



**UNIVERSITY  
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# **Are green bonds delivering on their green promise?**

A qualitative study exploring the motives and effects of green bond issuances

Accounting and Finance

Master's thesis

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There is a global concern over combatting climate change and the need for rapid actions. Debt capital markets, with the largest pool of capital globally, also play a critical role. Green bonds have been introduced as one potential solution and the market has grown rapidly in recent years after the first one was issued in 2008. A distinct feature of green bonds is that the bond proceeds are to be ring-fenced for green projects. The green bond market has evolved through self-regulated market standards and now voluntary EU standard is also under development. The green bond market is characterized by high investor demand and more restricted supply, leading to often observed pricing difference compared to conventional bonds, the so-called green premium. Despite the noble aims of the instrument, it has faced criticism and concerns. For instance, the additionality of the instrument, whether green bonds are raising capital for green projects that would not otherwise happen, has been questioned. However, it has been suggested that the greatest impact of green bonds could come from the new standards of practice and cultural change that they are catalyzing.

Thus, the objective of the thesis is to examine the potential green bonds possess in facilitating the financing for the sustainability transition. The aim is approached by exploring the motivations and barriers for engaging in the green bond market. In addition, the study intends to understand how green bonds affect the operations of different market participants and influence market practices. For this purpose, different green bond market participants, including issuers, investors and underwriting banks, are approached. The research is designed as a case study, using Finland as the context. The data is collected through nine (9) semi-structured interviews, which are analyzed using theory-directed content analysis as a method.

The study yielded several interesting findings. Firstly, in terms of delivering impact, the biggest benefit of green bonds may be the increased transparency and awareness these instruments are creating in the financial markets. Secondly, green bond issuers are mainly motivated by the ability to connect their organizational level sustainability work to financing and communicate that to different stakeholders. External pressures and market expectations are also increasingly driving green bond issuance. Thirdly, the lack of internal expertise and capabilities or lack of eligible projects are usually the main barriers to green bond issuance. Lastly, the additionality of green bonds cannot be claimed, at least in a way it is typically understood, as green bonds are not financing projects that would not have received financing otherwise. As the green bond market and green definitions have evolved in recent years and will continue to evolve, more data on the environmental impacts of green bonds becomes available, which may provide fruitful avenues for future research.

**Key words:** green bonds, green finance, sustainable finance

Pro gradu -tutkielma

**Oppiaine:** Laskentatoimi ja rahoitus

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**Otsikko:** Ovatko vihreät joukkovelkakirjalainat niin vihreitä kuin mitä lupaavat? Kvalitatiivinen tutkimus vihreiden joukkovelkakirjalainojen vaikutuksista ja markkinaosapuolten motivaatioista

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Huoli ilmastonmuutoksesta on maailmanlaajuinen ja tarve nopeille teoille on ilmeinen. Velkääomamarkkinoilla suurimpana pääoman lähteenä maailmanlaajuisesti on myös suuri rooli. Vihreät joukkovelkakirjalainat on kehitetty yhdeksi potentiaalisiksi ratkaisuksi ja niiden markkina on kasvanut nopeasti viime vuodet sen jälkeen kun ensimmäinen laskettiin liikkeelle vuonna 2008. Tämän instrumentin erityispiirre on, että joukkovelkakirjan rahoituksen käyttö on rajattu vihreisiin projekteihin. Vihreiden joukkovelkakirjalainojen markkina on kehittynyt itesääntelyn kautta, mutta esimerkiksi EU valmistelee parhaillaan omaa standardiaan. Historiallisesti näiden instrumenttien kysyntä on ollut tarjontaa suurempaa, mikä on johtanut hinnoitteleroon, jota myös vihreäksi preemioksi kutsutaan. Jaloista tarkoituksiperistä huolimatta vihreät joukkovelkakirjalainat ovat kohdanneet myös kritiikkiä. Kyseenalaistettuna on esimerkiksi niin kutsuttu lisäisyys, rahoitetaanko näillä instrumenteilla vihreitä projekteja, jotka eivät muuten saisi rahoitusta. On myös esitetty, että kenties vihreiden joukkovelkakirjojen suurin vaikutus seuraa uusista toimintatavoista ja kulttuurin muutoksesta, joitana nämä ovat katalysoimassa.

Siten, tämän tutkimuksen tarkoitus on tutkia vihreiden joukkovelkakirjojen potentiaalia kestävyystransition rahoittamisessa. Tämän tavoitteen saavuttamiseksi tutkitaan eri markkinaosapuolten motivaatioita ja kohtaamia haasteita. Lisäksi tutkimus pyrkii selvittämään miten vihreät joukkovelkakirjalainat vaikuttavat eri markkinaosapuolten toimintaan ja markkinakäytäntöihin. Tutkimus on tapaustutkimus, jossa Suomi toimii kontekstina. Empiirinen aineisto kerätään puolistrukturoiduilla haastatteluissa, joissa haastatellaan eri markkinaosapuolia: liikkeellelaskijoita, sijoittajia ja avustavia pankkeja. Aineisto yhdeksästä (9) haastattelusta analysoidaan teoriaohjaavan sisällönanalyysin keinoin.

Tutkimus poiki useita mielenkiintoisia löydöksiä. Ensiksi lisääntynyt läpinäkyvyys ja tietoisuus kestävyyskysymyksistä rahoitusmarkkinoilla ovat vaikuttavuuden näkökulmasta vihreiden joukkovelkakirjalainojen suurimpia hyötyjä. Toiseksi liikkeellelaskijoiden suurin motivaatio vaikuttaa olevan mahdollisuus yhdistää rahoitus organisaatiotason kestävyystyöhön. Lisäksi vihreät joukkovelkakirjat tarjoavat kanavan kommunikoida näistä eri sidosryhmille. Myös ulkoinen paine ja markkinoiden odotukset kannustavat vihreiden liikkeellelaskuun. Kolmanneksi sisäisten resurssien ja sopivien vihreiden investointien puute vaikuttavat olevan suurimpia esteitä vihreiden joukkovelkakirjalainojen liikkeellelaskulle. Viimeisenä johtopäätöksenä voidaan todeta, että vihreät projektit saavat rahoitusta myös ilman vihreitä joukkovelkakirjalainoja, joten tällaisesta lisäisyydestä ei voida puhua. Vihreiden joukkovelkakirjojen markkinat ja vihreyden määritelmät ovat kehittyneet merkittävästi viime vuosina ja kehityksen jatkuessa tulevaisuudessa voidaan tutkia vihreiden joukkovelkakirjalainojen hyötyjä lisääntyneen tiedon kautta.

**Avainsanat:** vihreät joukkovelkakirjalainat, vihreä rahoitus, kestävä rahoitus

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# 1 Introduction

## 1.1 Background and motivation

Financing climate actions is now more relevant than ever. With the growing concern over climate change and the need for rapid actions, financial markets are increasingly looking for ways to contribute. As debt capital markets are the largest pool of capital globally, these sources of financing can play a critical role (WWF 2021). The first green bond was introduced in 2007 when the European Investment Bank (EIB) issued a climate awareness bond (European Investment Bank 2007). The World Bank, in cooperation with the Swedish bank SEB, developed the concept of green bonds as a response to a request from Swedish institutional investors. The World Bank's first green bond was issued in 2008. (World Bank 2019).

Green bonds are commonly defined as “any type of bond instrument where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible green projects” (International Capital Market Association 2021). This means directing capital towards environmentally friendly projects, such as renewable energy, clean transportation, green buildings, energy efficiency, sustainable management of natural resources, clean water, and climate change adaptation. What makes green bonds different from traditional bonds is the commitment to use the proceeds for green projects, assets, or business activities. The development of green bonds has been praised as one of the most important innovations of the past decade in the field of sustainable finance (Maltais & Nykvist 2020, 1).

The green bond market has grown every year since its inception, at an accelerating speed since 2013, when the first corporate green bond was issued by a Swedish property company Vasakronan (Vasakronan). Since 2008, the World Bank has issued nearly USD 150 billion in green bonds, being the biggest green bond issuer in volume, followed by the European Union. As governments and corporates are issuing green bonds at an increasing speed, annual issuance volume is forecasted to reach USD 500 billion in 2021 and USD 1 trillion already in 2023. (Climate Bonds Initiative 2021a.) Europe is leading the way, with 48% of the global issuance in 2020, followed by North America and Asia-Pacific. Of individual countries, the biggest issues in terms of volume came from USA, Germany, France, and China, in respective order. (Climate Bonds Initiative 2020a). Other debt

instruments promoting sustainable finance, such as sustainability-linked bonds and social bonds, have been introduced in recent years. Being the most prominent among these instruments, green bonds will be the focus of this study. While being notable in the sustainable debt segment, green bonds still represent a drop in the ocean, accounting for about 1% of the global bond market (Climate Bonds Initiative 2021b).

What sets green bonds apart from conventional bonds is the green label, making the definition of green a central question. While green bonds have been around for over a decade, there are various definitions for what constitutes as green. As a response to the lack of standardized processes and definitions of green, market participants have developed voluntary principles and standards, such as the Green Bond Principles (GBP) introduced by International Capital Market Association (ICMA) in 2014. Regional standards for green bonds, such as the upcoming European Green Bond Standard (EUGBS), which will be aligned with the EU taxonomy, have also emerged. (MacAskill et al. 2021, 3.) Green Bond Principles, which have been widely adopted as the market standard, suggest best practices for the green bond issuance process, with the aim of increased transparency and disclosure. The principles include recommendations for four components, namely: 1) defining the eligible use of proceeds, 2) a process for choosing eligible green projects, 3) transparent management of proceeds, and 4) annual reporting on the allocation of proceeds and expected impact. To add credibility, creating a Green Bond Framework and obtaining an external review are recommended. (International Capital Market Association 2021.) As these are only recommendations for best practices, external verification plays a large role in promoting the credibility of the market.

The pricing of green bonds has received wide attention from both market participants and academics. Previous studies (Ehlers & Packer 2017; Baker et al. 2018; Zerbib 2019; Gianfrate & Peri 2019) have shown evidence of a green bond premium, also referred to as “greenium”, meaning that green bonds pay lower yields compared to traditional bonds with similar characteristics. Ehlers and Packer (2017) identified the so-called greenium only in the primary market and not in the secondary market. However, evidence of the greenium remains inconclusive. Green bond discount, indicating a positive yield differential, has been found in some studies (Karpf & Mandel 2018; Dorfleitner 2021), while others have found no evidence of the green premium (Larcker & Watts 2020; Flammer 2021). The evidence of no green premium is consistent with the industry practice, as

investor surveys and interviews indicate that investors are not willing to sacrifice returns when investing in green bonds (Nykvist & Maltais 2020, 9; Flammer 2021, 514).

However, it has been argued that the existence of greenium may be due to strong investor demand, indicating investors' interest in green funding (Gianfrate & Peri 2019, 132; Climate Bonds Initiative 2021c). This also is evidenced as on average higher oversubscriptions for green bonds compared to traditional bonds (Climate Bonds Initiative 2021c). Of recent issuances, the EU's inaugural green bond issued in October 2021 was oversubscribed by over 11 times (Financial Times 12.10.2021). Caroline Harrison, a researcher from Climate Bonds Initiative (CBI), stated that the greenium is currently evident globally and they expect that to persist until all the debt is sustainable (S&P Global 15.9.2021). Larcker and Watts (2020, 3) argue that investors' non-pecuniary preferences are not necessarily driving differences in asset prices, but prices are affected by the issuer's sustainability performance through effects on profitability and risk. This makes sense considering that for most green bonds, the risk and profitability are derived from the issuer's entire operations, not only from the projects that are financed with the green bond.

While there remains inconclusiveness on the existence of green bond premium, it is evident that engaging in the green bond market comes with an additional cost for the issuer, for example in terms of reporting, managing the proceeds, and obtaining an external review. Larcker and Watts (2020, 2) examine the costs of issuing a green bond and find the underwriting cost for green bonds to be higher than for traditional bonds. While they did not find evidence of green premium, they raise questions on other benefits for green bond issuers. On the other hand, Maltais and Nykvist (2020, 13) state that green bonds allow investors and issuers to comply with their current sustainability targets with rather low costs, as green bonds are created to fit into the capital markets with only little supplementary investment analysis required.

Wider effects of green bond issuance for the issuing entity have also been studied. Flammer (2021) found a positive stock market reaction to green bond issuance, which was stronger for externally certified bonds and bonds from first-time issuers. In addition, she found an increase in ownership by green and long-term investors. Evidence of improved environmental performance after green bond issuance has also been found, for example as decreased carbon emissions (Flammer 2021; Fatica & Panzica 2021). It is still worth noting that the causal effects of green bonds and improved environmental performance

may not be directly observable as green bonds usually finance only a small fraction of the issuer's operations (Flammer 2021, 500; Fatica & Panzica 2021, 2699). However, Fatica and Panzica (2021, 2699) suggest that these findings reject the greenwashing argument and indicate that green bond issuers show credible commitment to climate action.

Despite these findings, the impact and additionality – whether green bonds are raising capital for green projects that would not otherwise happen – have been questioned in the context of green bonds. Maltais and Nykvist (2020, 4) claim that most of the green bonds could have been issued as conventional bonds with little difference to the issuers' ability to raise capital at favorable rates. Thus, it is a real concern that green bonds may seem more environmentally impactful than they truly are (Maltais & Nykvist 2020, 14). Tolliver et al. (2019, 2) add that as green bonds are to a large extent used for refinancing existing projects, the additional environmental impact and role in the project finance decision-making process is limited. Consequently, it has been suggested that stakeholders view the green bond market mostly as a communication tool (Deschryver & de Mariz 2020, 17). Green bonds are seen as important in creating a dialogue between issuers and investors concerning environmental risks and opportunities. Issuers use green bonds to communicate their pro-environmental actions and investors disclose and communicate their green bond purchases to show their commitment to environmentally friendly investments. (World Bank 2015, 45, 36.)

After all, what is attracting market participants to the green bond market? This is an important question to address in order to understand the role of green bonds in the transition to a sustainable economy. Only in recent years, there have been some qualitative studies examining the market participants' perspectives and motivations (e.g. Deschryver & de Mariz 2020; Maltais & Nykvist 2020; Sangiorgi & Schopohl 2021). Deschryver and de Mariz (2020) examine barriers that are slowing down the growth of the green bond market. They find that the financial benefits for issuers are unclear, there is a limited number of benchmarks, and the supply is lacking diversity and liquidity. In addition, they find risks of greenwashing and a need for globally standardized practices for managing the proceeds and reporting on impact. Maltais and Nykvist (2020) study the motivations of green bond issuers and investors, how green bonds change the way organizations approach sustainability, and whether green bonds are seen as an effective tool for shifting capital. They find that mostly non-financial factors, such as the ability to communicate sustainability work, are making green bonds attractive to market participants. They use

Sweden as a case study and conclude that there seems to be no lack of demand for green bonds, but a lack of projects appropriate for green bond financing (Maltais & Nykvist 2020, 13). Deschryver and Mariz (2020) also identify the limited supply of green bonds for investors as one of the barriers slowing down the scaling of the green bond market. This mismatch of supply and demand levels makes the motivations of green bond market participants especially topical for further research. Sangiorgi & Schopohl (2021) analyze survey evidence of European institutional investors' green bond investment practices and factors affecting decision-making. However, the perspective of the issuer remains only very little explored, and they suggest that research on issuers' views on green bond issuance and experienced benefits and obstacles would complement their findings.

Measuring the real, additional impacts of green bonds has proved challenging. In fact, it has been argued that the impact of green bonds could be best measured by the new standards of practice and cultural change they are catalyzing (Michaelsen 2018). Gilchrist et al. (2021, 10) add that as developed economies are expected to favor market-based solutions for tackling the global ecological sustainability crisis, we need a deeper understanding of what truly motivates companies to take on environmentally friendly investments in contrast to just addressing environmental issues rhetorically. Thus, motivated by the limited existing knowledge, this study attempts to understand what green bond market participants' motivations and experiences tell about the transformative potential of the instrument. Are green bonds indeed delivering on their green promise?

## **1.2 Research objectives, questions, and methodology**

The objective of this thesis is to examine the potential green bonds possess in being an effective instrument for financing the sustainability transition. The aim is approached by examining the market participants' experiences from engagement with green bonds. The aim of the study is approached with the following research questions:

1. What are the motivations of different market participants for engaging with green bonds?
2. What challenges are the market participants experiencing?
3. How is the engagement with green bonds affecting the operations of different actors and influencing market practices?

Given the aim for a deeper understanding of experienced motivations and barriers, a qualitative research strategy is well suited. The study is conducted with semi-structured interviews, where the aim is to explore the research topic inductively (Yin 2018). Green bond issuers, investors, and intermediaries, such as underwriting banks, are interviewed. Intermediaries may be able to provide information regarding the prospective issuers and non-issuers, which would otherwise be difficult to identify and contact. Drawing from multiple perspectives allows for exploring a deeper understanding of the topic, which is vital in building a robust qualitative study (Kaczynski et al. 2014, 131). The interview data will be supplemented with publicly available data related to green bond issuances, such as green bond prospectuses and green bond frameworks.

The focus of the study will be on Finland, which creates an interesting setting given Finland's ambitious target of reaching a net-zero economy by 2035 (Ministry of the Environment). The first green bond in Finland was issued in 2016 by MuniFin (MuniFin 2016) and other financial and non-financial corporates have joined the market since. However, the market in Finland is still in its infancy with only 14 corporate issuers to date. Experience from these pioneers will be vital in understanding the potential of scaling the green bond market further. Given the limited number of potential research participants in Finland, i.e. organizations having issued green bonds, further limitations were not used.

Since there are only very few examples of green bond issues in Finland in recent years, a qualitative method will generate in-depth information on the topic. This may also create exciting avenues for future research. Qualitative interview data may help in creating hypotheses for further testing the role of variables and mechanisms when more data becomes available. As most of the literature on green bonds focuses on the financial implications of green bonds, the rationales behind green bond issuance decisions have not received much attention, thus calling for further research. Qualitative research methods allow for exploring the reasoning behind these decisions (Eriksson & Kovalainen 2008).

### **1.3 Structure of the thesis**

This thesis has eight chapters. The first chapter provides an introduction to the topic and motivation for the research. Research objectives are also presented. The second chapter dives into green bonds as a sustainable debt instrument. It presents an overview of different sustainable debt instruments and key concepts in the green bond market. This includes an overview of the green bond market development, different market participants, the

regulatory environment, and the pricing of these instruments. The third chapter is the literature background which covers the concepts of sustainable finance, corporate social responsibility, and responsible investing for parts that are relevant to the scope of this thesis. In addition, it presents the concept of additionality, which provides background for assessing the impact of sustainable finance. This chapter ends with an overview of previous, recent studies on motivations and impact in the context of green bonds.

The fourth chapter introduces the methodological approach for this study. The research approach and design are discussed, as well as principles for selecting cases and collecting interview data. The data analysis methods are briefly introduced, followed by a discussion on research ethics. Chapter five, empirical analysis, presents the findings from the interviews. This chapter is organized to cover the following themes: definitions for sustainable finance, motivations and barriers for engaging with green bonds, and impacts of green bonds. More specific aspects are discussed under more detailed subheadings. In the discussion in chapter six, the empirical analysis is connected to previous literature. Chapter seven presents conclusions and evaluation of the study. The thesis concludes with a summary in chapter eight. The interview guide is found in the Appendix section.

## 2 Green bonds as a sustainable debt instrument

### 2.1 Sustainable debt instruments

The introduction of green bonds started the discussion on the use of proceeds of debt instruments and linking those to specific sustainable uses. As a result, different types of debt instruments with a sustainability focus have been introduced. We will briefly review these instruments to understand the position of green bonds as a part of the sustainable debt landscape.

Sustainable debt instruments are labeled for their intended social and/or environmental impacts. Table 1 presents the two currently used forms for incorporating sustainability into debt instruments, either with a focus on the use of proceeds or issuer level targets referred to as KPIs (Key Performance Indicators). With the use of proceeds type of instruments, funds are earmarked and allocated to specific projects or assets with sustainability impacts. In contrast, sustainability-linked loans and bonds focus on issuer-level sustainability performance targets. The proceeds may be used for general corporate purposes, but the interest rate is linked to the achievement of the pre-defined sustainability targets (KPIs) and issuers will be penalized for not achieving those targets. (see e.g. Schmittmann & Chua 2021, 8).

Table 1. Sustainable debt types (Adapted from Schmittmann & Chua 2021; Climate Bonds Initiative 2021b)

Debt type	Debt style	Purpose	Cumulative issuance USD bn (2020)
Green bond	Use of proceeds	Environmental projects	1,139
Green loan	Use of proceeds	Environmental projects	501
Social bond	Use of proceeds	Social projects	192
Sustainability bond	Use of proceeds	Environmental & social projects	143
Sustainability-linked bond	Issuer KPI-linked	Institutional ESG targets	16
Sustainability-linked loan	Issuer KPI-linked	Institutional ESG targets	311

Sustainability-linked instruments allow new kinds of issuers to enter the sustainable debt market. However, a major concern with these instruments is the difficulty in comparing issuer-specific KPIs against peers and global targets to assess the ambition level. (Climate



Bonds Initiative 2020a.) Bonds are debt instruments that can generally be traded on the secondary market whereas a loan is an agreement between the borrower and lender(s) and is usually not tradable.

In addition to the debt types presented in Table 1, the Climate Bonds Initiative recognizes the use of proceeds transition bonds as a separate type of sustainable fixed income. Transition bonds allow high emitting issuers to access funding for their transition towards more sustainable operations on their way to net-zero emissions. These bonds are financing activities that would not be considered green in themselves but are critical components for the transition. Typical issuers come from sectors such as aviation, mining, or highly emitting materials production such as cement and steel. (Climate Bonds Initiative 2021a.)

Green bonds are the most prominent of the sustainable debt types as the cumulative issuance amounts indicate in Table 1. What sets green bonds apart from traditional bonds is the focus on the use of proceeds, tracking of allocation, impact reporting, and external reviews. This provides bond investors with an increased level of transparency and allows the bond market to contribute to green finance. (EU Technical Expert Group on Sustainable Finance 2019, 18.) Bonds are a key tool for financing climate action as bonds are used for financing capital expenditure intensive long-term projects such as renewable energy investments (Wörsdörfer 2019, 9).

## **2.2 Development of the green bond market**

Development of the green bond market started in 2007 when a climate awareness bond was issued by the European Investment Bank (European Investment Bank 2007). The first bond with the green bond label was issued in 2008 by World Bank, in cooperation with the Swedish Bank SEB, responding to a request from climate concerned Swedish pension funds (World Bank 2019). This started the systematic process of directing capital to green investments with measurable and usually verified environmental benefits (MacAskill et al. 2021, 2). The Copenhagen Accord in 2009 provided a major boost to the green bond market, as it set out that financial markets need to play a key role in the fight against climate change by mobilizing private capital for climate change mitigation and adaptation projects. Several major economies agreed that the development of financial products that focus on environmentally beneficial investments and appeal to influential investors are significant for the fight against climate change. (Bachelet et al. 2019, 2–3.)

However, for the first years, development banks were mainly responsible for green bond issuances (Monk & Perkins 2020, 5). The market did not start to grow considerably until after 2013 when the first corporate and municipal green bonds were being issued and the International Finance Corporation's (IFC) benchmark issuance of USD 1 billion received strong investor demand and sold within an hour (Bachelet et al. 2019, 3). Another important development was the creation of Green Bond Principles (GBP), which were developed by market players and introduced by ICMA (International Capital Market Association) in 2014. Increased standardization and growing demand for green bonds led to an increase in the average issuance size and diversification of issuers. (Monk & Perkins 2020, 5–6). Following the Paris Agreement of 2015, the first-ever legally binding global agreement to limit global warming, nations and companies started to align their operations to limit global warming to 1.5 degrees. This pushed for increased investments in renewable energy and other environmental initiatives. (Bachelet et al. 2019, 3.) The green bond market has grown considerably year-on-year after 2014 as illustrated in Figure 1. Climate Bonds Initiative (2021a) estimates the annual green bond issuance in 2021 to reach USD 500 billion and exceed USD 1 trillion in 2023. The number of outstanding green bonds already reached USD 1 trillion milestone in 2020 (Climate Bonds Initiative 2020a, 6).

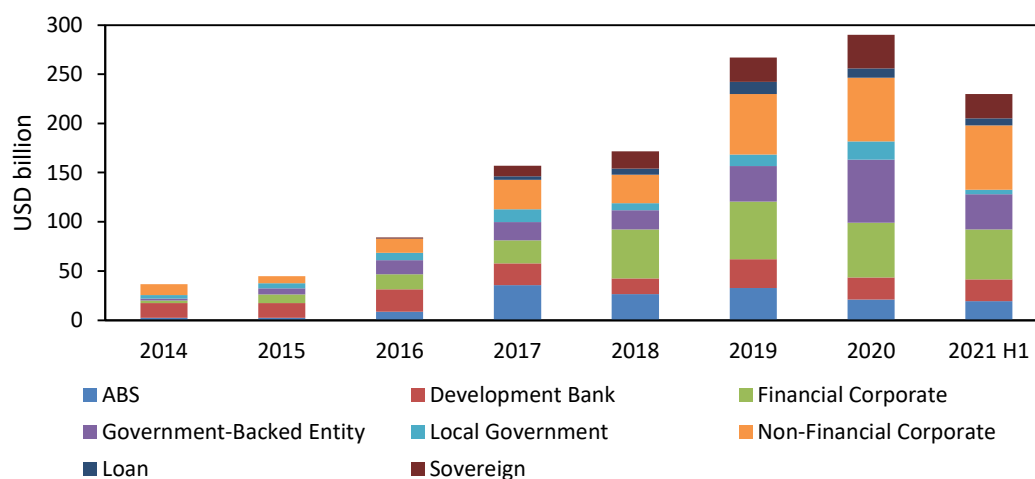


Figure 1 Green bond issuance by issuer type (Climate Bonds Initiative 2021)

Despite the fast growth of the market, several barriers have been identified to the green bond market development. Issuers face uncertainty with the types of assets and projects that may be financed through green bonds and are concerned about the reputational risks

alongside green definitions. In addition, the economic incentives for the issuers were unclear, the external review procedure was seen as complex and the reporting process was viewed as laborious. All in all, simply the lack of eligible green projects was seen as a barrier. (EU Technical Expert Group on Sustainable Finance 2019, 21.)

### **2.3 Key market participants**

Although the green bond market was initiated by multinational development banks, today green bond issuers also include corporates, financial corporates, as well as municipal and sovereign actors as presented in Figure 1. In 2020, 80% of green bond issuances originated from developed markets, where Europe was the largest region responsible for 48% of the global total. Other major regions for green issuance were North America and Asia-Pacific. Of individual countries, USA, Germany, France, and China led green bond issuance in 2020, in respective order. (Climate Bonds Initiative 2020a.)

Non-financial corporates and government-backed entities led the issuance in Europe, each contributing to 25 % of the regional issuance volume. As seen in Figure 1, the ratio is similar globally, with financial corporates being the third-largest issuer type. Issuers have diversified beyond real estate companies, banks, and utilities. For instance, representing the automotive sector Volkswagen (EUR 2bn/USD 2.3bn), Daimler AG (EUR 1bn/USD 1.1bn), and Volvo (EUR 500m/USD 580m) issued their inaugural green bonds in 2020. (Climate Bonds Initiative 2020a.) The share of sovereign issuers has grown steadily since the first sovereign green bond was issued in 2016 by Poland (Monk & Perkins 2020, 6). Despite the fast growth Monk and Perkins (2020, 10) argue that so far, the green bond market has been supply-constrained, as the benefits of green bonds have been attractive to only a small share of potential issuers.

Demand for green bonds comes from a wide range of investors as the financial characteristics of green bonds are similar to conventional bonds while coming with a dedication to environmental benefits. Green bond investors range from retail and high-net-worth to institutional investors, who may have a special focus on environmental investments. (Bachellet et al. 2019, 3.) Green bonds have started the discussion on the use of proceeds disclosure, which allows investors to better understand the effects of their investment (e.g. WWF 2021, 59), making these instruments especially appealing for investors seeking environmental impact. So far investor demand for green bonds has been high and a key in spurring market growth.

Financial institutions, as investors and intermediaries, have a crucial role in ensuring that financial resources are directed to environmentally and socially friendly uses and that the economy is transitioning to a green direction (Wörsdörfer 2019). Financial intermediaries, such as underwriting banks, support the green bond transactions. Most prominent banks today have dedicated teams for assisting their clients in issuing green bonds in the international debt capital markets. (Deschryver & de Mariz 2020, 5.) Underwriters and arrangers have had a central role also in the development of the green bond market as the idea of developing such an instrument was brought to the World Bank by an underwriting bank. Intermediaries were also key actors in developing the Green Bond Principles. (Monk & Perkins 2020, 7.) However, according to WWF (2021, 5) between 2016–2020 largest 30 investment banks have still underwritten USD 4 trillion of debt for fossil fuels, earning total fees of nearly twice the amount they made underwriting or arranging green debt transactions. Even if the amount of green debt increases, the capital needs to shift from doing environmental harm to doing environmental good, and the key players in originating and distributing financial capital need to be incentivized for the shift.

Other key actors include NGOs, service providers, governments, and regulators. UK-based Climate Bonds Initiative (CBI), established in 2009, has acted as a key player in promoting the green bond market growth for instance by providing resources such as data on green bond issuance and reports on market developments and green bond pricing (Monk & Perkins 2020, 6–7). Other important actors include service providers such as external verifiers, assurers, and index providers. Additionally, governments and regulators are important actors. Although the early development of the green bond market was led by market participants, especially in developing economies state-led approach has helped scale the market. The most evident example is China, where the People’s Bank of China published binding green bond guidelines in 2015. India has adopted a similar state-led approach to standardize the local green bond market. (Monk & Perkins 2020, 8.)

## **2.4 Self-regulatory environment for green bonds**

### **2.4.1 The Green Bond Principles**

The green label is initially what differentiates green bonds from traditional bonds and thus common definition of green is key for the credibility of the market. Standardization of the market was initiated by market participants, who developed the Green Bond

Principles (GBP), published by International Capital Market Association (ICMA) in 2014. The GBP are voluntary guidelines that aim at increased transparency and disclosure by defining best practices for the green bond issuance process. The principles include recommendations for four components: 1) defining the eligible use of proceeds, 2) a process for choosing eligible green projects, 3) transparent management of proceeds, and 4) annual reporting on the allocation of proceeds and expected impact. For defining eligible use of proceeds, the GBP provide a broad, non-exhaustive list of project categories such as renewable energy, energy efficiency, pollution prevention and control, green buildings, clean transportation, environmentally sustainable management of land use and natural resources, climate change adaptation, conservation of terrestrial and aquatic biodiversity, sustainable water and wastewater management, and solutions for the circular economy. (International Capital Market Association 2021.)

In addition, the GBP strongly recommend the green bond issuer to create a Green Bond Framework and to obtain an external review. The Green Bond Framework (or legal documentation) should describe the alignment with the four above-mentioned components of the GBP and explain the link to the issuer's overall sustainability strategy. Disclosure of other taxonomies or green certifications and standards used for project selection is also encouraged. Obtaining external reviews is recommended for both the pre-issuance and post-issuance documentation to confirm alignment with the GBP. (International Capital Market Association 2021.) The GBP have become a widely adopted market practice as today 97% of green bond issuances internationally claim alignment with these (WWF 2021, 49). Even if the Green Bond Framework and external review are not mandatory components, those have become a market standard practice. The GBP have been updated multiple times since their initial release to reflect higher market standards. The latest revision of the principles was published in June 2021. The GBP have also served as a basis for developing national or regional standards and guidelines.

Green bond frameworks have also faced criticism. As the Green Bond Framework and the intended use of proceeds are presented at the issuance, the environmental impacts of the bond are challenging to evaluate at that point. What makes it challenging is that many issuers list a variety of project or asset types where bond proceeds may be directed and thus allocations to specific uses and environmental impacts cannot be predetermined or guaranteed (Tolliver et al. 2019, 7). In addition, Tuhkanen and Vulturius (2020) find that many green bond issuers do not link their green bond frameworks to organizational-level

climate targets and thus fall short of taking a comprehensive approach to the transition towards carbon neutrality.

#### 2.4.2 Other market standards

The Climate Bonds Initiative, an international investor-focused charity, has developed a Climate Bonds Standard (CBS) and Certification scheme. This also builds on the Green Bond Principles, and certification under the CBS confirms alignment with the GBP and uses scientific criteria to confirm that a bond is aligned with the targets of the Paris Agreement. Certified Climate Bonds accounted for approximately 15 % of the green bond market in 2020 (Climate Bonds Initiative 2020a, 10). In addition, national green bond standards have been developed for instance in China and India. The International Standards Organization (ISO) published in 2021 its ISO 14030 standard for evaluating the environmental performance of green debt instruments (WWF 2021, 49).

European Commission is currently preparing a voluntary EU Green Bond Standard (EUGBS) to enhance the growth and credibility of the EU green bond market. The main difference compared to the widely adopted Green Bond Principles is that under EUGBS eligible green projects should be aligned with the EU taxonomy, which is a classification system for environmentally sustainable economic activities. The standard also requires transparent reporting on the allocation of the bond proceeds and environmental impact. In addition, external review is required to ensure taxonomy alignment and compliance with the regulation. All external reviewers need to be registered with the European Securities Markets Authority (ESMA), which supervises the reviewers to ensure the reliability of their services. (European Commission n.d. 1.) The proposal was published by the European Commission in July 2021 and the draft regulation is expected to be finalized in late 2022 (WWF 2021, 51).

Given that there are currently multiple voluntary standards and guidelines attempting to standardize the green bond market, aims to harmonize regional standards are underway. To align with international practices, in 2021 China removed clean coal projects from its list of eligible projects, as those had been very controversial (WWF 2021, 49). The European Union and China are also discussing the differences between their green bond standards and attempting to converge those in the future (Bachelet et al. 2019, 4). Beyond creating standards for green bonds, regulators affect the market development through

support schemes and the development of taxonomies for defining green activities (Schmittmann & Chua 2021, 9).

As suggested by various standards, external reviews play an important role in ensuring the credibility of the green bond market. According to Climate Bonds Initiative (2020a, 10), nearly 90 % of qualified green bonds in 2020 had an external review, most often in the form of a second party opinion (SPO). Other forms of external review include assurance/verification, certification, and green rating. According to CBI, second party opinions are most often sought for larger individual bonds, such as issuances from government-backed entities, sovereigns, and non-financial corporates. Many second opinion providers, such as the Center for International Climate Research (CICERO), Sustainalytics, and Vigeo, provide granular assessments on the degree of potential environmental impacts of a green bond.

Compared to SPOs, verification reports are usually less detailed as they may for instance only verify whether a bond is aligned with the GBP. Verifications are typically issued by audit companies such as PwC or KPMG. Certification refers to a CBI certification, confirming alignment with their Climate Bonds Standard. Green ratings are provided by credit rating agencies such as S&P and Moody's, which for instance rate green bonds on a five grade scale from 'excellent' to 'poor'. These are more quantitative compared to SPOs and rely on the issuer's environmental performance data. (Dorfleitner et al. 2021, 6–7.) Green bond indices also act as a form of external review or certification as index providers identify green bonds that are included in the index via their own methodology and inclusion in a green bond index may be valued by investors. Indices usually claim consistency with the GBP but have their own additional factors such as specific industry focus or requirements for size and liquidity. (Ehlers & Packer 2017, 93–94).

Complying with the GBP and obtaining an external review create additional costs for the green bond issuer. Larcker and Watts (2020, 2) also found that the underwriting costs for green bonds are higher compared to conventional bonds, which makes them more attractive for arrangers, and may affect their motivations. However, external reviews have proven to be associated with bond pricing benefits for the issuer (Baker et al. 2018), which will be later discussed in chapter 2.5. In the same vein, Flammer (2021) finds that externally reviewed green bonds attract more investor demand and issuers with certified green bonds lower their carbon emissions more than issuers of non-certified bonds. Thus,

external reviews play an important role in ensuring the credibility of the green bond market. Even if there are no legally binding sanctions if the green targets are missed, it seems that the expectations from stakeholders and fear of adverse publicity pressures companies to comply.

## 2.5 Pricing of green bonds

### 2.5.1 Conventional bond pricing

A bond is a form of debt instrument, where the issuer of the bond (borrower) agrees to pay the investor (lender) back the principal amount, also called face value, at maturity. The issuer of the bond usually pays a fixed interest rate periodically (commonly annually or semi-annually), known also as the coupon payment, to the investor until the maturity of the bond. Yield is the rate of return realized by the investors. It is a function of the bond's current price in the market and its coupon payment. As the bond price increases the yield decreases and the other way around. (see e.g. Choudhry 2010, 2–5.) The financial structure of green bonds is identical to conventional bonds.

Climate Bonds Initiative (n.d.) recognizes five different types of green bonds. The most common type is the **use of proceeds bond**, where the proceeds are earmarked for green projects and the debt is backed by the issuer's entire balance sheet. Other green bond types are backed by green projects or assets and thus transfer some of the project risk to the holder of the green bond. These are also called asset-backed green bonds. One of these is the **use of proceeds revenue bond**, which differs from the use of proceeds bond so that the debt is backed by the green projects' revenues. Third type, **project bond**, refers to a bond where the proceeds are ring-fenced for specific projects whose assets and balance sheet act as debt recourse. Fourth, **securitized bond** proceeds are earmarked for an underlying pool of projects, which are being financed or refinanced. The debt is secured by the underlying projects, which may be for example green mortgages or solar leases. Fifth, **covered bond** proceeds are earmarked for the underlying group of projects and in the case of issuer default these are backed by the underlying projects. Although most green bonds being issued are the use of proceeds type, it is important to acknowledge the different types, as these have implications for bond pricing and impact assessment.

Merton (1974, 449) documents three items that essentially affect the pricing of corporate bonds: the risk-free rate, the underlying bond characteristics, and the probability of



default or probability that the issuer is unable to pay back its debt obligations. Government bonds are considered to be riskless in terms of default and are usually used as a proxy for the risk-free rate of return. Merton mentions coupon rate, maturity date, seniority of the debt in case of default, and sinking fund as examples of the underlying characteristics. The probability of default is usually proxied by the credit rating. Bond characteristics often examined in the literature include also for example yield, volatility, and liquidity (see e.g. Bachelet et al. 2019). Menz (2010, 121–122, 129) argues that through a generally lower risk premium, the bond issuer's sustainability performance should affect the bond pricing. However, after studying the European corporate bond market, he suggests that corporate social responsibility has not yet been incorporated into bond pricing. In the context of green bonds, the pricing difference compared to conventional bonds has been widely studied empirically, which we will review next.

### 2.5.2 Green bond premium

Green bonds are designed to be comparable to conventional bonds, only differentiated by their specific use of proceeds commitment for green projects. As the financial characteristics of green bonds do not differ from conventional ones, the pricing should be similar, unless investors give value to the green credentials of the bond. Hachenberg & Schiereck (2018, 3) argue that the green feature of a bond is an additional element that may be favored by the investors and thus lead to increased demand and explain the tighter pricing for green bonds.

Many empirical studies have found a disparity in the pricing of green bonds compared to traditional bonds. These studies are investigating the pricing difference, also known as “green bond premium” or “greenium”, which is defined as the difference between yields of a conventional bond and a green bond with otherwise identical characteristics. (see e.g. Agliardi & Agliardi 2019). A negative green bond premium, either on the primary market or secondary market, implies that a green bond is trading at a lower yield (or higher price) compared to a conventional bond with the same characteristics. This is usually referred to as greenium, which would indicate that investors are willing to accept a lower yield in exchange for the green investment opportunity. (MacAskill et al. 2021, 1.) However, the existence of such pricing difference is not explained by the modern portfolio theory, which assumes that investors are rational, markets are efficient, and expected returns are a function of risk (Dorfleitner et al. 2021, 2).

Several studies have identified the existence of a negative green bond premium (see e.g. Ehlers & Packer 2017; Baker et al. 2018; Hachenberg & Schiereck 2018; Zerbib 2019; Gianfrate & Peri 2019). In previous research, the average green bond premium has been between two (Zerbib 2019) and eighteen basis points (Ehlers & Packer 2017; Gianfrate & Peri 2019). Ehlers and Packer (2017) identified a green bond premium at issuance, while they did not identify a premium in the secondary market after hedging for currency risks. However, across their small sample of just 21 green bonds, the variation is large, as shown by the standard deviation of 27 bps for the yield difference. Baker et al. (2018) studied a larger sample of 2,083 municipal bonds in the US market and found a green bond premium of about six basis points in the primary market (at issuance). In addition, they found evidence that green bond ownership is more concentrated to environmentally concerned investors, who may be willing to sacrifice some return for holding green bonds. They found both effects to be larger for externally verified green bonds. Regarding bond characteristics, municipal green bonds had higher credit ratings and longer maturities compared to ordinary bonds (Baker et al. 2018, 11).

Hachenberg and Schiereck (2018) study the secondary market and find evidence of only marginal premium (trading tighter) for green bonds from financial and corporate issuers while they find government green bonds trading marginally wider. They conclude that the issuer industry and the existence of ESG ratings influence the pricing. Zerbib (2019, 40–41) finds a “small, albeit significant” green premium of two basis points, which is more evident for low-rated and financial bonds. They argue this premium to be significant in the sense that it is small enough to not discourage investing in green bonds but still demonstrates investor demand and opportunities for issuers to widen their bondholder base.

When studying European green bonds Gianfrate and Peri (2019) find evidence for green bond premium both in primary and secondary markets, which is larger for corporate issuers, as observed in previous studies. To conclude, the green bond premium seems to be driven by the demand from investors directing funds towards environmentally-friendly investments to avoid climate change related risks and to comply with the current or future regulation (Gianfrate & Peri 2019, 132, 134). Climate Bonds Initiative (2021c) examined 75 USD and EUR denominated green bonds issued in the first half of 2021. Green bonds in the sample experienced higher oversubscriptions compared to conventional bonds, which was especially evident for the USD bonds. Another interesting finding is that 66%

of green bonds were allocated to investors with green or responsible investment mandates. Pricing at issuance was studied for 33 green bonds, of which 11 exhibited greenium and 15 were priced in line with conventional bonds.

On the contrary, some studies have found conflicting evidence and argue that a green bond discount (positive premium) is associated with the pricing of green bonds meaning that green bonds offer higher yields than conventional bonds (see e.g. Karpf & Mandel 2018; Bachelet et al. 2019; Dorfleitner et al. 2021). Karpf and Mandel (2018) examine 1,880 US municipal bonds on the secondary market and find a positive green bond premium, also called the green bond discount, of nearly 8 basis points. Bachelet et al. (2019) also find that green bonds have higher yields compared to conventional bonds. However, they observe that the issuer's reputation and third-party verification to a large extent affect the pricing. According to their findings, third-party verification eliminates the yield difference which implies that investors require a higher return for green bonds that are considered less credible. Thus, verification is essential for reducing information asymmetries. Dorfleitner et al. (2021) compare 250 bonds to matched conventional bonds in the time period from 2011 to 2020 and find on average positive green bond premium. However, they also find that external verification, especially second party opinion, leads to a higher green bond premium. This effect seems to be strongest for bonds rated dark green, indicating that investors indeed value the environmental credentials of green bonds.

Lastly, recent studies have not identified green bond premium and suggest that green bonds are priced in line with comparable conventional bonds (Larcker & Watts 2020; Flammer 2021). Larcker and Watts (2020) do not find evidence of pricing differential when comparing municipal green bonds to nearly identical non-green bonds from 2010 to 2016 by the same issuer on the same day. They argue that "the mixed evidence from prior studies is the result of methodological design misspecifications that produce biased estimates" (Larcker & Watts 2020, 4). They find municipal green bonds to be a convenient sample as municipal issuers often issue conventional and green securities at the same time. Despite finding no difference in pricing, underwriting costs for green securities were on average 10% higher compared to non-green securities. However, they find that green bond issuers benefit from a more diversified investor base. Flammer (2021) on the other hand focuses her analysis on the global corporate green bond market, where she did not find a green bond premium from 2013 to 2018. However, she finds that green bond issuance leads to increased ownership by green and long-term investors. In addition, the stock

market response to green bond issuance is positive in her sample while the effect is stronger for first-time issuers and certified green bonds.

MacAskill et al. (2021, 11) conclude that bond governance characteristics, such as green bond certification, investment grade rating, and government or municipal issuer, especially affect the green premium. However, it seems that as the market matures, the green bond premium may diminish. On the other hand, Flammer (2021, 514) speculates that investors could settle for a lower yield for green bonds in the future after the so-called low-hanging fruits of profitable green projects have been taken advantage of and become scarcer. The pricing of green bonds has important implications for examining the motivations behind green bond issuance. Although the evidence of green bond premium is mixed, there are various findings of green bond premium, both in the primary and secondary market. Secondary market performance may have important implications for the success of future green bond issuances, however it is the primary market price that ultimately affects the issuer's cost of capital (Partridge & Medda 2020, 54). Pricing advantage may act as a financial incentive for the green bond issuer, as theoretically a profit-maximizing entity would be interested in issuing a green bond only if the higher issuance costs are being compensated by the benefits associated with the issuance. These benefits may be monetary or non-monetary, which may however lead to financial benefits as a result of improved corporate reputation for instance. (Lau et al. 2022, 381.)

## 3 Literature background

### 3.1 Sustainable finance

#### 3.1.1 The connection between sustainability and finance

Finance and sustainability have been connected in extensive academic research in the past 50 years, resulting in different framings for finance, such as sustainable, environmental, green, and climate finance (Naidoo 2020, 271). Policies, industry practices (such as frameworks), and different labels and standards have shaped the sustainable finance landscape (Migliorelli 2021).

When discussing the interconnection between sustainability and finance, we start by examining definitions for sustainability. The widely referenced definition for sustainable development has been presented by the United Nations' Brundtland Commission in 1987 as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission 1987). Raworth (2017) adds to this definition by specifying that these needs have to be fulfilled without stressing the processes of the Earth system. The interplay between social needs and environmental boundaries may be illustrated as a doughnut where social foundations set out the baseline where people and communities can prosper. The outer ceiling is formed by the planetary boundaries which describe the environmental limits. (Raworth 2017.) The concept of planetary boundaries, introduced by Steffen et al. (2015), defines the boundaries of nine ecological capabilities of the Earth within which humanity can safely operate. These boundaries consider climate change, biodiversity, land-system change, freshwater use, biochemical flows, ocean acidification, air pollution, ozone layer depletion, and novel entities, which refers to e.g. chemical pollution.

Levine (2005) recognizes that the financial system provides the following functions: 1) allocating capital and producing ex-ante information about investment options, 2) monitoring investments and practicing governance after allocating capital, 3) facilitating trading, diversification, and risk management, 4) mobilizing and pooling savings as well as 5) facilitating the exchange of services and goods. The first three functions make finance particularly useful and crucial for the transition to a sustainable economy and give the actors in the financial sector a possibility to play a leading role (Schoenmaker & Schramme 2019, 18).

There are various definitions for sustainable finance. European Commission (n.d. 2) defines sustainable finance as “the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects”. This definition has also been adopted by the World Bank. However, Migliorelli (2021, 2) proposes that sustainable finance should rather be referred to as “finance for sustainability”, to better reflect the context of industry and policy as well as to steer practice. This suggests that finance should be understood as an independent factor aiming to contribute to the sustainability of the society, especially to be aligned with the Paris Agreement and the United Nation’s Sustainable Development Goals (SDGs). This approach is also consistent with the sustainability transition approach (e.g. Naidoo 2020). Naidoo (2020, 271) describes sustainability transitions as the normative goal and necessary processes for addressing the goals of SDGs and the Paris Agreement.

Finally, Cunha et al. (2021, 3824) suggest sustainable finance and investment (SFI) to be used as an umbrella term for all concepts related to financial and investment activities grounded on sustainability-oriented strategies. Based on an extensive literature review Cunha et al. (2021, 3826) propose the following definition: “SFI is the management of financial resources and investments with the aim of promoting long-lasting, positive, and measurable social and environmental impacts”. Therefore, three elements that set SFI apart from traditional finance and investment can be distinguished. Firstly, social and environmental factors are incorporated into financial and investment decision-making as core elements (Urban & Wójcik 2019). Secondly, SFI is grounded in a long-term view which is crucial when addressing global sustainability challenges (Busch et al. 2016; Widyawati 2020). Thirdly, the results and methodological approaches need to be measurable (Höchstädter & Scheck 2015; Renneboog et al. 2008a). Different terms and approaches related to SFI have evolved over the years, from socially responsible investment to responsible investment, impact investment, and ESG investment. Approaches to responsible investing will be covered in more detail in chapter 3.3.

### 3.1.2 Different stages of sustainable finance

Deriving from the typology for business sustainability developed by Dyllick and Muff (2016), Schoenmaker (2017, 22) introduces a framework for explaining the developmental trajectory of sustainable finance. The balance between financial and sustainability

motives is understood differently at each stage. These three stages of sustainable finance are presented in Table 2.

Table 2. Stages of sustainable finance (Schoenmaker 2017)

Note: F = financial value, S = social impact, E = environmental impact, T = total value. At Sustainable Finance 1.0, the maximization of F is subject to minor S and E constraints.

Sustainable Finance Typology	Value created	Ranking of factors	Optimization	Horizon
Finance-as-usual	Shareholder value	F	Max F	Short term
Sustainable Finance 1.0	Refined Shareholder value	$F > S$ and E	Max F subject to S and E	Short term
Sustainable Finance 2.0	Stakeholder value	$T = F + S + E$	Optimise T	Medium term
Sustainable Finance 3.0	Common good value	$S$ and E $>$ F	Optimize S and E subject to F	Long term

Sustainable finance typology demonstrates the trajectory from short-term shareholder value maximization to optimization of wider stakeholder value. At the final stage, long-term common good value is created. (Schoenmaker & Schramade 2019, 19-20.) Migliorelli (2021) similarly recognizes that there has been a clear evolution in the meaning of sustainable finance, developing from a risk management perspective to actual value creation through impact.

The finance-as-usual approach is consistent with the argument of Friedman (1970) that the social responsibility of a company is to increase its profits. At this stage, the aim is at maximizing the financial returns and creating maximal shareholder value. The perspective is inside-out, focusing on business objectives driving decision-making and action. Often this results in high externalized costs that are not recognized, measured, or managed. (Dyllick & Muff 2016, 163).

On the sustainable finance 1.0 level sustainability is approached from a cost and business risk reduction perspective. Although sustainability concerns are considered in decision-making and operations, the underlying business objectives focus on creating short-term shareholder value. From a business perspective, this could mean new rules for compliance or processes for emissions reduction. (Dyllick & Muff 2016, 163–164.) From investors' perspective financial value is maximized through exclusions, where the investor or lender avoids the so-called 'sin' companies, which create very negative social or environmental

impacts. Examples of exclusions include tobacco companies and more recently also fossil fuels. (Schoenmaker & Schramade 2019, 21.) At this level, environmental and social concerns are often considered after being raised by external stakeholders such as NGOs (Dyllick & Muff 2016, 163).

According to Schoenmaker & Schramade (2019, 22), sustainable finance 2.0 considers broader stakeholder value, and the combination of social, environmental, and financial value is optimized. This refers to the triple bottom line approach – people, planet, profit – first introduced by Elkington (1997). At this level, sustainable value creation is a result of purposeful actions targeting pre-defined sustainability objectives. Progress is not only managed, but also measured and reported. (Dyllick & Muff 2016, 164–165). Financial institutions include negative environmental or social externalities in their decision-making, for instance in the form of ESG integration. Externalities might be priced for example in the form of a carbon tax or negative reputational impacts and thus incorporating these factors is another form of managing financial risks in the medium or long term. However, optimizing the combined value of social, environmental, and financial factors could lead to compensating for poor performance on one sustainability aspect with added focus on another aspect. (Schoenmaker & Schramade 2019, 30, 22–23.) Dyllick & Muff (2016, 165) argue that this perspective is still considering sustainability from the inside-out by asking how a company may reduce its negative impacts.

Finally, sustainable finance 3.0 adopts a long-term horizon and considers sustainability from an opportunity, rather than a risk perspective (Schoenmaker & Schramade 2019, 24). Truly sustainable companies have adopted an outside-in perspective. Rather than just minimizing negative impacts, these organizations seek to create notable positive impacts in critical areas of environmental and social issues. (Dyllick and Muff 2016, 165–166.) At this stage, finance is used as a means for fostering sustainable development and financial institutions choose to only invest in companies or projects that are sustainable. Investments are selected based on their potential to create positive environmental or social impacts. (Schoenmaker & Schramade 2019, 24.)

However, financial viability needs to be considered as a fair financial return is one decisive factor. The question of the level of fair financial returns remains inconclusive. (Schoenmaker & Schramade 2019, 24.) Are financial institutions willing to sacrifice some of the financial return in exchange for environmental and social benefits? According



to Global Impact Investment Network's (GIIN 2020, 80) Annual Impact Investor Survey, 67% of respondents principally target risk-adjusted, market-rate returns, while 18% seek below-market but closer to market-rate returns. The remaining 15% is targeting returns closer to capital preservation. Target returns vary by investor type, all surveyed pension funds and insurance companies target market-rate returns and so do 85% of for-profit asset managers.

Lau et al. (2022) argue that the level of green bond premium, which they found to be slightly over one basis point (0.01%) on average, reflects the level of how much investors are willing to pay for environmental benefits. They conclude that sadly, this is not much. In the same vein, Heeb et al. (2022) find that investors are willing to sacrifice some return for sustainable investment but are not selecting investments with higher impacts which would require them to give up more returns. However, they show that investors' willingness to pay (WTP) varies between differences in impact, but not consistently with the absolute impact levels. They argue that investors' valuation of impact is driven by emotions instead of calculation and rather than optimizing the impact of their investments, they are optimizing the "warm glow" while maximizing the financial performance. They conclude that the practical implication of this is a risk that financial institutions are incentivized to offer products that offer a good feeling rather than a real impact (Heeb et al. 2022, 7). Continuing from this, in the following chapters we will explore in more detail why and how do organizations engage with sustainability practices and especially sustainable finance.

### **3.2 Corporate social responsibility**

Okoye (2009, 623) suggests that corporate social responsibility (CSR) is an essentially contested concept, which implies that a universal definition for CSR is not necessary, although common reference points and examples are still needed for setting the core for the concept. Based on an extensive literature review, Frynas and Yamaki (2016, 261) consider CSR as an umbrella term for describing frameworks and practices which acknowledge that companies bear responsibility for their impact on the natural environment and society, sometimes beyond what is legally required. Maltais and Nykvist (2020, 4–5) argue that engagement with green bonds may not be conceptualized as a form of CSR, but still find this vast body of theoretical and empirical work in CSR useful in explaining motivations for participating in the green bond market.

Various theoretical perspectives have been used to explain engagement with CSR practices. Frynas and Yamaki (2016) categorize theories explaining CSR as either external or internal drivers. Most theories (stakeholder theory, institutional theory, legitimacy theory, and resource dependence theory) approach CSR from the perspective of external drivers while the less widely used theories (resource-based view, agency theory) focus on internal drivers. Theories that consider external drivers usually address the relationships between society and the firm, considering CSR as a result of conforming to societal norms and social relationships. The role of the managers is to seek societal legitimacy by aligning CSR with the expectations of society. Theories considering internal drivers concentrate on internal organizational processes, where CSR results from either managerial decisions and financial calculations or ethical, values-based judgements. (Frynas & Yamaki 2016, 261.)

Deriving from theories explaining CSR activities and socially responsible investing, Maltais and Nykvist (2020, 5) distinguish three categories for explaining motivations for engagement with sustainability activities: direct financial incentives, business case benefits, and legitimacy and institutionally-oriented drivers. In the context of green bonds, direct financial benefits from the issuer perspective are realized if the green bond lowers their cost of capital and/or improves access to capital. For investors, there is a financial incentive if the instrument provides better returns, and/or lower risk, and/or better diversification benefits than other comparable instruments. High CSR scores and voluntary CSR disclosure have been proved to be associated with a lower cost of equity (see e.g. Dhaliwal et al. 2011; El Ghoul et al. 2011), while CSR performance is also shown to lower the cost of debt (see e.g. Oikonomou et al. 2014).

Business case drivers refer to motives related to the economic performance of the issuer or investor that is not directly related to the performance of the green bond (Maltais & Nykvist 2020, 5). Following Hockerts' categorization (2015), business case incentives for corporate sustainability include four dimensions: risk reduction, increased operational efficiency, branding benefits, and creation of new markets. Possible risks include for instance accident risks, regulatory risks related to potential future sustainability regulations, and reputational risks, which are also related to maintaining the firm's social license to operate. Operational efficiency may come from efficiency in resource utilization, attracting talented employees, and improvement in employee productivity due to higher motivation because of sustainability commitments. Branding advantages may be realized for

instance as premium pricing or in relation to customer acquisition or retention. (Hockerts 2015, 103–106.) Creating new markets could mean creating new investment products for sustainability-oriented investors and/or attracting new customers to existing offerings (Riedl & Smeets 2017). Huang (2022, 1587) also positions risk management and the development of long-term competitive advantages as elements motivating ESG activity by firms.

For legitimacy and institutionally-oriented drivers, Maltais and Nykvist (2020) follow the framework of Fernando and Lawrence (2014) in integrating stakeholder, institutional, and legitimacy theory. Stakeholder theory presumes that companies are affected by the actions of their stakeholders and thus need to take into account their interests. Institutional theory assumes that the survival and success of a firm are dependent on gaining legitimacy within institutional environments. Similarly, legitimacy theory assumes that a firm's operations are based on a social contract with the society and success depends on obtaining legitimacy. (Frynas & Yamaki 2016, 263–268.) Drawing from these theories Fernando and Lawrence (2014, 169–170) predict three possible motivations for organizations to engage in CSR practices. First, organizations may be driven by the need to legitimize their activities in the face of societal pressures. Secondly, they may need to show accountability to stakeholders with sustainability demands. Lastly, there is a need to conform to the institutional norms and beliefs that are imposed on the organization, which eventually leads to homogeneity between organizations in the same field. Similarly, Huang (2022, 1587) argues that a firm's sustainability activity may be motivated by the attempt to build a social license, which is developed and maintained in all operations as the firm conforms to the changing external and internal conditions.

There is a vast body of literature examining the connection between corporate social responsibility and financial performance. Several studies find that firms with strong ESG performance are also financially more profitable than other firms (see e.g., Eccles et al. 2014; Khan et al. 2016). Eccles et al. (2014) find that companies who adopt voluntary sustainability policies, which they consider high sustainability companies, develop distinct organizational processes which differentiate them from the low sustainability companies. These organizational processes tend to integrate sustainability at many levels, they more commonly for instance have the board of directors formally responsible for sustainability, have a long-term orientation, and measure and disclose more non-financial information. These seem to pay off as they find high sustainability firms notably

outperforming their peers, both on stock market performance and accounting measures, in the long-term.

Khan et al. (2016) study sustainability investments and find that when making a distinction between material and immaterial sustainability issues for different industries, companies with good ratings on material sustainability issues remarkably outperform peers with poor ratings on these issues. On the other hand, they do not find companies with good ratings on immaterial sustainability issues outperforming. This has important implications for practitioners as well, suggesting that ESG performance measures should take into account materiality considerations to better explain the link between corporate sustainability and financial performance. These findings on the link between CSR and financial performance have important implications for investors who look to integrate ESG analysis into their investment process. Next, we consider the different approaches investors have for incorporating sustainability into their investment decision-making.

### **3.3 Investor engagement and strategies for responsible investing**

In previous literature, various terms are used for describing sustainable investment practices, such as ethical, social, responsible, and socially responsible investing. Sustainable and responsible investing (SRI) is generally described as an investment approach that adopts long-term orientation and integrates environmental, social, and governance (ESG) factors into investment analysis and decision making (e.g. Eurosif 2018, Busch et al. 2016). It combines traditional financial analysis with an assessment of ESG factors to secure long-term returns while benefiting the wider society by affecting corporate behavior (Eurosif 2018). Investors have different motivations for such practices, some are mainly motivated by improved management of ESG-related financial risks while others have a genuine motivation for contributing to sustainable development (Busch et al. 2016, 305). Different motivations have led to the development of different approaches for operationalizing sustainability in the investment context.

Eurosif (2018) recognizes seven categories for sustainable investment strategies: selection of best-in-class investments, exclusion of holdings from the investment universe, engagement and voting on sustainability issues, norms-based screening, sustainability-themed investment, ESG integration and impact investing. These categories with short explanations are presented in Table 3.

Table 3 Sustainable and responsible investment strategies (Eurosif 2018)

Strategy	Description
Best-in-class investment selection	Selection of companies with the best ESG performance in a particular sector
Exclusion of holdings from investment universe	Exclusion of companies, countries, or sectors which are involved in activities considered unsustainable e.g. weapons, tobacco, nuclear power
Engagement and voting on sustainability matters	Active ownership, e.g. utilization of shareholder rights
Norms-based screening	Selection of investments in compliance with international standards and norms, e.g. UN Global Compact
Sustainability-themed investment	Selection of sustainability-related assets into themed funds, e.g. renewable energy, clean technology
ESG integration	Inclusion of ESG factors into traditional financial analysis
Impact investing	Creation of intentional, additional, and measurable social and/or environmental impact alongside financial return

According to Eurosif's (2018) survey, the most commonly used SRI strategy by European asset managers in 2017 was exclusions, followed by engagement and voting and ESG integration. Impact investing was still a niche strategy. Although being a popular strategy, it is argued that exclusions are not real SRI as there will be other investors willing to buy such investment, and thus exclusions should be combined with an attempt for engagement and voting (Eurosif 2018, 22). Eurosif (2018, 20) highlights that these strategies are not mutually exclusive and for example, norms-based screening is often combined with other strategies such as exclusions and/or engagement. ESG integration and impact investing are the most growing strategies and also the most promising in terms of delivering impact. When discussing debt investors specifically, Menz (2010, 130–131) argues that they may be more focused on the downside perspective, as they are not able to benefit from the potential upside. Thus, he says that debt investors are less interested in engaging with the best-in-class approach but more focused on avoiding the worst performers in sustainability metrics to minimize the tail risk related to negative events. In addition, compared to equity investors with for instance voting rights, debt investors lack the tools pressure management.

ESG integration is sometimes used as a proxy to describe the whole of responsible investing, however, the expectations and practices of ESG integration have progressed in recent years. As there is no universal approach to ESG integration in practice, strategies vary across investors and asset classes. (Eurosif 2018). This makes the impact of ESG integration contested because it depends on how the investor implements such a strategy

(Busch et al. 2016, 311). Eurosif (2018) recognizes that ESG integration varies from a superficial tick-a-box approach to a well-defined strategy that is integrated into the whole investment process.

Impact investing is seen as the most advanced form of responsible investing. Impact investing aims at creating measurable social and environmental impacts alongside financial returns (GIIN 2020). The creation of impact should be intentional and depending on the investor's requirements, targeted financial returns may range from below-market-rate to market-rate returns (GIIN 2002; Eurosif 2018). Being a more proactive form of responsible investing, impact investing also requires increased engagement from the investors (Agrawal & Hockerts 2019, 160). Although green bonds have been positioned as an instrument for impact investing (e.g. Eurosif 2018; Flammer 2021; Schoenmaker 2017/2019), it should be noted that the impact of green bonds depends on how these are in practice structured and used by issuers and investors (Mangot & Fonquergne 2021, 11).

Different types of investors have different incentives for engaging with responsible investing. Busch et al. (2016, 312–313) make a distinction between financial investors, deontological investors, consequential investors, and expressive investors. Financial investors utilize ESG information to achieve better financial returns. Deontological investors are values-driven and avoid supporting irresponsible businesses while being concerned about the potential impact outcomes of their investments. Consequential investors aim at influencing companies by directing investments toward companies with positive sustainability impacts. Expressive investors use sustainable investments for enhancing their reputation and public image.

Most of the SRI literature is focused on the financial performance of SRI while the ultimate goal, changing the corporate behavior to be more sustainable, might be overlooked (Widyawati 2020, 633). In the same vein, Busch et al. (2016, 304–305) argue that while ESG criteria are increasingly integrated into investment decisions, this seems to have little impact on shifting business practices towards sustainability demands. In addition, Scholtens (2006, 28) argues that other financing channels than the stock market might be more impactful in 'greening' businesses as the stock market seldom provides new finance to the companies. Similarly, Menz (2010, 121) mentions that companies use the debt markets as a source of financing more often than the equity markets, and thus creditors could have a major influence by including corporate social responsibility in the valuation of

financial instruments. He also argues that the debt market is characterized by a high number of institutional investors, who have more pressure potential and the resources to incorporate complex sustainability issues into their investment decisions. The impact of sustainable finance will be discussed in the following chapter.

### **3.4 Understanding the impact of sustainable finance**

While green finance is financing green activities, it does not require that these activities need to be new initiatives or ones that would not be done without green financing. For this reason, green finance often claims credit for impacts that go beyond what was driven by green financing. (Grote & Zook 2022, 22.) The issue Grote and Zook (2022, 22) describe is called additionality, and they argue that green financing “needs to cause environmentally friendly activity, or otherwise nothing changes in the baseline scenario”. Additionality has also been a central concept in assessing environmental policies.

The concept of additionality was included in Kyoto Protocol, an international agreement that aims to reduce greenhouse gas (GHG) emissions by setting binding emission reduction targets for individual countries. It was adopted in 1997 and entered into force in 2005. As part of the Kyoto Protocol three market-based mechanisms were introduced – International Emissions Trading, Clean Development Mechanism (CDM), and Joint Implementation (JI) – which allow for GHG emission reductions in other countries, where the reductions are most cost-effective. (UNFCCC.) The requirement for additionality was introduced in connection to Clean Development Mechanism and Joint Implementation. Kyoto Protocol defined the additionality of CDM projects as “reductions in emissions that are additional to any that would occur in the absence of the certified project activity”. A slightly differing definition for additionality of JI projects was “a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur”. (Kyoto Protocol 1997.) However, there appears to be no technical reason for the differing definitions (Gillenwater 2012, 11).

Gillenwater (2012, 13) criticizes the Kyoto Protocol definition for specifying the project both as the cause and the effect for assessing additionality and baselines. Motivated by the ambiguity in discussing additionality, Gillenwater (2012) sets out to define additionality in the environmental policy context, especially in connection to GHG emission offset programs. He argues that: “Conceptually, additionality is a determination of whether a proposed activity will produce some "extra good" in the future relative to a reference

scenario, which we refer to as a baseline. In other words, additionality is the process of determining whether a proposed activity is better than a specified baseline.” In connection to this, the concept of a baseline is defined by “the absence of the specified policy intervention that is created by the offset policy or program”. In addition, he argues that “additionality is about causation. It is about deciding if a proposed activity is being caused by a policy intervention.” (Gillenwater 2012, 3.) Gillenwater (2012, 7) argues that additionality and baselines are relevant for a range of activities and products where credit is assigned for performance improvements.

Additionality in the context of green bonds is defined as financing new projects that would not receive financing otherwise (see e.g. Chiang 2017, 18). Green bonds have faced criticism for repackaging conventional bonds without creating additionality (Dupre et al. 2018; Shishlov et al. 2016, 5–6). It has been argued that a lower cost of capital, in the form of green premium, is a prerequisite for green bond additionality, as it would allow financing of projects that would not be profitable otherwise (Chiang 2017, 17–18; Shishlov et al. 2016, 4–5, 18). However, the misalignment between investor and issuer interests may create a gap between scaling the green bond market and ensuring meaningful contribution (Shishlov et al. 2016, 18). These contradictions are not easy to resolve as investors demand pricing parity with conventional bonds and credit ratings poorly take environmental risks into account (Jones et al. 2020, 56).

However, green finance practitioners argue that additionality is an unfair demand as bonds are often used for refinancing (Cripps 2018; Michaelsen 2018). Thus, industry practitioners suggest that green bond impact should rather be measured by new standards of practice and cultural changes these are catalyzing. For instance, green bonds have acted as a catalyst for the financial industry to consider sustainability issues, started the discussion on defining green activities, and created an increased focus on transparency on the use of proceeds of bonds. (Michaelsen 2018.) Grote & Zook (2022, 27) also point out that instead of just waiting for the capital markets to work more efficiently in terms of delivering impact, the focus could be on directly regulating firms, which however has been a more unpopular option and largely a political question.

### **3.5 Previous studies on motivations and impact**

In recent years, there have been some studies examining the green bond market participants’ perspectives and motivations (e.g. Deschryver & de Mariz 2020; Maltais &



Nykvist 2020; Sangiorgi & Schopohl 2021; Flammer 2021; Grote & Zook 2022). Deschryver and de Mariz (2020) examine barriers that are slowing down the growth of the green bond market. They find that the financial benefits for issuers are unclear, there is a limited number of benchmarks, and the supply is lacking diversity and liquidity. In addition, they find risks of greenwashing and a need for globally standardized practices for managing the proceeds and reporting on impact. Deschryver and Mariz (2020) also identify the limited supply of green bonds for investors as one of the barriers slowing down the scaling of the green bond market.

Maltais and Nykvist (2020) study the motivations of green bond issuers and investors, how green bonds change the way organizations approach sustainability, and whether green bonds are seen as an effective tool for shifting capital. Deriving from CSR and SRI literature, their theoretical framework divides possible motivations into financial, business case, and institutionally oriented / legitimacy. They find that factors mostly supporting the business case, such as the ability to communicate sustainability work, are making green bonds attractive to market participants. They use Sweden as a case study and conclude that there seems to be no lack of demand for green bonds, but a lack of projects appropriate for green bond financing (Maltais & Nykvist 2020, 13).

Flammer (2021) studied three possible explanations for green bond issuance, namely: signaling, greenwashing, and cost of capital. She only found support for the signaling argument, indicating that issuers use green bonds for signaling their environmental commitments. Flammer (2021, 502) argues that the signal is most likely credible as by issuing green bonds companies commit significant amounts of capital to green projects. The credibility is in most cases enhanced by obtaining a third-party verification for the green bond. Supporting the credible signaling argument, she found that following the green bond issuance firms indeed improve their environmental performance, as measured in improved environmental ratings, and a decrease in CO<sub>2</sub> emissions. They also attract more investors with a long-term focus and green preferences. (Flammer 2021, 514.)

Sangiorgi and Schopohl (2021) analyze survey evidence from 48 European institutional investors' green bond investment practices and factors affecting decision making. According to their findings, investors prefer green bonds from corporate and sovereign issuers. There seems to be especially strong unmet demand for green bonds from non-financial corporates operating in the automotive, industrials, and utilities sectors. The main

decisive factors for investors are strong green credentials and competitive pricing. This suggests that investors are unwilling to invest in green bonds with unclear or poor reporting on the allocation of proceeds and impact. Interestingly investors support the creation of minimum standards for green definitions but are divided on whether strict or less strict definitions would be more suitable for growing the market. Emphasis on competitive pricing is interesting in the light of previous evidence on the green bond premium (e.g. Ehlers & Packer 2017; Baker et al. 2018; Hachenberg & Schiereck 2018; Zerbib 2019; Gianfrate & Peri 2019).

Grote and Zook (2022) study how the green initiatives by the finance industry contribute to limiting global warming. They argue that ESG financing fails in delivering the outcomes that economic theory and finance literature predicts. First, they argue that the real-world impact that green finance can deliver is minuscule, due to the only minor reduction in returns. Secondly, they find that only very few investors are willing to sacrifice returns for climate impacts and that the finance community is mainly considering the transition risk, which may result from tightening climate regulation. They argue that in the absence of clear standards for measuring impact, many financial products are easily greenwashed, and these products are good business for fund managers, for instance. Thirdly, they are concerned about the difficulty in distinguishing green financing from conventional financing as most green investments would have been made anyway. Grote and Zook (2022, 24) argue that as a result, green finance is mostly satisfying the needs of the financial industry, rather than resulting in meaningful environmental benefits.

## **4 Data collection and methodology**

### **4.1 Research approach and design**

Considering that the impacts of green bonds on different market participants' operations are little studied, the research is designed to be exploratory in nature and thus qualitative research methods are the most suitable. According to Yin (2018, 9–13), a case study as a research method is well-suited when three conditions hold. Firstly, the form of research questions is often “how” and “why”. Second, the focus should be on contemporary events. And third, the researcher has little or no control over these events. Thus, a case study is selected as an appropriate research approach for this thesis.

Eriksson and Kovalainen (2008, 118) suggest that an extensive case study, which involves multiple cases, may be used for mapping common patterns and properties across cases. The aim is to develop, elaborate, or test theoretical constructs through comparisons between multiple cases (Eriksson & Kovalainen 2008, 118–119). In this thesis, we will elaborate on the theoretical constructs that arise from previous literature. Data collection is approached through semi-structured interviews. The aim is to find meaningful responses to research questions and topics that are derived from previous literature (Tuomi & Sarajärvi 2018).

### **4.2 Selecting cases and data collection**

Data were collected in nine (9) semi-structured expert interviews. Semi-structured interviews are chosen as a data collection method as these allow flexibility and clarifying questions and additional questions in case new topics appear during the interviews that the researcher had not included in the interview guide (Eriksson & Kovalainen 2008). An interview guide is used to help in collecting similar kinds of empirical data on each case, which allows for comparisons between cases (Eriksson & Kovalainen 2008, 122). The order of questions may have varied during the interviews and certain questions may have been left out in case the interviewee covered the topics in connection with other questions. The interview guides for each interviewee type are available in the Appendix section. Following the suggestion of Tuomi and Sarajärvi (2018), the interview guide was sent to the interviewees in advance which allowed them to prepare for the interview.

Interviews were conducted in February and March 2022 by video calls via Zoom and Teams. In addition, one interview was conducted as a phone call. The initial interview questions were always in English, however, interviews were conducted in Finnish or in English, depending on the interviewee's preference. Interviewees were informed about the anonymization in the reporting of results, in order to enhance the openness of responses. All interviewees were willing to be quoted for this study, either with or without needing to give explicit consent to individual quotes. On average the interviews lasted for 50 minutes, the longest interview being 73 minutes and the shortest being 30 minutes. All interviews were recorded and transcribed, resulting in 67 pages of the transcript with a font size of 11 and spacing of 1.

Finland is used as a context for the study and interviewees represent different prominent green bond market participants in Finland. Many represented organizations have operations in other countries as well and are especially prominent in the Nordics. To gain a range of insights and have the opportunity to verify perspectives (Berry 2002), interviewees were selected to represent the three primary actor groups within the green bond market. These include issuers, investors, and intermediaries, who provide services in advisory, bond issuance arrangement, marketing, brokerage, and have responsibility for green bond sales to investors. This allows for data triangulation and helps avoid biased conclusions. Within this sample, interviewees were selected based on their experience and involvement with the market. Interviewees were initially approached by email or LinkedIn message. Some of them were approached through contacts, which proved to be helpful. An overview of interviews is presented in Table 4. Later interviewees will be referred to as for example Issuer 1, referring to the organization type and differentiating different interviewees with numbers.

Interviewed issuers represent both financial issuers and non-financial corporate issuers. One of them is a financial institution that uses the green bond proceeds for green lending and the other one is a corporate issuer that uses the proceeds for its own investments. Together they have issued multiple green bonds, with an average issue size of nearly EUR 300 million and the largest issue of nearly EUR 600 million. The interviewed persons have been involved with the green bond issuances of these organizations since their very first green bonds and have also experience in creating the green bond framework. Both interviewees have senior positions within their organizations, one interviewee being in the position of a Group Treasurer.

Table 4 Overview of interviews

Interviewee	Role	Interview date	Interview duration
1. Issuer 1	Senior position within the funding unit	24.2.2022	1h 13min
2. Intermediary 1	Global lead for sustainable finance within a large bank	2.3.2022	59min
3. Intermediary 2	Head of Debt Capital Markets	3.3.2022	1h 12min
4. Intermediary 3	Lead for sustainable finance advisory services	7.3.2022	58min
5. Intermediary 4	Senior position within the credit sales unit	8.3.2022	45min
6. Intermediary 5	Head of Debt Capital Markets	8.3.2022	30min
7. Issuer 2	Group treasurer	10.3.2022	30min
8. Investor 1	Head of Fixed Income	15.3.2022	45min
9. Investor 2	Senior Portfolio Manager	29.3.2022	41min

Intermediary interviewees were selected to represent different perspectives on the green bond advisory and issuance process. All interviewees represent prominent organizations with operations in multiple Nordic countries. Two interviewees act as the Head of Debt Capital Markets in their respective organizations, both having nearly 20 years of experience working with bond transactions. Both are also experienced with green bonds, each with over 10 years of experience working with sustainable finance products or green bonds. One interviewee is responsible for sustainable finance in the organization he represents. To illustrate this person's long experience with green bonds, he was involved in the climate awareness bond transaction by European Investment Bank back in 2007.

One interviewee represents the credit sales function and is working with sales of various sustainable debt instruments, including green bonds, both in the primary and secondary market. One interviewee is leading the advisory function for sustainable finance and is working both with issuers and investors. Primarily the services consist of helping issuers to facilitate and structure sustainable finance instruments, mainly green bonds, and loans. Three of the interviewees are representing the same organization. One of them has also been involved in the development of the EU Green Bond Standard. The high representation of intermediary representatives is justified as they have experience working with a wide range of both issuers and investors and thus are able to comment on both perspectives. In addition, given their perspective as an intermediary, they may be able to discuss the topic more freely.

In total two investors were interviewed. Investor 1 is responsible for fixed income within the organization. The interviewee has responsibility for fixed income funds and acts as the principal portfolio manager for a fund focused on green bonds and other sustainable bond investments. This person has experience working with green bonds for four years. Investor 2 acts as a Senior Portfolio Manager at a prominent institutional investor in Finland. The interviewee has over 15 years of experience working within the credit market and is managing a portfolio of investment grade credit. The interviewee mainly invests in corporate green bonds directly and is partaking in green bond primary market transactions regularly.

In qualitative research, it is crucial that interviewees are experienced in the topic of the research and thus their selection should be carefully considered (Tuomi & Sarajärvi 2018). To conclude, we were talking to experts who are knowledgeable of the topic of the research and can be considered to give relevant views on the topic.

### **4.3 Data analysis and research ethics**

Transcripts of the interviews form the main source of empirical data for the analysis. In addition, annual reports and other relevant publicly available online sources, published by the organizations the interviewees represent, were used to verify certain perspectives and supplement interviewee responses related to for instance definitions for sustainable finance and responsible investing. According to Tuomi and Sarajärvi (2018), content analysis is a commonly used method in qualitative research, however, it may be used also for quantitative studies. Generally describing content analysis starts with deciding what is interesting in the collected data given the purpose and aims of the research. Then the researcher goes through the data and distinguishes the parts that are relevant for the research. Next, the data is coded into different categories, themes, or types, after which the conclusions are reported. Therefore, content analysis is a suitable method for analyzing various kinds of documents systematically and objectively. In this context, the document may be also interviews or speeches, as long as those are documented in writing. Although content analysis is useful in organizing and summarizing empirical material for drawing conclusions, it has faced criticism for its incompleteness in a case where the researcher has failed to arrive at meaningful conclusions, but instead presents organized data as results. (Tuomi & Sarajärvi 2018.) In order to tackle that issue, organized data is discussed in connection to previous literature.

In this thesis, thematic coding is used to organize empirical interview transcripts into themes or categories. Different responses, perspectives, and key concepts are organized under these categories. The creation of categories is guided by the interview questions and literature background. Although the analysis of the empirical data is not strictly guided by a pre-given theoretical framework, theoretical concepts from prior research are used to assist in describing and analyzing the empirical data and meanings in it (Eriksson & Kovalainen 2008, 129). Tuomi and Sarajärvi (2018) distinguish three approaches for content analysis: data-driven, theory-directed, and theory-driven. In this case, data is analyzed through theory-directed content analysis, where theory is used as a support for analysis, but the analysis does not rely directly on theory. The role of prior knowledge is not theory-testing but rather supports the findings. For instance, certain classifications or categorizations may be derived from theory. (Tuomi & Sarajärvi 2018, 82.) Below is a simplified illustration of the analysis process used.

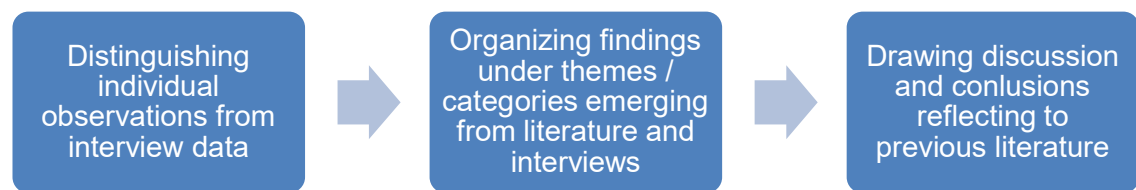


Figure 2 Simplified illustration of the analysis process

Ethical considerations are important in all kinds of research, but they are especially crucial when collecting primary data from humans. The study follows the ethical principles of research in humanities and social and behavioral sciences of the Finnish National Board of Research Integrity (TENK 2012). The informed consent for participation in the research was given by all research participants. Participants were informed about the purpose and aims of the research, and they were allowed to ask for additional information about the research at any point in the process. The anonymity of research participants and represented organizations was ensured.

## 5 Empirical analysis

In empirical analysis, the data from the interviews is presented. The chapter is organized to reflect the research questions and covers perspectives and findings which are interesting when aiming to understand green bonds as a tool for the sustainability transition. First, the different definitions for sustainable finance are covered, to bring context to the interviewees' other responses. Then aspects related to motivations and barriers for engaging with green bonds are covered. Lastly, perspectives regarding the impacts of green bonds are discussed. The empirical analysis is enriched with quotes from the interviews. Responses to research questions are discussed in chapter 6, where findings from the empirical analysis are linked to previous literature.

### 5.1 Definitions for sustainable finance

Interviews with different market participants started with discussing their definition of sustainable finance, or more specifically green finance, and the meaning it has for the organization. As green bonds are a part of this realm, it is important to understand how different players approach this topic more generally to comprehend the role of green bonds. Different market participants approach these definitions through their own business perspectives. For instance, underwriters approach this through the sustainable finance products and services that they are able to offer and set specific targets through for example green lending volumes. First, different definitions presented by intermediaries will be discussed. Some interviewees define sustainable finance through their activities and strategic focus, which includes societal contribution, as Intermediary 1 emphasizes:

It is about ensuring that we channel more financing to activities that have a positive societal contribution and less to those that have a negative societal contribution. For our organization, it is one of the strategic pillars of the bank's role. (Intermediary 1)

Many intermediaries comment that green and sustainable finance is generally understood through products, such as green bonds, which are defined through market practices.

There perhaps is not a one singular definition or a binary definition on what is green finance or sustainable finance as such. I think in broad terms when we talk about sustainable finance, we mainly talk about transactions that are structured in a manner that is consistent with the existing market practices. On sustainable finance, the core products are often within bonds and loans. So, we look at green loan principles, social loan principles, green bond principles, social bond principles, sustainability bond guidelines, sustainability-



linked loan principles, sustainability-linked bond principles, so anything that is structured according to the existing market guidance and market practices we can deem as being sustainable financing. (Intermediary 3)

For intermediaries, these green and sustainable finance products are an integral part of their business but also tools for concretizing their organizational sustainability commitment and targets.

Within about the past five years we have seen that in our organization and in other banks, we have started to think that also banks should have sustainability targets. And in these five years, sustainable finance and green finance have become the main tool for the bank to implement its own sustainability commitments and targets. (Intermediary 2)

And with the word “tool” the respondent refers to sustainable finance and green finance products that they are offering to their clients. With these products, the bank is also able to fulfill its own targets and commitments related to sustainability. Intermediary 4, who represents the credit sales function, also defines sustainable finance through specific products as he sees that it is the debt capital markets (DCM) side that defines green finance for them, as the DCM side decides which deals they bring to the market.

In connection to these definitions, all intermediaries have set specific targets for sustainable finance, for instance in volumes or share of green lending. It is worth noting that all of the interviewed intermediaries work on multiple fronts of green finance as they may not only advise on green bond issuances, but also provide asset management services, and themselves issue green bonds, where the proceeds are used for green loans. However, during the interviews, the focus was on their perspective as advisors and underwriters of green bond transactions.

From the issuer’s perspective, sustainable finance is understood as an overarching topic, that is connected to the sustainability strategy of the organization. Both issuers highlighted that sustainability is an integral part of all of their operations and way of working as an organization. The corporate issuer representative, Issuer 2, stresses that they do not see green funding as a separate box, but rather as an integral part and in line with the sustainability work that is done in other parts of the organization. When planning any investment, one of the first considerations is to make sure that it fits into the organization’s sustainability criteria. Issuer 2 sees green bonds as a natural, one could even say obvious, part of their operations.

This [green funding] is part of the bigger picture, considering what is happening in the financial market at the moment it would be absurd that we would operate as a company as we do, but we would not align our funding with that and would continue to use sort of conventional financing. So, I think it is part of the bigger picture, how we operate as a company. (Issuer 2)

From a financial issuer's perspective, which Issuer 1 is representing, the definition is similar. For them, sustainable finance is also very linked to the organization's mission, sustainability strategy, and all operations. In line with the comments from intermediaries, Issuer 1 also defines sustainable finance through their products, such as green bonds and green finance, which they are offering to their clients.

From the investor perspective, it makes sense to discuss the definition of responsible investing and how green bonds fit into that. For both investors responsible investing and their approach to that is defined at the organizational level. In the roles of the interviewees responsible investing policies are reflected as exclusions, which define boundaries for their playing field. In addition, both organizations integrate sustainability in their analysis and investment process, and one mentions a "best-in-class" approach to investment selection. Investors also signal their sustainability commitments through specific goals, such as carbon neutrality for their investment portfolio and specific reduction targets for the carbon intensity of their investments. Even if Investor 2 does not have a separate green portfolio, they track the climate allocation of their portfolio as a whole.

When discussing the definition of responsible investing, Investor 1 was asked about impact investing in connection to green bonds. Somewhat surprisingly he saw pure impact investing, not quite as charity, but as investing that is less concerned about returns. His organization is not using impact investing as its approach and in his view, it has to do with the difficulty of measuring. As the impacts of green projects are realized only in the future, he sees the pricing of these factors as difficult, nearly impossible, at the time of green bond issuance.

These definitions serve as a basis for exploring the engagement with green bonds further. However, these definitions say very little about the ambition level and transformative power of the tool, green finance, and green bonds more specifically.

## 5.2 Motivations and barriers for engaging with green bonds

This section is focused on the first and second research questions, aiming to understand why different market participants are interested in engaging with green bonds and what are the potential barriers to green bond issuance. First, the focus is on the motivations behind green bond issuance, in understanding who usually initiates green bond issuance and why are green bonds issued. Then we examine what kind of organizations have the best readiness for issuing green bonds and what typically are the prerequisites. This leads to examining the potential barriers to green bond issuance. This section concludes by discussing the investor perspective specifically, why are investors typically interested in green bonds.

### 5.2.1 Motivations behind green bond issuances

Issuers say that the initiative for green bond issuance was mainly driven by their internal motivation. However, also seeing what is happening in the financial markets and responding to investor demand acted as an initiator to some extent. After defining green funding as an integral part of the sustainability work of the company as a whole, Issuer 2 (corporate issuer) continues to describe that the idea for issuing a green bond was initiated by the treasury function. He clarifies that it did not come as an order from the CEO or board of directors, but that the finance professionals within their organization wanted to set challenges and sustainability targets for themselves. Both interviewed issuers were early movers in the green bond market in Finland, so their experiences might differ compared to what initiates green bond issuances today. This is reflected in the intermediary responses, who see the variety of issuers and motivations. Intermediary 1 highlights the dynamics of how different actors may influence the green bond issuance decision.

I think it is very difficult to say exactly that this was driven by us or this was driven by the issuer, it is typically a combination of both but probably more the issuers themselves that want to do it. But also, if the issuers are following what is happening in the financial markets and responsive to investor interests then it could also be the investors in a way that drive the process. If the investors want to have a green bond from a company, that might also be one of the triggers. (Intermediary 1)

All intermediaries have somewhat similar views. Most intermediaries say that the idea of issuing a green bond is usually initiated by the issuer. Intermediary 2 emphasizes how

typically in Finland a green bond issuance is a result of long-term work, which has usually been initiated by the sustainability department.

The sustainability department sets the company's sustainability targets and green bonds or green loans are, in a way, a tool for the financial aspect to implement these sustainability goals. (Intermediary 2)

Although the sustainability work has been driven by the sustainability departments, Intermediary 2 still sees that, at least in Finland, it is ultimately the shareholders who require that these companies are committed to ambitious sustainability targets and integrate these also into their funding.

It comes from corporate boards, through shareholders. That is the case in Finland. Shareholders require their company to commit to their sustainability objectives and act responsibly and the board instructs the operating management to establish these sustainability principles and objectives and to incorporate these into all operations of the company, including financing. (Intermediary 2)

Intermediary 2 sees that as it is in the interest of the shareholders to maximize the value of the company, it is from a risk management perspective vital to take ESG issues into consideration and commit to ambitious sustainability targets. According to him, it could be argued that companies who manage their ESG issues properly are usually capable of delivering at least market-rate returns for shareholders. While breaches in ESG issues expose investors to the risk that their return on investment will be lower than that of a competitor. He sees that this kind of thinking has become mainstream in the last two to four years. Based on this observation, he says that the underlying financial motivation is also clear, and it cannot be claimed that sustainable finance would be merely driven by sustainability motives. It also seems that even if bond investors do not necessarily have the power to affect the issuers' operations, shareholders may be driving the green bond issuance by creating pressure for companies. Issuers and intermediaries were asked to describe more specifically the motivations for green bond issuances they have experienced.

For both issuers, sustainability is an integral part of their operations, and they see green bonds as a part of the wider sustainability work in their organizations. When describing motivations behind green bond issuance, Issuer 1 highlighted the good availability of eligible green projects, strong investor demand, and the ability to contribute to the national sustainability targets, emphasizing also the societal importance. Strong investor demand

allowed them to widen their investor base and attract financing from investors with green mandates, which was also one motivational driver. They wanted to offer investors an instrument through which to invest in green projects. On the other hand, as a financial issuer, they are able to offer their clients green financing and attempt to incentivize their clients to conduct green projects. In the case of the financial issuer, the good availability of eligible green projects refers to the availability of projects eligible for green loans.

Issuer 2 highlights that following what is happening in the financial markets, they wanted to be on the top of that development with their green bond issuance. While the process was internally initiated by the treasury department and part of the wider sustainability work of the organization, the issuer was somewhat motivated by fulfilling investor expectations for their company.

This is a part of what is happening in the investor world, expectations for a company like us, we try in advance to meet those expectations that are put on us. That is, we challenge ourselves in many areas, especially in regards to sustainability and setting ambitious goals for ourselves and thus trying to guide our own actions. And in the same way, this green bond is part of it. (Issuer 2)

In fact, Issuer 2 states that it was a clear target to be an early mover in the green bond market, which may lead to various internal or external benefits. A key factor is the reputational benefits, which may then be reflected for instance in the stock price and in relations with partners and customers.

The benefits are partly internal, partly external, can appear at best even in the share price, the reputation of the firm, as a partner, in the eyes of customers, that someone is willing to pay one percent more for our products than a competitor's products when we are in many different fronts working on such things [sustainability]. So, in a way the company's reputation in the big picture and the fact that if you're the last one, everyone else has been doing this for three years, then it doesn't look so good in your overall operations. It is usually good to have a little courage and experiment and through that bring out the firm's real branding too. (Issuer 2)

However, neither of the issuers stated financial motivations. In fact, both of them wanted to stress that financial motivations were not the drivers behind the green bond issuance decision.

Our intention has not been at any point to do these at a better price, that has not been any motivation. But motivation has been our role and our clients' projects that are really good and the fact that we want to help investors and

expand our investor base. Then the fact that you can do these at a slightly better price is just a little bonus. (Issuer 1)

This makes sense, given that often the green premium at issuance is smaller than the margin discount that is given to the clients in connection to green lending. However, when discussing pricing benefits Issuer 2 points out the reputational benefits of green bonds and how those might work as a “quality stamp” for the whole organization, which may lead to more favorable pricing of other bonds from the issuer as well.

Intermediaries state similar motives for green bond issuances, as Intermediary 1 well summarizes the typical motivations.

Some issuers are attracted by possibly lower financing costs. Some issuers see it important to expand their investor base. And why is that important? Well, it helps also on the pricing and they might get more attractive financing costs, but it also helps with stability that you have a broader investor base that you may tap into. And then some issuers want to connect their financing operations with their core sustainability strategy, making it a really end-to-end process so that they have a sustainability strategy that goes across all activities including the financing of the company. Those tend to be the three most common drivers. You could perhaps add as the fourth one improving the public profile of the company. And it is a combination of those four I would say. Some are driven by only one of them, some are driven by all four of them. (Intermediary 1)

Based on issuer responses, however, it seems that the lower financing costs may not be the main motivation usually. Intermediary 3 argues that even though the possibility of a slightly lower issue price on green transactions must be taken into consideration, it is usually not the main motivation, because it is very difficult to estimate the pricing difference and be confident that there will be financial savings. He concludes that perhaps the biggest motivation is ensuring the attractiveness of the issuance and linking financing to the sustainability work within the issuer. Intermediary 5 also sees that a green bond as an instrument is an attractive way for the issuer to concretize their sustainability strategy.

Bond as an instrument has been appealing to many companies because it is one of the few commercial applications for sustainability side functions. After all, sustainability strategy, and how it fits into their business, plays more or less important role to each company these days. And from that angle, it has also been interesting for companies to use this opportunity where they can practically concretize it. There has been a demand for it and there have been a lot of attractive aspects from the borrower’s point of view. (Intermediary 5)

Intermediary 3 also sees the external pressure and investor expectations as one of the biggest drivers behind issuance decisions.

I would say that today one of the biggest motivations for companies to even consider green issuance is the fact that it is increasingly expected by the markets. The whole dynamic of a green bond market has shifted quite significantly over the past years, whereas a couple of years ago it used to be perhaps an exception if someone would do a green bond transaction, and then investors would be asking that ‘why is it that you are doing a green bond, what is the motivation behind it’. Whereas nowadays the whole dialogue has perhaps been shifting to a point where, if you don’t do a transaction that has, I mean it doesn’t necessarily have to be green, it can be social, sustainable or sustainability-linked. Nevertheless, if you do a transaction that doesn’t really have any specific sustainability structure within, then the question is quite likely from investors that ‘why, why isn’t there, don’t you have an opportunity to do it’. (Intermediary 3)

Although the focus here is on Finland, Intermediary 3 stresses that one will most likely get different answers from actors in different countries, even among Nordic countries. In addition, one might get different responses depending on who you interview in the company, as Intermediary 1 puts it, when being asked about the usual weighting between financial and non-financial motivations.

It varies a bit, I would say. And it could also vary a bit depending on who you speak to at the company. Typically, the treasurer has a mandate to ensure the lowest possible financing costs and hence the treasurer would be perhaps more driven by the cheaper financing. Whereas the sustainability person or the CFO or the company’s management might be more driven by the fact that it connects with the issuer’s overall sustainability strategy. So, I think there is not a clear answer to that. Perhaps if I compare a bit to the early days of green finance then there has been a shift where it in the beginning was perhaps more a financial cost saving exercise whereas now also the non-financial aspects are more important. (Intermediary 1)

Based on perspectives from different market participants green bonds are typically used for connecting the finance and sustainability work of the issuer. However, green bonds also come with reputational benefits for issuers, which may even lead to financial benefits, although those are not usually the main motivation. Also, external pressure and responding to investor expectations is increasingly a motivation behind green bond issuances as these instruments are becoming increasingly mainstream.

### 5.2.2 Organizational readiness for green bond issuance

Following the discussion on motivations behind green bond issuance, it is useful to briefly consider what kind of organizations usually have the best readiness for issuing green bonds. Intermediary 1 and Intermediary 3 mentioned companies with large capital expenditures for individual projects, where it is easy to say whether an asset or project is green or not.

Those companies or institutions that have large capital expenditures for individual projects, where it is easy to measure the impact and the purpose of the financing. Typically for instance utilities and real estate that dominate the green finance market because those type of activities are clearly defined to one object or one project with large capex. But equally important work is done in many companies that do for instance energy efficiency improvements with many small, gradual steps where the individual investment is maybe so small that it doesn't warrant issuing a bond on the back of that. (Intermediary 1)

In addition to utilities and real estate, financial institutions have also been active in issuing green bonds as banks usually have large exposure to those previously mentioned sectors and it is rather easy for them to identify balance sheet commitments that could be financed or re-financed with green bonds. However, Intermediary 3 comments that this used to be the case four-five years ago, but that this has started to evolve.

Especially due to the introduction of the proposals on the EU green bond standard and especially the EU taxonomy, these definitions have been broadening all the time. So, you can see much more and more companies, even on those sectors that are not that capital intensive, may not have that much tangible assets on their balance sheets, becomes perhaps slightly easier for them to also start considering whether or not a green bond would work for them in terms of the overall practicality of setting up such a structure. (Intermediary 3)

On top of having the eligible assets or projects for green financing, internal expertise and processes related to sustainability work are also important capabilities making green bond issuance possible, as Intermediary 2 pointed out.

Primarily it is large corporations with a long history of sustainability work and related communications. Such are in the best position, because if we think of a green bond issuance process, which should be completed for example in six months, then we know that the company has the targets, processes, employees, metrics, reporting practices, and internal organizations, which are capable of taking care of the green bond preparation phase, but are also able



to bear responsibility for the reporting and monitoring requirements generated by the green bond. (Intermediary 2)

Intermediary 3 has a similar view as he describes what kind of internal expertise the issuer needs to have.

Perhaps in broad terms, a company who enters a green bond market must really have the internal expertise in place to make sure that they know internally how to evaluate different investment plans and different assets and different projects that they are running, that whether or not they can be considered as green. I mean, we as an advisor for example in connection to a bond issuance, we can only help companies to a certain point. We can do most of the work and help the companies in their issuance process but then you as a company, you must be able to monitor these assets, you must be able to make these investment decisions and qualify certain investments and capex plans either green or non-green and sort of keep that internal mechanism in place over time. And then you must also be able to report on it, you must be able to calculate expected environmental impacts, you must be able to provide transparent reporting to your investors. And if you don't have this internal expertise in place, then it is very difficult for that company to, well maybe they can issue a green bond but it might be very difficult for them to convince investors in the long run that they know what they are doing. So, certainly you need to have a certain degree of maturity on sustainability internally. (Intermediary 3)

Intermediary 2 also mentions that green bank financing may act as a gateway to green bonds, as the discussion on connecting finance to sustainability targets is significantly less risky to have with a familiar bank than with the whole investor universe, which would be the case with a green bond. For instance, a company may start with a revolving credit facility, where the marginal is tied to the company's sustainability targets. Then the next step could be to issue a green bond or sustainability-linked bond.

### 5.2.3 Barriers to green bond issuance

Issuers had differing views on what could have been potential barriers to green bond issuance. One sees the resources and costs as a potential barrier. The internal process and especially allocation and reporting during the lifetime of the bond is perceived as very laborious. In addition, the second party opinion is viewed as rather expensive. Going forward new regulations, the EU Green Bond Standard, and EU taxonomy may even add barriers. However, the other issuer did not consider costs and required internal workload as a potential barrier. He however mentioned that one needs to be realistic about the expected workload and that the costs will be slightly increased. As a bigger issue, he saw that the increased workload often affects people who are very busy already. Both issuers

mentioned that the use of green bonds is limited and thus finding enough eligible green projects could be a hurdle. In addition, the lengthiness of the process when issuing the first green bond was mentioned.

Intermediaries had similar experiences of potential barriers. Intermediary 1 and 3 mentioned the costs of issuing a green bond, however, both of them see that the cost of setting up frameworks and reporting was maybe a bigger obstacle some years ago than it is today. However, the internal costs related to the process are typically more concerning than the external costs, according to Intermediaries 1 and 3.

I mean of course it is not free and if you are a small issuer it might make a difference. But typically, if you save one basis point on the issuance, then you have also covered your costs. I think it is rare that issuers would be concerned about the external costs, the second party opinion provider. It is more the internal costs and the labour put into the process that's concerning them typically. (Intermediary 1)

There is one argument being made that costs are an additional entry of barrier for several issuers, especially those who are perhaps not that familiar with the market, don't really know how it works, don't necessarily have all the internal resources in place, who might need to consider hiring additional people or at least training existing employees in order to make sure that they can meet the annual requirements that they must have in place for maintaining these green bonds. (Intermediary 3)

Even though Intermediary 1 points out that in the vast majority of cases the additional costs of issuing a green bond are being compensated in the issuance price, Intermediary 3 highlights the uncertainty of the pricing differential.

If you are a company that is highly focused on costs, and what I mentioned earlier on sort of uncertainty on the pricing differential on green versus non-green, I mean you don't know until you have issued whether or not you were able to issue through your outstanding credit curve for example or not. Whereas setting up the framework, getting the second opinion, namely getting the second opinion is something you know you will have to pay a certain amount of additional fees compared to a non-green issuance. (Intermediary 3)

Aligned with the issuer comments, Intermediary 1 and 3 both see the lack of eligible green assets and expenditures as one barrier. Intermediary 1 also points out that the project financing element of green bonds is limiting the issuance volume.

One of the big drivers, and now I'm sort of going back to what is it that we need in order to have green bonds, well we need green investments. Partly it is perhaps because we still do not have sufficiently much green investments.

But secondly, also because a green bond is structured in a way where it is financing a project or many projects and that's not really how large companies fund themselves. Large companies could have just a general corporate purpose financing, part of which is channelled to green activities. So, I wouldn't limit the number of investments going to green activities solely to green bonds. Also many other ordinary bonds or bank loans finance green activities, it's just that it's not ring-fenced into a green activity. (Intermediary 1)

Related to what is needed in order to issue a green bond, Intermediary 3 mentions the lack of internal expertise as a potential barrier. Intermediaries identified also other barriers that did not arise in the discussions with the issuers. This was related to the fast development of the green bond market practices and standards, meaning the Green Bond Principles and the application of those, and potential reputational risks associated with green bond issuances. As Intermediary 2 describes it, Finnish companies who have traditionally issued bonds, many of which are traditionally material and energy intensive, have been very cautious with the risk of greenwashing claims and have rather waited for the further development of the regulatory framework and standardization of the market. Intermediary 3 mentions that Finnish green bond issuers have been "extremely careful about not making any claims on greenness in connection to their debt financing that might backfire" and thus pose a reputational risk.

With green bonds Finnish issuers may not have wanted to be at the forefront because the market is developing so fast that what was considered green two years ago may no longer be green enough today. And the companies have not wanted to expose themselves to criticism in so far as their actions could be considered greenwashing. And in my opinion, the companies have not wanted to be exposed to extra dialogue and risk through this dialogue, which may arise if you issue a green bond that is not necessarily of highest quality. (Intermediary 2)

This is not a science-based evidence but rather just an anecdote on the Finnish market itself, but one consideration that perhaps has been slowing down the adoption of green bonds within Finland, especially some years ago, was the fact that many Finnish companies, they were extremely careful about not making any claims on greenness in connection to their debt financing that might backfire. So Finnish companies were very much concerned about the reputational aspects and that was mainly due to the fact that the definition of what is green was not perhaps very clear. And to some extent today still it is to some extent subjective in the market. If you look at it outside the EU taxonomy and simply look at the existing market practices, you don't really still today have clear definitions and binary definitions. And I don't even know if it's meant to be or should there be binary definitions but I think that has been a historical challenge in the market that it is up to the issuer to make a claim whether or not something is green or not. And then it is up to the markets to decide whether they buy into it or not. (Intermediary 3)

This has led the Finnish green bond issuers to wait for the green definitions to standardize further and wait for examples from other countries. However, as a result, green bonds by Finnish issuers have been viewed credible by investors and green bond issuances from Finland have been successful.

#### 5.2.4 Investor interest towards green bonds

Many types of investors are interested in green bonds, however especially investors with a green mandate, for example managing a fund committed to investing in green bonds, come up in the interviews with different market participants. When issuers benefit from the wider investor base, they usually refer to these kinds of investors, which would not be interested in or even able to invest in their conventional bonds but are interested in their green bonds. However, Issuer 1 mentions that based on their experience, today every investor type considers sustainability and ESG issues and they are increasingly interested in the ESG ratings and operations of the issuer as a whole.

Increasing regulation is mentioned by the intermediaries as one key driver behind investor interest towards green bonds.

Increasing regulation, also on the investor side, especially within Europe of course, is a topic that is driving the interest in buying green bonds. [--] We are increasingly having more and more funds who have within their mandate a specific request to make sure that for example the bond instruments that they buy are green. (Intermediary 3)

In the same vein, Intermediary 2 sees that all actors in the market – investors, arrangers, banks and issuers – are committed to their sustainability targets. As a result, for example new funds investing only in green bonds have emerged. This specific mandate for investing in green bonds was brought up by all intermediary respondents. Intermediary 4 points out that there has been a huge demand for green financial products, and asset managers have in response created products such as green bond funds. He notes that it is good business for asset managers, but also thinks that “almost everybody with money nowadays is very interested in making the world a better place”. Intermediary 1 has a similar view on this:

Most investors who would be interested in green bonds nowadays have a specific mandate to invest in them, might be a fund who has their objective to invest in green bonds or it might be in a pension fund for instance, a certain part of the portfolio that should be green. So that's really now a big driver of

it. But of course we should look beyond that, so why do they have this mandate, why is it that there is a specific green portfolio. And that is a desire to channel more finance, in their part to channel more financing to something that has a positive environmental objective. At least I hope that is the typical motivation for it. And doing it via green bonds is a relatively easy way in a sense that then you have a very clear criteria defined for in which way does this particular bond have a positive contribution. Of course, you could invest in the same company's ordinary bonds if it is a company that has a very green profile but with a green label bond you also get the added benefit of actually somebody having analyzed it and confirming sort of the greenness or positive contribution of it. (Intermediary 1)

In other words, according to Intermediary 1, investors seem to be mainly interested in green bonds because those are a relatively convenient way for investors to fulfill their own sustainability commitments. Both investors indeed find green bonds to be a useful instrument for fulfilling their sustainability targets. Investor 1 also mentions that green bonds complement the brand image they want to build and are a good fit with their overall strategy. Related to the topic of convenience, Intermediary 3 found transparency a key factor explaining the investor interest towards green bonds.

To some extent, I think the early adoption on the investor side was due to the fact that green bonds offer more transparency compared to traditional bonds. Typically, if you look at the documentation of a bond, quite often especially in the Nordics it says that it's for general corporate purposes and refinancing of existing debt. And then you will have the company presentation, you will have an opportunity to discuss with the company and ask questions, but with green bonds that is always given that you must be very transparent on what is it that you are intending to use the proceeds for and what are the expected environmental impacts. So, I think the transparency has been one factor that has been appealing for the investors for quite some time now. (Intermediary 3)

Intermediaries recognize that there is typically higher interest in green bonds than conventional bonds as anyone can invest in a green bond, but certain investors may not be able to invest in conventional bonds. In addition, Intermediary 4 says that based on his experience green bonds are typically less volatile than conventional bonds, as green bonds are usually the last bonds that investors want to sell. Investor 1 also confirms that green bonds may be generally preferred over conventional bonds, perhaps suggesting that green bonds are becoming mainstream instruments.

There is not really a situation where we could not prefer green bonds where ever possible. Of course, it is also a question of pricing, issuer risk, maturity, and industry diversification, and also geographical allocation. But if it fits

into these criteria, then a green bond is of course always the better option.  
(Investor 1)

Investor 2, who does not have a portfolio with a specific focus on green bonds but invests in green bonds as a part of their credit portfolio, has a similar view. In the analysis process, the credit risk and pricing are still the main criteria, but the greenness and other sustainability metrics have come on top of this. She says that in case there are a lot of bond issuances in the market, green bonds may be perceived as more interesting and may have a higher chance of being looked at more closely.

When being asked about the difference between green bonds and conventional bonds, where the issuer is high performing measured in ESG metrics, Investor 1 sees that there is a clear added benefit that comes with green bonds.

They're not exactly the same because of the higher reporting obligation of green bonds from the issuer. We are paying for the information here, and the more information we have, the more optimal the risk-return ratio is for us. However, our starting point here is to make profit, this is business for us, and our investors seek returns. So, the risk-return ratio is something we have to consider, and information reduces risk. (Investor 1)

According to Investor 1, long-term investors such as pension funds are especially interested in green bonds. As their investment horizon is long, managing tail risk becomes especially important. However, he also mentions the desire to make an impact as one key driver. Regarding the creation of the green bond fund, he mentions that it is also beneficial considering the bank's own brand and therefore it was something they wanted to do.

### 5.2.5 Pricing of green bonds

As mentioned in chapter 5.2.1, the potential pricing difference is not usually the main motivation for green bond issuers. Chapter 5.2.4 on the other hand concludes that investors are usually not too concerned of the so called greenium. However, this often-observed pricing difference has important implications for the green bond market and is connected to both the motivations and impacts. For instance, one question is whether this so-called green premium is justified. Investor comments presented in the previous chapter suggest that the increased transparency of green bonds comes with lower risk, which may justify the pricing difference. In the interviews the intention was not to specifically examine the pricing difference or existence of premium, but to rather discuss the experience different

market participant have regarding pricing and what implications does the potential pricing difference have for them and the green bond market.

Firstly, it is useful to understand the bond pricing process, which in many instances leads to a more favourable pricing for the issuer, if the bond is heavily oversubscribed. Intermediary 2 explains how bonds are priced through auction mechanism, which means that the more investors' interest a bond receives, the lower pricing the issuer is able to have for the bond.

The auction mechanism in these bonds goes so that the arranger bank gives this indicative price to the market, that the issuer thinks it will issue the bond at this yield. But the issuer reserves the right to lower the price during the pricing process, if there is demand in the market at a lower yield. Then the mechanism is very straightforward, that the more there are subscriptions without price limit, or which do not impose a minimum yield requirement for their subscription, then the bond pricing may be lowered and the cheaper financing cost it will be for the issuer. (Intermediary 2)

Intermediary 2 explains how additional capital is being allocated to green bonds, meaning that there are more interested investors. And this additional capital is coming from investors with a green investing mandate or policy. This explains the typically higher oversubscription for green bonds, as any investor is able to invest in a green bond, but certain investors may not be able to invest in conventional bonds.

There is new capital being allocated to this specific new product category, green bonds, and it is additional capital, or it may be away from somewhere, but that capital does not eat up the normal capital which would in any case be allocated to a conventional bond from the green bond issuer. (Intermediary 2)

Issuer 1 emphasizes how the pricing difference may be realized in the issuance process. To start with, the indicative price, so called initial price thoughts (IPT) may be one basis point better for a green bond, compared to a conventional bond. And as another component, during the pricing process the issuer may be able to tighten (lower) the price more than in the case of green bonds. For instance, if there is a EUR 500 million bond but one receives orders worth EUR 3 billion there is an oversubscription of 6 times and that allows the issuer to lower/tighten the pricing further. Issuer 1 also points out that pricing in the secondary market affects the price of their next green bond issuance, so the secondary market performance is also important from the issuer perspective.

For instance, if our green bond is trading clearly one basis point tighter, at a better level compared to a conventional bond, then at our next green bond

issuance we are able to say that our secondary market price is one basis point better, which allows us to start the new issuance (IPT process) at a better price of one basis point. (Issuer 1)

Investor approach to green bond pricing does not really differ from conventional bonds. Investor 1 comments that they look at the absolute pricing, how is the green bond pricing compared to other bonds from the same issuer. Investor 2 explains that credit risk and pricing of the bond remain the most important factors for them when making investment decisions. Intermediary 4 elaborates on the same issue.

The main thing, even if it's a green bond, is still the credit quality of the issuer. But green bonds usually price tighter. That means that they sure don't have to pay as much for green bonds than they do for conventional bonds, and that can pretty easily be examined for companies who have conventional and green bonds outstanding. Usually, the green bonds are cheaper in relation to the conventional bonds. (Intermediary 4)

Interviewees agree that greenium exists, even if rather small in many cases. Intermediary 2 concludes that it is worth relying on research knowledge about greenium, but the amount of greenium varies between issuer types, and also as a function of credit quality and market situation. According to intermediaries, investors are generally not willing to pay extra just to hold green bonds. However, they have to accommodate to the market dynamics, where there is more demand than supply for green bonds.

I don't think they [investors] actually would be prepared to pay that and that's been a discussion that has been ongoing in the green bond market since the early days, who is it actually that should pay less or more. Because the issuer might say that actually we need that discount because it is extra work for us and setting up the framework and all of that costs money. Whereas the investor could also turn around and say that there is no different credit risk in this bond compared to your ordinary bonds, why would there be a discount. And that discussion was more prevailing six-seven years ago than what it is now, I think. The only reason why there really is a pricing difference between green bonds and conventional bonds is that there is more demand than there is supply. If you would ask an investor they would probably say that no, we are not willing to take a lower return on it, but that is just the market dynamics at the moment given the supply and demand imbalance. (Intermediary 1)

You know if you want to buy a green bond you might just have to give away few basis points on the new issuance just to get a piece of it and hold it in your fund and meet the requirements that you are supposed to meet. So I don't think the pricing itself, or the investors' willingness to pay less, I think it has a little bit less to do with willingness rather than they just sort of have to accommodate for the existing market circumstances. (Intermediary 3)



Intermediary 2 also comments that due to the limited supply of green bonds, investors are settling for a slightly lower yield in order to be able to invest in products that are fulfilling sustainable development objectives. Issuer 1 recognizes the puzzle over the question that who should bear the additional costs of green bonds. From a credit risk and loan terms perspective green bonds are similar to conventional bonds. However, according to Issuer 1 the extra flavor comes from the added transparency to what is being financed. And this is what makes green bonds interesting for investors. In addition, investors usually benefit from the better pricing on the secondary market.

In the same vein, Investor 1 comments that in the case of green bonds they are paying for the additional information and transparency that they would not have in the case of a conventional bond. In addition, Investor 1 mentions that green bonds usually come with less volatility due to the buy-and-hold nature of many green bond investors. This additional information and lower volatility are reflected on the risk-return ratio. In his view these factors explain most of the greenium. Intermediary 4 also mentions the typically lower volatility of green bonds.

Green bonds have been pricing slightly tighter, especially at issuance, compared to conventional bonds. But it comes from the risk-return ratio and I think that in green bond investing this risk management is actually the main thing, not only the impact on these ESG factors, but this risk management, mainly tail risk management. (Investor 1)

Also, many market participants see the pricing difference so small, that it makes little difference for them. Issuer 1 for instance says that the greenium could be in the range of one to two basis points, meaning between 0.01 and 0.02 %. However, she recalls that these are difficult to compare as they tend to differ for example between different currencies. The greenium may be more evident in the Euro market than in the USD market as there are more green investors in the Euro market. Intermediary 4 also emphasizes the rather small greenium.

I mean, of course, if you are an investor, you want as much return as possible. But if it's a good project that they deem to be investable, they are usually very willing to invest, even if the yield is not quite as high as it would be for a conventional bond. And this is just my opinion, but the greenium, I suppose is the term, is not massive. Usually, it is cheaper but it isn't like a conventional bond is going to yield 2% then the green bond is going to yield 1%. It's rather that green might yield 1.8% or something like that. So it's usually not massive and credit profile of the company is still the main driver of the pricing. (Intermediary 4)

Issuer 1 considers greenium, the size of the order book and new issue premium as key metrics for measuring the success of a green bond. However, these are all standard measures for bond issuances. Issuer 2 mentions that they not specifically measure the success of a green bond, however relative pricing (greenium), effects on other bonds, and secondary market pricing are tracked. Both issuers have experienced favorable pricing for their green bonds. Issuer 2 explains that the better-than-expected performance for certain bonds has been due to the current market dynamic, levels of investor demand compared to supply on green bonds. Going forward, Investor 1 sees that as green investments will increase at scale this will lead to significant green bond issuances. And as the supply of green bonds increases, he expects the greenium to decrease to some extent, of course given the general interest rate level.

### **5.3 The impacts of green bonds**

This section focuses on the third research question, which aims at understanding what the impacts of green bonds from different market participants' perspectives are. The intention is to understand whether green bonds are an effective tool for fuelling the sustainability transition and what may be the biggest limitations. Other complementing instruments and approaches are also discussed briefly as they came up in the interviews. Examining the impacts starts with a discussion on the topic of additionality: how it is understood and whether green bonds are funding projects that would not receive financing otherwise or whether these affect investment decisions. Then the impacts on internal processes and market practices are discussed, followed by examining the potential ways to enhance impacts and improve market practices further. Next, the criterion for a credible green bond is examined. This section concludes by exploring green bonds as a tool for the sustainability transition.

#### **5.3.1 Discussion on additionality**

Green bonds are not creating additionality in the sense that they would be funding projects or assets that would not receive financing otherwise, this is something that all interviewees were unanimous on. This was explained by the high liquidity on the markets in the last ten years.

We need to put this into perspective that we have had an exceptional ten years in the financial markets with excess liquidity and hence additionality has not really been a question for anything, irrespective of green or non-green,

everybody gets financing, it's just the cost of it. And therefore, it is clear that everything that has been financed with green bonds, they would have received financing anyway. So, there is nobody who could claim that green bonds have brought financing to projects that otherwise wouldn't have received it. (Intermediary 1)

However, some interviewees commented that going forward this might change as the liquidity becomes more restricted and interest rates are expected to rise. Investors have also realized that their green bond investments do not have any additional impact, as the demand is so high for these instruments anyway.

At first, we thought that this is a good thing and we want to support this [green bond] market, but we have established many times that this market does not necessarily need our support. That the demand is much higher than the supply. (Investor 2)

Other view on additionality is whether green bonds are able to affect issuers' investment decisions or shift capital from unsustainable to more sustainable uses. Most respondents agree on the fact that green bonds themselves do not affect the investment decisions of companies. The possible difference in the cost of financing is not meaningfully big. Rather Issuer 2 sees green bonds as a part of a larger, positive cycle.

Green bonds and future taxonomy will not directly steer certain investments, investments as they are, must be good enough to be viable. The fact that someone can get funding for 10 basis points, 0.1% cheaper, it doesn't change one investment for better or worse. Of course, quite a lot of investments are being made today, even those that, according to the classical Turku School of Economics calculation models, are not extremely profitable, which can be related to the company's reputation, emissions, and achieving environmental objectives. But even those, as such, are not going to lead to green bonds. But maybe here it is better to look at the big picture, that if you make good investments that lead to lower emissions, it will improve the reputation of the company, which can improve the stock price, can lower the cost of financing, and with cheaper financing you can then finance the next round of good investments for which you can even issue green bonds. I would say that they are part of a bigger positive cycle for the company rather than something that motivates specific investments. (Issuer 2)

If you consider companies then the greenium has nevertheless been so small that the difference in the cost of financing is hardly a matter of life and death for any company. But certainly it is also a pretty significant thing in terms of the brand and reputation of companies, which then brings benefits. (Investor 1)

However, Intermediary 3 has a bit more optimistic view and sees that some companies are specifically looking what they need to change in their operations in order to be able to issue green bonds.

I think it is maybe very difficult to say this categorically to cover all the issuers, of course you will always have issuers who are running their business as usual and not necessarily changing much, issuing green bonds and sort of running the business as it is. And then you might have issuers who say that: 'Look, the next time we do a bond transaction we want to do a green bond, what do we have to do to get there? What additional aspects do we have to consider in our construction projects in order for us to call them really green construction projects or green buildings once they are completed? And then you know, let's make the changes today so that in the future we can issue green bonds'. (Intermediary 3)

When digging deeper into that finding, Intermediary 3 emphasizes that companies looking to change their practices in order to be able to issue green bonds could generally be divided into two buckets: either companies who have realized that they might have difficulties attracting capital going forward due to investors' ESG concerns, or companies that are maybe newer and more agile, who may profile their services or products around sustainability and attempt to align those with e.g. taxonomy requirements. Intermediary 2 also mentions that there are already some situations when companies have difficulties in attracting financing in certain markets unless they are able to prove their sustainability commitments.

There are situations that in some markets, for example in Sweden, where the dialogue around green finance and sustainability issues is already taken quite far. So there are players who may not be able to receive any more financing from the SEK market in other forms than green bonds. There may therefore be companies that are so controversial in their core business, that is, clearly still in the fossil economy, so the ability for these players to raise financing in the bond market in a non-green format has clearly weakened in recent years, if not in some cases become impossible. (Intermediary 2)

However, he says that the effect is not material for these kinds of companies, because the SEK market for instance is a marginal source of financing for them. In line with other interviewees, Intermediary 2 still thinks that companies are able to get financing, with few exceptions, without ever needing to use green financial instruments. So he does not believe that certain investments would not be made because the company would not be able to issue a green bond. However, interestingly Intermediary 2 had a bit differing view on additionality, and he argues that green bonds do affect investment decisions and that the concept of additionality was first misunderstood.

What I personally criticized when green bonds became more common, was that additionality was initially misunderstood. That is, it was thought that if any company is green at a general level, let's take real estate investment companies for example. There was a debate about whether a real estate investment company's financing could be called green if, say, the energy efficiency ratings of the company's real estate are really high. Additionality of the funding was forgotten there, when financing it's on-going, basic activities, but the euro changed nothing, that company would have continued on the same track. [--] Now today I think more attention has been given to the understanding of additionality, i.e. when the proceeds of the green bond must be allocated to green projects according to the company's green finance policy, which is declared in the company's green finance framework, validated by the second party opinion. And it is often discussed that most of that money must go to real investments with measurable environmental impact. Today, the debate is precisely around the point that what is the measurable environmental impact of the investment that this money is promised to be spent on. (Intermediary 2)

Thus, today additionality is understood through the measurable impact that the green projects are creating. Regarding additionality, one aspect mentioned was whether the demand for additionality is always fair, as there are companies that already have a sustainable business model.

I am maybe personally slightly hesitant to categorize companies based on the fact that are they really changing something or are they really doing something additional in order to issue green bonds or not. Because we do have plenty of companies who, and this used to be a debate also years ago I think, that whether or not green bond issuance brings something additional, so there has been the question of additionality. I think to some extent the EU taxonomy for example will or it should maybe fade away this discussion a bit because why shouldn't you be able to issue a green bond even without changing anything if, and only if, your existing business model is already sustainable. (Intermediary 3)

Given that there has not really been additionality, what is the added benefit of green bonds then? One Intermediary describes how he was really skeptical about green bonds some years ago, precisely because of the additionality question. However, now he sees other advantages that this instrument has brought.

So what has then been the additional benefit of green bonds, if there is no additionality? The additional benefit has been transparency and awareness. [--] Additionality I'm actually not concerned about, but I completely agree that there isn't really additionality. (Intermediary 1)

These additional benefits will be further discussed in the next chapter.

### 5.3.2 Impacts on internal processes and market practices

Green bonds have certainly impacted the activities of all market participants while becoming mainstream instruments in the bond markets. To illustrate the growth of the green bond market, measured in volume, in 2021 approximately half of the corporate bond issuance in Finland was in a green format. Perhaps the most evident impact is the requirement for new kinds of expertise from all market participants. Intermediary 5 summarizes the implications to different actors.

First of all, if an instrument becomes so strongly a part of the market, in terms of proportion or weight, then it has created a requirement for certain expertise and competence for all market participants. What it has required from the investor side is, of course, more understanding and competence, not only that the investor knows how to assess general risk of an individual player in relation to returns, but also a little more specifically that what ESG position this firm has. This has brought expertise to the investor field, but also to the organizing banks. For example, we created our sustainable finance advisory unit few years back. This has increased demands and expectations, why not also business opportunities. And then thirdly, from the issuer side each company is certainly a little more aware of their own sustainability aspects, how those are implemented into their own business. (Intermediary 5)

Many interviewees give concrete examples on how the required expertise has changed in their organizations and affected their operations. Issuers especially highlight the learning aspects and mention that in a sense everyone in the firm nowadays needs to be a sustainability expert to some degree. For intermediaries the significant change is that they have also needed to broaden their expertise to be able advice their clients on sustainable finance questions and transactions. All of the interviewed Intermediaries have established specialized teams or units for advisory on sustainable finance matters.

This whole sustainability focus that we have at the firm is very big in everything, in investor relations meetings, and those are the questions we are prepared for quite a lot. And I would say that even if you don't have an actual sustainability responsibility in your role, each of us at the firm must be a sustainability expert at a certain level and needs to be able to tackle these questions and issues. I think that we, as a company and as individuals in the company, have learned and evolved significantly over the last few years. (Issuer 2)

We have recruited people with quite different backgrounds, we have people with environmental sciences background or environmental engineering educations. (Intermediary 1)

We at the debt capital markets have our own sustainable finance department where we have several specialists who assist our clients in drafting these frameworks and are responsible for project management and have discussions with the second party opinion providers. (Intermediary 2)

The emergence of green bonds in the market has revolutionized the financial sector, traditional bank lending and bond markets, significantly. That it has created numerous new jobs, new departments, and new skills needs. (Intermediary 2)

These changes in operations and increased expertise in sustainability issues is creating increased awareness of these topics, which Intermediary 1 mentions to be one key benefit of green bonds. However, as he mentions, it is difficult to distinguish what is exactly green bonds' role in facilitating that change.

And awareness in that all of a sudden from the treasury part and financial part of the company, not being interested in sustainability at all, all of a sudden they are. And all of a sudden, if sustainability hasn't been a core element of the company's strategy, it is brought to the CFO's table. And the CFO then says "okay look, we can actually get cheaper financing if we do these and these things related to sustainability". And that has brought awareness to the financial decision makers of the company, but also awareness to the broader management team of the company about the importance of sustainability. This development has coincided with other developments related to sustainability so I'm not saying that green bonds have been the key facilitators of it, but it certainly has helped in sort of bringing sustainability topics from the marketing department much closer to the core decision making of the company. (Intermediary 1)

Intermediary 2 mentions that in his view the biggest impact comes from the fact that financial institutions, who have also been the early green bond issuers, had to start identifying the loans that have been allocated to green activities. And thus, they had to create processes for assessing and monitoring these.

Investor 1 mentions that one needs to be familiar with the changing regulation, such as the Green Bond Principles, EU Green Bond Standard, EU taxonomy, and ISO 14030 Green Bond and Green Finance Standard. In addition, in their organization all portfolio managers are required to complete an ESG analyst certification. Investors also rely on external service providers with ESG information when assessing and monitoring green bond investments, as they cannot claim to be experts in all aspects related to sustainability. Intermediary 4 also mentioned that green bonds not only increase reporting and impact monitoring from the issuer side, but also add more reporting, analysis, and data collection for investors. This new kind of expertise is reflected in for example investment

operations in the form of exclusions and ESG integration. However, this development is not only related to green bonds, but an overall approach to responsible investing.

We have as an investment strategy in this green bond fund, and also more generally, that there is obviously this exclusion and then there is this positive screening, but especially ESG integration. And ESG integration means that you have to get acquainted with this analysis in another way and be able to understand and integrate it into the normal analysis of financial statements or analysis that we do anyway when we make investment decisions and choose whether or not to invest. And it really has to be integrated in the whole process so that this is not a separate part but goes hand in hand and simultaneously with the rest of the analysis. (Investor 1)

In relation to gaining new kinds of expertise, green bonds have changed the way of communication within organizations, reducing “silos”. Indeed, bringing sustainability more integrally into everyone’s agenda. For issuers, this means more internal communication and collaboration between different units. This was realized for instance as common targets for sustainability and finance. One interviewee mentioned how sustainability became officially part of their funding unit.

It has eradicated quite a lot of our internal silos, which are automatically created in large organizations, that people in a particular niche chat with each other. So these [green bonds] have brought treasury and sustainability teams closer in many ways, we are more like one team, though far apart in the organization chart. We have common goals in these matters, and we do everything in cooperation and know each other a lot better than previously. (Issuer 2)

In addition to affecting internal practices, interviewees recognized that green bonds have affected market practices. One of the most evident consequences was bringing sustainability topics to the discussions between market participants. Interviewees mentioned that even in the case of conventional bonds, sustainability topics are always discussed these days.

I think all of this and the increasing popularity of them [green bonds] has brought this entire theme to the minds of investors and of course the asset owners as well, being the people who gave the investors that money. One thing is the fact that now that there all these bonds linked to sustainability, then even if the bond itself is not linked to it, these factors are still considered and are very important criteria in the investment selection process. I think that would be probably the biggest thing that green bonds are, at least in my opinion, a very large reason as to why these are thought about nowadays, even if the bond is not green in itself. (Intermediary 4)



Intermediary 3 has a similar view and concludes that the biggest benefit of green bonds has been the increased sustainability focus across financial markets. This has also led to evolving green definitions and formulation of best practices.

Maybe I don't have a very clear answer on how that change has happened but first of all, there has been a change in the sentiment of companies. And I think it used to be, maybe this is especially prevalent in the Nordic environment that we live in, that these days whatever financing transaction you have on table, it doesn't happen without discussing the sustainability aspects of the transaction itself, the potential underlying investment, or the potential previous investment that might be refinanced. So I think the whole development of green bonds has really been bringing sustainability much much higher on the agenda also for finance professionals. In itself, what else might it mean for the market as such, I think it's been fairly clear that the overall knowledge and overall sentiment has been shifting, but at the same time as we have been having a very rapid increase in the market, volumes, overall development, and also considering the fact that the whole green bond market was very subjective to everyone's opinions not too long ago in the past. There has been a much bigger focus on the regulation side on how green bonds should work, how green finance and sustainable finance overall should work. So I think what has really been evolving over the time is really definitions, concepts, how these should work and what are the best practices. So I think the sort of benefit of the whole green bond market has really been an increasing focus on sustainability across the financial markets. (Intermediary 3)

Investor 1 also mentions that ESG topics are covered significantly more these days than previously. He mentions how bond issuers nowadays provide a lot more information on ESG issues as they have noticed that investors require that nowadays. Communication around these topics has significantly increased. Even though green bonds have increased discussion on sustainability issues, Investors still see that given the high demand for green bonds, they are not able to demand significant changes from issuers.

Although there have been different market situations over the years, this demand has remained strong and this is very much a market for companies and the issuers, in the sense that the investor cannot demand much because there is more demand than supply. (Investor 2)

Increased transparency comes along with the increased communication and reporting, which Intermediary 1 brought up as a key benefit of green bonds. Issuer 1 also discussed this topic and predicts that this may lead to the future focus being more on the sustainability of the issuer's operations as a whole. Intermediary 5 also brings up that all these changes in the market have been partly driven and supported by regulation, such as the EU taxonomy. This aims at standardizing definitions, what is considered green and

sustainable. And while creating definitions it also steers action and sets requirements for instance for reporting.

### 5.3.3 Ways to enhance impacts and improve market practices

Most interviewees viewed that the green bond market has worked well and has reached a good level of standardization in recent years. However, Intermediaries 3 and 4 mention that there is still ambiguity when it comes to green definitions.

I don't see very many burning issues, but of course there's been at least historically, a lack of very clear regulation on these and it's been a bit subjective as to what is green and what is not. So I think that still is in its developing phase and it continues to evolve every day. I'm more so referring to the sort of the shade of green issue here. What is green and what is not keeps on evolving daily and of course we have a regulation from the EU that is, of course, for us operating in Europe, that is the most important one. But I think even if EU has regulation, I think the market still has their own responsibilities in this because whatever EU regulation is, it is always going to be political and countries will be trying to push whatever is good for them, but this is just my opinion, this is not my organization's opinion. (Intermediary 4)

I think, if we think about what needs to be improved, on a personal note, I think there is still maybe slightly bit too much ambiguity in terms of how greenness for example is defined. So, we are still every once in a while coming across situations where there is really no unified definitions, where it is very much up to the issuer itself to make claims on what is green and what is not. (Intermediary 3)

Intermediary 3 also points out that the green bond market should become more accessible in order to make the market more equal and scale it further.

And really in order to make the market equal, we should have a better access to green financing markets and we should have equal tools available for issuers even considering the possibility of doing any green financing. And actually that applies both on the bond and loan side of the business. So I think there is some degree of sort of "mystifying" the whole sustainable finance market and I think we should try to get rid of it and make the whole concept much more clear, much more tangible, much more accessible, in order to really scale up the green financing market. Which then in return would of course hopefully lead into higher impacts as we would have more and more financing towards green purposes, provided that the green purposes then would also be scientifically detailed instead of having very ambiguous and subjective definitions on what's green. So, better definitions, and clear definitions, and better accessibility to the market. (Intermediary 3)

Most improvement ideas were related to even higher quality of reporting and disclosure, however some actors pointed out that there needs to be an optimal level as too high level

of required reporting also makes issuing green bonds more demanding and more costly and may increase the barriers for green bond issuance. Investor 1 was hoping for more detailed and comprehensive reporting on impact, however mentions that as these green projects are typically long term, data on the realized benefits will only be available later.

Green bonds have only been issued for some time, so as time goes on, we will be closer to finding out what their actual effects have been. We would certainly hope for more comprehensive impact reporting that what it has actually done in terms of CO2 emissions or, for example, biodiversity, which has been the tangible benefit or impact. But, of course, they cannot be expected here and now because these are long-term projects all. (Investor 1)

Related to data availability, Intermediary 2 mentions that sustainability information could be better available and organized on the Bloomberg terminal, which is widely used for conducting green bond transactions.

Some interviewees gave suggestions on how to make the market even more accessible and how green investments could be increased. In regards to the issuance process, Intermediary 2 sees that there is an increasing need for non-bank advisory services, which would speed up the green bond issuances. However, he mentions that consulting companies are already increasingly responding to this need. Issuer 1 mentions that in order to have more green projects, more regulation is needed on both ends, to project design phases and also to financing. In addition, dialogue between the design and financing process could be increased.

#### 5.3.4 What makes a credible green bond

When discussing the criteria for an eligible green bond, topics that arose in the interviews were additionality, concerns related to refinancing, alignment with the Green Bond Principles (GBP) and EU taxonomy, and long-term plan of the issuer. Most respondents consider that the current self-regulation of the market functions well and that there are no major concerns related to the credibility of green bonds. When addressing the credibility issue, Intermediary 1 sees that there are two sides to it, the technical structure, and the use of proceeds. For the structure he mentions that there are very good standards put forward by ICMA, referring to the GBPs. Regarding the use of proceeds, he describes the progress that has taken place.

Then we have the question of use of proceeds, what will the borrower use the money for and is that sustainable enough. And I think we have gone through

an interesting process from that being a bit all over the place in the beginning, and with a bit everything being accepted, into market self-regulation through to a large extent the Climate Bonds Initiative, who have drafted a standard for how to assess what the proceeds should be used for. And now moving into formal regulation through the EU taxonomy. And I think that will continue to evolve, the part on what the proceeds are used for, I think the taxonomy criteria will be difficult to fulfill at least in the beginning for very many sectors. But over time those should be the ones that prevail in defining what is green. (Intermediary 1)

Intermediary 2 on the other hand emphasizes that green bonds should be used on investments which truly improve the issuer's sustainability.

Personally, I think that the green bond proceeds should be used principally for investments, and those should verifiably take the company to an above basic level from the perspective of contributing to the Sustainable Development Goals. So I think that additionality is still the key word here. And perhaps I could see that, even when green bonds can be used to refinance green investments, I think that the eligible refinancing must be taken with great care that we do not continue to finance the same investment over and over again with a green bond. If you consider that there is a big investment with a pay-back period of twenty years, then there will always be new loans every five years and it will always be funded in green, then where is the additionality in that situation? The money that is allocated there has a non-existent impact because it funds an investment that has already been made. (Intermediary 2)

Intermediary 3, along with most other interviewees, considers the GBPs as sort of a baseline criteria for assessing the credibility. In addition, he argues that the use of proceeds should support the core activities of the issuer.

Well this goes into very sort of subjective topic again, I think on the green bonds, as the whole market is, so I would suspect that you would have as many answers on this question as there are people answering the question. Perhaps the one guiding principle always has been that a green bond must meet the requirements and recommendations set out in Green Bond Principles. I think that is a given fact. But then the next point is of course that you can get into a situation where you technically meet all the criteria but still the transaction as such isn't really appealing to the markets. We have couple of examples over the past years, I think the early version of sort of reputational risk and market dissatisfaction was the Repsol green bond from maybe 2017 or 2018. Well anyway, the highly fossil-based company doing a green bond where there was a consensus within the market that the offering did lack a real environmental impact and it wasn't really at the core of the issuer's business. And that is what you can always argue and what you also have to look into in these green bonds is that is it a sort of one of opportunistic transaction or whether it is really something that is rooted into the company's overall business strategy and storyline. (Intermediary 3)

Issuer 2 also sees that these green projects or assets should support the core operations of the issuer. As an example of greenwashing, he mentioned a fossil energy company, which issues a green bond for financing wind power while most of their business is relying on fossil fuels. In the same vein, Intermediary 4 emphasises the importance of a long-term plan from the issuer. However, he also mentions the transition perspective, that it may be challenging to directly exclude certain industries for example, which cannot be phased out in the short-term, but are not sustainable in the long-term.

Even if they are improving in the short term but if the long-term plan is not there, then I probably would not consider them green enough. (Intermediary 4)

Intermediary 5 argues that the market has matured in a sense that he does not see greenwashing as a big risk anymore. He considers that the banks advising issuers and second party opinion providers are able to filter the transaction to a good extent.

I feel like we might have been able to go forward from having to judge whether some green bond is good or not good. Each green bond, in my view at the moment, is broadly qualified as green and there is no need to evaluate other than perhaps the risk of a company which is then priced on the market. This is probably where those who are deeper into sustainability issues can offer different views, but it seems to me that those [green bonds] that are screened by organizing banks, including ours, and external verifiers will pass through, so in my world everything qualifies green at an adequate level. (Intermediary 5)

Both investors heavily relied on third-party analysis and required the second party opinion. However, they both were satisfied with the requirements coming from the Green Bond Principles and viewed that bonds fulfilling that criteria and having a second party opinion were credible green bonds for them. One investor also mentioned their background, perhaps indicating that it is hard for them to be both finance and sustainability experts, which is why they also rely on third-party knowledge on sustainability matters. In addition, Investor 1 mentioned their exclusion policy, which would not allow them to invest in a green bond from an oil company for instance. In addition to the GBP, bonds aligned with EU taxonomy and ISO standards will be credible green bonds for Investor 1. He also sees refinancing a bit problematic and mentions that seeing the impact of a green project into 10–15 years is difficult.

### 5.3.5 Tool for sustainability transition

When discussing the potential of green bonds as a tool for driving sustainability transition, it is firstly important to define the transition, as Intermediary 3 points out. Somewhat surprisingly he sees that the word transition has a slightly negative tone to it.

To some degree green bonds work quite well for sort of financing transition, but then you know, what is transition? Transition has, due to these couple of to some extent criticized examples from the bond market over the past years, the word transition has slightly negative tone to it. So then it is generally preferred that green bonds would not be associated with the word transition, given that it sounds, within the markets usually if you say that this transition financing, it is usually seen that fine it is transition, it is not green. So it is not that sort of robust, it is not that environmentally friendly. And maybe that is a misconception that should be changed, but when we talk about transition then we should be very clear on what really is transition and from what and to where. And within what timeline. And against which benchmark or against which scientific evidence. (Intermediary 3)

When discussing transition in the context of transitioning to carbon neutrality and reaching the UN's Sustainable Development Goals, interviewees state that green bonds are currently either the best tool or at least one of the tools for financing the sustainability transition. Many justify their view with the green bond issuers' obligation to allocate the proceeds to green uses and report on the allocation and impact.

The most effective tool in use at the moment. Since green bond is a use of proceeds based product and money must be allocated to green investments and, to a limited extent, financing operating expenditure. (Intermediary 2)

I do think they are an efficient tool because you know what the money is going to go into and companies have to report on how much of the capital has been allocated already and many other things. So it can be followed at least on an annual basis, I believe, as to what the company is actually doing. (Intermediary 4)

However, Issuer 1 states that certain things can be achieved through financing, but more is needed in the real economy, more incentives for green projects. Intermediary 1 shares this view and argues that green bonds in themselves are not the driver for transition.

I think green bonds in themselves or green finance, that's not the driver or that's not the only thing that is needed for transition. So what we need is transition in the real economy. So it's the companies, and consumers, but mostly companies that need to transition and they need to have the correct incentive structures to do that transition, both through market signals on how their own clients react but also through regulation. And that's what we want to achieve. Then the financial markets' role is to channel financing for that transition, so

that there are no bottlenecks for the real economy to transition. (Intermediary 1)

However, Intermediary 1 sees that green bonds are a useful tool for guiding financial markets in decision making by providing labels for sustainable activities.

As long as the financial markets are capable of measuring what type of activity is sustainable and what is not, so that they can channel less money to those that are not sustainable and more money to those that are sustainable. And that is then where green financial instruments come in because they provide those labels, they help to guide the market in making those choices. (Intermediary 1)

In addition, while the focus is on financing the positive things, important is also the focus on reducing financing of harmful activities. Market participants see the upcoming EU taxonomy especially helpful in this regard.

They [green finance] are there to finance the positive things, but that doesn't actually mean that we have reduced any financing from the harmful things. Again, we have been through an economic or rather financial market cycle where everything has received financing. So, we also need mechanisms to limit financing to those activities that are harmful. Of course in a transitional way, for those activities that can transition. And therefore, I think European Commission's contemplations on creating a taxonomy for harmful activities will be a positive thing and something that we support, because that would create similar labels to activities that are clearly harmful. (Intermediary 1)

The second most effective tool is then the exclusion mechanisms, which, for example taxonomy can partially be considered. That is, if a taxonomy does not consider an activity sustainable from an environmental point of view, or climate change, whatever the goal is, then on the basis of this information, funds will be diverted away from financing such activities. (Intermediary 2)

Intermediary 1 also points out that green financial instruments are not the only thing that counts.

There is a lot of sustainable finance that goes through the financial markets without that ever being called green or sustainable in any way. It is just that, it's ordinary finance which is needed for the transition and that is equally important, I think. (Intermediary 1)

Many interviewees also brought up other instruments, which they consider even more effective than green bonds or see as complements. Sustainability-linked bonds (SLBs) were mentioned by most interviewees, and those are expected to continue to co-exist with green bonds.

But overall, if you look at industries that are capital intensive, there green bonds certainly have a place in helping industries transition, provided that they are able to really have such investments that can be really labelled as green. But then again, as mentioned in the beginning, you can always do a green bond without really touching the business model and changing anything within your business. And that works for good and that works for bad. So another instrument that has been gaining ground in the past years is of course sustainability-linked bonds, where you don't have that specific asset or that specific investment that you are financing but rather simply the terms of the bond are linked to your overall company targets. (Intermediary 3)

For instance, Issuer 2, who is a corporate issuer, says that in his opinion sustainability KPI -linked instruments would fit them better and maybe are more the direction for the future. Intermediary 3 also points out that in some cases SLBs might be better suited to finance the transition as there the issuer as a whole is committed to concrete sustainability targets, rather than just having a single green investment without measuring the greenness of the issuer as a whole. Investor 1 sees that the reward or punishment feature of SLBs is useful for guiding the market.

Investor 1 also mentions that green loans are another good tool, which is maybe even more impactful than green bonds, at least when considering European companies who use more bank financing than bonds. Intermediary 4 also agrees, considering the dialogue these instruments allow.

Bank lending and other types of private lending can be even more efficient because you are going to be able to have more dialogue with the issuer because it's usually only a few lenders. If it's a green bond then it can be 100 or something. Then of course the dialogue is quite a bit more difficult. Of course that dialogue can also happen but, if there's fewer lenders then it's probably more efficient and usually in private debt instruments the KPIs and all the covenants for the loan can be much more specific than in a bond format where you are going to have to kind of please all those 100 bond investors or whatever the larger amount is. But of course then vice versa, if it's a private debt instrument then it's less lenders and then it's up to the opinion of those few lenders and then somebody else might not agree with how sustainable those covenants or KPIs are. (Intermediary 4)

In line with the discussions regarding the development of the sustainable finance market, some see that green bonds may even be an instrument that is needed only for the transition period, for integrating sustainability into all bond transactions.

Then let's see if ten years from now there is a need for such instruments or if these sustainability issues are so far integrated into corporate analysis in the same way as other credit ratings. It may be that we go back to normal bonds



even, or there will be new features, but it could be that green bonds are intermission instruments for us in 2019–2023 for instance. (Issuer 2)

If green bonds are successful in bringing sustainability higher on the agenda on the debt markets as well and the high level of transparency on the use of proceeds allocation and impact becomes a market standard, this could even be the case for future.

## 6 Discussion

In this chapter, the findings from the study and empirical analysis from the previous chapter are connected to the theoretical background and findings from previous literature. The discussion is organized according to the research questions, to achieve the aim of this study. Firstly, the motivational aspects of different green bond market participants are covered in order to respond to the first research question. Secondly, the challenges and potential barriers in the green bond market are examined in light of the second research question. Thirdly, the effects of green bonds on market participants' operations and market practices are being discussed to cover the third research question. The overarching objective is to be able to make conclusions on the potential that green bonds possess in being an effective tool for enhancing the sustainability transition.

### 6.1 Motivations

In line with previous literature, interviewees cited multiple motivations for engagement with green bonds. When considering the categorization of Maltais and Nykvist (2020), business case benefits, as well as legitimacy and institutionally oriented benefits seem to be the most prevailing motivations in the Finnish market. Financial motivations were considered less important, mainly because the potential pricing difference is hard to estimate prior to green bond issuance and the green premium is usually not significant. The experience of a green bond premium is aligned with the findings of many empirical studies (e.g. Ehlers & Packer 2017; Baker et al. 2018; Hachenberg & Schiereck 2018; Zerbib 2019; Gianfrate & Peri 2019), whereas similarly to Flammer (2021) we do not find much support for the cost of capital related issuance motivations.

However, issuers mentioned that reputation and branding benefits from green bonds, the so-called "quality stamp" for the organization, may lead to better pricing of other bonds or even improved share price, which is also observed by Flammer (2021). Lau et al. (2022) also find that for example improved corporate reputation associated with green bonds may lead to financial benefits and thus act as a motivation. Interestingly intermediaries stated financial savings as one possible issuance motivation, whereas interviewed issuers wanted to stress that these did not act as motivations. Even if the pricing benefit may not usually be the main motivation for the issuer, in line with the argument made by Zerbib (2019), even a small green premium may be especially important in the sense that

it is small enough to not discourage investing in green bonds and demonstrates high investor demand which comes with opportunities for issuers to widen their bondholder base.

In the same vein, issuers mentioned ensuring the attractiveness of the bond issuance and expanding the investor base as motivations. These could be categorized as financial motivations as these aim at improving the access to capital and may lead to better pricing. Some intermediaries also emphasized that the outcome of the issuance is usually best if one is able to do it in a green format. Investors saw that green bonds may come with an improved risk-return ratio, which might explain the green bond premium, and thus there may be a financial motivation for them as well. Investors stressed the importance of tail risk management, which is in line with the argument of Menz (2010) that debt investors are especially focused on minimizing tail risks from negative events as they are not able to benefit from the upside as equity investors are. Mirroring to the categorization of Busch et al. (2016), most green bond investors seem to be of the financial type, where ESG information is utilized mainly to improve financial returns. In line with the conclusions of Gianfrate and Peri (2019), the high demand for green bonds may be explained by investors' interest in minimizing climate-related financial risks and complying with the current or upcoming regulatory demands.

However, investors and intermediaries stated somewhat differing views on justifications for the pricing differential, green premium. Intermediaries stated that investors are usually not willing to accept lower returns for green bonds but simply must accommodate to the current supply-demand imbalance in the markets. Investors however stated that they are paying for the additional information and transparency that comes with green bonds. Even if investors would not be willing to sacrifice returns for the environmental benefits explicitly, they seem to place value on the added information and transparency, which is reflected on the risk-return ratio. This is not surprising as it is in line with the findings of GIIN (2020) survey, where all surveyed pension funds and insurance companies target market-rate returns as well as most for-profit asset managers. In line with the critical arguments of Lau et al. (2022), the small green premium may be reflecting how much investors are willing to pay for environmental benefits, which is not a lot. On the other hand, this has allowed for the fast growth of the green bonds market, as these are a convenient way for investors to contribute, without having to sacrifice on returns.

Green bonds seem to bring various business case benefits for different market participants, which are one of the main motivations for many, aligned also with the findings of Maltais and Nykvist (2020). Hockerts' (2015) four dimensions for business case incentives – risk reduction, increased operational efficiency, branding benefits, and creating new markets – were all identifiable from the interviews. All market participants mentioned that green bonds come with branding benefits. Representing the expressive investor type (Busch et al. 2016), investors use green bonds also to enhance their public image and reputation. For issuers, green bonds may reflect positively on their other financing costs and relations with investors and other stakeholders. Some even mentioned that this reputational benefit may even lead to customers' higher willingness to pay for their products. The ability to connect financing operations with the core sustainability strategy may be seen as an organizational efficiency gain, which reduces organizational gaps and allows different teams to work more efficiently together and towards common goals. Issuers also mentioned the organizational learning aspects.

For the interviewed issuers green bonds were an integral part of their sustainability work as a whole. This indicates that green bonds are also used for communicating their sustainability work to investors. In connection to the findings of Flammer (2021), it seems that green bonds are used for signaling environmental commitments, as issuers commit to certain green investments. For intermediaries, green bonds exhibit a business opportunity, as they have established specialized units for advising in sustainable finance matters and their expertise is increasingly sought after. From an investor perspective, the demand for sustainable finance products, such as funds focusing on green bonds, creates business opportunities. Investors also had specific sustainability targets for their portfolios and green bonds do help them in tracking and meeting those.

Many market participants mentioned motivations related to legitimacy and institutionally oriented benefits. Issuers cited fulfilling expectations from their investors as one motivation. This finding is supported by Fernando and Lawrence (2014) who argue that organizations are motivated by the need to respond to the sustainability demands of their stakeholders. One issuer also stated that they viewed it as important to be leading this development and being an early mover. Intermediaries also saw that nowadays green bonds are issued because it is increasingly expected by the markets. In line with various studies (e.g. Eccles et al. 2014; Khan et al. 2016), interviewees mentioned that shareholders are starting to recognize the financial benefits of sustainability work and demand that increasingly

from the companies. All market participants in a sense have to be part of the green bond market because it is increasingly expected. Additionally, different market participants need to increasingly meet regulatory demands, many of which are related to sustainability disclosure and for instance, the investor interest in green bonds was also driven by this, according to intermediaries.

In addition to these motivations, some intermediaries mentioned the normative goal of directing more capital to sustainable sources and less to harmful uses. This is closer to the sustainability transition approach (Naidoo 2020), while most actors understandably work with a definition for sustainable finance closer to the one proposed by European Commission for instance. Green bonds are undeniably a relatively convenient instrument for investors as all other characteristics are similar to conventional bonds, while the only differentiating factor is the increased transparency on the use of proceeds allocation and impact. On top of that typically comes the added benefit that somebody, usually a second party opinion provider, has analyzed the green bond and confirmed its greenness. The convenience for investors does not come as a surprise as green bonds were initially developed as a response to investor request (World Bank 2019). In line with previous literature (e.g. Bachelet et al. 2019), green bonds seem to be appealing to a wide range of investors. Based on the interviews, especially investors with a green mandate are interested in green bonds. However, nowadays any investor might be interested in these, which is suggesting that green bonds are becoming a mainstream instrument.

The readiness for a green bond issuance alongside the underlying motivations is defining what kind of green bonds are brought to the market. So far, at least in the Finnish market, green bond issuers have been mainly companies that are already advanced in their sustainability work. However, this may lessen the transformative power of green bonds, as this instrument is not so easily accessible for issuers lagging with their sustainability work. On the other hand, if green bonds could act as an incentive for changing the internal processes and course of action, that would be more powerful. One intermediary indeed mentioned that non-bank advisory may help companies that are lagging with the internal sustainability processes and capabilities. Green bond issuers have also lacked diversity as typically these have been companies with large capital expenditures for individual projects where it is easy to categorize these as green or not. Traditionally these have been from utilities and real estate sectors. However, issuers are starting to diversify (Climate Bonds Initiative 2020a), as some intermediaries also noted. They see that green bonds are

becoming more accessible for issuers from less capital-intensive sectors, especially due to the broadening green definitions that EU GBS and taxonomy are driving forward.

## 6.2 Barriers

Issuers stated various potential barriers to green bond issuance. The costs of the issuance process we perceived as rather high and the internal processes and reporting were seen as laborious. Larcker and Watts (2020) also find that underwriting costs for green bonds are higher than for conventional bonds. However, interviewees perceived the costs related to internal processes as more of a hurdle, not exactly the external costs in connection to the issuance. Comments from the interviews are in line with the findings of Deschryver and de Mariz (2020), that the financial benefits of green bonds are not clear for the issuers and this may act as a barrier to issuance. However, according to intermediaries issuers nowadays are not too concerned about the costs and potential uncertainties of financial benefits associated with green bonds.

Regarding the lack of standardization in practices that would act as a barrier to issuance, as Deschryver and de Mariz (2020) identified, most respondents did not recall this being a barrier. In connection to the issue of standardization, one somewhat surprising aspect that intermediaries brought up was the reputational risk related to green bonds. This is related to the finding of Deschryver and de Mariz (2020) that the limited number of benchmarks and limited diversity of green bond supply slow down the market growth. Especially previously this was a bigger concern when the market was still in its infancy and Finnish issuers were extremely careful about not making any claims about greenness that could backfire. However, as a result, green bonds by Finnish issuers have been of high quality and well-received by investors. EU Technical Expert Group on Sustainable Finance (2019) also brought up that issuers face uncertainty regarding the green definitions, what assets and projects are suitable for green bonds, and are concerned about the potential reputational risks. However, interviewees mentioned that as the market standardizes more and for instance EU taxonomy comes into effect, this may be less of a hindrance. One interesting finding is that investors were rarely concerned about greenwashing in connection to green bonds and viewed that market standards are working well in that sense, however, it was the issuers themselves that were especially cautious.

The lack of available eligible projects for a green bond may be a bigger hindrance and a more structural barrier concerning the green bond market. Many intermediaries cited that

the project financing structure of a green bond makes finding eligible projects challenging. Whether or not limiting the impacts of green bonds, at least this is limiting the issuance volumes. As Monk and Perkins (2020) also argued, the benefits of green bonds have been attractive only to a smaller group of potential issuers. As discussed in the previous chapter, green bonds have been especially appealing to large issuers from certain sectors, with rather advanced sustainability practices. In addition, one intermediary commented on how the sustainability discussion is easier to have with a familiar bank and for this reason, many potential issuers may start their sustainable finance journey with for instance green loans or a revolving credit facility linked to sustainability targets. However, as mentioned earlier, the definitions for green projects are broadening, which allows for a wider range of issuers to consider green bonds.

All in all, the potential barriers identified by the EU Technical Expert Group on Sustainable Finance (2019) – unclear economic incentives and laborious reporting process, uncertainty with green definitions, and lack of eligible projects – were also mentioned in the interviews. However, it seems that as the green definitions are evolving and standardizing, that is becoming less of a barrier for issuers. On the other hand, more structural issues such as the reporting process and distinguishing eligible projects continue as barriers for certain issuers.

### **6.3 Impacts**

We start the discussion on impacts by examining the definitions of green and sustainable finance as well as responsible investing from the perspective of different market participants. These provide important implications for discussing the impacts further. Financial institutions as intermediaries and investors have a key role in ensuring that capital is directed to sustainable uses and the economy transitions (Wörsdörfer 2019). In line with this, intermediaries comment on how they have realized that they also need to have sustainability targets and one mentioned that sustainable finance is about ensuring that they “channel more financing to positive uses and less to those that have a negative societal contribution.” Concerning sustainability targets, green bonds and other sustainable finance instruments seem to be key tools for intermediaries and investors to fulfill those targets and demonstrate their contributions. Most respondents however define sustainable or green finance through instruments with such labels, rather than through the normative goal of contributing to sustainability targets. If sustainable finance is defined and related

goals are set through products such as green bonds, it is essential to make sure that these products are truly contributing to the demands of sustainability. However, from the issuer's perspective, green finance is understood as an overarching topic, which is closely linked to all of their operations and sustainability work.

Interviewed investors define responsible investing through the use of exclusions and ESG integration. However, sustainability is considered from the risk management perspective, not necessarily to drive measurable environmental impact. This approach refrains from the desired sustainable finance 3.0 (Schoenmaker & Schramade 2019), where investments would be made based on the potential to create a positive environmental impact. This is in line with the findings of Heeb et al. (2022) that investors are willing to sacrifice some return for sustainable investments but are not selecting higher impact investments if those would require sacrificing more returns. Despite green bonds being positioned as an instrument for impact investing (e.g. Eurosif 2018; Flammer 2021; Schoenmaker 2017/2019), interestingly one investor stated that due to the difficulty in measuring and estimating impact, they do not associate green bonds with impact investing. However, as Tolliver et al. (2019) also highlight, the environmental impacts of green bonds are challenging to estimate at the time of issuance when typically a list of possible eligible projects is being presented in the Green Bond Framework.

Market participants were unanimous on the fact that green investments financed with green bonds would have received financing anyway and are not creating additionality in that sense. In line with the critical arguments towards green bonds' additionality (see e.g. Dupre et al. 2018; Shishlov et al. 2016), market participants do not claim additionality either. Most market participants understood additionality in the context of green bonds similarly as was set out already in the Kyoto Protocol. However, one intermediary adopted a definition more in line with Gillenwater (2012), who suggests that proposed activities should produce some extra good in the future when compared to a baseline scenario. This understanding of green bond additionality suggests that green investments financed via green bonds should take the issuer to an above basic level from the perspective of contributing to the Sustainable Development Goals.

However, all interviewees indicated that in the market conditions with excess liquidity, additionality has not been a question as pretty much everything gets financing. On the other hand, in a more capital constrained future the case could be different. Intermediaries



have already noticed that in certain markets fossil fuel companies may have difficulties in accessing bond financing in a non-green format. This example is from Sweden where the green bond market is more mature than in Finland. If green bonds can drive this kind of change with the awareness they are raising, this could have impactful implications for the financial markets. However, when discussing the benefits and impacts of green bonds, most interviewees were not concerned about the missing additionality but instead identified other benefits. This view is in line with green finance practitioners (Cripps 2018; Michelsen 2018), who argue that additionality may even be an unfair demand for green bonds and we should instead focus on other benefits this instrument has brought.

Following the suggestions of Cripps (2018) and Michaelsen (2018), we examined the cultural changes and new standards of practice that green bonds may have catalyzed. To our understanding, these have not been studied empirically before in the context of green bonds. Regarding internal practices and capabilities, market participants have acquired new kinds of expertise and capabilities related to sustainability. In line with the findings of Deschryver and de Mariz (2020), interviewed intermediaries have dedicated teams for assisting their clients in green bond transactions. While advisory on sustainable finance matters requires new expertise, it also creates business opportunities. Additionally, financial institutions engage in the green bond market from multiple fronts, and as early green bond issuers they had to create processes for identifying loans for green purposes and assessing impact. One intermediary even saw this as the biggest impact of the green bond market.

Issuers on the other hand have become more aware of the sustainability aspects of their business and sustainability has been brought to the core of decision-making at the organizations. Green bonds have reduced organizational “silos” and changed the communication within issuing organizations. Issuers see green bonds as a part of a positive cycle of sustainability actions, and according to intermediaries some issuers may even be looking to change their operations to be able to issue green bonds. Green bond issuance requires development of internal processes for the related management and reporting, which could be a form of distinct organizational processes which differentiate high sustainability companies from low sustainability companies, as suggested by Eccles et al. (2014). In addition, green bond issuers need to be able to distinguish eligible green projects or assets. It is difficult to distinguish what changes in practices were especially motivated by green bonds, or whether green bonds are a result of advanced sustainability work within issuers.

However, green bonds come with a higher reporting obligation compared to traditional bonds. Referring to the concept of additionality, this higher reporting could even be considered as such, at least for the time being, when this is not the standard level of reporting on conventional bond proceeds allocation and impact.

From the investor perspective, green bonds have created requirements for expertise in analyzing these instruments and for familiarity with the changing regulation. In addition, increasing reporting, analysis, and data collection are also required from their side. As Menz (2010) points out, these institutional investors should have the resources to incorporate sustainability issues into their investment analysis and decisions. While ESG integration has become a common approach, investors rely largely on third-party sustainability information and analysis, and for instance on second party opinions, which on the other hand bring standardization and credibility to the market. In connection to the arguments of Heeb et al. (2022), rather than optimizing the impact of their investments, investors seem to maximize the financial performance, while optimizing the “warm glow”. Investors are able to create attractive products, such as green bond funds, and report on their green investments. However, in terms of delivering impact, if financial markets are able to measure and assess sustainability reliably, they can make more informed and impactful decisions. While Menz (2010) argues that the high number of institutional investors in the debt market has pressure potential on issuers, interviewed investors saw that because of the high demand for green bonds, they do not have much power to influence the issuers.

While ESG considerations may have been more prevailing in the equity markets, green bonds may be the main instrument bringing this awareness forward in the debt markets. This increased awareness and increasing focus on sustainability across financial markets had been recognized by all interviewed market participants. In addition, green bonds have increased the demands for transparency in the debt capital markets. For instance, investors are expecting increased transparency on what is being financed and on sustainability issues, and sustainability aspects are nowadays discussed in connection to any bond transaction. As a result, issuers today also provide a lot more information on ESG issues. On the other hand, Grote and Zook (2022) argue that green capital markets may even be counter-productive because while highlighting green initiatives they may block stricter real-world regulation. Based on interviews with different market participants there are reasons to be a bit critical towards their statement. After all, the green bond market started

as self-regulated and is only now moving to regulation for instance from the EU level. As green bonds are part of the larger shift in the capital markets it is perhaps difficult to say which changes were catalyzed by green bonds, but many new regulatory initiatives are being developed after green bonds were introduced.

Different market participants agreed that the green bond market has reached a good level of standardization and that the current self-regulation works well. The Green Bond Principles are considered as a baseline criterion and obtaining a second party opinion has become a market standard. These green credentials are also valued by investors (Sangiorgi & Schopohl 2021), as interviewed investors even explicitly stated that they would not consider investing in green bonds without the second party opinion. However, when discussing the improvement of market practices, some call for more clarity on definitions for greenness. One also adds that the green bond market should be made more accessible and unnecessary “mystifying” of the market should be eliminated to increase green investments. Some suggested that non-bank advisory services could help with improving the accessibility of the market. While all respondents are welcoming the further standardization of the market, some also saw issues that may come with it. For instance, some were worried about the increased issuance costs that may come with the EU GBS. In addition, the demand for higher quality reporting and disclosure needs to be balanced against the added workload to reach an adequate level without making the barriers for issuance unnecessarily higher.

Regarding credibility, in line with the concerns of Tolliver et al. (2019), some interviewees mentioned that refinancing needs to be considered carefully. They argued that the use of proceeds should support the core activities of the issuers, who also need to show a long-term plan and indicate how these green projects are supporting that. Contrary to the arguments of Tuhkanen and Vulturius (2020), interviewed issuers seem to link their green bond frameworks to their organizational level sustainability commitments and take a comprehensive approach to sustainability. As some intermediaries indicated, they expect to see green bonds contributing to the core operations of the issuers, even though some issuers may still take a more superficial approach to green bond issuance. The expectations of intermediaries are aligned with the findings of Khan et al. (2016) on the importance of acting on material sustainability issues.

Many findings from the interviews are in line with the critical arguments made by Grote and Zook (2022). First, changes in pricing are not meaningful and thus not able to affect capital allocation. Secondly, investors are not willing to sacrifice returns and are mainly concerned about managing risks and optimizing the risk-return ratio of their investments. Also, some market participants are concerned about the absence of clear standards for measuring and reporting impact. Different market participants however were not concerned about greenwashing and were rather satisfied with the self-regulation of the green bond market. It is also worth noting that from their perspective it may be satisfactory if the standards are not too high, thus the measuring and reporting burden is not too big, which allows more and more green bond issuances, and investors are happily able to communicate about their green bond investments. Facilitating green transactions is also in the interest of intermediaries.

When discussing the potential of green bonds as a tool for sustainability transition, we need to be very clear on what is meant by transition, since the word transition may have a negative tone to it as one interviewee indicated. However, this may come from the existing market standards as transition bonds indeed are a separate instrument issued by high emitting issuers who are transforming to more sustainable operations but whose operations as such are not sustainable although are critical components in the transition (Climate Bonds Initiative 2021a). However, this is not conflicting with the view of Naidoo (2020), who argues that sustainability transitions comprise of the necessary processes for reaching the SDGs and the goals of the Paris Agreement. Many interviewees also highlighted that more is needed in the real economy and the role of the financial markets is then to channel financing for the transition, to make sure that there are no bottlenecks. As Grote and Zook (2022) argue, instead of just waiting for the capital markets to efficiently deliver impact, we could focus on regulating companies directly.

Of course, it is not a single financial instrument, but a range of suitable ones, that is needed to finance the sustainability transition in our societies. All interviewees agreed that green bonds are one suitable instrument in this regard, according to some it is even the best tool currently available. However, there are many complementing ones that have their own advantages. It was mentioned that in some cases the sustainability-linked bonds may be more suitable for financing the transitions as then the issuer as a whole is committed to sustainability targets rather than just having certain green investments. On the other hand, some indicated that bank lending and other types of private lending can be a more efficient

tool as the lenders are able to have more dialogue with the borrower as there are only a few lenders. Whereas in the case of a green bond there are many investors, for instance around 100, which makes the dialogue more difficult.

Regarding fostering the sustainability transition the main value of green bonds seems to come from the added transparency and awareness. Green bonds provide labels to help investors' decision-making and the industry's self-regulation aims at making sure that these labels are credible. Although green bonds are increasingly being issued and sustainability aspects are increasingly considered in all bond transactions, it is hard to say whether these really have power in shifting business practices towards real and increased environmental impact. This is similar to the argument of Busch et al. (2016) that while ESG integration in investment decisions increases, that might have little impact on shifting business practices. As Heeb et al. (2022) and Grote and Zook (2022) conclude, it might very well be that green bonds have so far offered a good feeling to different market participants, rather than delivering real impacts. However, one thing is for sure, green bonds seem to have brought sustainability much higher on the agenda in the debt markets as well. Whether green bonds are just a transition period instrument as some interviewees suggested, raising the standard level and making sustainability disclosure the new normal in the bond markets, that remains to be seen.

## 7 Conclusions and evaluation of the study

### 7.1 Conclusions

The study aimed to explore whether green bonds are an effective instrument for financing the sustainability transition. This objective was approached with three research questions. These aimed at understanding the motivations different green bond market participants have as well as potential barriers or challenges they are experiencing. In addition, the aim was to examine how the engagement with green bonds is affecting the operations of different market participants and influencing market practices, and thus advancing sustainability.

The first conclusion is that, in terms of delivering on their green promise, the biggest benefit of green bonds may be the increased transparency and awareness these instruments have promoted in the financial markets, and more specifically in the bond markets. Transparency in the sense that issuers are obliged to disclose the use of proceeds and impacts of their green projects, which is not the case for conventional bonds. And awareness in a sense that sustainability aspects are nowadays being considered in any bond transaction, whether green or not. This way green bonds may be driving the development of improved, new standards for market practices. In addition, these developments have created increased demands for sustainability expertise for different market participants. In connection to increased transparency, the important function of green bonds is the labeling, which helps investors in making investment decisions. Investors also seem to place value on the additional information that comes along with green bonds and see that this contributes to the improved risk-return ratio, which justifies the small pricing difference.

Secondly, the main motivation for many green bond issuers seems to be the ability to connect financing to their sustainability work at the organizational level and communicate that to different stakeholders. However, this was backed by many expected benefits related to a wider investor base as well as reputational and branding benefits, and thus green bonds were considered as a “quality stamp” for the issuing organization. Issuers were also motivated by responding to the external pressure and expectations from the market concerning their sustainability commitments. And thus, green bonds also acted as an important communication tool for signaling those commitments. However, lower costs of

financing were not stated as the main motivation usually, as the pricing benefit is usually rather small and difficult to estimate before issuance.

As a third conclusion, potential barriers to green bond issuances mostly come from a lack of internal expertise and capabilities or a lack of eligible green projects. Issuing green bonds generally requires distinct organizational capabilities and a rather advanced level of sustainability work within the issuing organization. On the other hand, green bonds may even act as a catalyzer for developing sustainability work further. The costs associated with the issuance, especially in relation to internal processes and reporting, are also perceived as rather high. However, these rarely act as a barrier to issuance. The use of proceeds structure of the green bond is limiting the suitability of the instrument for different types of issuers. Additionally, Finnish green bond issuers have been extremely cautious about potential reputational risks associated with green bond issuances. Thus, they have rather waited for the market to standardize further. However, this has led to carefully developing internal capabilities in sustainability work, which has later resulted in successful green bond issuances. The key to tackling these barriers is making the green bond market more accessible to a wider group of potential issuers, while not compromising the quality of the eligible green projects.

Lastly, green bond market participants were consistent on the fact that practically all projects financed with green bonds would have received financing anyway, so additionality cannot be claimed in a way it is typically understood. In addition, the green premium is not significant enough that green bonds would motivate or influence any investment decisions of the issuers. However, the green bond additionality may be understood through the additional transparency it is creating. As these green instruments are used for setting sustainability targets, then it is crucial to make sure that these instruments contribute to the desired targets. However, the question remains whether green bonds are mainly fulfilling the needs of different market participants rather than meaningfully contributing to the sustainability transition.

These conclusions can inspire future research on green bonds and sustainable finance. As more data on the environmental impacts of green bonds becomes available, examining these quantitative results could provide a fruitful avenue for future research. As the focus of this study was solely on Finland, future research could focus on different countries. Interviewee responses from this study indicated that there may be significant differences

even between Nordic countries. In addition, here the focus was mostly on corporate issuers, future studies could examine the differences between different issuer types and perhaps make a difference between one-time green bond issuers and repeat issuers. The green finance and green bond market and the regulatory environment has evolved significantly in recent years and will continue to evolve. The upcoming EU Green Bond Standard and its adoption in the market may provide interesting avenues for future research.

## 7.2 Evaluation of the research

Traditionally the quality of a research is analyzed through the concepts of validity and reliability. Validity refers to whether those phenomena have been studied that have been intended to be studied. (McKinnon 1988.) Yin (2018) further divides validity to four criteria: construct validity, internal validity, external validity, and reliability. With *construct validity* he refers to the question whether suitable operational measures are chosen for the concepts that are being studied. In line with the suggestion of Yin (2018, 43–44) multiple sources of evidence are being used for increasing construct validity.

According to Yin (2018) *internal validity* deals with statements of causal relationships and is valid for only explanatory and causal studies. Since the study is instead rather exploratory and descriptive in nature, internal validity is not relevant for it. *External validity* is concerned with the generalization of a study's findings. While case study is not capable of delivering statistical generalization, it may still provide analytical generalization. External validity is addressed by identifying the relevant theory and/or theoretical propositions and applying those to the research design. (Yin 2018.) This study's focus in Finland makes it difficult to generalize these findings in other regions.

Reliability of the study refers to factors such as the collected data, analysis process and conclusions derived from the findings (McKinnon 1988). *Reliability* addresses the question whether a study could be repeated with having similar results (Yin 2018, 42). As Yin (2018) suggests, reliability of the study is enhanced by using an interview protocol in order to provide good documentation of research procedures. The interview protocol is included in the Appendix.

In this study, validity and reliability have been enhanced with the following practices:

- triangulation of perspectives by interviewing different market participants



- selection of interview participants based on their expertise of the research topic
- verification of certain statements from publicly available company publications
- use of carefully crafted interview protocol/guide
- asking further/deepening and clarifying questions during the interviews
- careful transcription and analysis of interview data
- use of theory for explaining findings

In addition, possible rival explanations need to be anticipated and listed already as a part of the research design, so that data these perspectives can be included in data collection. Addressing these will strengthen the findings of the study. (Yin 2018, 33–34.)

## 8 Summary

There is a global concern over combatting climate change and the need for rapid actions. Debt capital markets, with the largest pool of capital globally, also play a critical role. Green bonds have been introduced as one potential solution and the market has grown rapidly in recent years after the first one was issued in 2008. A distinct feature of green bonds is that the bond proceeds are to be ring-fenced for green projects. The green bond market has evolved through self-regulated market standards and now voluntary EU standard is also under development. The green bond market is characterized by high investor demand and more restricted supply, leading to often observed pricing difference compared to conventional bonds, the so-called green premium. Despite the noble aims of the instrument, it has faced criticism and concerns. For instance, the additionality of the instrument, whether green bonds are raising capital for green projects that would not otherwise happen, has been questioned. However, it has been suggested that the greatest impact of green bonds could come from the new standards of practice and cultural change that they are catalyzing.

Thus, the objective of the thesis was to examine the potential green bonds possess in facilitating the financing for the sustainability transition. The aim was approached by exploring the motivations and barriers for engaging in the green bond market. In addition, the study intends to understand how green bonds affect the operations of different market participants and influence market practices. For this purpose, different green bond market participants, including issuers, investors and underwriting banks, are approached. The research is designed as a case study, using Finland as the context. The data is collected through nine (9) semi-structured interviews, which are analyzed using theory-directed content analysis as a method.

The study yielded several interesting findings. Firstly, in terms of delivering impact, the biggest benefit of green bonds may be the increased transparency and awareness these instruments are creating in the financial markets. Secondly, green bond issuers are mainly motivated by the ability to connect their organizational level sustainability work to financing and communicate that to different stakeholders. External pressures and market expectations are also increasingly driving green bond issuance. Thirdly, the lack of internal expertise and capabilities or lack of eligible projects are usually the main barriers to green bond issuance. Lastly, the additionality of green bonds cannot be claimed, at least

in a way it is typically understood, as green bonds are not financing projects that would not have received financing otherwise. As the green bond market and green definitions have evolved in recent years and will continue to evolve, more data on the environmental impacts of green bonds becomes available, which may provide fruitful avenues for future research.

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## Appendices

### Appendix 1: Guide for interviewing issuers

#### 1. Introduction

- What is your title and role in your organization?
- What is your experience of working with sustainability and finance and more specifically with green bonds?

#### 2. Interview questions

##### Warming up / definitions

- How is sustainable finance / green finance defined in your organization? What does it mean for your organization?

##### Green bonds as a financing option (issuance process, expectations, motivations)

- What motivated you to issue a green bond? Who initiated it? Can you differentiate the role of financial vs. non-financial motivations for your green bond issuance?
- What factors acted as barriers for your green bond issuance?
- How was the issuance process different from a conventional bond? (e.g. costs, expertise, partners)
- In what ways were the green bond terms different from conventional bonds (lainaehdot)?
- How do green bonds affect your investment / on-lending decisions?
- Would your green projects have accessed other financing than green bonds?
- What types of investments would your institution not make if you were unable to issue green bonds?
- What in your view makes a credible green bond?

##### Impacts of green bond issuance

- How has your green bond / have your green bonds performed in the market? Was it better or worse than expected (and compared to conventional bond)?
- How did the green bond issuance affect you organization? (*e.g. changes in operations, understanding and operationalization of sustainability, culture, investor relations, other stakeholder relations*)
- How do you define/measure the success of a green bond?
- How could the impact or success of the green bond be enhanced?
- In your view, are green bonds an efficient tool for the sustainability transition? Why (not)? What financial instruments (or practices) would be more effective for that purpose?

#### 3. Final comments

- Is there anything else we have not covered but you would like to add?

## **Appendix 2: Guide for interviewing investors**

### **1. Introduction**

- What is your title and role in your organization?
- What is your experience of working with sustainability and finance and more specifically with green bonds?

### **2. Interview questions**

#### **Warming up / definitions**

- How is sustainable finance/green finance/responsible investing defined in your organization? What does it mean for your organization?

#### **Investing in green bonds (process, expectations, motivations, pricing, impact)**

- What is your role in the green bond investment decisions?
- When and why would you prefer green bonds over conventional bonds?
- Does investing in green bonds require additional expertise from your organization?
- How do you approach green bond pricing? Does it differ from conventional bonds?
- How has investing in green bonds affected your operations (e.g. analysis, interaction with the issuer)?
- What in your view makes a credible green bond?
- What types of green bonds would you not consider as green enough?
- How do you monitor the green bonds you have invested in, as compared to monitoring your conventional bond holdings?
- What do you expect from the issuers' green bond reporting (pre- and post-issuance)? How satisfied have you been with it? What could be improved?
- What practices would need to be improved in green bonds issuance or trading?
- In your view, are green bonds an efficient tool for the sustainability transition? Why (not)? What financial instruments (or practices) would be more effective for that purpose?

### **3. Final comments**

- Is there anything else we have not covered but you would like to add?

## **Appendix 3: Guide for interviewing arrangers and intermediaries**

### **1. Introduction**

- What is your title and role in your organization?
- What is your experience of working with sustainability and finance and more specifically with green bonds?

### **2. Interview questions**

#### **Warming up / definitions**

- How is sustainable finance / green finance defined in your organization? What does it mean for your organization?

#### **Engagement with green bonds**

- How is the underwriting / arrangement process for green bond issuances different from conventional bonds? Is additional expertise required from your organization?
- Motivations of other parties: based on your experience...
  - What motivates organizations to issue green bonds? Who usually initiates it? Can you differentiate the role of financial vs. non-financial motivations for green bond issuances?
  - Why are investors interested in green bonds? When and why would green bonds be preferred over conventional bonds?
- What factors may act as barriers for green bond issuance?
- How are the issuance costs for green bonds different compared to traditional bonds?
- How is green bond pricing approached? Does it differ from conventional bonds?
- In your view, what kind of organizations have the best readiness for issuing a green bond? Why?
- If these organizations wouldn't be able to issue green bonds, what would be their other options?
- What in your view makes a credible green bond? What types of green bonds would you not consider as green enough?
- How has engagement with green bonds shaped market practices?
- What is the role of your organization in developing the green bond market?
- What practices would need to be improved in issuance or trading to enhance the impact of green bonds?
- In your view, are green bonds an efficient tool for the sustainability transition? Why (not)? What financial instruments (or practices) would be more effective for that purpose?

### **3. Final comments**

- Is there anything else we have not covered but you would like to add?