

Bachelor's Programme in Accounting

Evaluating Green Bonds' sustainable impact

A management accounting view on how green bonds impact issuing companies

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**Bachelor's thesis
2023**

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Title of thesis EVALUATING GREEN BONDS' SUSTAINABLE IMPACT

Degree Bachelor of Science in Economics and Business Administration

Degree programme Bachelor's programme in Accounting

Thesis advisor(s) Thomas Taussi

Year of approval 2023

Number of pages 27

Language English

Abstract

Environmental uncertainty and its implications are widely considered to be one of the megatrends affecting societies worldwide. As a result, financial markets have had to adopt to these circumstances. Sustainable finance is considered a major tool for corporations and nations to combat climate change (T. Busch et al. 2015; Camilleri, 2021).

One of the current main innovations in the domain of sustainable finance is the rising popularity of *Green Bonds*. Green Bonds are debt instruments, that are used to finance or re-finance green projects. Over the last decade, the issuance of green bonds has grown over tenfold (ICMA 2023).

Even though the pricing of green bonds and motivations behind their issuance are extensively studied (e.g. Flammer, 2021; Maltais & Nykvist, 2020), little is known on how green bonds actually impact sustainability.

This study takes a management accounting view on the sustainable impact green bonds deliver on their issuing companies. The purpose of this approach is to explore pathways and mechanisms of impact green bonds might initiate.

The data of this study was collected through four expert interviews, and the results were expressed by using management control systems as a framework. The main contribution of this method was a set of operational level mechanisms of how green bonds might initiate sustainable impact.

This study finds that sustainable impact of green bonds is delivered mainly through cultural control systems. The operational level impact evaluations are also used to suggest that to enhance the sustainable impact, future research of green bonds could focus on impact reporting and cybernetic control systems.

Keywords Green Bonds, Sustainable Finance, Management Control Systems, Sustainable Debt Instruments, Green Finance, Levers of Control

Table of content

1	Introduction.....	1
2	Literature review.....	3
2.1	Green Bonds and Sustainability	3
2.1.1	Green Bonds as a financial instrument.....	3
2.1.2	Key actors, regulation and certification	5
2.1.3	Green Bonds and sustainable impact	7
2.2	Management Control Systems	10
2.2.1	Management Control Systems and Strategy	10
2.2.2	Management Control System and Sustainability	12
3	Research material and methods.....	17
4	Empirical data analysis	19
5	Discussion of sustainability.....	24
6	Conclusions	26
	References.....	27

1 Introduction

Environmental uncertainty and its implications are widely considered to be one of the megatrends affecting societies worldwide. As a result, financial markets have also had to adopt to these changing conditions. Sustainable finance can create real change towards more environmentally friendly societies by for example promoting productivity and increasing investment in renewable resources (T. Busch et al. 2015). Sustainability related funding has been around for decades (Camilleri 2021), but it has significantly grown in size and impact during the last few years.

An instance of this growth can be seen in the Green Bond (GB) market that has grown over tenfold during the last decade (Climate Bonds Initiative 2022). Green Bonds are commonly referred to as conventional bonds of which the capital is used towards environmentally friendly activities such as energy efficiency or resource reuse. By total issuance of over \$500 billion in 2021 and rapid growth (Climate Bonds Initiative 2022), GBs could be one of the most significant developments of sustainable finance in the last five years.

The certification process for GBs is largely market based and unregulated by law meaning that there are no clear requirements for calling a bond “green”. However, there are several actors providing frameworks and guidelines as a tool for companies issuing GBs. It is also increasingly common for issuing companies to attain third party verifications to further strengthen the legitimacy of the green label.

Despite the additional costs related to pursuing the green label for their bonds, an increasing number of companies are willing to go the extra mile. This is happening even though capital acquired through GBs could often be raised by conventional bonds requiring no extra efforts related to labelling (Maltais & Nykvist, 2020).

Even though this controversy about the rationale behind GB issuance is commonly discussed in research, little studies have been made about the mechanism and pathways of which GB issuance effects the issuing companies.

This study takes a management accounting view on the sustainable impact GBs deliver on their issuing companies. The purpose of this approach is to explore pathways and mechanisms of impact GBs might initiate.

Management accounting is applied in this study through the use of management control systems frameworks. The main frameworks used in this study

are levers of control by R. Simons (1994) and management control systems as a package by Malmi & Brown (2008).

The study starts with a comprehensive analysis of previous literature conducted about GBs. The purpose of this section is to give the reader a good understanding of GBs as a financial instrument and the environment in which they are used.

Next, management control systems are introduced and the relevance of their use in this study is assured through the explanation of the connection between strategy and management control systems.

This study used semi-structured expert interviews to gather empirical data. The method produced explorative results, while remaining comparable between different interviews.

The results of this study confirmed that GBs are mainly used as a communication tool to show ambitions for environmental performance. However, some new insights were obtained on how these impacts show themselves on an operational level. The results are organized in accordance with the framework created by Malmi and Brown (2008) and discussed in detail in the results chapter.

New operational level insights give a more detailed description on how impact is delivered inside the issuing companies. They also give an opportunity to discuss and solve problems related to GBs and sustainability.

2 Literature review

In this chapter Green Bonds are reviewed through the lens of previous data and research conducted on the topic. To understand the impact GBs have in the issuing companies, it is beneficial to go through what GBs are, who are the actors involved in the GB market and how sustainability is considered in the process.

In the second section of this chapter control systems are introduced as a tool to conceptualize the impact GBs have in issuing companies.

2.1 Green Bonds and Sustainability

2.1.1 Green Bonds as a financial instrument

Green Bonds are a debt instrument that issuers use to finance or refinance environmentally sustainable activities. Activities that are considered environmentally sustainable are not regulated by law, but it is common practice to align the use of proceeds with the UN Sustainable Development Goals (SDG) as well as green frameworks provided by third party actors. GBs work in practice similarly to conventional bonds, but the proceeds are restricted to green projects only. In some cases when the issuing company is operating with an entirely green strategy the proceeds can be used towards general administrative purposes (Maltais & Nykvist, 2020).

There are many kinds of sustainable debt instruments, but what sets GBs apart from others is their focus into the use of proceeds instead of firm level Key Performance Indicators (KPI) related to sustainability (Climate Bonds Initiative 2022). Other sustainable debt instruments include for example social bonds, transition bonds and sustainability linked bonds, all of which have a different niche of sustainability area that they target. GBs can be considered the most popular amongst sustainable debt instruments when viewed through various measurements such as volume of issuance or number of bonds in the market (Climate Bonds Initiative 2022).

Sustainable finance is a concept that has been around for a couple of decades and has gone through many different phases. At its core sustainable finance is the act of allocating capital into different projects that enable present and future generations to have resources they need without exceeding the limits of the Earth (Schoenmaker, 2017).

Through the years the focus of sustainable finance has shifted from short-term profit towards long-term value creation while taking into account different perspectives of impact. Many different sustainability related inventions have emerged in finance during the last few decades. These include for example the creation of the United Nations SDGs that guide companies' actions globally and Environmental, Societal and Governance (ESG) that is widely used in sustainable investing and reporting.

Despite the relatively long history of sustainable investing, GBs have only become really popular during the last five years. The first GB was issued by European Investment Bank in 2007 and the proceeds were used for projects related to renewable energy and energy efficiency (EIB 2007). However, it took another decade for the annual volume of GBs to surpass 100-billion-dollar barrier (ICMA 2023). With tailwinds from increasing environmental concerns, policies and public climate awareness, GBs are issued annually by several hundreds of billions of dollars. However, during the recent years the issuance has slowed down mainly due to increasing interest rates. It is also estimated that issuers have been struggling to keep up with the rapidly changing regulation and reporting standards (Climate Bonds Initiative 2022).

Even though GBs were first more popular among the public sector, majority of the GB issuers now are financial and industrial corporations. Governmental actors accounted only around 20% of the total volume issued in 2022. However, the use of proceeds has not significantly changed over time as energy, buildings and transport continue to dominate the allocation categories (Climate Bonds Initiative 2023).

Evolution of green bond issuance (USD bn)

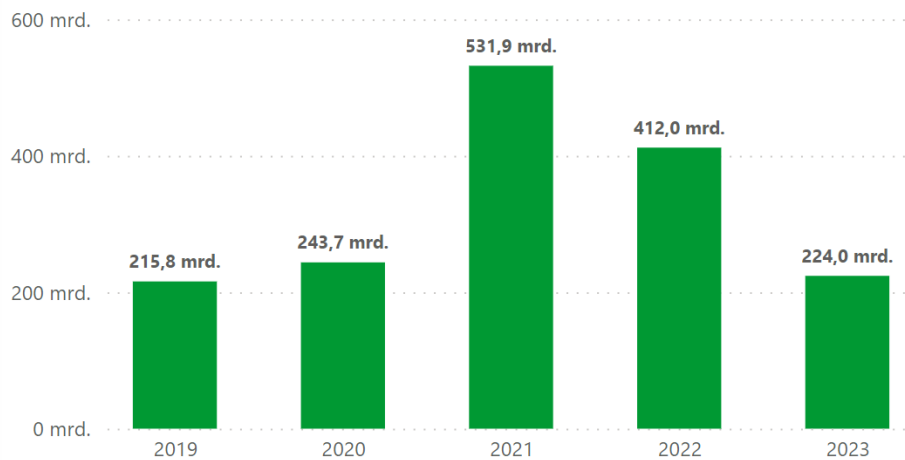


Figure 1. 2023 value of GB issuance is the cumulative up-to-date amount and not the value for the whole year. (International Capital Market Association 2023)

2.1.2 Key actors, regulation and certification

As mentioned earlier, the certification of bonds into green is not regulated by law and thus not enforced by any governmental authority. However, an exception can be found in China, where the GB market is mainly led by the government (Escalante et al., 2020). The Chinese market dynamics are not discussed further in this study, as they differ significantly from the western system.

The underlying principles regarding GB classification are created by the International Capital Market Association (ICMA) and are called “Green Bond Principles” (GBP). These principles guide the general criteria for applying a green status for a bond. The GBP provide voluntary guidelines for the process of bond application by identifying the key components involved in launching of a GB. The four key components are (ICMA 2021):

1. Use of proceeds
2. Process for project evaluation and selection
3. Management of proceeds
4. Reporting

In addition to these components, a heightened focus has been put into creating own GB frameworks and obtaining external reviews. Even though these principles are voluntary, most rating agencies base their ratings partly on the basis of the GBP making the alignment a standard procedure. However, there

are no regulators that could reject the green status of a bond if an issuing company would not align their operations with the GBP.

Some research has been done about the certification process of GBs. From an investor perspective, Ehlers and Packer (2017) state in their article called “Green bond finance and certification”, that there are two main databases for tracking GBs. These databases review and collect data about GBs and publish lists and indexes related to them. Being included in these indexes might increase the demand for GBs as index funds tend to gather large amounts of capital. A bond’s inclusion in such databases also acts like a certification itself, as the owners of the databases publicly provide additional requirements to be included in the index. CBI and green bond indices shown in table 1 below include sector specific criteria for their bond certification frameworks. For example, CBI has sector specific requirements for energy, waste, buildings and land use industries (Climate Bonds Initiative 2022).

In addition to database providers, external reviews are commonly conducted. Rating companies may go even beyond commonly used frameworks and provide more in detail impact reports to further enhance the legitimacy of the green label. Furthermore, rating companies often showcase their results in a multi-dimensional manner, contrary to the binary green or non-green classification. In table 1, this attribute is expressed as “Granular assessments of greenness”. External reviews are also sometimes done annually or at least in regular intervals. “Post monitoring activities/assessment” as put in table 1, enables data gathering along the project and ensures that the proceeds are used sustainably even after the initial launch.

Characteristics of different green bond identification and certification schemes					Table 1
	CBI Climate Bonds Certification	Green bond indices ¹	CICERO Second Opinions	Moody’s Green Bond Assessments	Standard & Poor’s Green Evaluations
Use of funds must be tied to green investment	Yes	Yes	Yes	Yes	Yes
Eligibility criteria differ by sector	Yes	Yes			Yes
Ex post monitoring/assessment				Yes	
Granular assessments of greenness			Yes	Yes	Yes
Quantitative weights for specific factors				Yes	Yes

¹ Bank of America Merrill Lynch, Barclays MSCI, Standard & Poor’s and Solactive.

Table 1. The first two columns represent database providers, and the rest are external reviewers. (Ehlers & Packer, 2017)

As a relatively new and rapidly growing market, regulation related to GB certification keeps evolving. In addition to market-based framework providers, institutional actors have grown an interest in the GB market. One of the

current evolvments in the European GB market stems from the European Union's attempt to harmonize the certification requirements. In January 2023, political agreement in making legislation for the EU "Green Bond Standard" (GBS) was made. The GBS will be based on three main requirements (European Commission 2023):

1. EU taxonomy-alignment
2. Reporting transparency
3. Accredited external verification

EU taxonomy alignment refers to a classification system created to improve transparency in environmental finance. The taxonomy has sector specific criteria for activities that can be called environmentally sustainable (European Commission 2023). The alignment of the use of proceeds with activities in the taxonomy is required to reach the GBS.

Detailed requirements related to reporting about the use of proceeds will be established. Unification of the reporting requirements aim to enable greater transparency, comparability and lower costs of reporting. The EU commission has proposed five key documents to ensure reporting transparency: EuGB factsheet, pre-issuance review, annual allocation reports, post issuance report and impact report (Badenhoop, 2022).

Accredited external reviewers will enforce the implementation of GBS. To be eligible for the green standard, at least one external review must be conducted. The overall leadership of the legislation will be led by European Securities Markets Authority (ESMA). External reviewers eligible for giving their opinion related to GBS will have to be registered and supervised by ESMA.

High hopes are set for the launch of the GBS. The introduction GBS is referred to as a key market event in several papers and it is marketed by the EU as the next "gold standard" in the GB market (Badenhoop, 2022; Deschryver & De Mariz, 2020; Ehlers & Packer, 2017). As EU is one of the biggest economic areas issuing GBs, the impact of successful EU led GB legislation could have major impact in the global GB markets too.

2.1.3 Green Bonds and sustainable impact

Green bond's original idea was to "contribute substantially to climate change mitigation" (EIB 2007). However, after over a decade of rapid growth in the GB market, studies about the yield of GBs significantly outweigh the research conducted about the actual impact GBs contribute to sustainability. Can GBs fulfil their original function and how do they do that?

When it comes to understanding the impact of GBs, it is important to acknowledge the incentives of the actors involved in the GB market. Are GBs used as a tool to create real change or are they just another “packaging” for conventional financial instruments?

Maltais and Nykvist (2020) have divided the incentives of engagement in the GB market into three categories:

1. Financial incentives
2. Business case incentives
3. Legitimacy and institutional incentives

Financial incentives refer to the cost of capital, risks and access to a diverse investor base. There is a huge demand for GBs among investors as GBs offer an opportunity to invest in specific green projects, eliminating company wide risks to the minimum. From an issuer’s perspective, the ability to access finance with project-specific risk rates might lower the cost of capital. In addition, the large demand for GBs allows issuers to have a wider investor base and more open dialogue with them. However, studies have found at most marginal differences in the yields of GBs and conventional bonds of similar nature (Flammer, 2021; Macaskill et al., 2021). As costs of obtaining the green label often exceed the premium GBs might have against conventional bonds, the contribution of financial incentives to GB issuance are weak. (Flammer, 2021; Maltais & Nykvist, 2020).

The most significant contributors to the issuance of GBs are the business case incentives. Business case incentives can be considered as branding, communication, and operational efficiency. Flammer (2021) refers to this incentive as “signalling” and claims that companies committed to improving their environmental performance use GBs as a tool to show their commitment and progress. Maltais and Nykvist (2020) have found similar results showing that companies that are already doing well environmentally find GBs an effective tool to communicate their efforts to internal and external stakeholders.

From an institutional and legitimacy perspective, GBs can be seen as a tool for satisfying institutional needs or as way to increase accountability for stakeholders. For example, issuing companies might want to satisfy their institutional investors needs for environmentally sustainable requirements by adding a green certification on their bonds (Maltais & Nykvist, 2020).

As incentives to engage in the GB market seem to be leaning towards marketing-based motives instead of shifting capital towards novel environmentally sustainable projects, it is important to examine the principles that make finance sustainable in general. Busch et al. (2015) state that from an ecological perspective sustainable finance requires:

- Increase in resource productivity
- Investment in renewable resources
- Recycling and reuse of materials
- Workability of local and global ecosystems

The governance of sustainable investments also needs to follow certain principles. Schoenmaker in his book “From risk to opportunity: A framework for sustainable finance” (2017) has looked at the governance of sustainable finance from different perspectives. These perspectives provide relevant additions to the lists made by Busch et al.

Schoenmaker states that from a company perspective, sustainable finance should be considered from the stakeholder perspective instead of shareholder perspective. Companies should strive to create long-term value for common good (Schoenmaker, 2017).

From an investor perspective, institutional owners should engage with companies about sustainability themes. To have more power, investors should build coalitions and co-operate when demanding sustainable action (Schoenmaker, 2017).

When it comes to market’s point-of-view, new alternative views of market efficiency should be promoted. This means that new environmental and societal risks might not be priced in yet.

Regulation and supervision should push for “buy and hold” investments available for retail investors. Financial institutions should also be stress tested for environmental risks in addition to traditional risk management (Schoenmaker, 2017).

With conditions and principles of sustainable finance in mind, the suitability of GBs for creating sustainable change can be assessed. Studies made concerning GBs effect on sustainability indeed tend to highlight similar mechanism of effect with sustainable finance in general.

Nykvist and Maltais (2020) claim that GBs change the way issuers and investors behave in financial markets making real change in operational level. GBs have opened a dialogue between investors and issuers about environmental issues making these themes a bigger part of the governance process. In addition, GBs have harmonized the way companies conduct and report green investments.

All these findings are consistent with the general principles of sustainable finance, especially in the areas of investor engagement and governance of

investments. More quantitative studies have also found evidence that companies issuing GBs improve their environmental performance after their issuance. Flammer (2021) states that the improvement of environmental performance is significant in issuing companies and companies with no intention of improving their environmental impact do not issue GBs.

On the other hand, it is worth noting that even though companies' environmental performance improves after GB issuance, it is not necessarily caused by the GB. Instead, companies dedicated to improvement use GBs as a marketing tool. Furthermore, GBs are rarely used to "shift" capital from less sustainable projects towards more sustainable projects (Maltais & Nykvist, 2020). The main critique about the use of GBs as a sustainable finance tool, called "additionality", is based on a similar idea concerning that GBs are not enabling novel green projects otherwise left undone and thus are not changing the status quo.

Indeed, as the argument of GB's inability to shift capital towards green projects that would otherwise not proceed is true, the impact GBs might have in enhancing sustainability through other pathways is worth exploring. In the next chapter, control systems are introduced as a tool to further examine the mechanism of impact GBs have on sustainability.

2.2 Management Control Systems

In this chapter management control systems (MCS) are introduced as a tool for conceptualizing impact and change inside companies. First, the link between strategy and strategy implementation is explained to shed light into why understanding strategy is important when measuring impact.

Then, two different MCS frameworks are introduced as a method for assessing impact of GBs in the results section of this thesis. Finally, literature concerning the connection between MCSs, and sustainability is briefly reviewed.

2.2.1 Management Control Systems and Strategy

The idea of MCS date back half a century, when Lowe (1971) wrote that "The purpose of management control system is to ensure that actions are in accordance with the firm's plans to achieve its objectives." The same idea still applies today, as MCSs are seen as a central part of strategy implementation.

Strategy itself is a complex concept, that has many definitions. In a business context, strategy can be described as a collection of unique plans and tactics

that guide actions of a company towards a common long-term goal (Porter, 1996, 1997). In addition, a good strategy evolves during the implementation process (Kaplan & Norton, 2008). MCSs are the link between strategy and actions a company operates and as strategy evolves during its implementation, MCSs influence strategy itself.

To better understand how strategy and operations are related, a closed-loop management system created by Kaplan & Norton (2008) can be examined. This system, illustrated in figure 2, explains the stages of strategy creation and implementation. No strategy nor MCS is the same and different organisations use different kinds of strategies and control systems (Malmi & Brown, 2008). However, the closed-loop management system communicates a general understanding of strategy and control processes that can be found in most organisations to some extent.

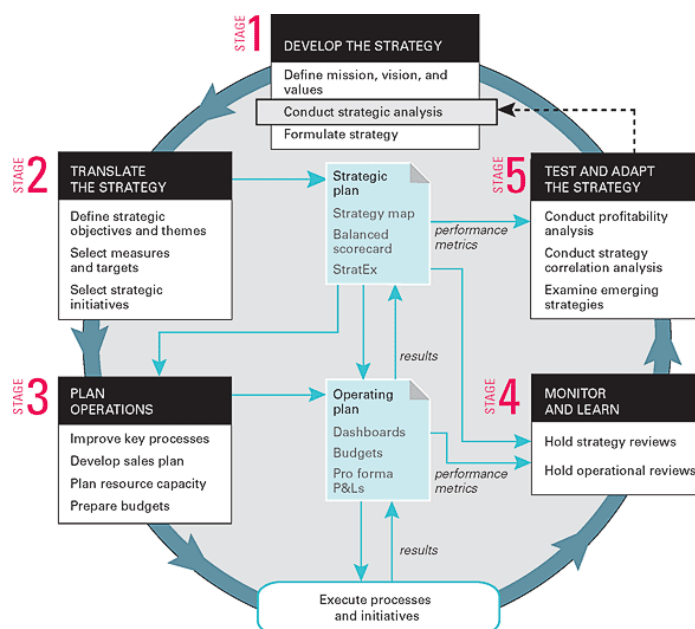


Figure 2. Five iterative stages of linking strategy and operations (Kaplan & Norton, 2008)

The closed-loop management system begins with developing a strategy. Strategy development is an iterative process itself, with inputs coming from the analysis of competitive environment and internal capabilities (Porter, 1996). Strategy can then be expressed as mission, vision, and values.

In the second stage, strategic plan can be conducted to translate the strategy into objectives and initiatives. These objectives and themes can be communicated with different tools including for instance balanced scorecard or strategy map.

The third stage focuses on more operational measures including budgets and dashboards. Traditionally MCSs have focused heavily on material planning, but nowadays the scope of MCSs has expanded to include more immaterial aspects of control such as culture and strategy (Malmi & Brown, 2008).

The last stages of the loop focus on monitoring, learning, and adopting. They suggest that the management needs to communicate between different individuals and departments about the performance of operations and the success of the strategy. If the underlying assumptions behind the strategy change, top management needs to consider adopting new aspects to their strategy.

As the closed-loop management system illustrates, strategy defines the core purpose of the company. Implementation of the strategy then translates the purpose into action and in turn affects the evolution of the strategy. Changes in the implementation process of the strategy certainly have impact on the business operations and ultimately strategy itself.

2.2.2 Management Control System and Sustainability

There is no standard way to deliver a well-functioning MCS (Malmi & Brown, 2008). However, in literature some of the elements of MCSs have been widely accepted as a good foundation for developing a MCS. The following two frameworks represent some of the most cited literature available about MCSs. In this thesis, these frameworks are used as a lens through which organisational impact of GBs is assessed.

Levers of Control

Levers of control is a framework created by R. Simons (1994). The framework represents formal and information-based control systems that top management uses to control business processes and drive strategic change and renewal (Simons, 1994). It is worth noting that informal controlling methods, such as culture or group norms, are not explicitly used in this framework.

Simons clusters MCSs into four categories based on their relationship with company strategy and how top managers use it. These four categories are illustrated in figure 3 below.

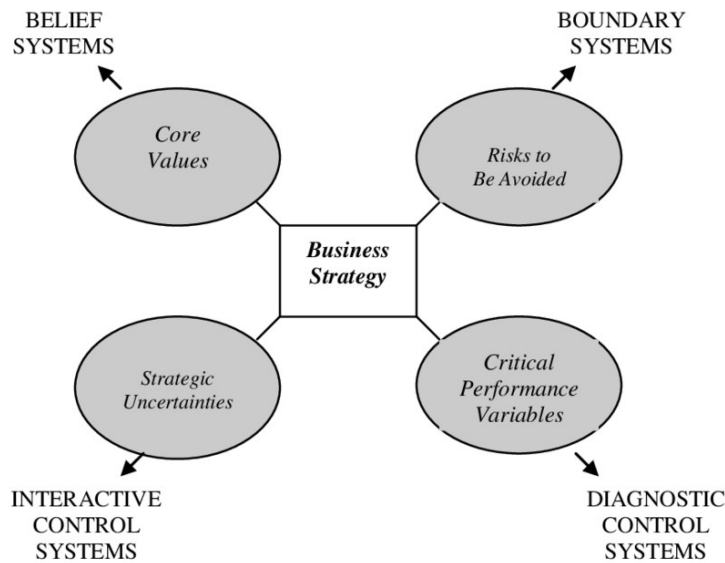


Figure 3. The left side of the figure represents “positive control systems” and the right side consists of “limiting control systems”. (Simons, 1994)

The framework can be divided into two sides based on the nature of the MCS methods. The left side of the figure represents “positive control systems” as they are by nature not limiting. Instead, the top left category of MCSs, *belief systems*, is a collection of ways top management can communicate the company values, mission, and direction to the employees. Some formal tools for communicating these values could be mission statements or credos. The fundamental purpose of these tools is to motivate the employees on the search of new business opportunities.

Interactive control systems also act as positive reinforcement, but towards organisational learning by promoting interaction between top managers and subordinates. Interactive control systems can be any MCSs if they are intentionally made interactive. Some ways that promote interaction in a system might be requiring top managers to be a part of the system operations, active involvement of top managers in the meetings regarding the system or continually challenging the assumptions and data behind decisions. Open dialogue between top managers and subordinates brings out strategic uncertainties and enables faster responding and learning from mistakes.

On the right side of figure 3, both categories of MCSs are considered “negative control systems”. This refers to the fact that both groups of MCSs are by nature limiting employee action instead of guiding.

Boundary systems, on the top right of figure 3, are involved in the same process of searching for business opportunities as belief systems. However, boundary systems act as a limit on what that might mean for employees. Formal systems limiting the search of opportunities include codes of conduct,

rules and standards that need to be met. These systems are created based on risks that need to be avoided.

Diagnostic control systems aim to provide fundamental data from business operations that enable monitoring of progress and control. Systems such as business plans, budgets and variances illustrate the condition of which the business is achieving its most important performance variables related to strategy.

Management control systems as a package

Levers of control framework has undeniable impact in MCS literature, but it has also received criticism. Some of the main critique is related to the vague definitions the framework provides for MCSs in general and the lack of informal variables (Malmi & Brown, 2008; Tessier & Otley, 2012).

Malmi & Brown (2008) address both of these issues in their attempt to create a new framework. The strength of studying MCS as a package lies in the ability to capture the concept in a broad enough manner to use empirically. It also acknowledges that MCSs do not work in isolation, but rather as a larger system. The weights of different systems are also not constant and are influenced by the specifics of the organisation. The addition of informal control systems, such as culture, are also strongly present in the framework.

Cultural Controls						
Clans		Values			Symbols	
Planning		Cybernetic Controls				Reward and Compensation
Long range planning	Action planning	Budgets	Financial Measurement Systems	Non Financial Measurement Systems	Hybrid Measurement Systems	
Administrative Controls						
Governance Structure		Organisation Structure			Policies and Procedures	

Figure 4. Five different organisational elements of MCS as a package. (Malmi & Brown, 2008)

In figure 4, five different categories are presented together as a MCS package. The term package refers to the fact that each control system might be created and operated separately from each other and by different apartments of the company. That means that MCSs can't be treated as a single entity. However,

all of these systems together contribute to the same strategy and thus together form a MCS. Next, different elements of the package are discussed.

Planning refers to control systems that aim to set goals and motivate employees to achieve these goals. Short-term planning, often meaning 12 months or less, is usually task oriented and has a tactical focus. Long-term planning has a broader horizon and focuses more on strategy.

Cybernetic controls are systems that measure performance, compare it to standards and motivate employees and managers to reach these standards and goals. Cybernetic control systems can be both financial and non-financial. Currently a popular hybrid of both financial and non-financial MCS could be a balanced scorecard consisting of different KPIs.

Reward and compensation systems aim to motivate employees and increase their performance. In addition to the traditional view of employee compensation being a part of cybernetic controls in budgets, rewarding can also be related to cultural aspects. For example, compensation can be related to group efforts instead of individuals, improving team mentality.

Administrative control systems control employee behaviour through the organisation of groups and teams. Organisational structure determines accountability and group size. Governance structure relates to the board and board committees and their accountability. Policies and procedures are standards and rules related to behaviour within the company.

Cultural control systems affect employee behaviour through clans, values, and symbols. Values and symbols can be expressed as formal systems like credos or mission statements, while clans refer to team or group specific sub-cultures. Organisational culture might be present without any active management, but culture is defined as a MCS when it is controlled and aimed to affect employee performance.

Management control systems and sustainability

The relevance of MCS frameworks to this thesis lies in the use of frameworks as conceptualising the impact GBs have in companies. Understanding different control systems and their impact on company strategy and operations enables a closer look at the pathways and relevance GBs have in delivering green impact. Some literature has been conducted on how MCSs and sustainable impact might be related to each other. Lueg & Radlach (2016) have conducted a thorough literature review about managing sustainable development through MCSs. In this literature review MCSs as a package by Malmi & Brown (2008) is used as a framework to wrap together the most common

systems to drive sustainable development (SD). The review states that empirical studies have discovered SD to be employed by all categories of the MCS framework used. However, the most common elements of MCSs as a package used for SD are cybernetic controls and administrative controls. It is also suggested that these systems are dominantly used, because they are already used to measure financial performance in companies and then SD goals are added to them without thinking about other systems (Lueg & Radlach, 2016).

Although a range of studies focus on sustainability and its control inside companies, little studies focus on particular sustainability related financial instruments and their effects through MCSs. When it comes to GBs, a few studies discuss their impact mechanisms on a general level, but not going into detail about pathways of impact or possible weaknesses. By combining a management accounting point-of-view on this matter, this study aims to bring new insights on the pathways and mechanisms GBs might enable sustainable development and financial performance.

3 Research material and methods

Because the effect of GBs in issuing companies is not an extensively studied field, this thesis aims to give an exploratory view of the matter. To deliver such exploratory results, a qualitative research method is adopted. In addition to the exploratory findings, this study can provide reassessment of assumptions, definitions, and findings of previous qualitative research conducted about GBs. This is important, because complex mechanisms and phenomena can easily be over simplified in research and the dynamics in the field can change (Lillis & Mundy, 2005).

To further specify the goals of this thesis, a framework created by Keating (1995) can be used to clarify how this study helps the growth of knowledge in the field of management accounting. Based on Keating's theory creation framework, this thesis most represents a "theory illustration case". Outputs of "theory illustration cases" are (Keating, 1995):

- Evidence to support the plausibility of a theory
- Respecified constructs and relationships
- Relative strength, limitations, and domains of rival theory
- Recommended next steps to specify theory

The main theories applied in this thesis are previous findings of the effects of GBs in issuing companies and MCS theory.

This study used semi-structured expert interviews as a data collection method. Semi-structured interviews allow flexibility in exploring new findings by asking follow-up questions about novel ideas. This data collecting method suits this study well, because it allows the exploration of new ideas while still having enough similarity to be comparable between different interviews (Eriksson & Kovalainen, 2015).

Four different interviews were conducted with experts in the domain of green finance. All the interviewed experts were from different organisations; three of which were GB issuing companies and one financial institution. The interviewees were provided with a general structure of the interview beforehand. The interviews were all conducted through Teams-calls and happened during August 2023. The composition of each interview differed a bit based on the role of the interviewee in the organisation, but all five interviews followed a consistent structure. Basic information about the interviewees is shown in table 2 below. To ensure the anonymity of the interviewees the exact role and organisation names are modified. The company names are replaced with different Pokemon types to help referencing to specific interviews later in the thesis.

Organisation	Industry	Role of the organisation	Expert role
Pikachu	Energy Distribution	Issuer	Head of Finance
Caterpie	Basic Materials	Issuer	Head of Finance
Pidgey	Basic Materials	Issuer	Head of Finance
Charmander	Finance	Intermediary	Debt Capital Markets Director

Figure 5. Overview of interviewed organisations and interviewees.

The data collected by interviews is reflected through the theory and frameworks introduced in the literature review section of this study. The use of the interview data is to clarify, operationalise and connect the theory relating to it and it is not to be used as an objective truth that should be portrayed as is (Ahrens & Chapman, 2006). Despite acknowledging the subjective nature of the interview data, there are several factors that could harm the validity of this study. These factors might be related to the observer bias, limited amount of interview data and general limitations of researcher's ability to process the data (Ahrens & Chapman, 2006). However, due to the social qualities of the domain and exploratory objectives of this study, the benefits of the selected research method outweigh the validity risks and thus this method was selected.

4 Empirical data analysis

The empirical results of this study are analysed and expressed with the help of MCSs as a package framework. Direct quotations from the interviews are used to give a lively view of the findings in practice.

Operational level impact mechanisms of GBs are visualised and summarised in figure 6.

Based on the interview data, a general understanding of how GBs relate to control systems was obtained. The interview did not directly imply the existence or classification of different MCSs, but the interview questions steered the interviewee towards discussing such themes. In figure 6 below, MCSs as a package framework created by Malmi & Brown (2008) is used as a tool to categorise the impact GBs have on issuing companies. Even though GBs might not directly initiate a change in a particular MCS, indirect effects can be significant enough to be discussed in this study. Next, different dimensions of figure 6 are discussed with quotations from the interviews.

Cultural Controls		
Clans Sustainability integration into different clans		Values Communicates a shared sustainability definition Green finance as a symbol
Planning		Cybernetic Controls
Action Planning Use of proceeds	Long Range Planning Framework creation	Non Financial Measurement Systems Impact evaluation and reporting
Administrative Controls		
Organisation Structure Reduction in "silos" inside the organisation New departments, new talent, learning		Policies and Procedures Sustainability regulation is an unseparable part of finance Understanding of sustainability regulation

Figure 6. Management control systems as a package framework (Malmi & Brown, 2008) adopted to visualise the impact green bonds have on management control systems.

Cultural control systems

Cultural control systems are under-represented in the study of sustainable development and MCSs. This could be a result of cybernetic systems dominance, as sustainability metrics have traditionally been tied to existing formal control systems (Lueg & Radlach, 2016). However, the empirical data from this study indicates that cultural control systems are in fact one of the main pathways through which GBs influence companies. For example, GBs have

contributed to a more uniform definition of sustainability inside organisations. The head of finance from “Caterpie” expressed this phenomenon as follows:

“In such a large organisation, sustainability is seen very differently by different departments. When we first started to use green bonds, us in the finance department had to try to understand sustainability from all these different viewpoints and they had to see our goals. Now as we have continued to work together more, we have developed a similar view on what sustainability means to us in practice.”
(Head of Finance, “Caterpie”)

A shared understanding of values and goals is fundamental for implementing effective MCSs, as the idea of MCSs is to guide and motivate employees to behave in a manner that benefits the company (Malmi & Brown, 2008). Without having shared values and goals, it is impossible for the employees to know what desired behaviour is.

In addition to the internal definitions, GBs initiate closer communication between investors and the company. Especially green investors were seen as “demanding” by the interviewees, requiring information about the company that might not be fully clear to the organisation itself. The pressure from outside stakeholders such as investors seems to be a strong force pushing companies towards a clearer understanding of current sustainability themes inside and outside their own organisation.

During the process of GB issuance, attitudes and subcultures of different units have also been affected. These subcultures, called clans in figure 5, seem to have changed as a response to the environment. In the past, employees in financial roles didn’t have to be experts in sustainability issues. Now on the other hand, sustainability competence is not only valued but required, as almost all kinds of debt need to take sustainability into account. The change in these attitudes towards sustainability have not changed instantly. The head of finance from “Pikachu” describes the GB issuance and its effect on employee attitude as an uncertain process:

“Me and my colleagues used a whole summer for the second-party opinion process. There was no disagreement, but more uncertainty, because it could not be proven that this will be good and there were a lot of questions I could not answer exactly. ... Afterwards it is easy to point out that these were the benefits (of the process) and costs would have incurred in the future anyway.”
(Head of Finance, “Pikachu”)

All five of the interviewed experts saw sustainable finance as the “new normal”. As this industry-wide view gets stronger, the attitude towards sustainability might shift even further towards sustainability being an enabler of financing instead a restriction.

In some cases, GBs can also be seen as a symbol of the company values. Symbols are an expression of desired culture, that lead employees to behave in a certain way (Malmi & Brown, 2008). In the case of “Caterpie”, GB’s symbolic value was seen as a part of convincing employees that the top management is committed to sustainable practices. The head of finance explained that:

“Our goal is to enable a sustainable future by producing renewable materials ... We want everybody to feel that they do work that matters. Us in the management also need to justify our commitment towards these goals.”
(Head of Finance, “Caterpie”)

Simons (1994) lists that belief systems materialise themselves as mission statements, statements of purpose and credos. Similarly, reports related to GBs can serve as a formal way of communicating company values, while also showing top management commitment towards them. Multiple studies have found that top management commitment is critical for sustainability implementation, as it raises awareness and assures legitimacy (Lueg & Radlach, 2016).

Planning

Malmi & Brown (2008) divide planning control systems into two categories: action planning and long-range planning. GB issuance generates formal documents relating to both categories of planning.

The use of proceeds evaluation acts as a guiding criterion for the eligibility of a bond to be green. At the same time, the plan for financing or refinancing green investments acts as a formal form of control through which funds are allocated to different projects within the investment period. Use of proceeds plan is by nature a financial plan, but when broken down to project level specifics, it can direct employee attention into different areas of the project.

On a broader level, the initial framework created by the issuing company to apply for a green certification can be seen as a long-range planning document. The green bond framework is created by the company in the beginning of the issuance process and is usually aligned with the ICMA green bond principles. For example, the Green Bonds Framework of “Pikachu” includes standards for evaluating and selecting green projects, management of the proceeds and reporting. This framework provides general rules and standards for employees working with the projects financed by GBs. The framework could also impact employees working with projects not financed by

GBs, as they might aim for the operations to align with the framework to attain green financing in the future.

Cybernetic control systems

When it comes to traditional sustainable finance instruments, cybernetic control systems are the main pathway that sustainable impact is controlled. This might be an outcome of the structure of these instruments, often linking their evaluation of sustainability to company level KPIs. They also might have variable interest rates depending on company's environmental performance, incentivising the sustainable development.

GBs on the other hand, are not directly tied to company level KPIs. Instead, impact reporting focuses on green projects financed by GBs. Impact reporting can act as a non-financial cybernetic control system when it is used as an ongoing process where environmental impact of projects is measured and compared to standards set by the GB framework. This process engages employees in such projects to behave in a way that contributes to the standards set for the project.

However, there is little evidence that these kinds of interactive control systems are initiated by GBs. Debt capital markets director from "Charmander" even mentions that:

*"...what is reported about the impacts is not set in stone, rather it is based on common market practices. Especially in the past it was only a suggestion, but now standards are tightening. However, the reporting standards have been less critical compared to the allocation of proceeds."
(Debt Capital Markets Director, "Charmander")*

This statement indicates that companies might have little incentives to invest in the continuous control and reporting of the impacts. The statement also supports one of the key findings of Maltais & Nykvist (2020), as they claim that GB issuers tend to highlight the signalling aspects of GBs more than the actual sustainable impacts.

Administrative control systems

Administrative control systems are the most frequently reported control system for sustainable development (Lueg & Radlach, 2016). In this regard, GBs seem to be no exception since much of the interview data can be related to administrative controls. One of the most reoccurring themes among all interviewees was the increased communication between different departments of the organisation. Some of the interviewed organisations also reported that new teams related to sustainable finance were put together, consisting of a diverse mix of professionals from different disciplines. The change in

organisation structure affects employee behaviour through accountability and governance (Malmi & Brown, 2008).

The effects of increasing use of GBs do not only stay inside the issuing companies but can also be seen in other market participants. For example, debt capital markets director from “Charmander” expressed that the “silos” of different departments inside banks have been reduced too. He stated that GBs are no longer only processed by sustainable finance teams, but rather in a joint effort with debt capital teams. He also mentions that the size of sustainable finance teams has grown in many organisations. Direct efforts towards information exchange and learning were conducted through formal training, but much of the learning process had come through being exposed to sustainability themes in a daily basis.

As finance is increasingly connected to sustainability, companies need to closely follow the changing regulation relating to it. Policies from e.g. EU level will have impact on how companies create their own sustainability governance procedures. Head of finance from “Pikachu” described their response to changing regulation as follows:

“We try to follow changing regulation to the best of our ability. ... In practice, we make projects about specific initiatives and use consultants to understand specifically what is required. We then implement these projects related to for example avoided emissions.”
(Head of Finance, “Pikachu”)

Issuing GBs forces companies to follow green finance regulation more closely, as they need to assure that what they do now will also be considered green in the future. Green investors also tend to be a strong driving force for policy related reporting, as many interviewees reported that the initiative for reporting environmental impacts comes from the investor side.

5 Discussion of sustainability

In this chapter the impact of GBs is reflected through main findings of previous literature concerning GBs and sustainability. First, the claim that GBs are mainly a signalling tool is discussed. Then, criticism about GBs as a sustainable finance tool is considered.

Main literature about GBs agrees on the fact that GBs are mainly used as a signalling tool (Flammer, 2021; Maltais & Nykvist, 2020; Schneeweiß, 2019). This means that the main function of GBs from an issuer's perspective is related to branding and communication. By communicating sustainable ambitions, GBs are expected to rise commitment and expectations related to sustainability (Maltais & Nykvist, 2020). Improved communication between different stakeholders regarding sustainability is also seen as major impact GBs have initiated.

The findings of this study are consistent with the signalling argument. Issuing companies interviewed reported a range of incentives and mechanisms that can be related to a signalling motive. In particular, cultural control systems discussed in the previous chapter related highly with communicating values and showing commitment towards sustainability. The examples demonstrated in the previous chapter add context and possible mechanisms on how signalling sustainability ambitions can create real change in organisations.

In addition to pure symbolic and signalling values, this study explores a range of other impact mechanisms that GBs initiate. Perhaps the most visible mechanism of impact GBs have initiated are related to administrative control systems. As sustainability has become a major part of evaluating investments and accessing financing, administrative controls have had to adopt. GBs as a popular sustainable finance instrument have provided many of the policies and regulation relating to sustainable finance. These policies and guidelines have become industry standards and companies feel strong pressure to follow them. From an administrative perspective, companies have adopted their organisational structure, grown sustainability related teams, and created sustainability related frameworks to match industry standards.

The main criticism about GBs' ability to enhance sustainability is directed towards "additionality". Main literature discussing this issue states that GBs are in fact not "shifting" capital into green investments that would otherwise not been done (Maltais & Nykvist, 2020). Instead, companies assess how much investments could achieve the green status and use GBs to finance existing sustainable efforts. Debt capital markets director from "Charmander" expressed his concern about GBs impact as follows:

*“It could be a welcomed update that green bonds would be used to finance something new and novel. Now, vast majority of green bonds are used for refinancing existing projects.”
(Debt Capital Markets director, “Charmander”)*

Findings like these seem to confirm that additionality is still a relevant issue when it comes to GBs ability to create sustainable impact. When reflecting the properties of GBs against the principles of sustainable finance introduced earlier by Busch et al. (2015), the conditions of sustainability only come true if improvements in productivity, resource use and efficiency happen. Refinancing existing infrastructure, even though zero carbon, cannot be seen as an improvement.

However, after evaluating GBs from a management control systems point of view, possible solutions can be explored.

One perhaps underutilized control mechanism seems to be impact reporting and regulation relating to it. As discussed in the previous chapter under cybernetic control systems, reporting of impacts is not specific. Currently reporting of impacts is mostly dictated by industry standards and investor demand. This leads to poor comparability and transparency of actual environmental impacts of projects financed by GBs. Harmonizing and tightening regulation related to environmental impact reporting would allow a better understanding of whether GBs initiate actual new cuts in emissions and other measurable environmental benefits. Improving the reporting standards would also act as a guideline for companies to control these activities internally. The consideration of additionality and refinancing could also be controlled by regulating reporting standards, because if refinancing existing infrastructure improvements is not considered a positive impact, companies would be forced to invest in novel green ideas.

The EU GBS might provide improvements in the reporting regulation. As the EU standard is still not in use, the actual impacts of new regulation are hard to predict. Nevertheless, the EU GBS obligates companies to align their activities and reporting with the EU taxonomy, making impact reporting more comparable and transparent.

6 Conclusions

This study aimed to reassure and explore the ways in which GBs affect their issuing companies' sustainability. Management control systems were used as a framework to conceptualise and categorise the pathways and mechanisms the impact was delivered.

Four semi-structured expert interviews were conducted to gather data from the domain of sustainable finance. Three of the interviewees worked in a GB issuing company, and one in a financial organisation. The interview data was then analysed and MCSs as a package framework was used to categorise the findings.

The main contribution of this study is a set of descriptive operational level mechanisms of how GBs affect their issuing companies. This study finds that contrary to how MCSs are usually used for sustainability implementation (Arjaliès & Mundy, 2013; Lueg & Radlach 2016), GBs effect their issuing companies mainly through cultural and administrative control systems, while cybernetic control systems are less prominent.

Many of the findings were in line with previous literature conducted on GBs. For example, this study is aligned with the consensus that the incentive of companies to issue GBs is mainly focused on branding and communication (Flammer, 2021; Maltais & Nykvist, 2020). However, no studies had been done on the effect of this communication tool on sustainability. The operational level insights provided new insights on how GBs deliver sustainable impact despite the motivations behind their issuance.

This study also confirms that the critique about GBs' lack of ability to shift capital towards novel green projects is still valid (Maltais & Nykvist, 2020). To combat lack of additionality, it is suggested that cybernetic control systems should be more utilized. Special focus on impact reporting and its regulation could be effective on pushing companies towards investing in novel green projects.

As all the interviewed experts agree that sustainable finance will be the "new normal", it is critical to continuously assess how sustainable finance instruments contribute to sustainable development. More studies related to new and growing sustainable finance instruments, such as sustainability linked bonds, should be conducted. Additionally, continuous reviews about the quickly changing regulation and its ability to enable effective use of sustainable finance instruments is necessary.

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