brand their assets with the Nordic environmental label "Svanemerket" (The Swan) [9] [10]. This is done to guarantee to their customers that the products they sell do not contain large environmentally harmful carbon emissions or involve companies that have ethical complication such as weapons or tobacco. This requires that the finance company needs to search more in-depth on what each company is producing. For example, when KLP issues an index fund for the customer, they need to have information on every company in this index, what they produce, whether they have an ESG score, and measure the carbon emission for each company in the index fund. KLP also mentions that it is challenging to get hold of good enough data on this type of company risk [9]. This shows

that there are higher requirements and less historical data to measure from green assets versus other assets.

This is based on the fact that green finance, unlike other financial incentives, must also take into account environmental protection and environmental concerns related to investment, projects and policy guidelines. Since green finance does not have a clear definition, this presents challenges on the company side, but also for the investor. On the corporate side, it can be challenging to know what is an approved environmental project. For example it can be challenging for the company to know how much carbon the project is allowed to emit or what amount of social responsibility a company must have in order to operate properly. [9] This is challenging in connection with the fact that this is based on objectives, which means that the company must try to interpret for themselves what makes a project green; what is the maximum tolerated emissions, and what is expected of social responsibility the company should take. It can be difficult for the company to know the degree of environmental friendliness and legislation it needs to include. Meanwhile, the investor can face misunderstandings about what a green company entails exactly.

Regarding the investor's challenge related to misunderstandings about what is a green company, as previously mentioned, the finance company KLP AksjeGlobal started a pilot project. They aim to conduct a climate risk analysis of the investments in their fund. As a result, they can invest in shares that are ranked highest in the environment, social responsibility, corporate governance (ESG). This fund is based on a index and excludes sectors and companies that violate these ESG criteria. The companies that score lowest on these criteria involve fossil energy, tobacco, weapons and mining. The criteria are applied to make it easier for the investor to invest in green financial assets [9]. In January 2015, the Oslo Stock Exchange was the first stock exchange in the world with its own list of green bonds. The list was established to highlight green investments. Oslo stock exchange categorises projects in renewable energy, energy efficiency projects, sustainable waste management, sustainable land use, biodiversity conservation, clean transport, climate change or climate adaptation as green [3].

In this thesis, these analysis tools have been used to create green portfolios based on sectors within renewable energy, healthcare, biotechnology, technology and recycling. These portfolios are used to calculate and examine whether green shares are overpriced. The examination will be based on research and proposals of the definition of green sectors in literature.

2.1 Definition of green finance in the literature

To find a suitable proposal for a definition of green finance, it is first important to understand what the word finance includes. The definition of the term finance is explained below.

"Finance is the application of economic principles to decision-making that involves the allocation of money under conditions of uncertainty. Investors allocate their funds among financial assets in order to accomplish their objectives, and businesses and governments raise funds by issuing claims against themselves that are invested. Finance provides the framework for making decisions as to how those funds should be obtained and then invested. It is the financial system that provides the platform by which funds are transferred from those entities that have funds to invest to those entities that need funds to invest.

The theoretical foundations for finance draw from the field of economics and, for this reason, finance is often referred to as financial economics." [11]

As mentioned earlier, there does not exist a commonly accepted definition of the term green finance. Some reasons may be that green finance can be expressed differently depending on the participant. [6] Another complicating matter is that many publications about green finance fail to include a definition of the term. For instance, neither IFC (2013) nor Spratt and Griffith-Jones (2013) try to define the term and the definition they propose differ significantly. [4] Below, I present some attempts that have been made to define green finance in existing research:

(1) *"Green finance is a broad term that can refer to financial investments flowing into sustainable development projects and initiatives, environmental products, and policies that encourage the development of a more sustainable economy. Green finance includes climate finance but is not limited to it. It also refers to a wider range of other environmental objectives, for example industrial pollution control, water sanitation, or biodiversity protection. Mitigation and adaptation green finance is specifically related to climate change related activities: mitigation financial flows refer to investments in projects and programs that contribute to reducing or avoiding greenhouse gas emission (GHGs) Whereas adaption financial flows refer to investments that contribute to reducing vulnerability of goods and persons to the effects of climate*

change" [12] [5]

(2) *"Green finance is a wider lens including more than investments and defined by Bloomberg New Energy finance and others. Most important is that it includes operational costs of green investments not included under the definition of green investment. Most obviously, it would include costs such as project preparation and land acquisition costs, both of which are not just significant but can pose distinct financing challenges." [13] [4]*

(3) *"According to our definition, ["Green Finance"(] GF[)] comprises all forms of investment or lending that take into account environmental impact and enhance environmental sustainability. A key element of GF is sustainable investment and banking, where investment and lending decisions are taken on the basis of environmental screening and risk assessment to meet environmental sustainability standards" [14] [4]*

These are three very different proposals on green finance. The first definition thoroughly explores the extent of environmental damage limitation related to industrial activity. However, it does not mention the economic risk linked to green investment or the impact of economic growth on companies [7]. This is essential for companies in order to stabilize equity. Stable equity for the company is, in turn, important in order to achieve growth and to have the ability to spread risk [15]. The latter two definitions focus more on the cost of green investment and the financial challenges associated with green projects. The latter two definitions have less focus on damage mitigation and instead focus more on climate change impact and sustainability related to financing according to proposals for definition (1) and (2).

(4) *"For the banking sector, green finance is defined as financial products and services, under the consideration of environmental factors throughout the lending decision making, ex-post monitoring and risk management processes, provide to promote environmentally responsible investments and stimulate low-carbon technologies, projects, industries and business." [16] [4]*

This definition constructed by PWC has set out a proposal for how the green banking sector interprets green finance. Similar to definition (2) and (3), they interpret the term as a loan product which takes environmental factors into account by following and monitoring the risk management processes. They are also responsible for promoting environmentally responsible investments. It seems that this definition has many similarities to the suggested proposal from definition (2) and (3). A main difference is that the proposal from PWC

also includes services under the definition of green finance. This proposal also does not explain for how the monitoring and risk management process should take place. It seems that the banking sector is proposing a definition for green financial products instead of the term green finance.

These suggestions for what green finance is or entails are seen from different points of view. For example, suggestion (4) is viewed from the bank's side and it will then be natural to define green finance from the bank's point of view. This is why they focus more on lending, monitoring and risk management. The other three proposals have emphasized sustainability policies and also included any restrictions applicable to green finance. It appears that green finance means to invest in environmentally friendly products and projects which aim to reduce or avoid greenhouse gas emissions, control industrial pollution, water purification, waste management and overall biodiversity protection. Green investments such as stocks, funds, bonds and equity funds are also a part of green financing. Hence, green finance emphasizes innovations such as technology, renewable energy, recycling and healthcare. Considering that these projects aim to reduce greenhouse gas emissions, whether they actually do so is debatable. However, this means the degree of greenhouse gas emissions in a project or investment to the company constitutes the probability for such a project to be profitable to the company and its shareholders or not will determine if a sector is under green finance. Below is my proposal for definition of green finance:

" Green finance is a field of green economy that emphasizes the way companies, institutions and individuals invest in environmentally friendly projects which aims to reduce greenhouse gas emissions. Where the funding level, profitability and the degree of greenhouse gas emissions related to the project will determine whether a project is green or not. An important aspect will be the cost and risk these projects and investment involve economic growth."

2.2 Norway and the USA

Green finance has a direct impact on the country's economic growth and development. With growing financial concerns for how companies and people impact the climate, it is important that the countries themselves take action for more ecological environmental benefits and pay attention to environmental protection in industry. The countries themselves can do this by requiring their domestic companies to make investments in environmentally

sustainable products and projects which aim to reduce or avoid greenhouse gas emissions, waste management, and biodiversity protection. The specifics of green industry have been outlined in Section 2.1.

Norway has a target to reduce emissions by at least 40% within 2030 and become a low-emission society within 2050 [17]. To reach the two degree target outlined in the Paris Accord, Norway plans to focus more on technological development and strengthen investment in green innovative procurement and research [17]. Since 2013, the government has increased the support for business-oriented research and innovation with 3 million NOK, inclusive budget deduction [17]. For 2018, the government has proposed to increase investment in research for low-emission development and green competitiveness with 20 million NOK, where it is suggested extra 10 million NOK to enable technologies [17].

To motivate the Norwegian industry to contribute to a more sustainable development and strengthening green competitiveness, the development of climate and environmental solutions will receive additional support [17]. Enova supports new technology so that the business community will develop and test new technology. The annual transfer to the climate and Energy Fund, which is managed by Enova, is increased from 1,85 million NOK in 2014 to 2,7 million NOK for the suggestion for 2018, inclusive surcharges on network tariff [17]. The company Innovaton of Norway also delegates out support for green solutions to companies, through grants for pilot demonstration projects based on environmental technology [17]. In the state budget for 2018, the allocation was proposed to be 264.5 million NOK. These subsidy schemes will contribute to increase value creation based on resources from sea, forests and land. Additionally, a renewable energy post under the agricultural agreement has a budget of 67 million NOK [17].

A strategy was adopted in 2015 up to 2020 that innovation Norway considers projects after criteria for business and socio- economic profitability. In cases where two projects are equally good, sustainable projects will be given priority [17]. To achieve this, a sustainability analysis is carried out, where opportunities and risks are assessed [17]. As a result, companies like for example Equinor have recently signed an agreement with the British government for the lease, securing and area of wind farm extension of approximately 196 km^2 in total. with the goal of contributing to the UK's decarbonization goals, along with providing benefits to local communities through local jobs and economic opportunities. Equinor is also planning a hydrogen plant in UK, this is a project for developing facilities for large-scale

production of hydrogen from natural gas in combination with carbon capture and storage (CCS). [18] Norsk Hydro has also begun to focus on low-carbon aluminum [19].

The U.S energy-related CO2 emissions increased 2.7% in 2018, up 0.6% from the growth rate in 2017. The overall carbon intensity of the U.S. economy declined 0.1% in 2018 compared to 2.9% decline in 2017 [20]. The decline on 0.1% resulted from a increase on 0.6% in carbon intensity of energy consumed [20]. There was an increase in weather-related and transportation energy demand [20]. In 2018, emissions from the residential and commercial sectors increased, defined as the building sector, led to growth in emissions on 5,2%. Transport-related emissions have been increasing since 2012 because of a recovering economy and moderate fuel prices [20]. Energy-related transportation sector increased with 1.5% and is now 8% higher than 2012, while emissions from the industrial sector have been declining. Natural gas is becoming the dominant source of energy, with emission increasing on 1.1% in 2018, and in recent year natural gas has surpassed petroleum [20]. Increasing use of natural gas has helped reduce overall U.S. CO_2 emissions growth because it is the least carbon-intensive of the fossil fuels used in electricity generation. Petroleum CO2 emissions have been relatively flat in recent years [20].

Beyond this there is little information on how the US government plans to motivate companies to invest more in green projects, while reducing and targeting of emission is follow what emerges from the Paris Agreement. A general decarbonization strategy appears to be missing. This is presumably due to the US's withdrawal from the Paris Accord, and a general unwillingness of the current political administration to address environmental issues.

Part II

Literature

This section will examine the general environmental challenges companies face, how they have handled it in the past, and how they are handle it today. This chapter will give examples of companies that try to avoid responsibility for their impact on the environment, and companies that have changed to

take more responsibility for the impact they have on the environment. It will be mentioned how some companies act in a gray zone that may give rise to suspicions of greenwashing. Further, there will be a discussion of the ESG criteria, which are parameters for measuring the companies' level of environmental, social and governance responsibilities. The criteria aim to make it easier for investors to select companies that take responsibility. Finally, the weaknesses of the ESG model will be discussed in more detail. The concept of greenwashing is used to discuss companies that act in a gray zone to attempt to be perceived as more socially and environmentally conscious than they actually are.

3 How companies go green

In the recent years, green issues have seen increased attention from business and industry, the media, politicians, decision makers, financial institutions, and the general public. There has been much discussion about the environment and the damaging effects produced by everyday activities. Extensive environmental damage has been caused by continuous consumption, marketing, manufacturing, processing and pollution, along with several specific environmental disasters. [21]

Companies have adopted various responses to green issues. They range from sticking their head in the sand to taking a defensive approach, or green product promotion. Recent history provides many examples where bad corporate social responsibility caused huge economic and financial losses. For example the Deepwater Horizon oil spill in April 2010: three month after this disaster, BP had lost half its share value, which represents tens of billions dollars [21]. It was reported that, given the size of the company, the oil spill impacted the UK economy as a whole. There are many other examples of disasters like this throughout the years [22]. Until recently, improving environmental performance has been a question of legislative compliance and occasional reactions to external event and pressures. The extent of improving overall green performance depends in a companies motivation and its choose of strategy [21].

Companies are used to coping, almost every day, with one or several news concerning their social responsibility (CSR) and what should be the companies' objectives is not settled. There are still lively controversies on this question. The ESG factors may impact company value and managers can no longer ignore this [22].

Corporate ecological responsiveness can be defined as a set of business initiatives aimed at curbing the business' impact on the natural environment. These initiatives can include changes in companies' products, processes and policies such as reducing energy consumption and waste generation, better use of sustainable resources, and the implementation of an environmental management system. The term ecological responsiveness does not refer to what a company should do, but to the initiatives that reduce the company's "ecological footprint" [23].

Previous research on organizations and the natural environment has identified four drivers of corporate ecological response and can be shown by using

a corporate ecological responsiveness model as illustrated in Figure 4:

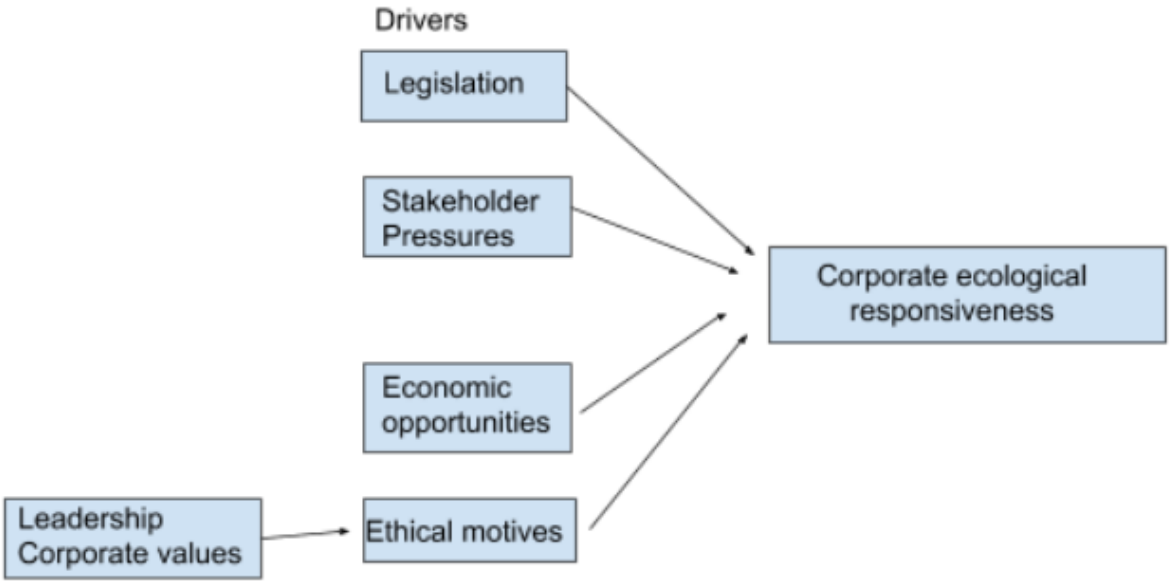


Figure 4: Organization chart showing the general responsibility for environmental issues in an organization

The importance of legislation to promote corporate ecological responsiveness has been widely recognized and companies can avoid capital costs by following legislation. At the same time, stakeholders have also been instrumental in selecting the company's ecological responsiveness. Customers, local communities, environmental interest groups and the environment itself encourages companies to consider ecological impacts in decision making. However, much indicates that shareholders have little effect on the company's organic decisions. Economic opportunities also influence the company's ecological decision. By mapping and optimizing production processes, companies can reduce their environmental impact while reducing procurement costs and waste management. Revenue can be enhanced trough "green" marketing, sales of waste products, outsourcing the company's environmental expertise, earn on company based resources such as corporate reputation, learning skills, product quality and investing in green projects and investments. These can be developed trough corporate ecological activities [23].

3.1 ESG-criteria

As mentioned earlier, issues such as climate change, employee rights and remuneration are becoming as important as traditional metrics for companies and investors and even more important in the investment decision-making process. Therefore companies are now being evaluated and rated on their environmental, social and governance criteria (ESG) performances by various third party providers of reports and ratings. Institutional investors, asset managers, financial institutions and other stakeholders are increasingly relying on these reports and rating to assess and measure company ESG performance over time and as compared to peers [24].

If the company itself was responsible for the scoring and reporting this, it would lead to manipulated numbers and false advertising from the corporate standpoint. This can be interpreted from the previous section, where companies want to be perceived as "green", as this "green" marking can be used to advertise the company or improve its reputation. Parallels can also be drawn to food labeled "environmentally friendly" or "organic", labels that do not necessarily have to be anchored in any strict definition. However, even when scores are attributed by external and independent actors, there are still possibilities that the reports and scores may be misleading. This issue will be discussed in more detail in the section on green washing, see Section 3.2.

This assessment and measurement often forms the basis of informal and shareholder proposal-related investor engagement with companies on ESG matters. Reporting and ratings methodology, scope, and coverage may vary greatly among providers. Many providers encourage input and engagement with their subject companies to improve or sometimes correct data [24]. Since there are numerous ESG data providers, it is not possible to collect all this data because the suppliers have different information.

3.2 Green Washing

In the previous section about the ESG criteria, the risk of manipulated numbers by companies that desire to be green despite the fact that they are not was mentioned. This opens for the question about whether green washing is increasing in prevalence. Green washing occurs when companies mislead consumers about their environmental performance or the environmental benefit of a product or service. The occurrence of green washing can have a major

negative effects on consumers and investors' confidence in green products. Green washing is particularly challenging in the context of limited or uncertain regulation. [25]

An example of green washing on a product level is seen in a case of LG Electronics who incorrectly certified refrigerators using energy stars. Energy stars, a third-party eco-label indicating that a product meets a set of energy efficiency guidelines, has certified many LG electronic refrigerator models. However, it was discovered that ten of the LG certified refrigerators had listed incorrect measurements of energy consumption on the labels and in reality did not meet the efficiency standards required to earn certification. Another example is General Electric's "ecomagination", a campaign that advertised the company's work in the environmental arena, while at the same time, General Electric lobbied to combat the EPA requirements for clean air. More work has been done on the product arena to categorize and quantify green washing than on the business arena [25]. The knowledge of corporate strategy communication on environmental performance remains incomplete [26].

4 Green stocks

There is no clear definition of what a green stock is, but the research done in this thesis uses available information to help build a definition of the term. This research has looked at funds that are defined and labeled as green. From these findings, there has been selected shares from companies that are considered green to form a composite portfolio. These companies have also been measured on ESG criteria. The companies did meet the criteria, but received a lower score than expected compared to the portfolio containing non-green companies. On the background of the ESG result the question of green washing appeared.

In the coming chapters, we assume that companies in sectors such as technology, Renewable energy, Recycling and bank and finance, are green companies because they fulfil the ESG criteria and are labeled as green in green market funds.

4.1 CAPM

To find out whether the stocks of the portfolios are overpriced or under priced, the natural models to use are CAPM, Fama-French three-factor model, Carhart four-factor model, and Fama-French five-factor model.

The CAPM model (capital asset pricing model) provides a a practical way to identify an investment with similar risk. Under CAPM, the market portfolio is a well-diversified, efficient portfolio representing the non-diversifisable risk in the economy. This model is widely used because it is simple and reasonably accurate. The investments have similar risk if they have the same sensitivity to market risk, which is measured by their beta with the market portfolio. The cost of capital of the investment opportunity equals the expected return of available investments with the same beta. This estimate is provided by the security market line equation of the CAPM. [15]

This paper will use the factor ERM, the excess return for the Norwegian and USA stock market, to compute the expected return of the assets. We can obtain the CAPM model [15]:

$$r_i = r_f + \beta_i * (E[R_{mkt}]) - R_f \textbf{(eq.1)}$$

where the R_f is the risk free rate, $E[R_{mkt}]$is the market return and the β_i is the measure of risk for asset $_i$. [15]

To give the CAPM model a greater weight, factor portfolios can be used to identify portfolios that we can combine to form an efficient portfolio. The $\beta^F 1_s, ..., \beta^F N_s$ are the factor betas, one for each risk factor, and have the same interpretation as the beta in CAPM. Each factor beta is the expected % change in the excess return of a security for a 1% change in the excess return of the factor portfolio (while the other factors is constant) [15]. When using more than one portfolio to capture risk, the model is known as a multifactor model, each portfolio can be interpreted as either a risk factor itself or a portfolio of stocks correlated with an unobservable risk factor. The model is also referred to as the Arbitrage Pricing Theory (APT) [15].

4.2 Fama-French factors

The Fama French factor models is a family of asset pricing models developed from 1992 onward by Nobel Prize winner Eugene Fama and Kenneth French [27]. The model is the result of an economic regression of historical stock prices and is a better tool for evaluating manager performance [27]. This model is based on time series data and the expression is defined in eq. (2) [28]:

$$R_{i,t} = \alpha_{0,t} + \alpha_{1,t}\beta_{i,t} + \alpha_{2,t}MV_{i,t} + \alpha_{3,t}BTM_{i,t} + u_{i,t} \textbf{(eq.2)}$$

Where $R_{i,t}$ are the monthly returns, $\beta_{i,t}$ are the CAPM betas, $MV_{i,t}$ are the market capitalisation's, and $BTM_{i,t}$ are the book-to-price ratios, each for firm $_i$ and month $_t$. The explanatory variables in the regression are the firm characteristics themselves [28]. This model shows that when we employ size and book-to-market in cross-sectional regression, these are highly significant related to returns, so small and value stocks earn higher returns all else equal than growth or large stocks [28].

The Fama-French three factor model has become widely used by academics and practitioners alike for estimating cross-sectional equity returns [29]. This model is motivated by two empirical regularities that CAPM leaves unexplained. These factors are the size premium (SMB), whereby size is meant that this factor measures the difference in returns between a portfolio of small stocks and a portfolio of large stocks [28]. The value premium (HML) is the

difference in returns between a portfolio of value stocks with high book-value to market-value ratios and a portfolio of growth stocks with low book-value to market-value ratios [28]. The corresponding regression model is shown in eq. (3):

$$R_{it} - R_{ft} = \alpha_{it} + \beta_1(R_{Mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \epsilon_{it} \textbf{(eq.3)}$$

Where R_{it} is the total return of a stock or portfolio $_i$ at time $_t$, R_{ft} is the risk free rate of return at time $_t$ and the R_{Mt} is the same as for the CAPM at time $_t$. $R_{it} - R_{ft}$ is the excess return on the market, SMB_t is the size premium (small minus big) and the HML_t is value premium (high minus low). The betas $\beta_{1,2,3}$ are the factor coefficients. [27]

The Carhart four-factor model, a multifactor model, has a distinct advantage over single-factor models because it is much easier to identify a collection of portfolios that captures systematic risk than just a single portfolio. This model add a fourth factor to the equations above based on the momentum, measured by the difference between the returns on the best performing stocks and the worst, this factor is known as (PR1YR). To implement the model it must be used historical average returns on the portfolios. The Carhart model can be obtained by eq. (4) [11]:

$$E(R_i) - R_f = \alpha_{i_t} + \beta_{1,ERM}(ERM_t) + \beta 2, SMB(SMB_t) + \beta_{3,HML}(HML_t) + \beta_{4,_PR1YR}(PR1YR_t) + \epsilon_{i,t} \textbf{(eq.4)}$$

The factors as ERM. SMB and HML is still the same as for the Fama-French three factor model, but now we have a fourth factor PR1YR (prior one-year momentum) some are the past return strategy, there we every year rank stocks by their return over the last one year, and construct a portfolio that goes long the top 30% of stocks and short the bottom 30%. This strategy requires to hold this portfolio for a year and this process needs to be repeated annually [11].

The Fama-French five-factor model is a new factor model in the Fama-French family. This model extends the three factor model with two new factors to capture profitability and investment [29]. This model provides a better description of average returns by absorbing value, profitability, and investment

patterns in Europe, North America, and Asia-Pacific [29]. All five of these factors are represented by portfolios. This raises the possibility of specification errors in the Fama French five-factor model [30]. This model can be obtained as eq. (5) [30]:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,ERM}(ERM_i) + \beta i, SMB(SMB_i) + \beta_{i,HML}(HML_i) +$$

$$\beta_{i,RMW}(HML_i) + \beta_{i,CMA}(CMA_i) + \epsilon_{i,t} \textbf{(eq.5)}$$

The first three factors $R_{i,t} - R_{f_t}, SMB_t$ and HML_t are well-known market, size and value factors. The factor RMW_t is the difference in returns in period $_t$ of diversified portfolios of stocks with robust and weak profitability. The CMA_t factor is the difference in returns for period $_t$ of diversified portfolios of conservative and aggressive firms with respect to investment behaviour [30].

Part III

Methodology and Data

This thesis uses quantitative methods. This is based on the characteristics of the research questions, which are structured and statistical in nature. The econometric approach in this thesis is used to analyse the stock price of the green and non-green portfolio for Norway and USA. There is used an analysis of ESG criteria to see if there is a connection between the green portfolio and non green portfolio. Here, the analysis between the ESG criteria and the pricing models are of interest. These analyzes will further be used to validate and compare the results between Norway and USA to examine similarities and differences for the two markets. In this chapter, the method and data collection procedure is presented.

5 Matching Method

The matching procedure starts by interpreting what constitutes green stocks. The distinction is made on the basis of previous theory and reports for green bonds and funds. The reason for this is that we do not have a definition on green stocks. Although shareholders may have many opinions of their own about what green stocks are, a common definition has not been established. The green and non-green shares have been divided into four portfolios, a "green" portfolio and "other" portfolio both for Norway and USA.

For the collection of pricing data is the program Thomsom Reuters used, where prices of each stock have been obtained. The four portfolios have a maturity of ten years, from 2010 until 2020, and all stocks include monthly returns. The portfolios contain equal weighting on 100 stocks in each portfolio, which are listed on Oslo Stock Exchange and Nasdaq Stock Exchange. The raw price series are converted into series of returns. Additionally, returns have the added benefit that they are unit-free. Below, there are presented two methods used to calculate returns from a series of prices, and these involve the formation of simple returns, and continuously compounded returns. The formula for the two returns is as follows: [28]

$$R_t = 100\% * ln(\frac{P_t}{P_{t-1}})$$

There could also have been used simple returns as defined by the following formula:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} * 100\%$$

This thesis uses continuously compounded returns to make a time series of prices. Where R_t denotes the return at time t, P_t denotes the asset price at time t and ln denotes the natural logarithm. P_{t-1} denotes the asset price one period backwards. [28]

It is not taken into account companies that have gone off stock exchanges or gone bankrupt because of COVID-19. These data are not necessarily representative of the current situation. However, the results can still give a small indication of the market developments.

6 Analysis of green and non green portfolio

This analysis contains two portfolios for both Norway and USA, so there are four portfolios in total. This is an analysis of differences and similarities between these portfolios and sectors. Oil companies that produce fossil fuels are deliberately taken out of the green portfolio, although these companies have initiated several environmentally friendly projects such as wind power, and subsequently are highly ranked according to the ESG criteria. Nevertheless, it is considered that oil production is the primary product for these companies. There are also signals that suggest greenwashing. The sectors and number of stocks for the green and non green portfolio for Norway is shown below:

The green portfolio for Norway includes the following sectors:

Green portfolio	
Description	Number of stocks
Finance	10
Technology	50
Bank	32
Renewable energy	7
Recycling	1
SUM	100

This portfolio includes the most companies under the heading technology, and the fewest companies under recycling. This shows that Norway invests the most in technology today followed by the banking sector. Even if the finance and banking sectors were combined, the technology sector would still be the largest sector.

The other portfolio for Norway includes the following sectors:

Other portfolio	
Description	Number of Stocks
Seafaring	13
Farmed Salmon	8
Oil and Gas	32
Tank Ship	3
Refining of Oil	7
Industry	17
Property	5
Service	4
Aviation	3
Shipping	2
Medicine	3
Media	3
SUM	100

It is clear that refining and oil companies dominate this portfolio, followed by the industry sector. The portfolio contains fewest companies within the shipping sector.

For USA there have also been created one green portfolio and one "other" portfolio, but with some different sectors included in the other portfolio. The green portfolio remains almost the same in terms of sectors as the green portfolio for Norway, expect for the recycling sector. This can indicate that the USA has less focus on companies that recycle compared to Norway. The "other" portfolio that contains other companies holds a greater variety of sectors than the other portfolio for Norway. This is because the Nasdaq stock exchange holds a wider range of companies within several sectors. This has to do with the United States' population, size and different priories compared to Norway. The sectors and number of stocks per sectors are shown below.

The green portfolio for USA companies includes the following sectors:

Green portfolio	
Description	Number of stocks
Bank	33
Technology	45
Renewable Energy	10
Finance	12
SUM	100

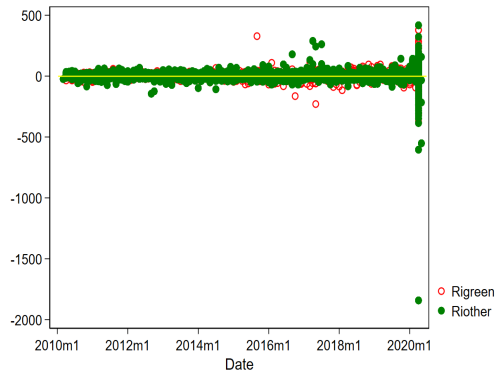
This portfolio contains most stocks from technology sector, followed by the bank sector just like for the Norwegian green portfolio. If we here combine the finance and bank sector, then we will end up with exactly the same number of stocks as the technology sector. This is different from the Norwegian portfolio. In total, the number of stocks in each sector do not deviate significantly from that of the Norwegian portfolio.

The other portfolio for USA includes the following sectors:

Other portfolio	
Description	Number of stocks
Aviation	6
Farmer	4
Gas	1
Gold	4
Industry	43
Infrastructure	3
Medicine	6
Minerals	1
Oil and Gas	9
Properties	12
Refining of Oil	4
Seafaring	3
Services	2
Sipping	1
Tobacco Farmer	1
SUM	100

As mentioned, this portfolio includes more sectors than the Norwegian counterpart, such as gold, farming, minerals, and tobacco farming. The tobacco farming sector could have gone under the farming sector, but it is deliberately chosen to display it as a separate sector. For this portfolio, the industry sector contains the most stocks by far, followed by the property sector. Gas, shipping, minerals and tobacco form the smallest sectors in the portfolio. Notably, this portfolio contains fewer oil and gas companies than the Norwegian one. This indicates that the oil and gas sector forms a bigger share of the economy in Norway than in the USA. The returns of the stocks in the two portfolios are shown in Figure 4.

(a) Distribution of returns for green and non-green stocks for Norway, for the time period 2010-2020.



(b) Same as figure a), but for the USA portfolio. Note the scaling of the Y axis compared to figure a).

Figure 5: Returns of the stocks in green and non-green portfolios for USA and Norway.

It appears that the Norwegian portfolio has a greater spread than the American portfolio. However, both portfolios have a somewhat similar spread overall.

The next chapter will take a closer look at the models and the estimated models some are used to estimate the α. The models used to calculate α are CAPM, the Fama-French three-factor model, the Carhart four-factor model, and the Fama-French five factor model. The CAPM model prices by only one factor, while the Fama-French and Carhart models are extensions of the CAPM model, that attribute several other factors to the model. Furthermore, the alpha intercept and the GRS test will be discussed in more detail, since these are the parameters that need to be interpreted. The actual execution of the ESG charts will also be described. Finally it will be explained what kind of data has been used in connection with the execution of the regression and the ESG criteria.

6.1 CAPM regression

For this analysis I have used a simple time series regression of the excess stock returns on the excess returns to the market portfolio [28]. The model is expressed in eq. (1):

$$R_{i_t} = \alpha_i + \beta_i R_{m_t} + \epsilon_{i_t} \textbf{(eq.1)}$$

The estimated eq. (1.1):

$$R_{i_t} = \alpha_i + b_i R_{m_t} + \epsilon_{i_t} \textbf{(eq.1.1)}$$

Where R_{i_t} is the rate of return for announcement $_i$ on day $_t$, R_{m_t} is the rate of return for the market index $_m$ on day $_t$, and α is the y-intercept also called the Jensen's alpha. This alpha will measure how much the stock under-performs, or out-performs, what is expected given its level of risk. β is the slope that measures the sensitivity of R_{m_t}, and ϵ is the disturbance term. There are used stock returns from companies listed on the Oslo stock exchange for both the green and other portfolio for Norway, and the Nasdaq stock exchange for the USA portfolios. This equation will describe the predicted return to use for calculating whether or not the green stocks are overpriced. [28]

There are many ways to calculate the regression of CAPM. But this thesis prefers to use the predicted return and calculate it with the real return, as shown in eq. (2):

$$\widehat{R_{i_t}} - R_{f_t} \textbf{(eq.2)}$$

Where R is the rate of return, m is the market index return, $\widehat{R_{i_t}}$ is the predicted or the expected return form equation (1) and R_{i_t} is the real return from the stock. Then the eq. will look like eq. (3):

$$\widehat{R_{i_t}} - R_{f_t} = \alpha + \beta(R_m - R_f) + \epsilon_i \textbf{(eq. 3)}$$

Estimated eq. (3.3):

$$\widehat{R_{i_t}} - R_{f_t} = \alpha + b(R_m - Rf) + \epsilon_i \textbf{eq. 3.3}$$

Where the parameters are the same as before. But this makes it easier to regress in Stata. Then I use the excess returns and subtract the risk-free rate and perform the regression with the market risk premium. The regression will then calculate the alpha. The risk-free rate and market risk premium is obtained from Kenneth R. French's website [28].

6.2 Fama French regressions

Since CAPM only contains one factor, then the Fama French three factor model, Carhart four factor model and Fama-French five factor model will also be used in this analysis to find out whether the stocks in the green portfolio generate higher average returns than the other portfolio. This has important implications for asset pricing and for the way that we think about risk and expected returns. For example, it is known that stocks of small companies, value stocks and stocks with momentum yield higher returns than those having the opposite characteristics.

Fama French is estimated as a time series of cross-sectional model. First I use a factor-based model with three factors also called a Fama French three factor

model. In the context of a time series regression which is run separately on each portfolio $_i$, as shown in eq. (4) [28]:

$$R_{i,t} = \alpha_i + \beta_{i_M} RME_t + \beta_{i,_S} SMB_t + \beta_{i,_V} HML_t + \epsilon_{i,t} \textbf{ (eq.4)}$$

The estimated model eq. (4.4):

$$R_{i,t} = \alpha_i + b_{i_M} + b_{i,_S} + b_{i,_V} + \epsilon_{i,t} \textbf{(eq. 4.4)}$$

Where $R_{i,t}$ is the return on the portfolio $_i$ at time $_t$, ERM, SMB and HML are the factors mimicking portfolio returns for the market excess returns, firm size, and value respectively. The reason for using this time series regression is to compare the parameter estimates qualitatively across the the portfolio $_i$ [28].

The next model from the Fama French family is the Carhart factor (1997), also called the Carhart four-factor model. This model adds a fourth factor to the equation, the momentum factor, which is measured as the difference between the returns on the best performing stocks over the past year and the worst performing stocks as mentioned in the literature. The formula for this regression is defined as eq. (5) [28]:

$$R_{i,t} = \alpha_i + \beta_{i,_R} RME_t + \beta_{i,_S} SMB_t + \beta_{i,_V} HML_t + \beta_{i,_P} PR1YR_t + \epsilon_{i,t} \textbf{(eq.5}$$

The estimated model eq. (5.5):

$$R_{i,t} = \alpha_i + b_{i,_R} + b_{i,_S} + b_{i,_V} + b_{i,_P} + \epsilon_{i,t} \textbf{(eq. 5.5)}$$

One of the newer models used in this analysis from this family is the Fama-French five-factor model (2015). It is presented in eq. (6) [28]:

$$R_{i,t} = \alpha_i + \beta_{i,_M} ERM + \beta_{i,_S} SMB_t + \beta_{i,_V} HML_t + \beta_{i,_R} RMW_t + \beta_{i,_C} CMA_t + \epsilon_{i,t} \textbf{(eq.6)}$$

The estimated model eq. (6.6):

$$R_{i,t} = \alpha_i + b_{i,_M} + b_{i,S} + b_{i,v} + b_{i,_R} + b_{i,C} + \epsilon_{i,t} \textbf{(eq. 6.6)}$$

Where the two last factors are the difference in returns in period t of diversified portfolio of stocks with robust and weak profitability. CMA is meant to measure the difference in returns for period $_t$ of diversified portfolios of conservative and aggressive firms with respect to the investment behavior. Like for the other three Fama French regression. [28]:

6.3 The intercept

6.3.1 The GRS statistic

To calculate the alphas I will use Ordinary Last Square regression (OLS) within time series data and OLS cross-sectional data or panel data. I will use the same for Multiple Linear Regression (MLR) when calculating with more than one parameter to calculate the alpha. There will also be used a GRS-test (Gibbon, Ross, and Shanken) or the F distribution, Which is calculated as [31]:

$$J_1 = \frac{(T-N-1)}{N}[1 + \frac{\widehat{\mu}_m^2}{\widehat{\sigma}_m^2}]^{-1}\widehat{\alpha}'\widehat{\sum}^{-1}\widehat{\alpha}$$

Under the null, J_I is unconditionally distributed around F, with N degrees of freedom in the numerator and T-N-1 degrees of freedom in the denominator. This test is used for time-series regressions. N regressions are run, which result in N different α, one for each asset. The GRS-test is used to eliminate the need to evaluate a model based on too many alphas. This F-test examines the hypothesis that all alphas from a set of time series regression are jointly equal to zero [31]. This test is performed because it is asymptotically valid where the GRS-test is valid for finite samples. If the intercept is not significantly different from zero, it will entail that the model captures all the priced risk factors [31].

In practice, this test will describe a new line at the efficient frontier, because the test statistic from the GRS-test measures the difference in the slope of the two lines in the model where we calculate the line for CAPM, also called CAL (capital allocation line), which measures the risk of risky and risk-free

assets. If the line from the GRS-test is above the CAL line, it can signal higher risk, also called β and vice versa below the line for lower risk [31].

6.3.2 Jensen's alpha

As the name suggests, Jensen's alpha (α) was introduced by Jensen (1967) [32]. Is used to to measure the risk-adjusted return of a security or a portfolio of securities in line with the expected market return from CAPM [32]. The higher the alpha, the better performance of a security or a portfolio of securities since it has earned more than expected return in CAPM. The alpha has become one of the key risk metrics used in the modern portfolio as stated in association for investment, management and research [32]. α is often estimated with OLS (ordinary least square) estimator and monthly data set, like in this case. The returns of the portfolio or securities are known to be normally distributed, especially with small sample size data sets, like for Fama (1965) [32]. This may help to raise concerns about the validity of the α estimates and investment decision making process with OLS estimator [32].

It was Jensen who proposed to add the y-intercept coefficient α to CAPM for explaining the possibility of superior forecasting knowledge from investors picking the securities that earn more than the risk premium for their levels of risk in the CAPM [32]. The model of CAPM is described in section 6.1. Jensen's α can be calculated as below:

$$\alpha_i = (r_{i,t} - r_{f,t}) - \beta_i(r_{m,t} - r_{f_t})$$

[32]

6.4 Data Description

The data used to calculate these regressions are collected from Eikon Reuters and, as mentioned earlier, Kenneth R. French website [33] The returns are collected from the database Eikon [34] This database is a terminal to collect data from different stock exchanges. From this database, data have been collected from the closing prices from the stocks listed on Oslo stock exchange for Norway and the stocks listed on Nasdaq stock exchange for USA. I have then calculated the closing prices into continuously compounded returns because this is the performed rate to use when calculating these regressions.

The continuously compounded return is log-returns, so the return across assets can more easily be compared. Compounded returns are time-additive compared to simple returns.

The rest of the parameters in these regressions are collected from the earlier mentioned Kenneth R. French. The parameters are the monthly data for the Fama French factors, market return and risk-free rate. To perform this regression, the Fama-French 5 factors for Europe have been used for the Norwegian portfolio, and 5 factor numbers for USA have been used in the portfolio for USA. Both of the data contains T-bills as the risk free return. Ordinarily, Norwegian state obligations would have been preferable to use as the example of risk free returns for the Norwegian portfolios. However, as there is a comparison with the US and it is desired to test for a term of ten years' monthly returns, it will make sense to use the T-bill rate as risk-free rate. Using the same base line makes it easier to compare portfolios between the two countries. For the two Norwegian portfolios there could have taken advantage of the data from Bernt Arne Ødegaard's website [35] However, as these data end in 2019, this source would have been missing data for three months, creating an incomplete picture. Therefore, it is determined to be right to use the data from Kenneth R. French website.

7 ESG analysis

All companies in the four portfolio have been evaluated according to the ESG criteria to compose a score for each company (See Appendix blablabla for details). The evaluation results in illustrations of the ESG score distribution in the four portfolios for Norway and USA. The purpose of this is to see if there are any significant differences between the ESG score for green companies compared to the ESG score for all other companies. It is sought to find out whether these scores actually rank these companies right and to see if there are some signals of greenwashing as described in section 3.2. The purpose of this analysis is to see whether the companies that have the highest ESG ranking are the companies that focus on traditional "green" activities: recycling, renewable energy and technology. According to Enova and Innovation Norway, it is the companies that have this focus that get extra support to develop projects aimed at reducing carbon emissions [17]. Before this analysis was made, the expectation was expectation that companies in the green portfolios would have the highest ESG-criteria score. Likewise, for the two portfolios with non-green companies, there should be lower scores overall because many of these companies operate in sectors like oil, gas, industries that produce environmentally hostile products, refining of oil, shipping and aviation. These are sectors which are heavily debated in politics and is labeled as environmental violators, something the companies in these sectors themselves disagree with.

For example, the fossil fuel industry exposed to the climate risk, such as Equinor (earlier Statoil), have invested huge in offshore and onshore wind farms beside their projects in oil exploration and production [18]. If companies like Equinor are ranked high on the ESG-score, this can be a signal of greenwashing by starting many green projects in an attempt to compensate for the carbon emission the other projects generate - at least in terms of their public image. Since the ESG criteria measures the degree of green investments, this can have an impact on the score and make the company seem more environmentally friendly than it really is.

An extended ESG tool developed by Reuters is made to identify companies that are involved in products such as alcohol, tobacco and armaments. These parameters combines ESG metrics with other factors like model scores try to identify ethical investment opportunities. [34]

ESG combined score			
ESG score			ESG controversies score
Environmental	Social	Governance	ESG controversy
Resource use	Workforce	Management	controversies across
Emission	Human rights	Shareholders	all 10 categories are
Innovation	Community	Corporate social	aggregated in one
	Product responsibility	Responsibility (CSR) stratgy	category score

Reuters then ranks this data by grades where the highest possible grade is A+ and the lowest is D-. The combined ESG scores provide a rounded and comprehensive scoring of a company's ESG performance, based on the reported information pertaining to the ESG pillars, with an "ESG controversies" overlay captured from global media sources. This score is used to discount the ESG performance score based on negative media stories. It does this by incorporating the impact of significant, material ESG controversies in the overall ESG score. [34]

When companies are involved in ESG controversies, the extended ESG score is calculated as the weighted average of the ESG scores and ESG controversies score per fiscal period, with recent controversies reflected in the latest completed period. When companies are not involved in ESG controversies, the extended ESG score is equal to the ESG score. [34]

The controversies score is calculated based on 23 ESG controversy topics. During the year, if a scandal occurs, the company involved is penalized and this affects their overall ESG score and grading. The impact of the event may still be seen in the following year if there are new developments related to the negative event; e.g lawsuits, ongoing legislation disputes or fines. All new media materials are captured as the controversy progresses. The controversies score also addresses the market cap bias from which large cap companies suffer, as they attract more media attention than smaller cap companies. [34]

The conversion from a percentile score to a letter grade is based on the table below.

Score range	Grade	Description
0.0 <- score <- 0.083333	D -	"D" score indicates poor relative ESG performance and insufficient degree of transparency in material ESG data publicly.
0.083333 < score <- 0.166666	D	
0.166666 < score <- 0.250000	D +	
0.250000 < score <- 0.333333	C -	"C" score indicates satisfactory relative ESG performance and Moderate degree of transparency in reporting material ESG data publicly
0.333333 < score <- 0.416666	C	
0.416666 < score <- 0.500000	C +	
0.500000 < score <- 0.583333	B -	"B" score indicates good relative ESG performance and above average degree of transparency in reporting material ESG data publicly
0.583333 < score <- 0.666666	B	
0.666666 < score <- 0.750000	B +	
0.750000 < score <- 0.833333	A -	"A" score indicates excellent relative ESG performance and high degree of transparency in reporting material ESG data publicly
0.833333 < score <- 0.916666	A	
0.916666 < score <- 1	A +	

7.1 Data description

There are used second-hand ESG data from the analysis program Reuters Eikon Reuters where this program contains main characteristics for each company in these four portfolios for Norway and USA. These extended ESG-criteria are used to illustrate the grades for all companies and delegate them in a illustrated diagram to get an overview of how sectors and companies scores on these criteria.

Part IV

Results

8 ESG analysis

To find out whether or not a stock is green, the investors should be able to rank the company by ESG criteria where A+ is the highest and D- is the lowest possible score. First, the ESG criteria for Norwegian companies are reviewed. The companies included in the green portfolio will be measured according to these criteria and then presented in a graph. This will also be done for the portfolio that does not include green companies. The same process will also be done for the green and non-green portfolio for the United States. Finally, the results for Norway and the United States will be compared.

8.1 ESG scores for the Norwegian portfolios

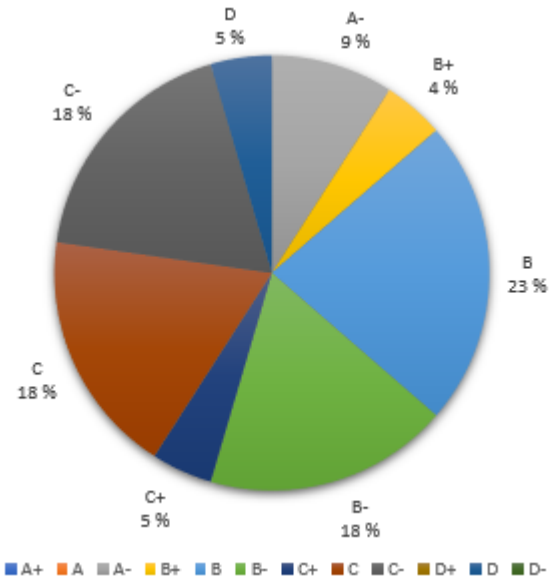


Figure 6: ESG score for Norwegian companies in the portfolio that are considered green. Author's illustration using data from Reuters [34]

Figure 5 shows the representative sample of 100 companies in the Norwegian "green" portfolio described in Section 7. These companies are in the sectors bank, finance, renewable energy, recycling and technology. It was expected that companies in these sectors would get higher grades than the portfolio with non-green stocks. From the figure it appears that the highest grade,

awarded to 9% of the companies inside the portfolio, is -A. The lowest grade is D, awarded to 5% of the companies. The companies that score lowest are found in the energy sector and some of the companies that score highest are in the technology sector and finance. Most of the companies are scored B,-B and -C. To see the scoring of individual companies, conf. the ESG grade in Appendix.

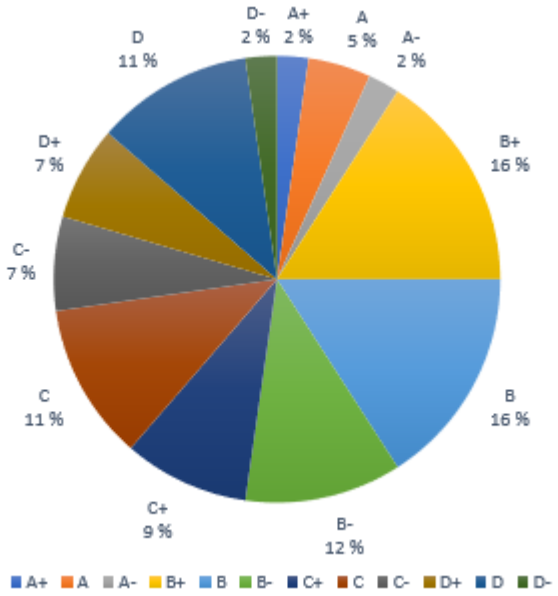


Figure 7: ESG score for all Norwegian companies in the "other" portfolio. Author's illustration using data from Reuters [34]

Figure 6 shows the ESG scores for the 100 companies in the Norwegian "non-green" portfolio described in Section 7. The companies in this portfolio operate within seafaring, farmed salmon, oil and gas, shipping, refining oil, product industry, property, service aviation, medicine and media. It was expected that companies in these sectors would get lower grades than the portfolio of green stocks. From the figures it appears that the highest grade for this portfolio is +A, a score not achieved in the "green" portfolio. What is interesting here is that one of the two companies with this score operates primarily in the field of oil and gas. The two companies are Equinor and Norsk Hydro. The two companies with the lowest ranking, D-, are also from the oil and gas sector, like Northern Drilling. Other companies ranked as D, 11% of the portfolio, represent a variety of fields, for example the property sector. Most of the companies are ranked between B+ and B-, which are very high scores considering that these companies are categorized in the non-green

portfolio.

From the test results it can be concluded that ESG scores alone are not sufficient to determine whether a company is truly green. Companies operating primarily in non-green sectors such as oil and gas can receive a higher ranking than companies operating within recycling and renewable energy. This is clearly against the intention of the ESG criteria, and may suggest either a weakness in the methodology or a degree of greenwashing on the part of non-green companies. If the latter is the case, it is an interesting observation that the companies in the "green" portfolio do not take advantage of greenwashing to bolster their ESG scores.

8.2 ESG scoring for USA portfolios

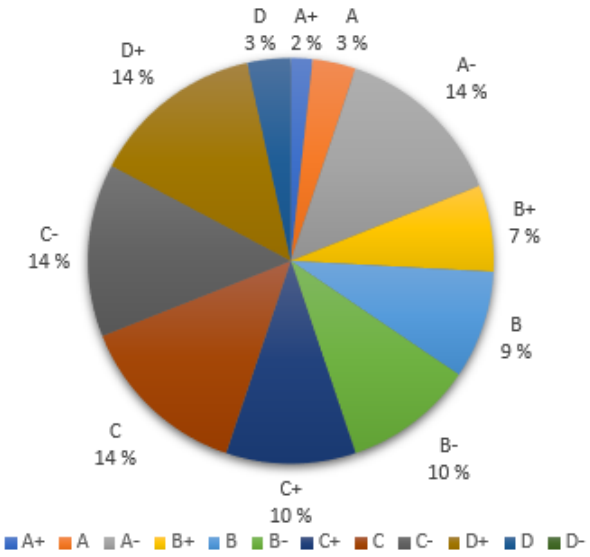


Figure 8: ESG score for companies in the US "green" portfolio. Author's illustration using data from Reuters [34]

Figure 7 shows the ESG scores for the green portfolio of USA companies. The companies in this portfolio are from sectors such as banking, technology, renewable energy and finance. Like with the green portfolio for Norway, it was also expected that these companies should be ranked higher than those in the non-green portfolio. As seen in Figure 7, the companies score between the highest A+ down to D, which is in line with expectations. The companies

that rank highest represent sectors such as technology, for example Microsoft, which holds the highest ESG score. For the "ESG combined" score, Microsoft ranks somewhat lower at C+ (see Appendix). The grade A+ is given to 2% of the portfolio, while the lowest grade D is seen in 3% of the portfolio. The D grade includes companies from sectors such as finance, here we have companies like TPG RE finance Trust. The rest of the companies lie between D+ and C+.

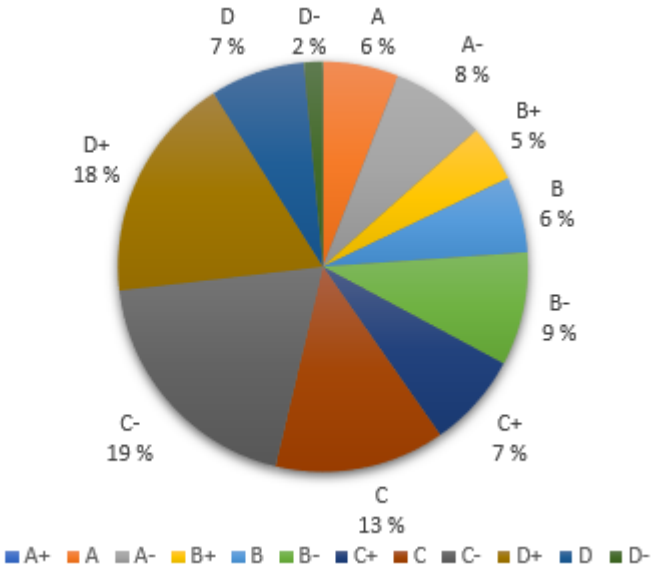


Figure 9: ESG companies in the US "other" portfolio. Author's illustration using data from Reuters [34]

Figure 8 shows the ESG scores for the companies belonging to the portfolio for non-green stocks. The portfolio includes companies operating in the sectors seafaring, oil and gas, farming, product industry, services, refining of oil, property, media, medicine, shipping and aviation. In this model, we see that the companies only go up to the A grade at the highest and D- at the lowest (appendix). It is not surprising that no companies in this portfolio reaches all way up to A+. These companies, as they appear in the literature, produce larger amount of carbon emissions. Sectors such as oil and aviation are also much debated.

Compared to the Norwegian portfolios, the US portfolios show a grade distribution more in line with expectations. The highest score of A+ is found within the green portfolio but not the other. Conversely, the "other" portfolio contains the grade D- which is not seen in the green portfolio. Likewise,

there is a greater proportion of companies ranked A+ to B- in the green portfolio than in the other portfolio, and a smaller proportion of grades C+ to D. Signs that could suggest greenwashing (or model deficiencies) are not as clear and present as in the Norwegian portfolios, as the green portfolio generally scores higher than the non-green portfolio.

8.3 Comparison ESG criteria between Norway and USA

There are some similarities between the portfolio for Norway and the portfolio for USA, but also some differences. By comparing the green portfolio for Norway with the green portfolio for USA, it appears that the spread between the scores is higher for USA than for Norway. The USA has scores starting from +A to not lower than score D, while for the Norwegian green portfolio, have no companies that scores above -A, which is two letters below the highest possible score. This may signal that the "green" companies in the USA are more focused on the environment, carbon emission and social responsibility than the Norwegian companies. This may have a possible connection with the report from the Norwegian government [17], who will start measuring companies that initiate green projects. The lowest grade found in the Norwegian green portfolio is D, this is the same as for the portfolio for USA. For the Norwegian portfolio it appears that the average of companies lies between the scores of B and C, while for USA the average lies between A and +C. This shows that the USA green companies score higher on average than those in Norway.

When it comes to the non-green portfolios for USA and Norway, the Norwegian portfolio displays grades from A+ down to D-, while the portfolio for USA grades between A and D-. Unlike the green portfolios, there is not as great a difference here. Both portfolios also have companies that score equally low. It is interesting to see that these companies score higher than first thought. But for USA, a larger proportion of companies are in the range between C and D, while the average of the companies for Norway is in between +B and -B. This indicates that the average of the companies different based on the portfolios of these two countries. Taken at face value, this signals that the Norwegian companies in these sectors have a higher focus on the environment, emissions and social responsibility, but it can also raise questions about greenwashing.

9 Matching method

This section presents the results from the matching approach. The purpose of this analysis is to estimate whether the green shares are overpriced compared to other stocks, both for Norway and USA. To do this, it was necessary to first find a suggested definition of green stocks from the theory, since there is no clear definition on what this is as shown in Section 2.1. Then the green shares are measured according to the ESG criteria. A portfolio has been created for green shares and a portfolio for other shares, for both countries. The basis for the green portfolio to be measured against the equity portfolio for all other companies is to see of there is any connection between green companies and other companies, both in a relation to price but also to the ESG criteria. The methods employed are described in Section 7. The results that appear according to ESG criteria for green and non-green companies will be interesting when measuring the level of social responsibility and environment for each portfolio.

9.1 Green and non-green portfolios for Norway

When using OLS (Ordinary least square) regression, it is important that the explanatory variables do not have to high correlation, because when we includes more explanatory variables to the model it is important that these variables are independent of each other, since the $\beta's$ will explain the dependent variable excess return. For example if two or more variables correlate 100%, this is called for perfect multicollinearity. When we have perfect collinearity, the explanatory variables will only describe each other. This is not desirable because the consequences of perfect multicollinearity can lead us to unstable coefficients and the model will not have enough unique variables to work as intended. In addition to unstable coefficients, the model will also give correspondingly high p-values. Because it becomes difficult to distinguish between which variables explain what. The best will be as low correlation between the variables as possible, so that the model does not become superior [28]

Table 1 Correlation between the factors, time series data

Panel A describe the correlation between the variables for the green portfolio, the factors are the Excess return for the portfolio, CAPM, Fama French three-factor and the Carhart's four-factor model.
For the time period 2010-2020.

Panel B shows the correlation between the variables for the other portfolio, the factor is the same as for the green portfolio, but I have changed the excess return green with other for the same time period.

Panel A	Green	ERM	SMB	HML	RMW	CMA
Green	1.000					
ERM	-0.026	1.000				
SMB	-0.034	0.103	1.000			
HML	0.009	0.471	0.089	1.000		
RMW	-0.007	-0.297	-0.068	-0.762	1.000	
CMA	0.014	0.069	-0.128	0.646	-0.484	1.000

Panel B	Green	ERM	SMB	HML	PR1YR
Green	1.000				
ERM	-0.026	1.000			
SMB	-0.033	0.103	1.00		
HML	0.009	0.470	0.089	1.00	
PR1YR	-0.014	-0.416	-0.030	-0.510	1.00

Panel C	Other	ERM	SMB	HML	RMW	CMA
Other	1.000					
ERM	-0.066	1.000				
SMB	-0.103	0.075	1.000			
HML	0.047	0.476	0.080	1.000		
RMW	-0.039	-0.316	-0.073	-0.770	1.000	
CMA	0.096	-0.069	-0.118	0.639	-0.483	1.000

Panel D	Other	ERM	SMB	HML	PR1YR
Other	1.000				
ERM	-0.066	1.000			
SMB	-0.103	0.075	1.000		
HML	0.046	0.475	0.080	1.000	
PR1YR	-0.007	-0.404	-0.021	-0.502	1.000

Table 1, panel A, shows the correlation between the variables from the CAPM, Fama- French three- factor and the five- factor model with the dependent variable green, which stands for green portfolio. for time period 2010-2020. Table 1, panel B, shows the correlation between the variables from the Carhart four- factor model for the time period 2010-2020. In panel a there are no variables that have perfect multicollinearity, the same also applies to the values in panel B. By comparing panel A with B then there will be a high correlation between Green and ERM with correlation -0.26, and for HML and Green with 0.009, for CMA and PR1YR with 0.014 and -0.014, for ERM and SMB with 0.103 and for SMB an HML with 0.089.

Table 1, panel C, shows the correlation between the Fama-factors and the dependent variable other, which stands for non-green portfolio, some includes the portfolio with all other companies. The same is for table 1, panel D, but here we have the Carhart four- factor model. Like the other model, is it not

perfect multicollinearity in model C or in model D. But across the models we have high correlation, like for ERM and Other with -0.066, Other and SMB with -0.103, ERM and SMB with 0.075 and for SMB and HML with 0.080.

This data have some challenges with high colinearity, although it is not necessarily perfect collinearity. But, because there is high correlation across panels A and panel B. Then these explanatory variables can help to provide superiors regressions.The challenge with superiors regression is that there will be challenges associated with the estimation of alpha, in that the values for alpha may be incorrect and the result will then not be durable. Therefore, the variables will be estimated based on the variables from each panel to avoid perfect multicollinearity.

Table 3 is a analysis of the intercept. In panel A are the intercepts alphas for the green portfolio and in panel B are the intercepts alphas for the other portfolio.

This table report the alpha, the standard deviation and the calculated GRS-statistics and its corresponding p-value [36]. This intercept is estimated in a time-series data and the meaning with performing a GRS-test by running an OLS regression are to testing whether the alphas are jointly zero. The test is performed by using the GRS-test to test the null hypothesis that all intercept for these four models CAPM, Fama French three, Carhart four and five-factors model are jointly equal to zero or $H_0 : \alpha_i = 0$ for all $_i$ [35]. If the null hypothesis is not rejected, then the intercept is not jointly significantly different from zero and the models include all priced risk factors [36]. As earlier mentioned under the Methodology section, if the null hypothesis is rejected, the model suggests abnormal returns. That means the model does not include all the priced risk factors. The GRS F test gives almost exactly the same rejection probability as does the asymptotic χ^2 test [36].

Table 2: Statistics for time – series intercept, time series data

Panel A shows the regression for the green portfolio, the first column describes the sample year used for this model. The second column describe which model the data is reported for. The third column present the estimated time-series alphas. The fourth column present the estimated time-series alphas with flexibility by AR(1). The fifth column present the std. deviation of the estimated time-series intercept. The sixth column reports the GRS-statistics, there the last column is the p-value for GRS-test. The alphas are estimated for the time period 2010-2020.

Panel B, shows the regression for the non-green portfolio, the panel contain the same columns that are estimated in panel A, but for non-green stocks. The alphas are estimated for the same time period 2010-2020.

Panel A		|α|	|$\overline{\alpha}$|	Qα	GRS-stat	p - GRS
2010	CAPM	-0.015	-0.015	0.051	0.128	0.720
-2020	FF3	0.216	0.216	0.000	0.545	0.460
	C4	0.392	0.392	0.000	2.186	0.139
	FF5	0.212	0.212	0.000	0.496	0.481

Panel B		|α|	|$\overline{\alpha}$|	Qα	GRS-stat	p - GRS
2010	CAPM	0.147	0.147	0.000	0.130	0.718
-2020	FF3	1.175	1.175	0.000	18.257	0.000
	C4	1.172	1.172	0.000	16.234	0.000
	FF5	1.107	1.107	0.000	15.649	0.000

In Table 3, it is shown that the GRS statistics are not jointly zero for either the green portfolio or the other portfolio. A high p-value for the GRS test would indicate that we could not reject the null hypothesis that the intercepts are jointly zero. From the models it is shown that, the Fama French five-factor model has a larger GRS statistics than the p-value. Which means that we reject the null hypothesis that the intercepts are jointly zero. This means that the excess return in these five models are not satisfactory explained by risk factors included in the model. For the CAPM it appears that the GRS statistics is lower than the p-value, which means that this model include priced risk factors. This model cannot be rejected.

For the other portfolio, it shows that the GRS statistics also here are larger than the GRS p-value for all Fama-French factors models, Which means that we reject the null hypothesis that the intercepts are jointly zero. which means that the excess return for these models are not satisfactory explained by risk factor included in the model. Expect for the CAPM model, this model cannot be rejected and include all priced risk factors.

Analyzing for returns for the portfolios a Jensen's alpha greater than zero. The portfolio will give a systematically higher return than what the to the capital value model predicts, when the alpha is higher than zero. It will be the opposite for an alpha lower than zero. For the green portfolio based on

the CAPM calculation, it seems that this model give systematically lower returns than the capital value model has predicted. Based on the estimated alpha of ca. -0.05%, while for the Fama French models which are extensions of the CAPM formula. Which takes in several parameters, the model shows that, the alpha is grater than zero for all Fama-factor by FF3: 0.22%, C4: 0.39% and FF5: 0.21%. And it turns out that the Carhart four-factor model is the one with the highest return by 0.39%. And the portfolio based on the Fama-French factors will be over priced. But by simply considering the CAPM model it will be interpreted as under priced. The reason for this may be based on that the Fama-French factors has several factors that make the model stronger and therefore we get a different result.

While for panel B, the other portfolio it seems that all models calculate a higher alpha than zero. It means that this portfolio will give higher return than predicated for CAPM and Fama-French models. The model that gives highest return is the Fama-French three-factor model with ca 1.18% and the lowest is for the CAPM model by ca 0.14%.

Table 2.1: Statistics for time – series intercept, time series data

Panel A shows the regression for Equinor, the first column describes the sample year used for this model. The second column describe which model the data is reported for. The third column present the estimated time-series alphas. The fourth column present the estimated time-series alphas with flexibility by AR(1). The fifth column present the std. deviation of the estimated time-series intercept. The sixth column reports the GRS-statistics, there the last column is the p-value for GRS-test. The alphas are estimated for the time period 2010-2020.

Panel B, shows the regression for the non-green portfolio, the panel contain the same columns that are estimated in panel A, but for Norsk Hydro. The alphas are estimated for the same time period 2010-2020.

Panel A		|α|	|$\bar{\alpha}$|	Qα	GRS-stat	p - GRS
2010 -2020	CAPM	0.911	0.911	0.512	84.758	0.720
	FF3	-0.009	-0.009	0.021	0.364	0.545
	C4	0.229	0.229	0.034	3.482	0.062
	FF5	0.237	0.237	0.001	4.204	0.040

Panel B		|α|	|$\bar{\alpha}$|	Qα	GRS-stat	p - GRS
2010 -2020	CAPM	0.069	0.069	0.489	0.103	0.748
	FF3	0.265	0.265	0.617	8.539	0.003
	C4	0.485	0.485	0.754	30.650	3.133e
	FF5	0.492	0.492	0.732	34.507	4.323e

Since the portfolio of non-green companies seems to have a higher return than the green portfolio. The fact that the oil company Equinor whose main task is to produce oil and gas, and Norsk Hydro, whose main task is to

produce aluminium score highest on the ESG criteria. I have here in table 3.1, chose to make price models for only these two shares with a maturity from 2010 to 2020. From the results it emerges that, with the capm model, the share of equinor gets an increased return of 0.91% and for Norsk Hydro it is only 0.07%. Although equinor for somewhat lower returns depending on which model is used. Will equation of Equinor surpass Norsk Hydro. This can be a possible driver of the portfolio with the other returns is so much higher priced than the portfolio of green stocks. Had I added Equinor to the green portfolio, it would have had a higher return. Financial institutions that makes portfolios and funds, will have a real probability of getting a higher return by adding Equinor to the portfolio and based on the ESG criteria it would also be right. So the question of greenwashing still stands.

9.1.1 Summary statistics

The summary statistics shows the descriptive statistics of the exogenous variables. This has been done because the descriptive statistics helps to simplify larger amounts of data. Each descriptive statistic reduce data into simpler summary. This model shows how well each factor explains the dependent variables Green, which is excess return to portfolio green and the variable other, which is excess return to portfolio non-green

Table 2 shows the descriptive statistics of the excess return variable and the exogenous variables. One for the green portfolio and one for the other portfolio. From the table it appears that PR1YR from the green portfolio has the highest estimated mean of 0.99 ca. 1%, and HML has the lowest on -0.47%. While for the other portfolio it seems that the PR1YR is the lowest estimated mean here of -0.99 ca. -1% and the highest is RMW with 0.38%. Between the two portoflios, it is the green portfolio that have the highest mean. It seems that it is low dispersion in the mean estimates.

The other variable and green variable naturally stands out, because these are the dependent variables.

Table 3: Summary statistics of the returns, time series data

Table 2 describe the statistics for monthly excess returns for the variables and factors in the green and other portfolios.

Green portfolio:

Variable	Mean	Min	Max	std. Dev	Obs
Green	-0.04	-372.29	378.28	21.33	9,403
ERM	0.33	-13.93	10.01	4.30	9,403
SMB	0.06	-4.32	4.22	1.48	9,403
HML	-0.24	-7.13	5.12	2.89	9,403
PR1YR	0.76	-6.92	7.10	2.52	9,403
RMW	0.386	-2.71	2.99	1.14	9,403
CMA	-0.05	-4.12	2.33	2.04	9,403

Other portfolio:

Variable	Mean	Min	Max	std. Dev	Obs
Other	-0.05	-1009.06	417.63	28.50	20,903
ERM	0.35	-13.93	10.01	4.30	20,903
SMB	0.07	-4.32	4.22	1.49	20,903
HML	-0.23	-7.13	5.12	1.85	20,903
PR1YR	0.77	-6.91	7.10	2.52	20,903
RMW	0.36	-2.71	3	1.48	20,903
CMA	-0.03	-4.12	2.33	1.03	20,903

9.2 Result for green and non green portfolio USA

For the two portfolio for USA, then the same procedure has been used as for the two Norwegian portfolios.

Table 1 Correlation between the factors, time series data

Panel A shows the correlation between the variables and factors for the green portfolio return, the Variables are the excess return for the portfolio, CAPM, Fama French-factor and the Carhart's four-factor model. Monthly data from 2010-2020

Panel B shows the correlation between the variables for the other portfolio, the factor is the same as for the green portfolio, but I have changed the excess return green with other for the same time period.

Panel A	Green	ERM	SMB	HML	RMW	CMA
Green	1.000					
ERM	-0.035	1.000				
SMB	-0.008	-0110	1.000			
HML	-0.031	0.276	-0.087	1.000		
RMW	0.012	-0.277	0.034	-0.688	1.000	
CMA	-0.048	-0.096	-0.096	-0.584	-0.306	1.000

Panel B	Green	ERM	SMB	HML	PR1YR
Green	1.000				
ERM	-0.034	1.000			
SMB	-0.008	-0.110	1.000		
HML	-0.031	0.276	-0.087	1.000	
PR1YR	-0.012	-0.323	0.194	-0.518	1.000

Table 1, panel A, shows the correlation between the variables from the CAPM, Fama-French three-factor and five-factor. There the variable green is the excess return variable and this panel is for the green portfolio for the time period 2010-2020. Panel B, shows the correlation between the variables from the Carhart four-factor model. There the variable green also are the excess return within the same sample period. In panel A, there is variable that are very high correlation for ERM and SMB for CMA with -0.096, for panel B, there is the correlation lower between the variables int the panel.

Between panel A and panel B we have more than one variables that have high correlation as for SMB and green with -0.008, for green and HML with -0.031, or ERM and SMB with -0.110, for ERM and HML with 0.276 and

SMB and HML with -0.087.

Thus may increase the likelihood of encountering spurious regression.

Panel C	Other	ERM	SMB	HML	RMW	CMA
Other	1.000					
ERM	-0.049	1.000				
SMB	-0.060	-0.129	1.000			
HML	0.034	0.280	-0.085	1.000		
RMW	-0.025	-0.297	0.027	-0.685	1.000	
CMA	-0.043	-0.089	-0.087	-0.576	-0.293	1.000

Panel D	Other	ERM	SMB	HML	PR1YR
Other	1.000				
ERM	-0.049	1.000			
SMB	-0.060	-0.129	1.000		
HML	0.023	0.280	-0.085	1.000	
PR1YR	-0.016	-0.317	0.193	-0.514	1.000

Table 1, panel C, shows the correlation between the variables and factors for CAPM and Fama-French three and five-factor model and the variable other is different form panel A and B. While panel D, shows the correlation between the variables and the factor for the Carhart four-factor model with the excess return variable other. In panel C, there is some of the variables highly correlated but not perfectly correlated to each other. Because there are no sample variation that can be explained by the other independent variables in the regressions.

For panel D, we also have some variables that have high correlation with each other, but none can perfectly explain the other. between the panels we also have high correlation between other and ERM with -0.049, other and SMB with -0.060, with ERM and SMB with -0.129, with ERM and HML with 0.280 and for SMB and HML with -0.085. These are variables i must take into account when estimating regression to avoid collinearity. Therefore, it is important to consider the possibilities for superiors regressions. And remove this if it occurs.

Table 2: Statistics for time – series intercept, time series data

Panel A shows the regression for the green portfolio, the first column describes the sample year used for this model. The second column describe which model the data is reported for. The third column present the estimated time-series alphas. The fourth column present the estimated time-series alphas with flexibility by AR(1). The fifth column present the std. deviation of the estimated time-series intercept. The sixth column reports the GRS-statistics, there the last column is the p-value for GRS-test. The alphas are estimated for the time period 2010-2020.

Panel B, shows the regression for the non-green portfolio, the panel contain the same columns that are estimated in panel A, but for the non-green portfolio. The alphas are estimated for the same time period 2010-2020.

Panel A		|α|	|$\bar{\alpha}$|	Qα	GRS-stat	p - GRS
2010	CAPM	0.013	0.016	0.000	0.111	0.738
-2020	FF3	-0.049	-0.047	0.012	0.694	0.404
	C4	0.194	0.194	0.015	1.142	0.285
	FF5	0.115	0.115	0.000	0.203	0.651

Panel B		|α|	|$\bar{\alpha}$|	Qα	GRS-stat	p - GRS
2010	CAPM	0.065	0.065	0.000	0.008	0.928
-2020	FF3	0.325	0.327	0.000	2.770	0.096
	C4	0.389	0.389	0.000	3.770	0.052
	FF5	0.548	0.548	0.000	8.006	0.005

Same as for the two portfolio for Norway, table 3, shows two panel A and B for the green and non green portfolio. Panel A, shows the alphas for the green portfolio. The GRS-tes is testing whether the alpha is jointly equal to zero or not. From the Grs statistic it appears that only Fama-French three-factors and the Carhart four-factor model can reject the null hypothesis and has unexplained abnormal returns. While for CAPM and Fama-French we fail to reject the null hypothesis and these model has included all price risk factors.

Panel B, shows the alphas for the non green portfolio. When testing for GRS for this portfolio, it appears that we reject the null hypothesis for all Fama-french factors and we fail to reject the null hypothesis for the CAPM model. Which means that the Fama-French factors has unexplained abnormal returns, while CAPM include priced risk factor.

For the Jensen's alpha it seems that for panel A, that CAPM, Carhart four-factor and Fama-French five-factor give higher return than the capital value model predict. While the Fama-French three-factor gives negative return. This indicate that the green portfolio is overpriced for the CAPM, Carhart and Fama-French model. While the Fama-French three-factor model is under priced.

Regarding panel B, alpha seems to be higher than zero for all estimated models. Considering that this panel is for the non green stock portfolio, it shows that it is over priced for all factors. While the Fama-French five factor is the model that gives the highest return of 0.58% and the Carhart four-factor gives the lowest return of 0.38%. By this is meant that you as an investor will get 58% more return than predicted according to the Fama-French five-factor model, if the model holds.

9.2.1 Summary statistics of the returns

Table 2 shows the descriptive statistics of the excess return variable an the exogenous variables, like the summary for the Norwegian portfolios. From the table for the green portfolio, it is shown that the PR1YR has the highest estimated mean of 0.75 or ca. 0.76% and HML has the lowest with -0.24 or ca. -0.25%. For the other portfolio is the PR1YR facotr also the variable with highest mean of 0.77% and the variable with lowest mean is HML with -0.22 or ca 0.23%.

Between the portfolios, it appears that the other portfolio have the variable with the highest mean. But both portfolios have the same variable PR1YR with the highest mean. While the green portfolio have the variable with the lowest mean,but as for the latest variable. This variable with the lowest mean also are the same for both portfolios, HML.

The variable other and green, same as for the two Norwegian portfolios. These two variable stands out because they are excess returns.

Table 3: Summary statistics of the returns, time series data

Table 2 describe the statistics for monthly excess returns for the variables and factors in the green and other portfolios.

Green portfolio:

Variable	Mean	Min	Max	std. Dev	Obs
Green	-0.06	-621.99	450.25	27.43	8,427
ERM	0.30	-15.44	11.88	4.84	8,427
SMB	0.12	-5.09	4.73	1.68	8,427
HML	-0.47	-10.96	6.36	2.45	8,427
PR1YR	0.99	-8.97	8.95	2.80	8,427
RMW	0.38	-3.85	3.48	1.53	8,427
CMA	-0.18	-4.1	2.95	2.23	8,427

Other portfolio:

Variable	Mean	Min	Max	std. Dev	Obs
Other	-0.01	-1009.06	431.04	34.18	9,239
ERM	0.34	-15.44	11.88	4.82	9,240
SMB	0.13	-5.09	4.73	1.67	9,240
HML	-0.44	-10.96	6.36	2.44	9,240
PR1YR	-0.99	-8.97	8.95	2.79	9,240
RMW	0.38	-3.85	3.48	1.54	8,240
CMA	-0.16	-4.10	2.95	1.22	9,240

9.3 Comparison between the results for Norway and USA

For the green and non-green portfolio for Norway, shows the correlation matrix that the models contain for green portfolio have a number of variables with a high correlation. Not perfectly correlated or multicollinear, but near, while the models for non-green portfolio contains more highly correlated variables than the green portfolio. Which will make it difficult for the model to give results that are completely credible. But the models will be able to give a result that provides an indicator of the pricing of the shares. For the green and non-green portfolio for USA, we have a larger share than for the Norwegian portfolios. Where the variables are highly correlated but not perfect

collinearity. While the portfolio that does not contain green stocks does not contains as many highly correlated variables. This will mean that the model for non-green shares will have a stronger explanatory power tan for the green portfolio. For Norway it is the other way around.

For table 3, for the green and non-green portfolio for Norway and USA, it appears that the GRS test for both countries. Is the CAPM model estimates that are closest to zero and have the lowest values of all estimated models. The CAPM model differs somewhat from the other models, both for Norway and for the USA in both GRS test but also for the alpha value. For both countries, alpha is almost zero in the CAPM model but the CAPM is negative for the green portfolio for Norway, while it is positive for USA. For the non green portfolio the alpha for the CAPM model is positive for both. This means that the return is higher than predicted. The model with highest alpha and GRS statistic for the Norwegian non green portfolio is the Fama-French five-factor. For the other portfolio it turns out that it is the Fama-French three-factor model that has the highest GRS stat. The highest alpha is the Carhart four-factor model, both for the green and non-green portfolio. For USA it seems that, it is the Carhart four factor model that have the highest GRS statistic for the green portfolio. For the alpha it appears to be the Carhart four-factor model, which is in common with the green portfolio for Norway. For the other portfolio is it is the Fama-French four factor that have the highest GRS statistics as for the green portfolio for Norway. It is the same model that have the highest alpha, unlike Norway. But unlike USA, have it for the non-green portfolio been selected two shares that are being tested in more detail, on the basis of signals about greenwashing.

For the summary statistics for both country, it shows that for the Norwegian portfolio it is the PR1YR some have the highest mean for the green portfolio and the lowest for the non-green portfolio. While ERM has the has the highest mean for the non-green portfolio and HML has the lowest mean for the green portfolio. For USA, it is PR1YR some have the highest mean in line with the green portfolio for Norway. While PR1YR also have the highest mean for the non-green portfolio. The variable CMA has the lowest mean for the green portfolio and the variable Other has the lowest mean for the non-green portfolio.

Part V

Discussion

The aim of this chapter is to answer the research questions, which were asked in the introduction, section 1.1. The research questions are:

- What is the formal definition(s) of green finance?
- Does improving a firm's environmental performance result in a higher stock price?
- Is there a difference in green investment between Norway and USA?

9.4 Green finance

To find a formal definition of what green finance is, it was necessary to understand what the very concept of finance is, which also referred to as financial economics. As shown in sections 2 and 2.1, it turns out there exists no formal definition of what green finance is. This is because green finance can be expressed differently depending one one's point of view. The governments' action plan for the USA and Norway focus more on historical and current level of emissions than on plans for reducing the emissions in the future. The Norwegian government also focuses on motivating companies to start projects that are environmentally friendly. The report mentions also the importance of the company taking social responsibility, but it does not provide clear guidelines on how this should be done, which means that the companies themselves must interpret what constitutes green projects. The Norwegian government mentions an objective regarding what is required for a green project, expressed as a goal of having the lowest possible carbon emissions. Beyond that, the companies are relatively free to interpret what "green" means. This may be a possible explanation for why the proposals for a definition of green finance differs widely - there is no agreed-upon definition to anchor the term. It is also worth reflecting on, that the importance of economic growth and that companies should actually be able to make money on the green project have been given a lower focus area than they should have. The purpose of the green project is that they should be profitable for

the company even without tax breaks and government support. Therefore, the author of this paper has come up with a proposal for a definition which also focuses on profit and economic growth, section 2.1. It has also been noticed that some of the proposed definitions from the literature, focus on the individual or their sectors' point of view.

9.5 Are the portfolios overpriced or underpriced?

By using the capital asset pricing model (CAPM), Fama-French three, Carhart four and five-factor models to estimate the alpha, one will be able to use the alpha value to measure risk-adjusted return for this portfolio in line with expected market returns, as explained in section 6.3.2. The alpha makes it possible to find out whether the portfolio has earned more than the expected return in this models. In the analysis of alpha for the green and non-green portfolio for Norway, it has been observed that the non-green portfolio also called "other" had a higher average alpha for all its models compared to the green portfolio. This was sensational because it was initially expected that the green portfolio should have a higher alpha than the non-green portfolio, based on the fact that green stocks and funds have received such great focus on the Norwegian market. Based in the ESG analysis, which aimed to measure the ESG criteria for the shares, it emerged that Norsk Hydro and Equinor were the two companies that were ranked highest, also higher than the companies in the green portfolio. This raised the question of whether this would have an impact on the returns. Therefore, a CAPM, Fama-French three, Carhart four and five-factor was performed on these two companies only. For Equinor the alpha values were very high in contrast to Norsk hydro. Which means that Equinor earns more than the expected return in CAPM, Carhart four and five-factor model. Fama French three factor differed from the remaining factors. But if we start from the other three models, the ESG criteria and the high return values can give a signal about greenwashing, see section 8. Equinor has received an unexpectedly high score considering the fact that its primary task is the production of oil, which is associated with large carbon emissions. It seems that there may be a possibility that their green activities overshadow their primary activity in the ESG analysis. The alphas of Norsk Hydro are also all positive but do not have as high value as Equinor. There are many indicators that companies like this can help create high returns. By looking at the green portfolio, it also creates negative returns for the CAPM model at first glance. But it turns out to be positive if we add to several factors in the model. There are many indications that

green funds today contain companies from oil sector, and that they help to create the illusion that the green funds and shares are more overpriced than they actually are.

The two portfolios for the United States forms a different image of the return on the green and non-green portfolio. Here, too, the non-green portfolio has a somewhat higher alpha than the green portfolio but not as high as the Norwegian non-green portfolio. This may indicate that the American companies have had a greater focus on environment and social responsibility, or that the extent of greenwashing is lower for American companies than for the Norwegian. It could have helped the analysis to further examine some single companies in these portfolios as well, but the author's knowledge of this market is less than for the Norwegian. The US also has a much larger stock market than Norway, meaning single companies are less likely to affect the overall picture of the market.

Considering the models used, it is important to consider that for example the CAPM formula is much debated concerning its accuracy when calculating whether a stock or a portfolio is under priced or over priced. This is the one of the reasons for using the other models with an extended number of factors, both for analysing the USA and Norway.

Based on the GRS test for Norway, it appears that the null hypothesis is rejected for most models treating both portfolios. This means that the portfolios are less efficient than suggested by the CAPM model. For USA, it shows that the green portfolio is more efficient than the non-green portfolio. This indicates that the green portfolio for USA may have a lower risk. The risk may be examined further by Macbeth two-step regression, which is recommended as further work by the author, but which is outside the scope of this thesis.

Part VI

Conclusion

This thesis examines what the finance sector is and what kind of challenges it faces related to the environment. This is a novel field of study known as green finance. The term refer to the financial market in relation to green

investments and activities. To make a meaningful analysis of green finance, it has been necessary to explore in detail what exactly defines green investment and companies. It is well known that a share is an ownership interest in a company. For this share to become a green investment, it is important that the company in question focuses on activities that are environmentally friendly and take social responsibility. This work has discussed which financial sectors comprise "green" activities. It has emerged that there is no clear definition of what "green finance" actually is. A definition of the term has therefore been proposed based on previously published theory. The thesis explores green finance using this new proposed definition as a base line.

The green financial markets of the USA and Norway have also been examined. Norway and the USA have different strategies and methods for how they respond to environmental challenges, which is reflected in governmental strategy documents. It appears that Norway has more clearly defined goals for future green development than the United States.

The literature section discusses the general environmental challenges faced by the financial sector. Examples of how companies evade responsibility for the environment has been shown, like for example figuratively sticking their head in the sand or literally ignoring their own oil spill, which may have disastrous consequences for the local environment or indigenous peoples living in the area. Therefore, the importance of social responsibility for the companies has also been addressed.

It is the responsibility of the individual company to invest in or initiate green projects. Since the environment has received a greater focus in recent times, several companies have a desire to be considered "green", both because it generates more attention from investors but also due to tax breaks and financial support for green projects. To determine whether a company takes the environment and social responsibility seriously, the concept of ESG criteria (environmental, social, governmental criteria) has been widely adopted. The purpose of ESG criteria is to grade the companies so that investors will be able to determine the level of responsibility in the shares they are buying. Greenwashing is one challenge that has arisen from this trend. Companies may be trying to improve their environmental image without actually taking on environmental responsibility, for instance by labeling their products as green when they really are not.

Based on economic theory, different models have been used to calculate alphas, which are used to determine whether a portfolio has a higher return

than what the model has predicted. The models used are CAPM, Fama-French three-factor, Carhart four-factor and Fama-French five factor. The multi-factor models are an extension of the CAPM model. The data and the method for calculating the intercept and the figure for ESG criteria have been presented, where it has been shown how the models are used with accompanying explanation. The method section shows how results have been obtained. Companies were first measured according to the ESG-criteria. It unexpectedly turned out that the companies from the non-green Norwegian portfolio had a higher ESG score than the Norwegian green portfolio. For the USA portfolios, the results were more in line with expectations, in that the green portfolio scored higher than the portfolio for non-green companies, and also higher than both the Norwegian portfolios.

It was then found that on average, all the portfolios were overpriced for the average of the models. Both the green and non-green portfolios were overpriced for both countries, although some models showed negative returns. It was also concluded that the finance markets in Norway and the USA are relatively different, owing among other things to a difference in market size. We also saw that the returns between the green and non-green portfolios of the USA where more similar than for Norway.

In conclusion, green finance is a relatively new field of study, with little data or research having been published so far. However, in light of increasing awareness of climate change, it is expected that green finance will receive greater attention in the years to come. Proper categorization of green companies is still in its infancy, because a solid definition of green finance has yet to be developed. Consequently, it has been shown that the "green" label is still often applied erroneously, and companies whose activities are not environmentally friendly still manage to achieve high scores in the metrics developed so far. Whether or not the company's activities are actually green also seems not to impact their financial returns as shown through their stock prices.

Part VII

Appendix

10 Appendix companies

Portfolio for Green sectors NO						
companiesu (100)	HQs	Sector	Description	ticker	RIC	employee
ABG sundal collier Holding	NO	Green	Finance	ASC	ASC.OL	267
Axactor	NO	Green	Finance	AXA	AXAC.OL	1040
Aqua Bio Technology	NO	Green	Technology	ABT	ATBT.OL	2
Atea	NO	Green	Technology	ATEA	ATEA.OL	7385
Adevinta	NO	Green	Technology	ADE	ADEB.OL	3639
Aurskog sparebank	NO	Green	Bank	AURG	AURG.OL	58
Arendals Fossekompani	NO	Green	Renewable Energy	AFK	AFK.OL	2243
AKVA Group	NO	Green	Technology	AKVA	AKVA.OL	1508
Aasen Sparebank	NO	Green	Bank	AASB-ME	AASB-ME.OL	29
Aega	NO	Green	Renewable Energy	AEGA	AEGA.OL	2
Asetek	NO	Green	Technology	ASETEK	ASETEK.OL	95
BRAbank	NO	Green	Bank	BRA-ME	BRA-ME.OL	54
B2Holding	NO	Green	Finance	B2H	B2H.OL	2685
BerGenBio	NO	Green	Technology	BGBIO	BGBIO.OL	26
Bouvet	NO	Green	Technology	BOUVET	BOUVET.OL	1369
Biotec Pharmacon	NO	Green	Biotechnology	BIOTEC	BIOTEC.OL	43
Bonheur	NO	Green	Technology	BON	BON.OL	3688
CintextVision	NO	Green	Technology	COV	COVI.OL	42
Creayon Group Holding	NO	Green	Technology	CRAYON	CRAYON.OL	1128
Carasent	NO	Green	Technology	CARA	CARAS.OL	30
DNB	NO	Green	Bank	DNB	DNB.OL	9225
Data Respons	NO	Green	Technology	DAT	DAT.OL	776
EAM Solar	NO	Green	Renewable Energy	EAM	EAM.OL	0
Funcom	NO	Green	Technology	FUNCOM	FUNCOM.OL	143
Fjordkraft Holding	NO	Green	Renewable Energy	FKRAFT	FKRAFT.OL	252
Grong Sparebank	NO	Green	Bank	GRONG -ME	GRONG-ME.OL	57
Gjensidige forsikring	NO	Green	Finance	GJF	GJFS.OL	3674
Goodtech	NO	Green	Technology	GOD	GOD.OL	314
Gaming Innovation Group	NO	Green	Technology	GIG	GAMING.OL	710
Helgeland Sparebank	NO	Green	Bank	HELG	HELG.OL	150
Høland og Setskog Sparebank	NO	Green	Bank	HSPG	HSPG.OL	40
Hiddn Solution	NO	Green	Technology	HIDDN	HIDDNS.OL	23
Insr Insurance Group	NO	Green	Finance	INSR	INSRI.OL	152
Itera	NO	Green	Technology	ITE	ITER.OL	486
Infront	NO	Green	Technology	INFRNT	INFRNT.OL	133
IDEX Biometrics	NO	Green	Technology	IDEX	IDEX.OL	115
Ice Group	NO	Green	Technology	ICE	ECEG.OL	172
Induct	NO	Green	Technology	INDUCT-ME	INDUCT-ME.OL	21
Jæren sparebank	NO	Green	Bank	JAEREN	JAREN.OL	82
komplett bank	NO	Green	Bank	KOMP	KOMPBK.OL	89
Kongsberg Gruppen	NO	Green	Technology	KOG	KOG.OL	6842
Kahoot	NO	Green	Technology	KAHOOT - ME	KAHOOT-ME.OL	0
Lifecare	NO	Green	Technology	LIFE-ME	LIFE-ME.OL	0
Lavo.TV	NO	Green	Technology	LAVO - ME	LAVO-ME.OL	7
Lillestrøm sparebank	NO	Green	Bank	LSTB-ME	LSTSB-ME.OL	48

Melhus Sparebank	NO	Green	Bank	MELG	MELG.OL	56
Nordic Semiconductor	NO	Green	Technology	NOD	NOD.OL	767
Nidaros Sparebank	NO	Green	Bank	NISB-ME	NISB-ME.OL	0
NEXT Biometrics Group	NO	Green	Technology	NEXT	NEXT.OL	90
Nel	NO	Green	Renewable Energy	NEL	NEL.OL	221
Nordic Nanovector	NO	Green	Technology	NANO	NANOV.OL	38
Napatech	NO	Green	Technology	NAPA	NAPAT.OL	107
Norbit	NO	Green	Technology	NORBIT	NORBIT.OL	249
Norwegian Finans Holding	NO	Green	Finance	NOFI	NOFI.OL	78
Otello Corporation	NO	Green	Technology	OTELLO	OTELLO.OL	493
Observe Medical	NO	Green	Technology	OBSERV	OBSERV.OL	0
PCI Biotech Holding	NO	Green	Technology	PCIB	PCIB.OL	13
PoLight	NO	Green	Technology	PLT	PLTO.OL	34
Protector Forsikring	NO	Green	Finance	PROTCT	PROTCT.OL	356
pareto bank	NO	Green	Bank	PARB	PARB.OL	37
Quantafuel	NO	Green	Technology	QFUEL-ME	QFUEL-ME.OL	14
River iGaming	NO	Green	Technology	RIVER-ME	RIVER-ME.OL	0
REC Silicon	NO	Green	Renewable Energy	REC	REC.OL	461
Sbanken	NO	Green	Bank	SBANK	SBANK.OL	344
sparebank 1 SR-bank	NO	Green	Bank	SRBANK	SRBANK.OL	1178
Storebrand	NO	Green	Finance	STB	STB.OL	1789
Sparebanken Telemark	NO	Green	Bank	SBTE	SBTE.OL	188
Sparebanken Sør	NO	Green	Bank	SOR	SORR.OL	507
Sogn Sparebank	NO	Green	Bank	SOGN	SOGNS.OL	50
Sparebanken Møre	NO	Green	Bank	MORG	SPMO.OL	373
Sandnes Sparebank	NO	Green	Bank	SADG	SADG.OL	141
Spare Bank 1 SMN	NO	Green	Bank	MING	MING.OL	1588
Skue Sparebank	NO	Green	Bank	SKUE	SKUE.OL	70
Sparebanken Øst	NO	Green	Bank	SPOG	SPOG.OL	199
StrongPoint	NO	Green	Technology	STRONG	STRONG.OL	538
Sparebank Vest	NO	Green	Bank	SVEG	SVEG.OL	701
SpareBank 1 Østlandet	NO	Green	Bank	SPOL	ORU6.L	1139
SpareBank 1 BV	NO	Green	Bank	SBVG	SBVGV.OL	340
SpareBank 1 Nord-Norge	NO	Green	Bank	NONG	MONG.OL	871
SpareBank 1 Ringerike Hadeland	NO	Green	Bank	RING	RING.OL	235
SpareBank 1 Østfold Akershus	NO	Green	Bank	SOAG	SOAG.OL	201
Sunndal Sparebank	NO	Green	Bank	SUNSB-ME	SUNSB-ME.OL	38
Scatec Solar	NO	Green	Renewable Energy	SSO	SSOL.OL	246
SpareBank 1 Nordvest	NO	Green	Bank	SNOR	SNORD.OL	149
SoftOx Solutions	NO	Green	Technology	SOFTOX - ME	SOFTOX-ME.OL	10
SpectrumOne	NO	Green	Technology	TEONE-ME	SPONE-ME.OL	40
Treasure	NO	Green	Finance	TRE	TREAS.OL	0
Totens Sparebank	NO	Green	Bank	TOTG	TOTG.OL	98
Techstep	NO	Green	Technology	TECH	TECHS.OL	221
Thin Film Electronics	NO	Green	Technology	THIN	THIN.OL	155
TietoEVRY	NO	Green	Technology	TIETO	TIETO.HE	15190
Targovax	NO	Green	Technology	TRVX	TRVX.OL	21

Tomra Systems	NO	Green	Technology	TOM	TOM.OL	4025
Ultimovacs	NO	Green	Technology	ULTIMO	ULTIMO.OL	16
Vow	NO	Green	Recycling	Vow	VOW.OL	66
Voss Veksel - og Landmansbank	NO	Green	Finance	VVL	VVL.OL	21
Webstep	NO	Green	Technology	WSTEP	WSTEP.OL	394
Zwipe	NO	Green	Technology	ZWIPE - ME	ZWIPE-ME.OL	31
Zalaris	NO	Green	Technology	ZAL	ZAL.OL	877
5th Planet Games	NO	Green	Technology	FIVEPG	FIVEPG.OL	47
employee in Bank/Finance						28397
Employee in Technology						52065
Employee in Renewable Energy						3425
employee in recycling						66
Total sum of employee						83955

Portfolio for other sectors NO						
companies (100)	HQs	sector	Description	ticker	RIC	employee
Axxis Geosolutions	NO	Other	Seafaring	AGS	AGSOL.OL	3
Atlantic Sapphire	NO	Other	Farmed Salmon	ASA-ME	ASA-ME.OL	35
Awilco Drilling	NO	Other	Oil and Gas	AWDR	AWDR.OL	142
AqualisBraemar	NO	Other	Oil and Gas	AQUA	AQUA.OL	179
ADS Crude Carriers	NO	Other	Tank Ship	ADSC-ME	ADSC-ME.OL	0
Austevoll Seafood	NO	Other	Farmed Salmon	AUSS	AUSS.OL	6490
Aker BP	NO	Other	Refining of Oil	AKERBP	AKERBP.OL	1649
Aker Solution	NO	Other	Oil and Gas	AKSO	AKSOL.OL	14705
Arcus	NO	Other	Industry	ARCUS	ARCUS.OL	424
Avance Gas Holding	NO	Other	Oil and Gas	AVANCE	AVANCE.OL	11
Awilco LNG	NO	Other	Oil and Gas	ALNG	ALNG.OL	7
AF Gruppen	NO	Other	Industry	AFG	AFGRA.OL	4220
Borgestad	NO	Other	Industry	BOR	BOR.OL	376
Baltic Seal Properties	NO	Other	Property	BALT-ME	BALT-ME.OL	0
BW Energy Limited	NO	Other	Refining of Oil	BWE	BWEE.OL	0
Byggma	NO	Other	Service	BMA	BMAX.ST	1047
Borr Drilling	NO	Other	Oil and Gas	BDRILL	BDRILL.OL	592
Bakkafrost	NO	Other	Farmed Salmon	BAKKA	BAKKA.OL	1032
BW LPG	NO	Other	Seafaring	BWLPG	BWLPG.OL	1798
Borregaard	NO	Other	Industry	BRG	BRGD.OL	1097
BW Offshore Limited	NO	Other	Oil and Gas	BWO	BWO.OL	2138
DNO	NO	Other	Refining of Oil	DNO	DNO.OL	1073
Entra	NO	Other	Property	ENTRA	ENTRA.OL	161
Europris	NO	Other	Service	EPR	EPRI.OL	1773
Equinor	NO	Other	Oil and Gas	EQNR	EQNR.OL	20500
Epic Gas	NO	Other	Oil and Gas	EPIC-ME	EPIC-ME.OL	0
Elkem	NO	Other	Industry	ELK	ELK.OL	6280
Electromagnetic Geoservices s	NO	Other	Oil and Gas	EMGS	EMGS.OL	125
Endúr	NO	Other	Aviation	ENDUR	ENDUR.OL	176
FLEX LNG	NO	Other	Oil and Gas	FLNG	FLNG.OL	6
Fjord1	NO	Other	Seafaring	FJORD	FJORD.OL	1264
Frontline	NO	Other	Oil and Gas	FRO	FRO.OL	135
Golden Energy Offshore Services	NO	Other	Oil and Offshore	GEOS-ME	GEOS-ME.OL	0
Golden Ocean Group	NO	Other	Industry	GOGL	GOGL.O	29
Höegh LNG Holdings	NO	Other	Oil and Gas	HLNG	HLNGH.OL	699
Havila Shipping	NO	Other	Shipping	HAVI	HAVI.OL	453
Hexagon Composite	NO	Other	Gas and Pipeline	HEX	HEX.OL	427
Interoil Exploration and Production	NO	Other	Refining of Oil	IOX	IOX.OL	49
Jinhui Shipping and Transportation	NO	Other	Shipping	JIN	JINS.OL	67
Kid	NO	Other	Service	KID	KID.OL	1038
Kværner	NO	Other	Oil and Gas	KVAER	KVAER.OL	2727
Kitron	NO	Other	Industry	KIT	KP5.OL	1743
Kalveness Combination Carriers	NO	Other	Seafaring	KCC	KCCA.OL	0
Lerøy Seafood Group	NO	Other	Farmed Salmon	LSG	LSG.OL	4317
Medisitm	NO	Other	Medicine	MEDI	MEDS.OL	105
Mowi	NO	Other	Farmed Salmon	MOWI	MOWI.OL	14537
Magnora	NO	Other	Oil and Gas	MGN	MGNR.OL	3
MPC Container Ships	NO	Other	Seafaring	MPCC	MPCC.OL	11
Magseis Fairfield	NO	Other	Oil and Gas	MSEIS	MSEIS.OL	426

Navamedic	NO	Other	Medicine	NAVA	NAVA.OL	28
Northern Drilling	NO	Other	Oil and Gas	NODL	NODL.OL	0
Norske Skog	NO	Other	Industry	NSKOG	NSKOG.OL	0
Norsk Hydro	NO	Other	Industry	NHY	NHY.OL	36236
Norwegian Air Shuttle	NO	Other	Aviation	NAS	NWC.OL	10215
Nordic Mining	NO	Other	Industry	NOM	NOMIN.OL	5
NattoPharma	NO	Other	Medicine	NATTO	NATTO.OL	16
NRC Group	NO	Other	Industry	NRC	NRC.OL	879
Norway Royal Salmon	NO	Other	Farmer Salmon	NRS	NRSM.OL	188
OKEA	NO	Other	Oil and Gas	OKEA	OKEA.OL	194
Okeanis Eco Tankers	NO	Other	Tank Ship	OET	OET.OL	0
Odfjell ser. A	NO	Other	Seafaring	ODF	ODF.OL	2530
Odfjell ser. B	NO	Other	Seafaring	ODFB	ODFB.OL	2530
Ocean yield	NO	Other	Seafaring	OCY	OCY.OL	8
Olav Thon Eiendomsselskap	NO	Other	Property	OLT	OLT.OL	431
Oddfjell Drilling	NO	Other	Oil and Gas	ODL	ODLL.OL	2297
Orkla	NO	Other	Industry	ORK	ORK.OL	18510
Oceanteam	NO	Other	Oil and Gas	OTS	OTS.OL	100
Polarcus	NO	Other	Oil and Gas	PLCS	PLCS.OL	322
PGS	NO	Other	Oil and Gas	PGS	PGS.OL	1258
Polaris Media	NO	Other	Media	POL	POLME.OL	748
Questerre Energy Corporation	NO	Other	Refining of Oil	QEC	QEC.TO	8
Q-Free	NO	Other	Industry	QFR	QFR.OL	390
RAK Petroleum	NO	Other	Refining of Oil	RAKP	RAKP.OL	1079
Reach Subsea	NO	Other	Oil and gas	REACH	REACH.OL	119
Selvaag Bolig	NO	Other	Property	SBO	SBOO.OL	92
Subsea 7	NO	Other	Oil and gas	SUBC	SUBC.OL	3989
Self Storage Group	NO	Other	Industry	SSG	SSG.OL	87
SAS AB	NO	Other	Aviation	SAS NOK	SAS.ST	11469
SATS	NO	Other	Services	SATS	SATSA.OL	10378
Schibsted ser. A	NO	Other	Media	SCHA	SBSTA.OL	8300
Schibsted ser. B	NO	Other	Media	SCHB	SBSTB.OL	8300
Siem Offshore	NO	Other	Oil and Gas	SIOFF	SIOFF.OL	1335
Solstad Offshore	NO	Other	Oil and Gas	SOFF	SOFF.OL	3620
Seadrill	NO	Other	Oil and Gas	SDRL	SDRL.OL	0
Storm Real Estate	NO	Other	Property	STORM	STORM.OL	6
Stolt-Nielsen	NO	Other	Seafaring	SIN	SNI.OL	6513
Star Bulk Carriers	NO	Other	Seafaring	SBLK	SBLK.O	145
S.D. Standard Drilling	NO	Other	Oil and Gas	SDSD	SDSD.OL	1
SalMar	NO	Other	Farmer Salmon	SALM	SALM.OL	1479
SeaBird Exploration	NO	Other	Oil and Gas	SBX	SBX.OL	325
Salmones Camanchaca	NO	Other	Farmer Salmon	SALMON	SALMOCAM.SN	1831
Team Tankers International	NO	Other	Seafaring	TEAM	TEAM.OL	912
Telenor	NO	Other	Industry	TEL	TEL.OL	21000
TGS-NOPEC Geophysical Company	NO	Other	Oil and Gas	TGS	TGS.OL	547
veidekke	NO	Other	Industry	VEI	VEI.OL	8568
Wilson	NO	Other	Seafaring	WILS	WILS.OL	1500

XXL	NO	Other	Service	XXL	XXLA.OL	3220
Yara International	NO	Other	Industry	YAR	YAR.OL	16757
Zenith Energy	NO	Other	Refining of Oil	ZENA-ME	ZENA-ME.OL	207
2020 Bulkers	NO	Other	Seafaring	2020	2020B-OL	3

Seafaring	17217
Oil and Gas	56929
Farmer	29909
Industry	116601
Service	17456
Refining of Oil	4065
Property	690
Media	17348
Medicine	149
Shipping	520
Aviation	21860
Total Sum of employee	282744

Portfolio of Green sectors USA						
companies (100)	HQs	sector	Description	Ticker	RIC	Employee
Amalgamated Bank	USA	Green	Bank	AMAL	AMAL.O	398
American National Bankshare, Inc.	USA	Green	Bank	AMNB	AMNB.O	355
American River Bankshares	USA	Green	Bank	AMRB	AMRB.O	102
Atlantic Union Bankshares Corporation	USA	Green	Bank	AUB	AUB.O	1989
Apple	USA	Green	Technology	AAPL	AAPL.O	137000
Advanced Energy Industries, Inc.	USA	Green	Renewable Energy	AEIS	AEIS.O	10917
ASE Technology Holding CO., Ltd.	USA	Green	Technology	ASX	3711.TW	68100
Aspen Technology, Inc.	USA	Green	Technology	AZPN	AZPN.O	1466
ADDvantage Technologies Group, Inc.	USA	Green	Technology	AEY	AEY.O	188
Adesto Technologies Corporation	USA	Green	Technology	IOTS	IOTS.O	260
Akamai Technologies, Inc.	USA	Green	Technology	AKAM	AKAM.O	7724
Akoustis Technologies, Inc.	USA	Green	Technology	AKTS	AKTS.O	75
Allied Motion Technologies, Inc.	USA	Green	Technology	AMOT	AMOT.O	1700
Amkor Technology, Inc.	USA	Green	Technology	AMKR	AMKR.O	29650
Applied Genetic Technologies Corporation	USA	Green	Bioteknologi	AGTC	AGTC.O	72
Axcelis Technologies, Inc.	USA	Green	Technology	ACLS	ACLS.O	1009
Bank of America Corporation	USA	Green	Bank	BAC	BAC	208000
BancorpSouth Bank	USA	Green	Bank	BXS	BXS	4693
Bank7 Corp.	USA	Green	Bank	BSVN	BSVN.O	74
BankFinancial Corporation	USA	Green	Bank	BFIN	BFIN.O	242
Bank First Corporation	USA	Green	Finance	BFC	BFC.O	284
Bank Of Nova Scotia	USA	Green	Bank	BNS	BNS.TO	101813
Bank of N.T. Butterfield & Son Limited Voting	USA	Green	Bank	NTB	NTB	1512
BankUnited, Inc.	USA	Green	Bank	BKU	BKU	1511
Bank of South Carolina Corp.	USA	Green	Bank	BKSC	BKSC.O	79
Bank OZK	USA	Green	Bank	OZK	OZK.O	2774
Bio-Techne Corp	USA	Green	Bioteknology	TECH	TECH.O	1800
Brqs Technologies, Inc.	USA	Green	Technology	BRQS	BRQS.O	3
Bottomline Technologies, Inc.	USA	Green	Technology	EPAY	EPAY.O	1700
Bank of Comerce Holdings	USA	Green	Bank	BOCH	BOCH.O	214
Bank of Hawai Corp	USA	Green	Bank	BOH	BOH	2124
Bank Of Montreal	USA	Green	Finance	BMO	BMO.TO	45513
Bank of the James Fiancial Group Inc	USA	Green	Bank	BOTJ	BOTJ.O	160
Brookfield Renewable Partners	USA	Green	Renewable Energy	BEP	BEP	2175
Capital City Bank Group	USA	Green	Bank	CCBG	CCBG.O	891
Check Point Software Technologies Ltd.	USA	Green	Technology	CHKP	CHKP.O	1967
ChipMOS TECHNOLOGIES INC.	USA	Green	Technology	IMOS	IMOS.O	0
Cognizant Technology Solutions Corporation	USA	Green	Technology	CTSH	CTSH.O	292500
Canadian Solar Inc.	USA	Green	Renewable Energy	CSIQ	CSIQ.O	9724
Capitala Finance Corp.	USA	Green	Finance	CPTA	CPTA.O	0
Colony Bankcorp, Inc.	USA	Green	Bank	CBAN	CBAN.O	333
Citigroup, Inc.	USA	Green	Finance	C	C	200000
Elmira Savings Bank NY	USA	Green	Bank	ESBK	ESBK.O	132
Everspin Technologies, Inc	USA	Green	Technology	MRAM	MRAM.O	108
Exela Technologies, Inc.	USA	Green	Technology	XELA	XELA.O	0

Envision Solar International, Inc.	USA	Green	Energy	EVSI	EVSI.O	18
First Solar, Inc.	USA	Green	Renewable Energy	FSLR	FSLR.O	6600
FARO Technologies, Inc.	USA	Green	Technology	FARO	FARO.O	1818
Goldman Sachs Group Inc.	USA	Green	Bank	GS	GS	34400
Global Water Resources Inc	USA	Green	Renewable Energy	GWRS	GWRS.O	75
GTY Technology Holdings, Inc.	USA	Green	Technology	GTYH	BTYH.O	108
Horizon Technology Finance Corporation	USA	Green	Finance	HRZN	HRZN.O	19
HDFC Bank Limited	USA	Green	Bank	HDB	HDB	84325
ICICI Bank Limited	USA	Green	Bank	IBN	IBN	82724
Independent Bank Corp.	USA	Green	Bank	INDB	INDB.O	1348
JP Morgan Chase and Co.	USA	Green	Finance	JPM	JPM	251196
Keysight Technologies Inc.	USA	Green	Technology	KEYS	KEYS.K	13600
Lioyds Banking Group Plc	USA	Green	Bank	LYG	LYG	63069
Microsoft	USA	Green	Technology	MSFT	MSFT.O	124000
Microchip Technology Incorporated	USA	Green	Technology	MCHP	MCHP.O	12656
Maxar Technologies Inc.	USA	Green	Space technology	MAXR	MAXR.K	5800
Metropolioan Bank Holding Corp	USA	Green	Bank	MCB	MCB	167
M&T Bank Corporaton	USA	Green	Bank	MTB	MTB	16973
NortheastBank	USA	Green	Bank	NBN	NBN.O	183
Net 1 UEPS Technologies, Inc.	USA	Green	Technology	UEPS	UEPS.O	3146
Niu Technologies	USA	Green	Technology	NIU	NIU.O	0
Northeast Bank	USA	Green	Bank	NBN	NBN.O	183
Opus Bank	USA	Green	Bank	OPB	OPB.O	767
Preferred Bank	USA	Green	Bank	PFBC	PFBC.O	279
Powerbridge Technologies Co., Ltd.	USA	Green	Technology	PBTS	PBTS.O	231
Royal bank Of Canada	USA	Green	Bank	RY	RY	80000
Rimini Street Inc.	USA	Green	Technology	RMNI	RMNI.O	1270
Sky Solar Holdings Ltd	USA	Green	Renewable Energy	SKYS	SKYS.O	164
Solaredge Technologies Inc	USA	Green	Renewable Energy	SEDG	SEDG.O	2431
Sol-Gel Technologies, Ltd	USA	Green	Bioteknology	GE	SLGL.O	61
SolarWinds Corp	USA	Green	Technology	SWI	SWI	3251
Seagate Technology PLC	USA	Green	Technology	STX	STX.O	43000
Sailpoint Technologies Holdings, Inc.	USA	Green	Technology	SAIL	SAIL.K	1168
SIGA Technologies Inc.	USA	Green	Bioteknology	SIGA	SIGA.O	41
Slack Technologies, Inc.	USA	Green	Technology	WORK	WORK.K	2045
Sensata Technologies Holding plc	USA	Green	Technology	ST	ST	21050
Silicon Motion Technology Corporation	USA	Green	Technology	SIMO	SIMO.O	1122
Signature Bank	USA	Green	Bank	SBNY	SBNY.O	1472
TPG RE Finance Trust, Inc.	USA	Green	Finance	TRTX	TRTX.K	0
Technical Communications Corporation	USA	Green	Technology	TCCO	TCCO.O	24
TESSCO Technologies, Inc	USA	Green	Technology	TESS	TESS.O	772

Tesla, Inc	USA	Green	Technology	TSLA	TSLA.O	17782
The Bank of Princeton	USA	Green	Bank	BPRN	BPRN.O	178
Verb Technology Company, Inc.	USA	Green	Technology	VERB	VERB.O	18
Viomi Technology Co., Ltd	USA	Green	Technology	VIOT	VIOT.O	527
Vivint Solar Inc	USA	Green	Renewable Energy	VSLR	VSLR.K	2998
Wells Fargo and Company	USA	Green	Bank	WFC	WFC	264900
Westell Technologies, Inc.	USA	Green	Technology	WSTL	WSTL.O	123
Wayside Technology Group, Inc.	USA	Green	Technology	WSTG	WSTG.O	142
Wrap Technologies, Inc.	USA	Green	Technology	WRTC	WRTC.O	0
Wins Finance Holdings Inc.	USA	Green	Finance	WINS	WINS.O	0
WhiteHorse Finance, Inc.	USA	Green	Finance	WHF	WHF.O	0
Willis Lease Finance Corporation	USA	Green	Finance	WLFC	WLFC.O	232
York Water Co.	USA	Green	Renewable Energy	YORW	YORW.O	106
360 Finance, Inc.	USA	Green	Finance	QFIN	QFIN.O	691

Employee in Bank/finance	1456299
Sum of employee in Renewable energy	35208
Sum of employee in technology sector	799077
Total sum of employee	2290584

Portfolio for the other sectors USA						
companies (100)	HQs	sector	Description	Ticker	RIC	Employee
Abercrombie & Fitch Co.	USA	Other	Industry	ANF	ANF	90000
Advamced Emissions Solution, Inc	USA	Other	Industry	ADES	ADES.O	133
Aegion Corp	USA	Other	Industry	AEGN	AEGN.O	4900
Air T Inc	USA	Other	Industry	AIRT	AIRT.O	17700
Aircastle Limited	USA	Other	Industry	AYR	AYR.N^C20	111
Alaska Air Group Inc.	USA	Other	Aviation	ALK	ALK	19112
Allegiant Travel	USA	Other	Aviation	ALGT	ALGT.O	4363
Allete, Inc.	USA	Other	Infrastructure	ALE	ALE	1316
Amazon.com	USA	Other	Industry	AMZN	AMZN.O	798000
American Homes 4 Rent	USA	Other	Property	AMH	AMH	1324
Americas Car Mart, Inc.	USA	Other	Services	CRMT	CRMT.O	1504
American Woodmark Corp.	USA	Other	Industry	AMWD	AMWD.O	5808
Ardmore Shipping Corp	USA	Other	Shipping	ASC	ASC	1072
Ardagh Group S.A.	USA	Other	Industry	ARD	ARD	16300
Autoliv	USA	Other	Industry	ALV	ALV	65000
AAR Corp.	USA	Other	Aviation	AIR	AIR	4600
AECOM	USA	Other	Industry	ACM	ACM	86000
brigham Minerals, Inc	USA	Other	Minerals	MNRL	MNRL.K	41
Build A Bear Workshop Inc	USA	Other	Services	BBW	BBW	4200
Barrick Gold Corp	USA	Other	Gold	GOLD	ABX.TO	17260
Ball Corp.	USA	Other	Industry	BLL	BLL	18300
Beyond Air Inc	USA	Other	Medical	XAIR	XAIR.O	0
Big 5 Sporting Goods Corp	USA	Other	Industry	BGFV	BGFV.O	8800
China HGS Real Estate, Inc	USA	Other	Property	HGSH	HGSH.O	142
Cabot Oil & Gas Corp.	USA	Other	Refining of Oil	COG	COG	547
China Xiangtai Food Co Ltd	USA	Other	Industry	PLIN	PLIN.O	178
Costmare Inc	USA	Other	Seafaring	CMRE	CMRE.K	2000
CoreCivi Inc	USA	Other	Property	CXW	CXW	14075
Crown Crafts, Inc.	USA	Other	Industry	CRWS	CRWS.O	119
DLH Holdings Corp	USA	Other	Industry	DLHC	DLHC.O	1500
Dixie Group Inc.	USA	Other	Industry	DXYN	DXYN.O	1526
EuroDry Ltd.	USA	Other	Seafaring	EDRY	EDRY.O	0
Ever-Glordy International Group, Inc	USA	Other	Industry	EVK	EVK.O	8200
Exantas Capital Corp.	USA	Other	Property	XAN-C	XAN.C	688
Evoke pharma Inc	USA	Other	Medicine	EVOK	EVOK.O	5
Embotelladora Andina S.A.	USA	Other	Industry	AKO.B	AKOb	16296
Farmland Partners Inc	USA	Other	Property	FPI	FPI	13
Forterra, Inc	USA	Other	Industry	FRTA	FRTA.O	4578
Granite Point Mortgage Trust Inc.	USA	Other	Properties	GPMT	GPMT.K	0
GasLog Ltd	USA	Other	Oil and Gas	GLOG	GLOG.K	163
Gildan Activewear Inc	USA	Other	Industry	GIIL	GIL.TO	53000
Humana Inc.	USA	Other	Medicine	HUM	HUM	47200
Heico Corp.	USA	Other	Aviation	HEI	HEI	5900
Hillenbrand Inc	USA	Other	Industry	HI	HI	6500
Hexcel Corp.	USA	Other	Industry	HXL	HXL	6155
iStar Inc	USA	Other	Properties	STAR	STAR.K	155
ladder Capital Corp	USA	Other	Properties	LADR	LADR.K	76
Innospec Inc	USA	Other	Industry	IOSP	IOSP.O	2000
Intrepid potash Inc	USA	Other	Farmer	IPI	IPI	445

J.W. Mays Inc.	USA	Other	Properties	MAYS	MAYS.O	29
Kenon Holdongs Ltd.	USA	Other	Infrastructure	KEN	KEN	2100
Koppers Holding Inc	USA	Other	Industry	KOP	KOP	2120
LATAM Airlines Groups S.A.	USA	Other	Aviation	LTM	LTM	41729
LightInTheBox Holding Co., Ltd.	USA	Other	Industry	LITB	LITB.K	703
Mesa Royalty trust	USA	Other	Oil and Gas	MTR	MTR	0
Marathon Oill Corporation	USA	Other	Refining of Oil	MRO	MRO	2000
Murphy Oil Corp.	USA	Other	Refining of Oil	MUR	MUR	822
Marine products Corp	USA	Other	Industry	MPX	MPX	673
Marine petroleum Trust	USA	Other	Oil and Gas	MARPS	MARPS.O	0
MGP Ingredients, Inc.	USA	Other	Industry	MGPI	MGPI.O	341
NexTier oilfield Solutions Inc	USA	Other	Oil and Gas	NEX	NEX	6525
Ossen Innovation Co., Ltd.	USA	Other	Industry	OSN	OSN.O	191
Oil States International, Inc.	USA	Other	Oil and Gas	OIS	OIS	3428
Otter Tail Corporation	USA	Other	Infrastructure	OTTR	OTTR.O	2208
Orion Engineered Carbons S.A.	USA	Other	Industry	OEC	OEC	1493
Oxford Industries, Inc.	USA	Other	Industry	OXM	OXM	5800
ProPetro Holdong Corp.	USA	Other	Oil and Gas	PUMP	PUMP.K	0
Patrick Industries, Inc.	USA	Other	Industry	PATK	PATK.O	7500
P.A.M. transportation Services, Inc.	USA	Other	Industry	PTSI	PTSI.O	2666
RF Industries Ltd.	USA	Other	Industry	RFIL	RFIL.O	281
Starwood property Trust Inc	USA	Other	Properties	STWD	STWD.K	296
Seabridge Gold, Inc.	USA	Other	Gold	SA	SEA.TO	12
SEACOR Holdings Inc	USA	Other	Oil and Gas	CKH	CKH	2309
Sealed Air Corp.	USA	Other	Industry	SEE	SEE	16500
Southwest Airlines Co	USA	Other	Aviation	LUV	LUV	53500
Southwest Gas Holding Inc	USA	Other	Gas	SWX	SWX	2295
Scotts Miracle-Gro Company	USA	Other	Farmer	SMG	SMG	5600
Steris Plc	USA	Other	Medicine	STE	STE	12000
Trimas Corporation	USA	Other	Industry	TRS	TRS.O	3500
Tutor Perini Corp	USA	Other	Industry	TPC	TPC	9100
Twin River Worldwide Holdings Inc	USA	Other	Industry	TRWH	TRWH.K	4831
Two Harbors Investment Corp	USA	Other	Properties	TWO	TWO	2
Tempur Sealy International Inc	USA	Other	Industry	TPX	TPX	7400
Thermo Fisher Scientific Inc.	USA	Other	Medical	TMO	TMO	75000
TimkenSteel Corp	USA	Other	Industry	TMST	TMST.K	2500
Timmins Gold Corp	USA	Other	Industry	TG	QMX.V	3000
Top Ships Inc	USA	Other	Seafaring	TOPS	TOPS.O	136
Total S.A.	USA	Other	Oil and Gas	TOT	TOT	107776
Toyota Motor Corporation	USA	Other	Industry	TM	TM	364445
Tractor Supply Co.	USA	Other	Farming	TSCO	TSCO.O	26000
Transcat Inc	USA	Other	Industry	TRNS	TRNS.O	585
Transportadora De Gas del Sur	USA	Other	Oil and Gas	TGS	TGS	916
Tupperware Brands Corporation	USA	Other	Industry	TUP	TUP	11300
Universal Corp.	USA	Other	Tobaco Farmer	UVV	UVV	24000
Urstadt biddle properties, Inc.	USA	Other	Properties	UBA	UBA	57

U.S. gold Corp	USA	Other	Gold	USAU	USAU.O	25
Village Farms International Inc	USA	Other	Farming	VFF	VFF.TO	1000
VAALCO Energy, Inc	USA	Other	Refining of Oil	EGY	EGY	111
Yamana Gold Inc.	USA	Other	Gold	AUY	AUY	11037
Zoetis inc	USA	Other	Medicine	ZTS	ZTS	10600
Oil and Gass						123412
Industry						1656033
refining and oil						3480
Property						27457
Medicine						134205
Gold						28334
Minerals						41
Aviation						129204
Farmer						57045
Seafaring						2136
Infrastructure						5624
Shipping						1072
services						5704
Total Sum of employee						2173747

Green portfolio for Norwegian companies					
companies (100)	Description	ticker	RIC	ESG Score Grade	ESG Combined Score Grade
ABG sundal collier Holding	Finance	ASC	AGSOL.OL	NULL	NULL
Axactor	Finance	AXA	ASA-ME.OL	NULL	NULL
Aqua Bio Technology	Technology	ABT	AWDR.OL	NULL	NULL
Atea	Technology	ATEA	AQUA.OL	A-	A-
Adevinta	Technology	ADE	ADSC-ME.OL	NULL	NULL
Aurskog sparebank	Bank	AURG	AUSS.OL	C+	C+
Arendals Fossekompani	Renewable Energy	AFK	AKERBP.OL	B-	B-
AKVA Group	Technology	AKVA	AKSOL.OL	B+	B
Aasen Sparebank	Bank	AASB-ME	ARCUS.OL	NULL	NULL
Aega	Renewable Energy	AEGA	AVANCE.OL	NULL	NULL
Asetek	Technology	ASETEK	ALNG.OL	NULL	NULL
BRAbank	Bank	BRA-ME	AFGRA.OL	NULL	NULL
B2Holding	Finance	B2H	BOR.OL	NULL	NULL
BerGenBio	Technology	BGBIO	BALT-ME.OL	NULL	NULL
Bouvet	Technology	BOUVET	BWEE.OL	NULL	NULL
Biotec Pharmacon	Biotechnology	BIOTEC	BMAX.ST	NULL	NULL
Bonheur	Technology	BON	BDRILL.OL	C	C
CintextVision	Technology	COV	BAKKA.OL	B-	B-
Creayon Group Holding	Technology	CRAYON	BWLPG.OL	C-	C-
Carasent	Technology	CARA	BRGD.OL	C+	C+
DNB	Bank	DNB	BWO.OL	B-	B-
Data Respons	Technology	DAT	DNO.OL	D	D
EAM Solar	Renewable Energy	EAM	ENTRA.OL	B+	B+
Funcom	Technology	FUNCOM	EPRI.OL	B	B
Fjordkraft Holding	Renewable Energy	FKRAFT	EQNR.OL	A	C+
Grong Sparebank	Bank	GRONG -ME	EPIC-ME.OL	NULL	NULL
Gjensidige forsikring	Finance	GJF	ELK.OL	B-	B-
Goodtech	Technology	GOD	EMGS.OL	NULL	NULL
Gaming Innovation Group	Technology	GIG	ENDUR.OL	NULL	NULL
Helgeland Sparebank	Bank	HELG	FLNG.OL	D+	D+
Høland og Setskog Sparebank	Bank	HSPG	FJORD.OL	NULL	NULL
Hiddn Solution	Technology	HIDDN	FRO.OL	D	D
Insr Insurance Group	Finance	INSR	GEOS-ME.OL	NULL	NULL
Itera	Technology	ITE	GOGL.O	C-	C-
Infront	Technology	INFRNT	HLNGH.OL	C+	C+

IDEX Biometrics	Technology	IDEX	HAVI.OL	NULL	NULL
Ice Group	Technology	ICE	HEX.OL	NULL	NULL
Induct	Technology	INDUCT-ME	IOX.OL	NULL	NULL
Jæren sparebank	Bank	JAEREN	JINS.OL	NULL	NULL
komplett bank	Bank	KOMP	KID.OL	NULL	NULL
Kongsberg Gruppen	Technology	KOG	KVAER.OL	B	B
Kahoot	Technology	KAHOOT - M	KP5.OL	NULL	NULL
Lifecare	Technology	LIFE-ME	KCCA.OL	NULL	NULL
Lavo.TV	Technology	LAVO - ME	LSG.OL	C	C
Lillestrøm sparebank	Bank	LSTB-ME	MEDS.OL	NULL	NULL
Melhus Sparebank	Bank	MELG	MOWI.OL	B+	B+
Nordic Semiconductor	Technology	NOD	MGNR.OL	NULL	NULL
Nidaros Sparebank	Bank	NISB-ME	MPCC.OL	NULL	NULL
NEXT Biometrics Group	Technology	NEXT	MSEIS.OL	NULL	NULL
Nel	Renewable Energy	NEL	NAVA.OL	NULL	NULL
Nordic Nanovector	Technology	NANO	NODL.OL	D-	D-
Napatech	Technology	NAPA	NSKOG.OL	NULL	NULL
Norbit	Technology	NORBIT	NHY.OL	A+	B
Norwegian Finans Holding	Finance	NOFI	NWC.OL	D+	D+
Otello Corporation	Technology	OTELLO	NOMIN.OL	NULL	NULL
Observe Medical	Technology	OBSERV	NATTO.OL	NULL	NULL
PCI Biotech Holding	Technology	PCIB	NRC.OL	NULL	NULL
PoLight	Technology	PLT	NRSM.OL	C	C
Protector Forsikring	Finance	PROTCT	OKEA.OL	NULL	NULL
pareto bank	Bank	PARB	OET.OL	NULL	NULL
Quantafuel	Technology	QFUEL-ME	ODF.OL	NULL	NULL
River iGaming	Technology	RIVER-ME	ODFB.OL	NULL	NULL
REC Silicon	Renewable Energy	REC	OCY.OL	C-	C-
Sbanken	Bank	SBANK	OLT.OL	NULL	NULL
sparebank 1 SR-bank	Bank	SRBANK	ODLL.OL	B-	B-
Storebrand	Finance	STB	ORK.OL	A	B
Sparebanken Telemark	Bank	SBTE	OTS.OL	NULL	NULL
Sparebanken Sør	Bank	SOR	PLCS.OL	NULL	NULL
Sogn Sparebank	Bank	SOGN	PGS.OL	B	B
Sparebanken Møre	Bank	MORG	POLME.OL	NULL	NULL
Sandnes Sparebank	Bank	SADG	QEC.TO	D	D
Spare Bank 1 SMN	Bank	MING	QFR.OL	NULL	NULL
Skue Sparebank	Bank	SKUE	RAKP.OL	NULL	NULL

11 Appendix companies with ESG criteria

Sparebanken Øst	Bank	SPOG	REACH.OL	NULL	NULL
StrongPoint	Technology	STRONG	SBOO.OL	D	D
Sparebank Vest	Bank	SVEG	SUBC.OL	B	B
SpareBank 1 Østlandet	Bank	SPOL	SSG.OL	NULL	NULL
SpareBank 1 BV	Bank	SBVG	SAS.ST	B	C+
SpareBank 1 Nord-Norge	Bank	NONG	SATSA.OL	NULL	NULL
SpareBank 1 Ringerike Hadeland	Bank	RING	SBSTA.OL	B+	B+
SpareBank 1 Østfold Akershus	Bank	SOAG	SBSTB.OL	B+	B+
Sunndal Sparebank	Bank	SUNSB-ME	SIOFF.OL	NULL	NULL
Scatec Solar	Renewable Energy	SSO	SOFF.OL	NULL	NULL
SpareBank 1 Nordvest	Bank	SNOR	SDRL.OL	D+	D+
SoftOx Solutions	Technology	SOFTOX - ME	STORM.OL	NULL	NULL
SpectrumOne	Technology	TEONE-ME	SNI.OL	B	B
Treasure	Finance	TRE	SBLK.O	NULL	NULL
Totens Sparebank	Bank	TOTG	SDSD.OL	NULL	NULL
Techstep	Technology	TECH	SALM.OL	C	C
Thin Film Electronics	Technology	THIN	SBX.OL	NULL	NULL
TietoEVRY	Technology	TIETO	SALMOCAM.SN	NULL	NULL
Targovax	Technology	TRVX	TEAM.OL	D	D
Tomra Systems	Technology	TOM	TEL.OL	B+	B-
Ultimovacs	Technology	ULTIMO	TGS.OL	B+	B
Vow	Recycling	Vow	VEI.OL	C+	C+
Voss Veksel - og Landmansbank	Finance	VVL	WILS.OL	NULL	NULL
Webstep	Technology	WSTEP	XXLA.OL	C	C
Zwipe	Technology	ZWIPE - ME	YAR.OL	A-	A-
Zalaris	Technology	ZAL	ZENA-ME.OL	NULL	NULL
5th Planet Games	Technology	FIVEPG	2020B-OL	NULL	NULL

portfolio fo other Norwegian companies					
companies (100)	Description	ticker	RIC	ESG Score Grade	ESG Combined Score Grade
Axxis Geosolutions	Seafaring	AGS	AGSOL.OL	NULL	NULL
Atlantic Sapphire	Farmed Salmon	ASA-ME	ASA-ME.OL	NULL	NULL
Awilco Drilling	Oil and Gas	AWDR	AWDR.OL	NULL	NULL
AqualisBraemar	Oil and Gas	AQUA	AQUA.OL	NULL	NULL
ADS Crude Carriers	Tank Ship	ADSC-ME	ADSC-ME.OL	NULL	NULL
Austevoll Seafood	Farmed Salmon	AUSS	AUSS.OL	C+	C+
Aker BP	Refining of Oil	AKERBP	AKERBP.OL	B-	B-
Aker Solution	Oil and Gas	AKSO	AKSOL.OL	B+	B

Arcus	Industry	ARCUS	ARCUS.OL	NULL	NULL
Avance Gas Holding	Oil and Gas	AVANCE	AVANCE.OL	NULL	NULL
Awilco LNG	Oil and Gas	ALNG	ALNG.OL	NULL	NULL
AF Gruppen	Industry	AFG	AFGRA.OL	NULL	NULL
Borgestad	Industry	BOR	BOR.OL	NULL	NULL
Baltic Seal Properties	Property	BALT-ME	BALT-ME.OL	NULL	NULL
BW Energy Limited	Refining of Oil	BWE	BWEE.OL	NULL	NULL
Byggma	Service	BMA	BMAX.ST	NULL	NULL
Borr Drilling	Oil and Gas	BDRILL	BDRILL.OL	C	C
Bakkafrost	Farmed Salmon	BAKKA	BAKKA.OL	B-	B-
BW LPG	Seafaring	BWLPG	BWLPG.OL	C-	C-
Borregaard	Industry	BRG	BRGD.OL	C+	C+
BW Offshore Limited	Oil and Gas	BWO	BWO.OL	B-	B-
DNO	Refining of Oil	DNO	DNO.OL	D	D
Entra	Property	ENTRA	ENTRA.OL	B+	B+
Europris	Service	EPR	EPRI.OL	B	B
Equinor	Oil and Gas	EQNR	EQNR.OL	A	C+
Epic Gas	Oil and Gas	EPIC-ME	EPIC-ME.OL	NULL	NULL
Elkem	Industry	ELK	ELK.OL	B-	B-
Electromagnetic Geoservices s	Oil and Gas	EMGS	EMGS.OL	NULL	NULL
Endúr	Aviation	ENDUR	ENDUR.OL	NULL	NULL
FLEX LNG	Oil and Gas	FLNG	FLNG.OL	D+	D+
Fjord1	Seafaring	FJORD	FJORD.OL	NULL	NULL
Frontline	Oil and Gas	FRO	FRO.OL	D	D
Golden Energy Offshore Services	Oil and Offshore	GEOS-ME	GEOS-ME.OL	NULL	NULL
Golden Ocean Group	Industry	GOGL	GOGL.O	C-	C-
Höegh LNG Holdings	Oil and Gas	HLNG	HLNGH.OL	C+	C+
Havila Shipping	Shipping	HAVI	HAVI.OL	NULL	NULL
Hexagon Composite	Gas and Pipeline	HEX	HEX.OL	NULL	NULL
Interoil Exploration and Production	Refining of Oil	IOX	IOX.OL	NULL	NULL
Jinhui Shipping and Transportation	Shipping	JIN	JINS.OL	NULL	NULL
Kid	Service	KID	KID.OL	NULL	NULL
Kværner	Oil and Gas	KVAER	KVAER.OL	B	B
Kitron	Industry	KIT	KP5.OL	NULL	NULL
Kalveness Combination Carriers	Seafaring	KCC	KCCA.OL	NULL	NULL
Lerøy Seafood Group	Farmed Salmon	LSG	LSG.OL	C	C
Medisitm	Medicine	MEDI	MEDS.OL	NULL	NULL
Mowi	Farmed Salmon	MOWI	MOWI.OL	B+	B+

Magnora	Oil and Gas	MGN	MGNR.OL	NULL	NULL
MPC Container Ships	Seafaring	MPCC	MPCC.OL	NULL	NULL
Magseis Fairfield	Oil and Gas	MSEIS	MSEIS.OL	NULL	NULL
Navamedic	Medicine	NAVA	NAVA.OL	NULL	NULL
Northern Drilling	Oil and Gas	NODL	NODL.OL	D-	D-
Norske Skog	Industry	NSKOG	NSKOG.OL	NULL	NULL
Norsk Hydro	Industry	NHY	NHY.OL	A+	B
Norwegian Air Shuttle	Aviation	NAS	NWC.OL	D+	D+
Nordic Mining	Industry	NOM	NOMIN.OL	NULL	NULL
NattoPharma	Medicine	NATTO	NATTO.OL	NULL	NULL
NRC Group	Industry	NRC	NRC.OL	NULL	NULL
Norway Royal Salmon	Farmer Salmon	NRS	NRSM.OL	C	C
OKEA	Oil and Gas	OKEA	OKEA.OL	NULL	NULL
Okeanis Eco Tankers	Tank Ship	OET	OET.OL	NULL	NULL
Odfjell ser. A	Seafaring	ODF	ODF.OL	NULL	NULL
Odfjell ser. B	Seafaring	ODFB	ODFB.OL	NULL	NULL
Ocean yield	Seafaring	OCY	OCY.OL	C-	C-
Olav Thon Eiendomsselskap	Property	OLT	OLT.OL	NULL	NULL
Oddfjell Drilling	Oil and Gas	ODL	ODLL.OL	B-	B-
Orkla	Industry	ORK	ORK.OL	A	B
Oceanteam	Oil and Gas	OTS	OTS.OL	NULL	NULL
Polarcus	Oil and Gas	PLCS	PLCS.OL	NULL	NULL
PGS	Oil and Gas	PGS	PGS.OL	B	B
Polaris Media	Media	POL	POLME.OL	NULL	NULL
Questerre Energy Corporation	Refining of Oil	QEC	QEC.TO	D	D
Q-Free	Industry	QFR	QFR.OL	NULL	NULL
RAK Petroleum	Refining of Oil	RAKP	RAKP.OL	NULL	NULL
Reach Subsea	Oil and gas	REACH	REACH.OL	NULL	NULL
Selvaag Bolig	Property	SBO	SBOO.OL	D	D
Subsea 7	Oil and gas	SUBC	SUBC.OL	B	B
Self Storage Group	Industry	SSG	SSG.OL	NULL	NULL
SAS AB	Aviation	SAS NOK	SAS.ST	B	C+
SATS	Services	SATS	SATSA.OL	NULL	NULL
Schibsted ser. A	Media	SCHA	SBSTA.OL	B+	B+
Schibsted ser. B	Media	SCHB	SBSTB.OL	B+	B+
Siem Offshore	Oil and Gas	SIOFF	SIOFF.OL	NULL	NULL
Solstad Offshore	Oil and Gas	SOFF	SOFF.OL	NULL	NULL
Seadrill	Oil and Gas	SDRL	SDRL.OL	D+	D+

Storm Real Estate	Property	STORM	STORM.OL	NULL	NULL
Stolt-Nielsen	Seafaring	SIN	SNI.OL	B	B
Star Bulk Carriers	Seafaring	SBLK	SBLK.O	NULL	NULL
S.D. Standard Drilling	Oil and Gas	SDSD	SDSD.OL	NULL	NULL
SalMar	Farmer Salmon	SALM	SALM.OL	C	C
SeaBird Exploration	Oil and Gas	SBX	SBX.OL	NULL	NULL
Salmones Camanchaca	Farmer Salmon	SALMON	SALMOCAM.SN	NULL	NULL
Team Tankers International	Seafaring	TEAM	TEAM.OL	D	D
Telenor	Industry	TEL	TEL.OL	B+	B-
TGS-NOPEC Geophysical Company	Oil and Gas	TGS	TGS.OL	B+	B
veidekke	Industry	VEI	VEI.OL	C+	C+
Wilson	Seafaring	WILS	WILS.OL	NULL	NULL
XXL	Service	XXL	XXLA.OL	C	C
Yara International	Industry	YAR	YAR.OL	A-	A-
Zenith Energy	Refining of Oil	ZENA-ME	ZENA-ME.OL	NULL	NULL
2020 Bulkers	Seafaring	2020	2020B-OL	NULL	NULL

Green portfolio for USA companies					
companies (100)	Description	Ticker	RIC	ESG Score Grade	ESG Combined Score Grade
Amalgamated Bank	Bank	AMAL	AMAL.O	B	B
American National Bankshare, Inc.	Bank	AMNB	AMNB.O	D+	D+
American River Bankshares	Bnak	AMRB	AMRB.O	NULL	NULL
Atlantic Union Bankshares Corporatio	Bank	AUB	AUB.O	C	C
Apple	Technology	AAPL	AAPL.O	A-	C
Advanced Energy Industries, Inc.	Renewable Energy	AEIS	AEIS.O	C+	C+
ASE Technology Holding CO., Ltd.	Technology	ASX	3711.TW	C-	C-
Aspen Technology, Inc.	Technology	AZPN	AZPN.O	B-	B-
ADDvantage Technologies Group, Inc.	Technology	AEY	AEY.O	NULL	NULL
Adesto Technologies Corporation	Technology	IOTS	IOTS.O	NULL	NULL
Akamai Technologies, Inc.	Technology	AKAM	AKAM.O	B	B
Akoustis Technologies, Inc.	Technology	AKTS	AKTS.O	NULL	NULL
Allied Motion Technologies, Inc.	Technology	AMOT	AMOT.O	D+	D+
Amkor Technology, Inc.	Technology	AMKR	AMKR.O	C	C
Applied Genetic Technologies Corpor	Bioteknologi	AGTC	AGTC.O	NULL	NULL
Axcelis Technologies, Inc.	Technology	ACLS	ACLS.O	C+	C+
Bank of America Corporation	Bank	BAC	BAC	A-	C+
BancorpSouth Bank	Bank	BXS	BXS	C	C
Bank7 Corp.	Bank	BSVN	BSVN.O	NULL	NULL

BankFinancial Corporation	Bank	BFIN	BFIN.O	NULL	NULL
Bank First Corporation	Finance	BFC	BFC.O	NULL	NULL
Bank Of Nova Scotia	Bank	BNS	BNS.TO	A-	B-
Bank of N.T. Butterfield & Son Limited	Bank	NTB	NTB	C-	C-
BankUnited, Inc.	Bank	BKU	BKU	C+	C+
Bank of South Carolina Corp.	Bank	BKSC	BKSC.O	NULL	NULL
Bank OZK	Bank	OZK	OZK.O	C	C
Bio-Techne Corp	Bioteknology	TECH	TECH.O	B	B
Brqs Technologies, Inc.	Technology	BRQS	BRQS.O	NULL	NULL
Bottomline Technologies, Inc.	Technology	EPAY	EPAY.O	C-	C-
Bank of Comerce Holdings	Bank	BOCH	BOCH.O	NULL	NULL
Bank of Hawai Corp	Bank	BOH	BOH	B-	B-
Bank Of Montreal	Finance	BMO	BMO.TO	A	B-
Bank of the James Fiancial Group Inc	Bank	BOTJ	BOTJ.O	NULL	NULL
Brookfield Renewable Partners	Renewable Energy	BEP	BEP	C+	C+
Capital City Bank Group	Bank	CCBG	CCBG.O	D+	D+
Check Point Software Technologies Lt	Technology	CHKP	CHKP.O	B-	B-
ChipMOS TECHNOLOGIES INC.	Technology	IMOS	IMOS.O	NULL	NULL
Cognizant Technology Solutions Corp	Technology	CTSH	CTSH.O	B+	C+
Canadian Solar Inc.	Renewable Energy	CSIQ	CSIQ.O	NULL	NULL
Capitala Finance Corp.	Finance	CPTA	CPTA.O	NULL	NULL
Colony Bankcorp, Inc.	Bank	CBAN	CBAN.O	NULL	NULL
Citigroup, Inc.	Finance	C	C	A	C+
Elmira Savings Bank NY	Bank	ESBK	ESBK.O	NULL	NULL
Everspin Technologies, Inc	Technology	MRAM	MRAM.O	NULL	NULL
Exela Technologies, Inc.	Technology	XELA	XELA.O	C-	D+
Envision Soalr International, Inc.	Renewable Energy	EVSI	EVSI.O	NULL	NULL
First Solar, Inc.	Renewable Energy	FSLR	FSLR.O	B+	C+
FARO Technologies, Inc.	Technology	FARO	FARO.O	D	D
Goldman Sachs Group Inc.	Bank	GS	GS	A-	C
Global Water Resources Inc	Renewable Energy	GWRS	GWRS.O	NULL	NULL
GTY Technology Holdings, Inc.	Technology	GTYH	GTYH.O	NULL	NULL
Horizon Technology Finance Corporati	Finance	HRZN	HRZN.O	NULL	NULL
HDFC Bank Limited	Bank	HDB	HDB	B+	B+
ICICI Bank Limited	Bank	IBN	IBN	B	C
Independent Bank Corp.	Bank	INDB	INDB.O	C	C
JP Morgan Chase and Co.	Finance	JPM	JPM	A-	C+
Keysight Technologies Inc.	Technology	KEYS	KEYS.K	B+	B+

Lioyds Banking Group Plc	Bank	LYG	LYG	A-	C+
Microsoft	Technology	MSFT	MSFT.O	A+	C+
Microchip Technology Incorporated	Technology	MCHP	MCHP.O	B-	B-
Maxar Technologies Inc.	Space technology	MAXR	MAXR.K	C+	C+
Metropolioan Bank Holding Corp	Bank	MCB	MCB	C-	C-
M&T Bank Corporaton	Bank	MTB	MTB	C+	C+
NortheastBank	Bank	NBN	NBN.O	NULL	NULL
Net 1 UEPS Technologies, Inc.	Technology	UEPS	UEPS.O	NULL	NULL
Niu Technologies	Technology	NIU	NIU.O	NULL	NULL
Northeast Bank	Bank	NBN	NBN.O	NULL	NULL
Opus Bank	Bank	OPB	OPB.O	D+	D+
Preferred Bank	Bank	PFBC	PFBC.O	D+	D+
Powerbridge Technologies Co., Ltd.	Technology	PBTS	PBTS.O	NULL	NULL
Royal bank Of Canada	Bank	RY	RY	A-	B-
Rimini Street Inc.	Technology	RMNI	RMNI.O	C	C
Sky Solar Holdings Ltd	Renewable Energy	SKYS	SKYS.O	NULL	NULL
Solaredge Technologies Inc	Renewable Energy	SEDG	SEDG.O	NULL	NULL
Sol-Gel Technologies, Ltd	Biotechnology	GE	SLGL.O	NULL	NULL
SolarWinds Corp	Technology	SWI	SWI	C	C
Seagate Technology PLC	Technology	STX	STX.O	B	B
Sailpoint Technologies Holdings, Inc.	Technology	SAIL	SAIL.K	D+	D+
SIGA Technologies Inc.	Bioteknology	SIGA	SIGA.O	C-	C-
Slack Technologies, Inc.	Technology	WORK	WORK.K	NULL	NULL
Sensata Technologies Holding plc	Technology	ST	ST	C	C
Silicon Motion Technology Corporatio	Technology	SIMO	SIMO.O	NULL	NULL
Signature Bank	Bank	SBNY	SBNY.O	C-	C-
TPG RE Finance Trust, Inc.	Finance	TRTX	TRTX.K	D	D
Technical Communications Corporatic	Technology	TCCO	TCCO.O	NULL	NULL
TESSCO Technologies, Inc	Technology	TESS	TESS.O	NULL	NULL
Tesla, Inc	Technology	TSLA	TSLA.O	B-	C-
The Bank of Princeton	Bank	BPRN	BPRN.O	NULL	NULL
Verb Technology Company, Inc.	Technology	VERB	VERB.O	NULL	NULL
Viomi Technology Co., Ltd	Technology	VIOT	VIOT.O	NULL	NULL
Vivint Solar Inc	Renewable Energy	VSLR	VSLR.K	D+	D+
Wells Fargo and Company	Bank	WFC	WFC	A-	C
Westell Technologies, Inc.	Technology	WSTL	WSTL.O	NULL	NULL
Wayside Technology Group, Inc.	Technology	WSTG	WSTG.O	NULL	NULL
Wrap Technologies, Inc.	Technology	WRTC	WRTC.O	NULL	NULL

Wins Finance Holdings Inc.	Finance	WINS	WINS.O	D+	D+
WhiteHorse Finance, Inc.	Finance	WHF	WHF.O	NULL	NULL
Willis Lease Finance Corporation	Finance	WLFC	WLFC.O	NULL	NULL
York Water Co.	Renewable Energy	YORW	YORW.O	C-	C-
360 Finance, Inc.	Finance	QFIN	QFIN.O	NULL	NULL

Portfolio for other companies USA

companies (100)	Description	Ticker	RIC	ESG Score Grade	ESG Combined Score Grade
Abercrombie & Fitch Co.	Industry	ANF	ANF	B	B
Advamced Emissions Solution, Inc	Industry	ADES	ADES.O	NULL	NULL
Aegion Corp	Industry	AEGN	AEGN.O	D+	D+
Air T Inc	Industry	AIRT	AIRT.O	NULL	NULL
Aircastle Limited	Industry	AYR	AYR.N^C20	D+	D+
Alaska Air Group Inc.	Aviation	ALK	ALK	B-	B-
Allegiant Travel	Aviation	ALGT	ALGT.O	D	D
Allete, Inc.	Infrastructure	ALE	ALE	C	C
Amazon.com	Industry	AMZN	AMZN.O	A	C+
American Homes 4 Rent	Property	AMH	AMH	C	C
Americas Car Mart, Inc.	Services	CRMT	CRMT.O	D-	D-
American Woodmark Corp.	Industry	AMWD	AMWD.O	D+	D+
Ardmore Shipping Corp	Shipping	ASC	ASC	NULL	NULL
Ardagh Group S.A.	Industry	ARD	ARD	C+	C+
Autoliv	Industry	ALV	ALV	B-	B-
AAR Corp.	Aviation	AIR	AIR	C-	C-
AECOM	Industry	ACM	ACM	B-	B-
brigham Minerals, Inc	Minerals	MNRL	MNRL.K	NULL	NULL
Build A Bear Workshop Inc	Services	BBW	BBW	NULL	NULL
Barrick Gold Corp	Gold	GOLD	ABX.TO	A-	A-
Ball Corp.	Industry	BLL	BLL	B+	B+
Beyond Air Inc	Medical	XAIR	XAIR.O	NULL	NULL
Big 5 Sporting Goods Corp	Industry	BGFV	BGFV.O	NULL	NULL
China HGS Real Estate, Inc	property	HGSH	HGSH.O	NULL	NULL
Cabot Oil & Gas Corp.	Refining of Oil	COG	COG	C-	C-
China Xiangtai Food Co Ltd	Industry	PLIN	PLIN.O	NULL	NULL
Costmare Inc	Seafaring	CMRE	CMRE.K	D	D
CoreCivi Inc	Property	CXW	CXW	B-	C
Crown Crafts, Inc.	Industry	CRWS	CRWS.O	NULL	NULL
DLH Holdings Corp	Industry	DLHC	DLHC.O	NULL	NULL

Dixie Group Inc.	Industry	DXYN	DXYN.O	NULL	NULL
EuroDry Ltd.	Seafaring	EDRY	EDRY.O	NULL	NULL
Ever-Glordy International Group, Inc	Industry	EVK	EVK.O	NULL	NULL
Exantas Capital Corp.	property	XAN-C	XAN.C	NULL	NULL
Evoke pharma Inc	Medicine	EVOK	EVOK.O	NULL	NULL
Embotelladora Andina S.A.	Industry	AKO.B	AKOb	B+	B+
Farmland Partners Inc	Property	FPI	FPI	NULL	NULL
Forterra, Inc	Industry	FRTA	FRTA.O	D+	D+
Granite Point Mortgage Trust Inc.	Properties	GPMT	GPMT.K	D+	D+
GasLog Ltd	Oil and Gas	GLOG	GLOG.K	C	C
Gildan Activewear Inc	Industry	GIIL	GIL.TO	A	A
Humana Inc.	Medicine	HUM	HUM	A	A
Heico Corp.	Aviation	HEI	HEI	C-	C-
Hillenbrand Inc	Industry	HI	HI	C-	C-
Hexcel Corp.	Industry	HXL	HXL	B	B
iStar Inc	Properties	STAR	STAR.K	C-	C-
ladder Capital Corp	Properties	LADR	LADR.K	D+	D+
Innospec Inc	Industry	IOSP	IOSP.O	C+	C+
Intrepid potash Inc	Farmer	IPI	IPI	D	D
J.W. Mays Inc.	Properties	MAYS	MAYS.O	NULL	NULL
Kenon Holdongs Ltd.	Infrastructure	KEN	KEN	NULL	NULL
Koppers Holding Inc	Industry	KOP	KOP	C	C
LATAM Airlines Groups S.A.	Aviation	LTM	LTM	A-	A-
LightInTheBox Holding Co., Ltd.	Industry	LITB	LITB.K	NULL	NULL
Mesa Royalty trust	Oil and Gas	MTR	MTR	NULL	NULL
Marathon Oill Corporation	Refining of Oil	MRO	MRO	B	B
Murphy Oil Corp.	Refining of Oil	MUR	MUR	C-	C-
Marine products Corp	Industry	MPX	MPX	D+	D+
Marine petroleum Trust	Oil and Gas	MARPS	MARPS.O	NULL	NULL
MGP Ingredients, Inc.	Industry	MGPI	MGPI.O	C	C
NexTier oilfield Solutions Inc	Oil and Gas	NEX	NEX	C-	C-
Ossen Innovation Co., Ltd.	Industry	OSN	OSN.O	NULL	NULL
Oil States International, Inc.	Oil and Gas	OIS	OIS	C	C
Otter Tail Corporation	Infrastructure	OTTR	OTTR.O	C	C
Orion Engineered Carbons S.A.	Industry	OEC	OEC	C-	C-
Oxford Industries, Inc.	Industry	OXM	OXM	C-	C-
ProPetro Holdong Corp.	Oil and Gas	PUMP	PUMP.K	D	D
Patrick Industries, Inc.	Industry	PATK	PATK.O	D+	D+

P.A.M. transportation Services, Inc.	Industry	PTSI	PTSI.O	NULL	NULL
RF Industries Ltd.	Industry	RFIL	RFIL.O	NULL	NULL
Starwood property Trust Inc	Properties	STWD	STWD.K	D+	D+
Seabridge Gold, Inc.	Gold	SA	SEA.TO	D+	D+
SEACOR Holdings Inc	Oil and Gas	CKH	CKH	D+	D+
Sealed Air Corp.	Industry	SEE	SEE	C	D+
Southwest Airlines Co	Aviation	LUV	LUV	B+	B-
Southwest Gas Holding Inc	Gas	SWX	SWX	C-	C-
Scotts Miracle-Gro Company	Farmer	SMG	SMG	C-	C-
Steris Plc	Medicine	STE	STE	C+	C+
Trimas Corporation	Industry	TRS	TRS.O	C	C
Tutor Perini Corp	Industry	TPC	TPC	D+	D+
Twin River Worldwide Holdings Inc	Industry	TRWH	TRWH.K	NULL	NULL
Two Harbors Investment Corp	Properties	TWO	TWO	C-	C-
Tempur Sealy International Inc	Industry	TPX	TPX	C-	C-
Thermo Fisher Scientific Inc.	Medical	TMO	TMO	A-	A-
TimkenSteel Corp	Industry	TMST	TMST.K	C+	C+
Timmins Gold Corp	Industry	TG	QMX.V	NULL	NULL
Top Ships Inc	Seafaring	TOPS	TOPS.O	NULL	NULL
Total S.A.	Oil and Gas	TOT	TOT	A	C+
Toyota Motor Corporation	Industry	TM	TM	A-	C+
Tractor Supply Co.	Farming	TSCO	TSCO.O	B+	B+
Transcat Inc	Industry	TRNS	TRNS.O	NULL	NULL
Transportadora De Gas del Sur	Oil and Gas	TGS	TGS	C+	C+
Tupperware Brands Corporation	Industry	TUP	TUP	A-	B+
Universal Corp.	Tobaco Farmer	UVV	UVV	B	B
Urstadt biddle properties, Inc.	Properties	UBA	UBA	D	D
U.S. gold Corp	Gold	USAU	USAU.O	NULL	NULL
Village Farms International Inc	Farming	VFF	VFF.TO	NULL	NULL
VAALCO Energy, Inc	Refining of Oil	EGY	EGY	NULL	NULL
Yamana Gold Inc.	Gold	AUY	AUY	NULL	NULL
Zoetis inc	Medicine	ZTS	ZTS	B-	B-

12 Appendix models

With OLS USA

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2	R^2adj
Green Portfolio	0.132	-0.169	0.001	0.001
Other Portfolio	0.064	-0.327	0.002	0.002

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2	R^2adj
Green Portfolio	-0.049	-0.144	-0.198	-0.269	0.001	0.001
Other Portfolio	0.325	-0.453	-1.254	0.574	0.008	0.008

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2	R^2adj
Green Portfolio	0.193	-0.186	-0.110	-0.505	-0.386	0.003	0.003
Other Portfolio	0.389	-0.463	-1.233	0.513	-0.097	0.008	0.008

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2	R^2adj
Green Portfolio	0.114	-0.240	-0.269	0.081	-0.289	-1.285	0.004	0.004
Other Portfolio	0.547	-0.446	-1.260	-0.00	-0.953	0.551	0.009	0.008

With AR(1)

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2
Green Portfolio	0.013	-0.169	0.000
Other Portfolio	0.064	-0.327	0.000

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2
Green Portfolio	-0.049	-0.144	-0.198	-0.269	0.012
Other Portfolio	0.325	-0.453	-1.254	0.574	0.000

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2
Green Portfolio	0.193	-0.185	-0.110	-0.505	-0.386	0.001
Other Portfolio	0.389	-0.463	-1.233	0.513	-0.097	0.000

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2
Green Portfolio	0.114	-0.240	-0.269	0.081	-0.289	-1.285	0.000
Other Portfolio	0.547	-0.446	-1.260	-0.004	-0.935	0.551	0.000

With Paris

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2	R^2adj
Green Portfolio	0.015	-0.177	0.001	0.001
Other Portfolio	0.065	-0.330	0.002	0.002

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2	R^2adj
Green Portfolio	-0.047	-0.152	-0.200	-0.274	0.002	0.002
Other Portfolio	0.327	-0.457	-1.257	0.577	0.008	0.008

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2	R^2adj
Green Portfolio	0.193	-0.192	-0.112	-0.507	-0.383	0.003	0.003
Other Portfolio	0.389	-0.466	-1.236	0.518	-0.094	0.008	0.008

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2	R^2adj
Green Portfolio	0.115	-0.246	-0.269	0.075	-0.289	-1.279	0.004	0.004
Other Portfolio	0.581	-0.449	-1.263	-0.00	-0.930	0.554	0.009	0.009

For Norway

With OLS

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2	R^2adj
Green Portfolio	-0.015	-0.144	0.000	0.000
Other Portfolio	0.147	-0.470	0.004	0.004

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2	R^2adj
Green Portfolio	0.216	-0.203	-0.532	-0.324	0.002	0.002
Other Portfolio	1.175	-0.776	-2.130	-1.503	0.023	0.023

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2	R^2adj
Green Portfolio	0.392	-0.232	-0.522	-0.223	-0.218	0.003	0.003
Other Portfolio	1.172	-0.775	-2.130	1.505	0.003	0.023	0.023

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2	R^2adj
Green Portfolio	0.212	-0.225	-0.565	0.484	0.104	-0.266	0.002	0.002
Other Portfolio	1.07	-0.682	-1.982	1.013	0.027	1.264	0.024	0.024

With AR(1)

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2
Green Portfolio	-0.015	-0.144	0.051
Other Portfolio	0.147	-0.470	0.000

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2
Green Portfolio	0.216	-0.203	-0.532	0.324	0.000
Other Portfolio	1.175	-0.776	-2.130	1.503	0.000

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2
Green Portfolio	0.392	-0.232	-0.522	0.223	-0.218	0.000
Other Portfolio	1.172	-0.775	-2.130	1.505	0.003	0.000

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2
Green Portfolio	0.212	-0.225	-0.565	0.484	0.104	-0.266	0.000
Other Portfolio	1.107	-0.682	-1.982	1.013	0.027	1.264	0.000

With Paris

Panel A: CAPM

2010-2020	β_0	β_{ERM}	R^2	R^2adj
Green Portfolio	-0.015	-0.143	0.000	0.000
Other Portfolio	0.147	-0.470	0.004	0.004

Panel A: FF3

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	R^2	R^2adj
Green Portfolio	0.215	-0.202	-0.533	0.324	0.001	0.002
Other Portfolio	1.176	1.506	-2.126	-0.776	0.023	0.023

Panel A: C4

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{PR1YR}	R^2	R^2adj
Green Portfolio	0.329	-0.230	-0.522	0.223	-0.219	0.002	0.002
Other Portfolio	1.171	-0.775	-2.126	1.509	0.006	0.023	0.023

Panel A: FF5

2010-2020	β_0	β_{ERM}	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2	R^2adj
Green Portfolio	0.212	-0.224	-0.566	0.482	0.100	-0.267	0.002	0.002
Other Portfolio	1.105	-0.681	-1.973	1.015	0.040	1.289	0.024	0.024

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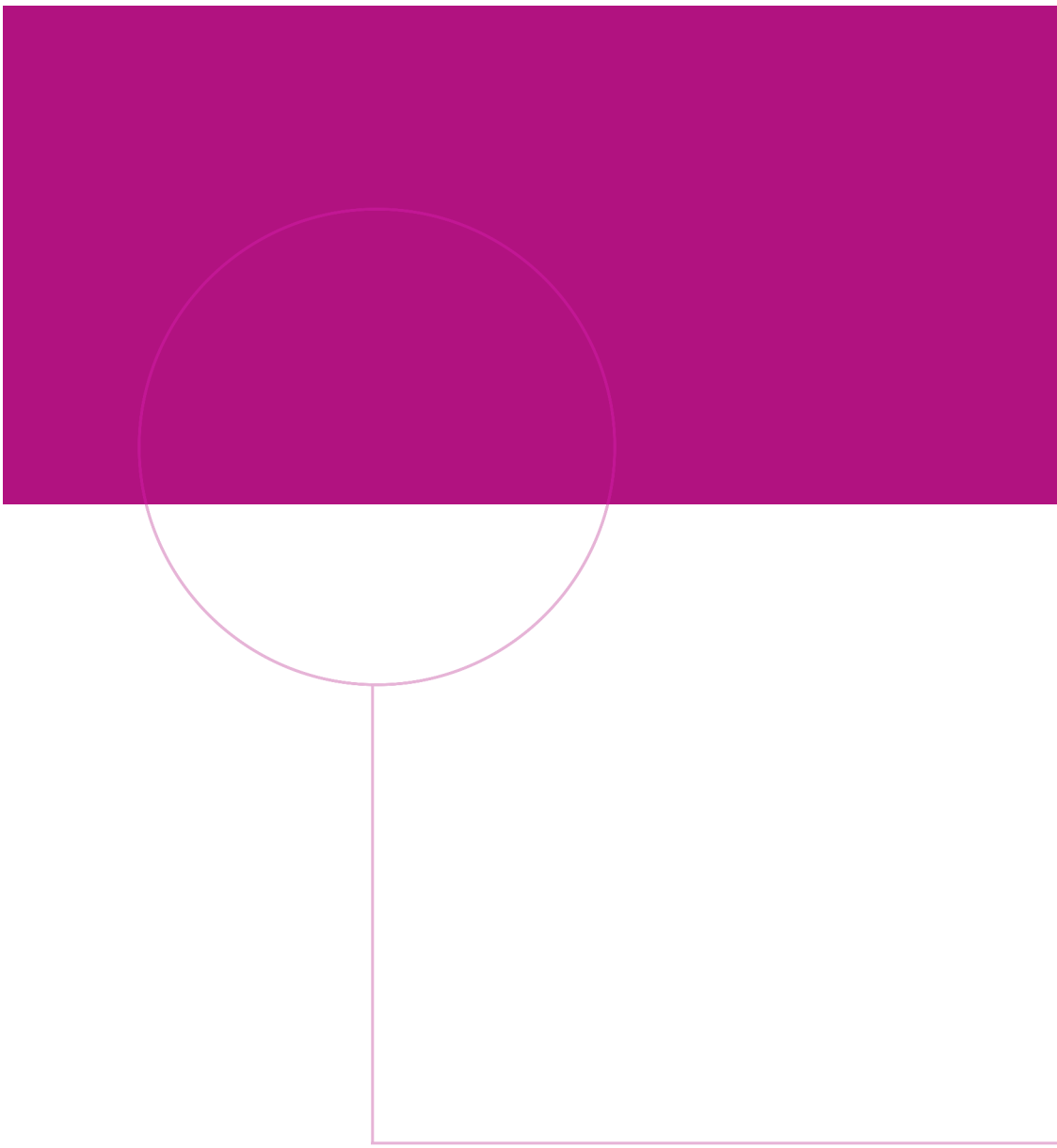

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