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## Master Thesis

# Control Systems for Sustainability: Exploring the patterns in Norwegian firms

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## Acknowledgment

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Sherina Rendini

## Abstract

Sustainability is becoming of high importance for companies. Businesses increasingly commit to sustainability initiatives and report on sustainability performances. They also start to develop and embed sustainability strategies into their operation activities, reshaping their business models, value and supply chains based on new principles like circular economy. Confidence in sustainability reporting and implementation of sustainability strategies are defined as a research area for the current study. Although the identified issues can be analysed from different angles, the current study utilises the concepts of internal and management controls, the practices of which are closely related.

Based on Malmi and Brown's management control framework (2008) and COSO Internal Control-Integrated Framework (2013), this thesis, first, examines what control mechanisms Norwegian companies are using to achieve sustainability goals, and then explores the extent to which packages of formal and informal control mechanisms are developed in the observed companies, further theorizing the sustainability control patterns. The study uses a mixed research design with the data collection methods of the online survey and semi-structured interviews.

The results of the study show that all control mechanisms were deployed in the researched companies, with cultural control and planning control being the most widely used types of control, and rewards and compensation being the rarest applied control system. The study identifies five distinct control systems packages and concludes that both formal and informal controls are likely to be necessary in order to achieve sustainability goals. In addition, the study theorizes the path towards developing a complete control package, discussing obstacles to moving from one package to another and, where possible, how to overcome them. The insights and recommendations provided in this paper are likely to support organizations in their effort to translate aspirations into practices. Finally, the study proposes opportunities for future research.

**Keywords:** *management control systems, internal control, package, sustainability strategy, sustainable development*

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## 1. Introduction

This section sets the context for the thesis. It explains the background to the research, starting with an overview of the research area and then narrowing down to the research questions. The section ends with a discussion of potential contributions to the current knowledge of the thesis topic.

### 1.1. Research area

During the last decades, the concept of sustainability has become of paramount importance (Kolk & van Tulder, 2010; Labuschagne et al., 2005; Miller et al., 2013). Increased public attention on environmental and social issues such as pollution, water scarcity, poverty, inequality led to the development and spread of global and local regulations (Howes et al., 2017). In 1987 the Brundtland commission expressed concerns regarding sustainable development and was the first to define it as *“meeting the needs of the present without compromising the ability of future generations to meet their own needs”* (United Nation, 1987). However, the following years indicated unsatisfactory progress towards sustainable development (Howes et al., 2017), and in 2015 United Nations committed to a new universal Agenda 2030, which urgent implementation according to the UN *“will require an even stronger global partnership, complemented by multi-stakeholder partnerships to mobilize and share knowledge, expertise, technology and financial resources”* (United Nation, 2015).

Private sector, part of this global partnership, is called upon to contribute to solving sustainable development challenges (United Nation, 2015). Investors, shareholders, employees, customers, suppliers and other stakeholders expect that businesses will be part of the solution to local and global sustainability problems (e.g., Flokk, 2021; Novo Nordisk, 2021; Philips, 2021). These stakeholders also expect transparency and openness about how businesses deal with sustainability issues (Arjaliès & Mundy, 2013). Pressured by stakeholders, businesses are increasingly required to commit to and report on sustainability performances. The number of companies that report on sustainability have increased considerably during the last decades (Kolk, 2004). For example, the percentage of S&P 500 companies publishing sustainability reports rose from 19% in 2010 (Boerner,



2013) to 90% in 2019 (Deloitte, 2020). While there is no doubt that the upward trend in sustainability reporting has been recognised as positive (KPMG, 2020), both internal and external stakeholders often do not have the same level of confidence in the quality of sustainability information as compared to traditional financial reporting (EY, 2020; S. Littan, 2019). As sustainability considerations become more integral to business and investor decision-making, the quality of sustainability data becomes increasingly important (EY, 2020; Littan, 2019) and constitutes the first part of the research area.

At the same time, the businesses' approach to sustainable development focusing on sustainability reporting and "eliminating negative effects of business" (Baumgartner, 2014) is no longer enough. Customers expect that corporate communication on sustainability matches actual sustainability engagement of companies, otherwise companies are criticised for greenwashing and in general distrusted (Baumgartner, 2014; Caputo et al., 2017; Lueg & Radlach, 2016). Sustainable Development Goals (SDGs) appeal to businesses to use creativity and innovations to create value for the common good (United Nations, 2015). As a result, companies started to develop and embed sustainability strategies into their operation activities, reshaping their business models, value and supply chains based on new principles like circular economy (e.g., Flokk, 2021; Novo Nordisk, 2021; Philips, 2021).

While more than 200 Norwegian companies have signed to follow UN Global compact principles for responsible business (UN Global Compact Norway, 2021), a PWS report shows that few Norwegian companies have actually integrated sustainability in their business strategy (PWC, 2019) and Sustainability Hub Norway (S-HUB) report states that "*implementation [of sustainability] is generally too slow*" (Sustainability Hub Norway, 2021). Accenture (2019) reported 99% of CEOs stated that their businesses wanted to commit to sustainability, however, only 48% of CEOs stated that their businesses are implementing sustainability into their operations (Accenture, 2019). The lack of integration and slow implementation of sustainability strategies constitute the second part of the research area.

It is important to note that in March 2020, the world was hit with the COVID-19 pandemic and businesses had been exposed to various challenges to overcome the crisis (Gregurec et al., 2021; Mukherjee & Bonini, 2020). Companies had to focus on recovering and surviving from the pandemic effects. This meant they had to set aside planned agendas in achieving SDGs (Mukherjee & Bonini, 2020). The pandemic has impacted the whole world, with an estimate of 35 to 60 million people that could be pushed to extreme poverty (Blazhevskaya, 2020; Mukherjee & Bonini, 2020). As the world is recovering from the pandemic, companies should accelerate efforts to act upon achieving the SDGs goals. Companies have the decision to steer new and more sustainable ways to shape future outcomes, compared to the pre-pandemic world (Blazhevskaya, 2020; Mukherjee & Bonini, 2020; Gregurec et al., 2021). For example, before COVID-19, businesses relied heavily on commuting, and the pandemic has forced businesses to be more technologically advanced, leading to “work-from-home” solutions. Reduced commuting has contributed to improving air quality resulting in the decrease of global CO<sub>2</sub> emissions by an estimated 17 per cent in early April 2020 (Mukherjee & Bonini, 2020).

Businesses have now been forced to review their strategies as a result of the pandemic. The Leadership in Risk Management European Report 2020 states that 60% of companies have new strategy approaches and 96% respondents stated that their controls and processes performed well in responding to the crisis (Board Agenda, 2020). External factors such as a pandemic have shown the fundamental need for control systems as a tool for achieving strategic and operational efficiency (Board Agenda, 2020; Lynch et al., 2014; Otley & Soin, 2014). With all of this in mind, the researchers were motivated to learn how, even in uncertain times, businesses implement control mechanisms to facilitate sustainability.

## **1.2. Research question**

Confidence in sustainability reporting and implementation of sustainability strategies are defined as a research area for the current study. Although the identified issues can be analysed from different angles, it is proposed to consider the concepts of internal and management controls, the practices of which are closely related. While management controls aim to steer companies toward the achievement of both short-term and long-term goals (e.g., Chenhall & Chapman,

2005; Gond et al., 2012), internal controls contribute to this process by providing reasonable assurance regarding the effectiveness and efficiency of operations, reliability of financial reporting, and compliance with laws, regulations and policies (COSO, 2013). Both types of controls are recognised to be efficient tools towards the achievement of organizational goals (Chenhall & Chapman, 2005; COSO, 2013; Simons, 1995). The organization's shift from a purely economic to a sustainability approach raises questions about the role of these control systems in a new business arena (Gond et al., 2012; Hertz et al., 2017).

The growing number of academic literature on management control for sustainability agrees that management control systems (MCS) play an important role in operationalization of sustainability and achievement of its goals (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Gond et al., 2012; Lueg & Radlach, 2016). However, despite the increased attention, the potential of MCS to embrace sustainability issues is yet under-researched (Crutzen & Herzig, 2013; Gond et al., 2012; Lueg & Radlach, 2016). Most research focuses on identifying specific aspects of management controls, but does not adopt a holistic approach to MCS which is essential to support organizations in their efforts to achieve sustainability objectives (Crutzen & Herzig, 2013; Lueg & Radlach, 2016). The role of internal controls in the field of sustainability appears to be even more limited. While there are numerous reports on the state of sustainability reporting (e.g., EY, 2020; KPMG, 2020; PWC, 2019), the academic research is scarce (Huang & Huang, 2020; Koo & Ki, 2020). Overall, the studies identified agree that the principles of the COSO framework (2013) can be effectively applied to all types of data and information, including sustainability (Herz et al., 2017; Litten, 2019).

Since the practice of control systems<sup>1</sup> for sustainability remains under-researched today (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Crutzen & Herzig, 2013), this paper aims to empirically explore controls employed by Norwegian companies to achieve sustainability goals. Drawing on data collected from the questionnaire using the Malmi and Brown's framework (2008) and COSO framework (2013), this paper aims to answer the following research questions:

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<sup>1</sup> for the purposes of the current study, the term "control systems" is used to combine management and internal controls

*RQ1: What control mechanisms are Norwegian companies using to achieve sustainability goals?*

*RQ2: What are the patterns of sustainability controls employed by Norwegian companies?*

As a result of the research, the researchers aim to get a better understanding of the use and design of control systems for sustainability and draw conclusions about the patterns of modern corporate practice in Norway.

### **1.3. Contribution to present knowledge**

The paper makes several contributions to the present knowledge. First, it addresses recent calls in the literature for broader exploration of corporate practices (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Crutzen & Herzig, 2013). The choice of survey data collection method aims to provide a broad picture of management controls practices of numerous companies rather than an individual company. Drawing on data collected from the questionnaire, this study fills this research gap by describing and exploring controls for sustainability in multiple Norwegian firms. The use of the survey also provides a comparison point for future studies, an opportunity which has been lacking in prior research (Crutzen & Herzig, 2013).

Second, the current study contributes to the literature by providing further insights into the use of the Malmi and Brown's framework (2008) and COSO framework (2013) as analytical tools for understanding the sustainability practices. In addition, the current study considers management and internal control as complementary mechanisms and theorizes arguments in favor of considering the two concepts together.

Finally, the study continues the research of Crutzen et al. (2017) contributing to further exploration of control systems packages for sustainability as well as patterns of their development. In addition, the study enriches the current research by exploring corporate practices in Norway, the geographic region which has not been researched to date. This may potentially provide information to further

research on contextual factors that drive the design and use of controls for sustainability.

## **2. Conceptual background**

This section presents the theoretical background of the research. It begins by introducing the concept of sustainability to provide the definition used for the purposes of this study, followed by an overview of the sustainability reporting development and, particularly, sustainability in Norway, which is the geographic location of the study. The section continues with a discussion of control systems. The literature relevant for the study was found following the search strategy in Appendix 10.

First, the role and historical development of management controls is presented with the main goal to justify the choice of Malmi and Brown's framework (2008) as a theoretical basis for the study. Then, the current knowledge of the use and design of MCS for sustainability is discussed. The review of individual controls for sustainability follows the discussion of management controls for sustainability as a holistic system. Second, the role and historical development of internal controls is presented with the focus on COSO framework (2013), which was chosen for the analysis of internal controls in this study. In line with the discussion of MCS, the section presents in detail the overview of the application of internal controls for sustainability. Finally, the section briefly justifies the possibility to consider the concepts of management control and internal control together.

The review of both management and internal controls led to the development of a questionnaire, which was subsequently used to conduct the online survey. Each question in the questionnaire is presented in the current literature review and supported by relevant previous research.

## 2.1. Sustainability

### 2.1.1. Concept of Sustainability

Sustainable development and sustainability are highly complex and ambiguous concepts, with numerous definitions from a human, business and environmental perspective (Engert et al., 2016). This can arguably be seen as the challenge of understanding and becoming sustainable (Engert et al., 2016). To continue the discussion on this topic, it is crucial to define what constitutes sustainability for the purposes of the current research.

The most widely used definition of sustainable development was introduced by the Brundtland Commission of the United Nations in 1987 and referred as “a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change depends on both current and future needs” (United Nation, 1987). The definition was further adopted by businesses, and the concept of corporate social responsibility (CSR) was introduced. CSR refers to “the firm’s considerations of, and response to, issues beyond the narrow economic, technical and legal requirements of the firm” (Davis, 1973). CSR is seen as actions that do social good beyond the interest of the firm, which can be required by law, to satisfy stakeholders (Khan et al., 2012). CSR has received a vast amount of attention during the last decades, including paramount research and discussions between academics such as, Giovannoni & Fabietti, (2014), policy makers, such as KOMpakt which is Government’s consultative body on matters relating to CSR in Norway (Regjeringen, 2016), practitioners, e.g. KPMG (2017), and business leaders such as Niall Fitzgerald, former CEO of Unilever, who said *“Corporate social responsibility is a hard-edged business decision. Not because it is a nice thing to do or because people are forcing us to do it... because it is good for our business”* (Reinhardt et al., 2008).

With societal pressures, stakeholders influence, government regulations and risk of reputation, organizations had to rebrand their core values and include CSR (Khan et al., 2012). Companies had to go beyond compliances and engage in doing social good which meant having conscious responsibility to develop the welfare of the society (Bebbington, 2001; Eccles et al., 2014; Khan et al., 2012; Lynch et al., 2014). Which in turn would not only be beneficial socially and

environmentally but also attract new investors and customers (Khan et al., 2012; Lynch et al., 2014). The CSR concept was criticised for focusing only on the “positive brand image”, stating that most companies engage in CSR only for reputational purposes and that sustainability is not implemented in the business daily practises and operations (Dudovski, 2012).

The Triple Bottom Line (TBL) is the concept that originated from John Elkington<sup>2</sup> in 1994, and was derived from the three dimensions of sustainable development: economic, environmental and social, which they also referred to people, planet and profit (Henriques & Richardson, 2013). The “tripartite core structure” emphasised that the three dimensions are not mutually exclusive but linked to each other (Geissdoerfer et al., 2017). In addition, all three elements of the TBL are seen as equally important dimensions even though initially environmental concerns dominated as the main driver in sustainability debate (Henriques & Richardson, 2013). The concept aims to ensure that business processes and operations are to be sustainable and feasible in the long run, with a more holistic view of their business activities (Zhang et al., 2018).

Another concept broadly used in the sustainability arena is corporate sustainability. The term is defined as “a business approach that creates long-term shareholder value by embracing opportunities and managing risks derived from economic, environmental and social developments” (Dow Jones Sustainability Indexes, 2009). The concept of corporate sustainability stems from four established concepts: 1) sustainable development, 2) CSR, 3) stakeholder theory, and 4) corporate accountability theory (Wilson, 2015). This holistic view recognizes the importance of corporate growth and profitability, while at the same time placing the need to achieve social and environmental goals at the same level of importance (Yilmaz & Flouris, 2010). The concept is similar to TBL and entails managing a business in a manner that ensures decisions that are being made today regarding economic, environmental and social conditions will also work and not sacrifice the future (Governance Group, 2020). For a comprehensive progress in corporate sustainability, it is necessary for a holistic perspective to be applied, to consider their impacts and interrelations (Baumgartner & Ebner, 2010).

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<sup>2</sup> is the cofounder and chair of SustainAbility, the world’s most long-established sustainable business consultancy based in Washington, London and Zurich.

Having models or frameworks with a holistic view will create opportunities that will bring value for multiple stakeholders (Yilmaz & Flouris, 2010).

Due to the mixture of terms, meanings, and applications, the current research refers to sustainability for any concept that addresses the three dimensions of ecological integrity, social responsibility and economic prosperity. It is also a practical approach for a further comprehensive review of the literature on the topic.

### *2.1.2. Sustainability Reporting*

Stakeholder theory is central to the concept of sustainability (Hörisch et al., 2014). Based on the stakeholder theory a company has to be considered as a network of stakeholders, whose needs to be integrated within the business strategy (Hörisch et al., 2020). The problem of sustainability is global and involves multi-stakeholders, including society in general, a local community, shareholders, employees, customers, and suppliers (Hörisch et al., 2020). To engage stakeholders and communicate the progress towards sustainable development companies integrate sustainability disclosures in annual reports or publish separated sustainability reports (Lynch et al., 2014). In the last decade, companies have increasingly adopted sustainability reporting all over the world. A report by KPMG (2020) showed that 80% of the companies worldwide now report on sustainability. The most common reporting standards are briefly described below.

In sustainability reporting, there are many frameworks and standards that guide companies on how to measure, assess and report on the ESG initiatives such as Sustainability Accounting Standards Board (SASB), International Organisation for Standardization (ISO), Global Reporting Initiative (GRI) (Khan et al., 2016). One of the major and most used non-financial reporting is the GRI, which has been identified as the dominant global standard for sustainability reporting in 2020 (KPMG, 2020). The GRI is a set of interrelated reporting standards in economic, environmental and social impacts that represents best practices for sustainability reporting (ESG Sustainability consultants, 2019). The UN Global Compact and the GRI have a collaboration aiming to help businesses report on SDGs (GRI, 2021; Nordea, 2020). This collaboration is one of many that demonstrate the growing efforts to harmonise and synchronise the different



reporting frameworks. There has been a growing demand from stakeholders for a standardized and unified methodology for reporting on sustainability performance in companies (ESG Sustainability consultants, 2019). The GRI standard is a useful tool for ensuring transparency and comparability, leading to more effective internal controls and reporting structures (ESG Sustainability consultants, 2019).

Sustainability reporting, which focuses on climate change and consequences from unsustainable externalities, is increasingly seen as complementary to risk management (Faris et al., 2013; Lynch et al., 2014). Stakeholders in the capital market are now more concerned with the risks associated with sustainability performance. Additionally, sustainability performance has a greater influence on investors decisions-making. A study by the UN's Principles for Responsible Investment shows that 73% of investors state that they take ESG issues into account when they make investment decisions; and 92% want companies to explicitly identify and integrate ESG factors in their business performance (Herz et al., 2017; PRI, 2017). In addition, companies are also required to communicate these initiatives and sustainability progress to all stakeholders, demonstrating a commitment to improve their reporting in economic, social, environmental sustainability (Eccles et al., 2014). This development of business ethics and corporate accountability has been the foundation for sustainability reporting. Companies are then tasked with establishing governance structures, internal control frameworks and incentives to mitigate those risks, balancing interests between financial returns and sustainability (Eccles et al., 2014; Lynch et al., 2014).

### *2.1.3. Sustainability in Norway*

Norway, the country considered in this study, is known as one of the richest countries in the world with a HDI index of 0.957 in 2019 (Statista, 2021). The country is consistently identified as the top country regarding quality of life, gender equality, low corruption and high levels of social voluntarism (Hellevik, 2008). Norway is recognized as one of the key frontrunners when it comes to advocating sustainability (Global Sustainability Hub, 2020). The extended and active role of the state is not only the link between businesses and sustainability, but is also the driving force behind the successful and rapid growth of the country's economy. Norway has had rapid economic development since the 1950s

due to the natural sources such as fishery, forests, petroleum and renewable energy (Qureshi et al., 2020). The Norwegian government has implemented policies that facilitate sustainable development, such as the establishment one of the world's first Ministries of Environment in 1972, the implementation of a natural resource accounting system in 1978 (Alfsen & Greaker, 2007), and the creation of more aggregated indicators of sustainable development before the System of Environmental Economic Accounting (SEEA) (United Nation, 2015).

With the high interest of all policy makers, customers and investors in the noteworthy civil society, Norwegian companies are pressured to promote corporate accountability and greener operations. In 2019, Deloitte Norway reported an increased number of Norwegian companies addressing sustainability (Deloitte, 2019). More than 200 Norwegian companies have signed up to the UN Global Compact network (UN Global Compact Norway, 2021), further testifying to the growing interest of firms that recognise that sustainability and social responsibility can provide a competitive advantage (Hagen, 2018). In 2020, the Circularity Gap report stated that Norway can become 45.8% circular by restructuring businesses, however now it is 2.4% circular, which is below the global average rate of 8.6% (Circle Economy, 2020). To help towards solving this problem, Norway established Circular Norway, which is the first and independent organisation that works in transforming a linear circular economy (Circular Economy, 2019). By providing frameworks, concrete actions, research and a collaborative platform, it aims to strengthen Norwegian firms to have a better circular economy transition (Circular Change, 2020; Circular Economy, 2019).

Norway is known for the Scandinavian model which creates a sense of happiness, security and equality among its population, which then manifests itself in sustainable development within the social pillar (Fiedorczuk, 2015). Surrounded by fjords and forestry, Norway has shaped its national identity and perception of nature as an 'ancestral home' (Witoszek, 2018) and contributes towards the social attitude of a "greener life". Ranked 7th in the Sustainability Development report (Sustainable Development Report, 2021), Norway is of interest to examine whether sustainability implementation in the Norwegian business world is as impressive as its socio-cultural and political attributes.

## 2.2. Control Systems

### 2.2.1. Management Control Systems

Control is a very important function for managers which “*keeps things on track*” (Merchant, 1985). The modern view of management control originated from Anthony (1965) who defined management control as “*the processes by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives*”. After, many terms and definitions of management control were evolved and most broadly, management control is defined as “*the process of steering organizations through the environments in which they operate in order to achieve both short-term and long term goals*” (Otley & Soin, 2014). There are several causes of the need for control which may range from absence of direction, motivational problems, and personal limitations (Merchant, 1985). The lack of control can have consequences such as inability to compete successfully in the marketplace (Merchant, 1985). Flamholtz (1983) explains the need for control by the fact that individuals and organisations share only partially congruent objectives, thus, control is essential to direct human efforts towards the achievement of those objectives. Merchant & Stede (2003) added “*...management control involves managers taking steps to ensure that the employees do what is best for the organisation.*”

Management controls include both formal and informal mechanisms to ensure achievement of organizational goals. Formal controls are explicit, tangible information-based controls such as structures, routines, procedures and processes (Crutzen et al., 2017). Informal controls, on the contrary, are implicit controls. These are unwritten norms about employee behaviour and organizational culture, such as values, beliefs and traditions (Ouchi, 1979; Simons, 1995) aimed to direct and empower (Mundy, 2012). Although the practice of formal and informal individual controls have been studied by researchers, the importance of broader conceptual approaches to management control was emphasized, which led to the development of MCS concepts (Malmi & Brown, 2008; Otley, 1995).

The earliest definition of management control systems was provided by Anthony (1965), who defined MCS as a search and gathering system for information, serving a common purpose of planning and control. This approach was later criticised for its narrow nature and was regarded as “calculative and

accounting-based practices” (Langfield-Smith, 1997; Merchant & Otley, 2006; Otley, 1999). Chenhall and Chapman (2005) and Langfield-Smith (1997) argued that MCS supports organisational strategy by communicating objectives, monitoring performance, and motivating to accomplish goals. The role of MCS has extended to influence strategic processes, i.e. strategy formulation and implementation within an organization (Ferreira & Otley, 2009; Langfield-Smith, 1997; Simons, 1995).

Simon (1995) defines the MCS as a tool for successful strategy execution and presents the levers of control framework to understand the relationship between MCS and strategy. The framework is based on the concept of ‘control system use’ and maintains that four controls are needed in an organisation to balance predictable goal achievement and creative innovation: beliefs, boundary, diagnostic and interactive control systems. Otley’s framework (1999), which was further broadly elaborated by Ferreira and Otley (2009), focuses on performance measurement systems. These frameworks divided control system models into two categories: performance, related to strategy and results control and, compliance controls, associated with action control and boundary setting (Ferreira & Otley, 2009; Otley, 1999).

However, even though both informal and formal controls are emphasised, Simons (1995) and Otley (1999) only focused on the use rather than design of MCS, not discussing the patterns necessary for managers to fulfill their role expectations (Haustein et al., 2014). Merchant and Van der Stede (2003) presented a framework that had more practical implications for MCS (Talja, 2016) and divided control practices in four different groups focusing on results, actions control, personnel control, and values and shared norms. However the framework is more compliance oriented (Talja, 2016) and identifies the groups as a “collection of controls” whereas Malmi and Brown (2008) argued that MCS do not operate in isolation, and their control elements support and strengthen each other.

Malmi and Brown (2008) proposed that a broader approach should be taken when studying and considering MCS, particularly the design and coordination of controls as a whole system. They state that organisations have numerous MCS and these systems are designed and coordinated intentionally, and should not be

regarded as a single system, but rather a package of systems (Malmi & Brown, 2008). This approach was earlier proposed by Otley (1999), who argued that meaningful connections between the use of control systems and overall results emerge only when the overall system is considered. Thus, further development of MCS as a “control package” was the result of a need to understand the integrative nature of goal alignment, adaptability and integration components in MCS (Berry et al., 2019).

According to Malmi and Brown (2008), studying MCS as a package would facilitate better theorising and more reliable conclusions about individual MCS practices and the design of MCS packages, which are defined by the authors as *“broadly mapping the tools, systems and practices managers have available to formally and informally direct employee behaviour”*. The current study employs a holistic approach to MCS and chooses Malmi and Brown’s framework (2008) as an analytical tool to address the research question investigated in this study. The use of the framework is suitable for this study for several reasons. First, it is more descriptive in nature, having less focus on the normative components, and more “free pre-assumptions regarding different controls systems and their use” (Andric & Sigurgeirsson, 2018; Haustein et al., 2014). Second, Malmi and Brown’s framework (2008) focuses on the significance of the integration and synchronization of control elements, it emphasises their mutually-reinforcing power in a control package (Andric & Sigurgeirsson, 2018). Finally, Malmi and Brown’s framework (2008) has been widely utilised in management control literature with over 2000 citations to date, however, as pointed out by Crutzen et al. (2017), it has received limited attention in regards to its ability to embrace sustainability issues. Crutzen et al. (2017) consider the framework suitable for an empirical exploration on different management control patterns in corporate practices, highlighting its flexibility and continuous learning.

The Malmi and Brown’s framework (2008) considers MCS as a package emphasising that “individual systems are designed and implemented by different actors at different points in time” (Strauß & Zecher, 2013). The framework consists of five types of controls: from the bottom known as administrative, representing the basis of controls, following the middle which are planning, cybernetic, reward and compensation; and the cultural controls at the top as the broadest set of controls (Figure 1).

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

Figure 1. Management control systems package (*Malmi & Brown, 2008*)

### 2.2.2. Management Control Systems for Sustainability

Although there has been an increasing number of academic literature on management control for sustainability over the past decade, the potential of MCS to embrace sustainability issues is yet under-researched (Crutzen & Herzig, 2013; Gond et al., 2012; Lueg & Radlach, 2016). This section first reviews empirical studies that have focused on MCS for sustainability as an entire system and then discusses individual control mechanisms for sustainability applying Malmi and Brown's framework (2008).

#### 2.2.2.1. Holistic view

Riccaboni and Leone (2010) explore the role of MCS in implementing sustainability strategies using the case of a multinational company Procter & Gamble. Particularly, the authors examine how MCS facilitates transforming sustainability strategies into action and how MCS should be modified when a strategic shift to sustainability occurs. The findings of the study suggest that environmental and social issues can be effectively integrated into conventional MCS. Moreover, Riccaboni and Leone propose that potentially a successful way for fostering sustainability is to integrate it into existing management control tools and practices, such as strategic planning, organizational structures and performance management systems.

Arjaliès and Mundy (2013) extend the scope of Riccaboni and Leone's study (2010) and explore the role of MCS for strategic renewal applying Simons' (1995) levers of controls framework. Thus, their study investigates the two roles of MCS: sustainability strategy formation and implementation. Drawing on data gathered through questionnaires from 36 France's largest listed companies, the authors conclude that companies in their study employ levers of control through diverse MCS in order to both form and implement sustainability strategies. Arjaliès and Mundy recognise the potential of MCS to transform organizational practices for sustainable development.

Gond et al. (2012) also use Simons' (1995) levers of control framework to theorize the integration of strategy and sustainability. The authors propose that the design of MCS, particularly, the extent to which control systems for sustainability (SCSs) are integrated into traditional MCS, will affect the triple bottom line performance. As a result the authors suggest 8 configurations that characterize the relationships between strategy-making process and control systems. For example, the last configuration "Integrated sustainability strategy" occurs when both control systems are integrated through organizational, cognitive, and technical dimensions. This configuration corresponds to the highest level of sustainability implementation. The case study-based research of Kerr et al. (2015) also highlights advantages of integration sustainability objectives into existing MCS practices, specifically the balanced scorecard (BSC). In addition, the authors theorize the relations between the strategy and MCS design using Simons' (1995) levers of control framework. For example, the authors propose that organisations with an environmental strategy of compliance are likely to use boundary systems to ensure compliance, while organizations following strategies of excellence integrate environmental issues into their interactive control systems and beliefs systems.

Crutzen et al. (2017), similar to the study of Gond et al. (2012), explore the existence of management controls for sustainability and the extent of their integration in traditional MCS. In contrast to previous studies, Crutzen et al. apply the Malmi and Brown's framework (2008), highlighting its practice-oriented approach and suitability for examining corporate practices. Also the authors indicate the bias of previous research towards the in-depth one single case study.

Thus, Crutzen et al. undertake a multiple case study of 17 large Western Europe companies to define patterns in corporate practices. The study findings suggest that organizations either deploy formal controls or informal controls to embed sustainability. As such, authors theorize that either culturally dominated or formally-established management controls are suitable for sustainability management. The current conclusion contradicts proposals of several researchers. Riccaboni and Leone (2010) suggest that in order to really operationalize sustainability formal and informal controls are both necessary. The single case study of Durden (2008) also highlights the need of both formal and informal controls for implementing the social aspects of sustainability. Morsing and Oswald (2009) illustrate the importance of informal control systems to ensure a successful implementation of sustainable business practices in Novo Nordisk A/S.

This section concludes by presenting findings of two literature review studies: Crutzen and Herzig (2013) and Lueg and Radlach (2016). Both works agree that a growing number of researchers propose that MCS are essential to facilitate sustainability integration within organizations. However, the studies also highlight that the current knowledge about MCS to support sustainability is limited in several ways. Below knowledge gaps that are relevant for the current study are highlighted.

First, Crutzen and Herzig (2013) emphasize that papers which they have reviewed mobilise “out-dated” management control frameworks. Specifically, the authors identify that none of the reviewed studies use the framework developed by Malmi and Brown (2008). The current literature review confirms this finding. Most of the examined papers use Simons’ (1995) levers of control framework with one exception of Crutzen et al.’ study (2017) which mobilises Malmi and Brown’s framework (2008). Second, Crutzen and Herzig argue that most research focuses on identifying specific aspects of management controls, but do not adopt a broader approach to MCS. Thus, few papers combine formal and informal controls and study interplay between these elements of MCS. Lueg and Radlach (2016) supports this finding. While the authors find the diversity of controls for sustainability, they stress the lack of study on MCS as a package. Consistent with Crutzen and Herzig (2013), Lueg and Radlach stress the dominance of environmental issues of sustainability, rather than social ones, in the research.



Finally, both literature review papers call for the study of contextual factors that determine the design and use of MCS.

#### 2.2.2.2. *Cultural controls*

Prior research has recognised the role of organizational culture as a facilitator for implementing sustainability strategies (Riccaboni & Leone, 2010; Morsing & Oswald, 2009). A gradual inclusion of sustainability principles into organizational culture, i.e. a set of norms, values and beliefs influencing employees behaviour (Malmi & Brown, 2008), support the achievement of sustainability goals (Durden, 2008; Morsing & Oswald, 2009; Riccaboni & Leone, 2010). Durden (2008) emphasises the importance of informal controls, specifying that using formal controls alone may not clearly convey the role of social responsibility within the business and the attention that managers should pay to it.

The process of incorporating sustainability in organizational culture relies on different control mechanisms that can be roughly divided into external and internal communication. The most widely-applied external communication mechanisms discussed in the reviewed studies were inclusion sustainability into the company's mission statement and core corporate values (Arjaliès & Mundy, 2013; Crutzen et al., 2017, Dechant & Altman, 1994; Durden, 2008; Morsing & Oswald, 2009). These formal statements ensure that employees are committed to common goals and also inspire them to seek organizational opportunities (Simons, 1995). The two questions included in the questionnaire in regards to cultural controls were *"Is sustainability integrated into the company's mission statement?"* and *"Is sustainability integrated into core corporate values?"*. In asking these questions, the researchers aimed to identify if companies' formal statements communicated both externally and internally are consistent with the sustainability purpose.

Other examples of internal communication that were widely applied in companies include communication through existing channels such as intranet (Arjaliès & Mundy, 2013; Crutzen et al., 2017) and emails (Arjaliès & Mundy, 2013; Crutzen et al., 2017), and channels designed specifically for sustainability purposes such as sustainability newsletters (Crutzen et al., 2017; Ricabboni & Leone, 2010),

sustainability-related events, campaigns, programmes (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Petrini & Pozzebon, 2010; Riccaboni & Leone, 2010), sustainability champions or ambassadors (Arjaliès & Mundy, 2013; Petrini & Pozzebon, 2010; Riccaboni & Leone, 2010), sustainability-related posters and other physical evidences, e.g. green building (Crutzen et al., 2017). The next question included in the questionnaire in regards to cultural controls was *“To what extent are the following communication channels used to increase employees' awareness of sustainability?”*. As options for answering this question, the respondents were offered the above communication channels. In asking this question, the researchers aimed to identify the most frequently used internal communication channels and to what extent internal communication channels were applied to communicate sustainability agenda.

The importance given to sustainability is communicated not only externally through formal claims and internally through formal communication channels, but also through the leadership commitment (Morsing & Oswald, 2009; Petrini & Pozzebon, 2010; Riccaboni & Leone, 2010). Petrini and Pozzebon (2010) argue that top management commitment is the major driver for incorporating sustainability into business practices, delivering a clear vision, and involving other stakeholders in working with sustainability. The authors claim that the top-level commitment is “the starting point for legitimization of a corporate vision of sustainability”. Thus, *“To what extent is senior management committed to sustainability?”* is another question included in the questionnaire. In their in-depth case study, Riccaboni and Leone (2010) argue that the coherent communication on sustainability issues coupled with the leadership behaviour congruent with sustainability values shows the company's desire to present itself as an organisation, which takes care of its stakeholders and sustainability. The final question, related to cultural controls, *“To what extent does organisational culture support the implementation of the sustainability strategy in your company?”* aimed to underpin the overall organizational culture.

#	Question	MCS/IC	Literature
1	Is sustainability integrated into a company's mission statement?	MCS - Cultural	Arjaliès and Mundy (2013), Dechant and Altman (1994), Riccaboni and Leone (2010)
2	Is sustainability integrated into core corporate values?	MCS - Cultural	Arjaliès and Mundy (2013), Crutzen et al. (2017), Dechant and Altman (1994), Durden (2008), Morsing and Oswald (2009)
3	To what extent is senior management committed to sustainability?	MCS - Cultural	Morsing and Oswald (2009), Petrini and Pozzebon (2010), Riccaboni and Leone (2010)
4	To what extent does organisational culture support the implementation of the sustainability strategy in your company?	MCS - Cultural	Lämsiluoto and Järvenpää (2010)
5	To what extent are the following communication channels used to increase employees' awareness of sustainability?	MCS - Cultural	Arjaliès and Mundy (2013), Crutzen et al. (2017), Morsing and Oswald (2009), Petrini and Pozzebon (2010), Riccaboni and Leone (2010)

*Table 1.1. Mapping survey questions on cultural controls with the literature review*

#### 2.2.2.3. Administrative controls

Administrative controls facilitate implementation of organizational goals through governance structure, organization structure, policies and procedures (Malmi & Brown, 2008). These controls are used to establish boundaries within which employees are allowed to engage in sustainability activities to ensure that their behavior is consistent with the company's objectives (Arjaliès & Mundy, 2013).

The inclusion of sustainability in a formal organizational structure emphasises the priority of sustainable development for a company (Morsing & Oswald, 2009; Petrini & Pozzebon, 2010; Riccaboni & Leone, 2010). Though there is no one-size-fits-all structure (Quinn & Dalton, 2009), centralized organizational structure in the form of shared service is most common among the companies studied in the previous research (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Riccaboni & Leone, 2010). The subordination of the Sustainability Department within the company also demonstrates the company's attitude to sustainability issues (Crutzen et al., 2017). In the studies of Crutzen et al. (2017) and Arjaliès and Mundy (2013) most companies have subordinated their Sustainability Department directly to the executive committee or the board

level, which, according to the authors, indicates an integrated approach to the application of administrative controls to sustainability issues. In order to understand if sustainability was incorporated into the organizational structure of companies in the study, the two questions were asked “*Does the company have a formal sustainability management structure?*” and “*To whom does the Head of Sustainability Department report?*”. To follow-up these questions an additional question was asked to respondents “*To what extent are sustainability-related responsibilities defined in job description?*”. This control mechanism supports companies to hold employees accountable for their responsibilities in the pursuit of sustainability objectives (Herz et al., 2017; Litan, 2019).

Various sustainability-related policies and procedures are widely-adopted by companies to direct employee’s behavior (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Haugh & Talwar, 2010; Morsing & Oswald, 2009). Examples of policies and procedures include code of conducts, ethical codes, environmental policies, ethical purchasing policies, whistle blowing procedures, recruiting policies (Arjaliès & Mundy, 2013; Haugh & Talwar, 2010; Morsing & Oswald, 2009). Policies and procedures direct employee’s behaviour “through the process of specifying how tasks or behaviours are to be performed or not performed” (Malmi & Brown, 2008). Thus, the question “*Does the company have sustainability-related policies and procedures?*” was asked, and respondents were presented with the list of possible procedures and policies mentioned above.

Various management system standards were developed to assist the progress of companies in their sustainability integration (Witjes et al., 2017). Studies, particularly focused on Small and Medium-sized Enterprises (SMEs), emphasise the benefits of implementing management systems (Albelda Pérez et al., 2007; Witjes et al., 2017). First, companies are required to publish reports providing stakeholders with information on sustainability performance (Witjes et al., 2017). Second, standards provide a practical solution and guidance to integrate sustainability in operations (Albelda Pérez et al., 2007; Witjes et al., 2017). Finally, several standards, like the EU Eco-Management and Audit Scheme (EMAS), stress the importance of employee involvement, an open dialogue with the stakeholders and the interaction with third parties (Witjes et al., 2017). Thus, the question “*What sustainability-related management systems are implemented*

*in the company?*” was asked, and respondents were presented with the list of management systems, like ISO 9001, ISO 14001, EMAS, ISO 45001, which were highlighted in previous studies (Albelda Pérez et al., 2007; Crutzen et al., 2017; Lämsiluoto & Järvenpää, 2010; Witjes et al., 2017).

The study of Arjaliès and Mundy (2013) found that most companies in their study carry out a systematic examination in regards to sustainability-related activities of suppliers. Examples of methods employed by companies include the use of questionnaires, the inclusion of sustainability-related criteria in invitations to bid, voluntary and contractual commitments, supplier audits (Arjalies & Mundy, 2013). Several studies also highlight the importance of sustainability in supply chain with a particular focus on social aspects of sustainability, such as human and labour rights, workers safety, etc. (Haugh & Talmar, 2010; Morsing & Oswald, 2009). Thus, companies formulate a set of ethical principles that suppliers have to commit to and comply with if they want to become and remain the companies’ suppliers (Morsing & Oswald, 2009). The question *“To what extent does the company carry out an examination of sustainability-related activities of its suppliers and customers?”* was asked to respondents.

Training and learning support the appreciation of the policies (Lueg & Radlach, 2016). They are important control mechanisms for changing behavior toward sustainability and internalizing sustainability concepts in the daily routine of all organizational areas (Dechant & Alman, 1994; Petrini & Pozzebon, 2010). Petrini and Pozzebon (2010) call education “the vehicle by means of which one disseminates sustainability to all areas”, Dechant and Alman (1994) recognise education as “a critical lever which can bring about more conscious environmental culture”. In addition, the authors emphasise that educated employees become the source of innovative ideas for further sustainability performance improvement. To conclude, Haugh and Talwar (2010) expect most organizations to use training courses and workshops to deliver technical information about sustainability to employees. Thus, the question *“Does the company have training related to sustainability?”* was asked to respondents. Those companies that have sustainability-related training, were followed-up with the question *“Which groups of employees have had sustainability training?”*,

since training has to be timely and adequate for all employees, particularly new hires (Dechant & Alman, 1994).

#	Question	MCS/IC	Literature
1	Does the company have a formal sustainability management structure?	MCS - Administrative	Arjaliès and Mundy (2013), Crutzen et al. (2017), Morsing and Oswald (2009), Petrini and Pozzebon (2010), Riccaboni and Leone (2010)
2	To whom does the Head of Sustainability Department report?	MCS - Administrative	Arjaliès and Mundy (2013), Crutzen et al. (2017), Morsing and Oswald (2009), Petrini and Pozzebon (2010), Riccaboni and Leone (2010)
3	To what extent are sustainability-related responsibilities defined in job description?	MCS - Administrative	Herz et al. (2017), Littan (2019)
4	Does the company have sustainability-related policies and procedures?	MCS - Administrative	Arjaliès and Mundy (2013), Crutzen et al. (2017), Haugh and Talwar (2010), Morsing and Oswald (2009)
5	What sustainability-related management systems are implemented in the company?	MCS - Administrative	Albelda Pérez et al. (2007), Crutzen et al. (2017), Dechant and Altman (1994), Lämsiluoto and Järvenpää (2010), Witjes et al. (2017)
6	To what extent does the company carry out an examination of sustainability-related activities of its suppliers and customers?	MCS - Administrative	Arjaliès and Mundy (2013), Haugh and Talwar (2010), Morsing and Oswald (2009)
7	Does the company have training related to sustainability?	MCS - Administrative	Dechant and Altman (1994), Haugh and Talwar (2010), Petrini and Pozzebon (2010)
8	Which groups of employees have had sustainability training?	MCS - Administrative	Herz et al. (2017), Littan (2019)

*Table 1.2. Mapping survey questions on administrative controls with the literature review*

#### 2.2.2.4. Planning controls

Companies involved in sustainability incorporate long-term and short-term sustainability goals into their planning processes (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Riccaboni & Leone, 2010). Communicating sustainability through goals provides meaningful direction to employees (Crutzen et al., 2017; Morsing & Oswald, 2009) and increases the probability that they assume responsibility which generally improves results (Meyer, 1994). Studies indicate a high level of application of long-term planning

(Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Riccaboni & Leone, 2010), which, according to Crutzen et al. (2017), is “hardly astonishing”, as the complexity of many sustainability issues cannot be approached solely by means of short-term actions. The first question on planning controls is *“Does the company have a sustainability strategy?”*. Several studies emphasise the importance of sustainability integration into the core business strategy (Crutzen et al., 2017; Gond et al., 2012; Riccaboni & Leone, 2010). Riccaboni and Leone (2010) argue that one of the key elements of the successful implementation of sustainable strategies is the integration of sustainable strategies with the traditional planning system. The follow-up question then was *“To what extent is the sustainability strategy integrated into the core business strategy?”*

The discussion of reasons behind developing the sustainability strategy is a popular topic in the research (Adams & Frost, 2008; Arjaliès & Mundy, 2013; Dechant & Altman, 1994; Morsing & Oswald; Riccaboni & Leone, 2010). The following main reasons were identified: to ensure compliance (Arjaliès & Mundy, 2013), to stay ahead of regulations (Adams & Frost, 2008; Dechant & Altman, 1994), to respond to stakeholders expectations and requests (Adams & Frost, 2008; Arjaliès & Mundy, 2013; Morsing & Oswald, 2009), competitive pressures (Adams & Frost, 2008; Dechant & Altman, 1994), to improve efficiency (Riccaboni & Leone, 2010). The high interest of the researchers in the companies’ motivation behind the development of sustainability strategies is explained by the fact that this may influence the design of MCS and sustainability performance (Dechant & Altman, 1994; Riccaboni & Leone, 2010). For example, Lueg and Radlach (2016) stress that a proactive environmental strategy is associated with high sophistication of sustainability MCS. In addition, Dechant and Altman (1994), for example, argue that companies that approach environmental problems with “quick fixes” following legislation requirements will find themselves at a competitive disadvantage. The researchers ask respondents the question *“To what extent does the following describe the main reasons behind developing the sustainability strategy in your company?”* to find out if there is any relationship between the design of MCS and the company’s overall motivation to engage in sustainability.

In regards to the long-term planning process two more questions were asked to respondents. The first one is *“Which approach does the company use to develop sustainability planning?”* with the possible response options: Top-Down, Bottom-Up, and Mixed approach. The approach used to develop sustainability planning is an important control mechanism, as it can affect commitment and employees' behaviours in working towards achieving the goals set (Malmi & Brown, 2008). The research of Arjaliès and Mundy (2013) revealed that over half of the companies in the study employ a top-down approach with no or occasional involvement of operational departments in the planning process, while other companies use a mixture of Top-Down and Bottom-Up approaches. In addition, Arjaliès and Mundy (2013) found that most companies in their study review sustainability goals on an annual basis or within the core strategy cycle. The second question, *“How often does the company review the sustainability strategy?”*, aims to signal both the importance of sustainability for the company and integration into the core planning process.

A clear and well-articulated definition of sustainability strategic priorities and their translation into specific and measurable goals are the main guiding principles for integrating sustainability issues into organizational management practices and day-to-day operations (Crutzen et al., 2017; Riccaboni & Leone, 2010). In addition, organizational factors such as aligning goals across the company can contribute to the level of applications of sustainability goals (Wisner et al., 2006). Despite the importance, Crutzen et al. (2017) find low application of action planning by the companies in the study, explaining this by the difficulty or inability to measure and formally manage sustainability mainly due to lack of knowledge or “perceived incompatibility” with traditional business practices. *“To what extent is the sustainability strategy translated into specific goals?”* is the next question which aims to find short-term planning control mechanisms. In addition, Riccaboni and Leone (2010) emphasise that sustainable targets and objectives have to be set up for the organisation as a whole, as well as for division and department in order to operationalise sustainability initiatives. Thus, the researchers also ask the respondents the question *“To which levels are sustainability goals cascaded within the company?”*.



#	Question	MCS/IC	Literature
1	Does the company have a sustainability strategy?	MCS - Planning	Arjaliès and Mundy (2013), Crutzen et al. (2017), Morsing and Oswald (2009), Riccaboni and Leone (2010)
2	To what extent is the sustainability strategy integrated into the core business strategy?	MCS - Planning	Crutzen et al. (2017), Riccaboni and Leone (2010)
3	To what extent does the following describe the main reasons behind developing the sustainability strategy in your company?	MCS - Planning	Adams and Frost (2008), Arjaliès and Mundy (2013), Dechant and Altman (1994), Morsing and Oswald (2009), Riccaboni and Leone (2010)
4	How often does the company review the sustainability strategy?	MCS - Planning	Arjaliès and Mundy (2013)
5	To what extent is the sustainability strategy translated into specific goals?	MCS - Planning	Crutzen et al. (2017), Riccaboni and Leone (2010)
6	Which approach does the company use to develop sustainability planning?	MCS - Planning	Arjaliès and Mundy (2013)
7	To which levels are sustainability goals cascaded within the company?	MCS - Planning	Arjaliès and Mundy (2013), Crutzen et al. (2017), Morsing and Oswald (2009)

*Table 1.3. Mapping survey questions on planning controls with the literature review*

#### 2.2.2.5. Cybernetic controls

Cybernetic controls represent “a process in which a feedback loop is represented by using standards of performance, measuring system performance, comparing that performance to standards, feeding back information about unwanted variances in the systems, and modifying the system's comportment” (Green & Welsh, 1988). They include budgets, financial and non-financial measurements, and hybrid systems (Malmi & Brown, 2008). The previous research finds a widespread application of cybernetic controls by companies that are engaged in sustainability (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009). Lueg and Radlach (2016) in their literature review paper propose that the high popularity of cybernetic controls might imply that these controls are most important for sustainable development. The authors also argue that industry and public listing has a positive effect on the sustainability incorporation in cybernetic controls, which is likely due to the requirement to publish such information for stakeholders.

Despite the widespread use of cybernetic controls, Crutzen et al. (2017) highlight that the level of sophistication of cybernetic controls was different in the observed companies. The authors distinguished a basic cybernetic system which is “a loose package of financial or non-financial indicators” and a complex system consisting of sustainability balanced scorecards and material flow cost accounting. The benefits of using hybrid systems for sustainability, particularly, balanced scorecard was highlighted in several case studies (Kerr et al., 2015; Lämsiluoto & Järvenpää, 2010; Morsing & Oswald, 2009). The integration of sustainability into a balanced scorecard has the following potential benefits: it allows the use of only one management system (Lämsiluoto & Järvenpää, 2010); it highlights the importance of environmental issues to all employees (Lämsiluoto & Järvenpää, 2010; Morsing & Oswald, 2009); and, finally, it strengthens the link between sustainability issues and economic performance (Lämsiluoto & Järvenpää, 2010). In regards to measurement systems the following question was asked “*Which indicators does the company use to measure sustainability performance?*” followed-up with “*To what extent is economic performance linked to sustainability performance?*”.

As critics to the existing practices of cybernetic controls, Arjaliès and Mundy (2013) state that a large proportion (29%) of the companies in their study do not integrate CSR indicators into reporting processes, and admit that CSR reporting has no formalized follow-up procedure. Lack of follow-up procedures indicate the limitation of the feedback process which is essential for comparison of the outcome with the standard, and, as a result, for modification of the behaviour (Malmi & Brown, 2008). The important mechanism of the feedback process is the performance review, which led to the next question “*How often is sustainability performance evaluated?*” In addition, Arjaliès and Mundy (2013) and Petrini and Pozzebon (2010) discuss the overall development process of sustainability indicators. Arjaliès and Mundy (2013) found that the initial indicators are usually selected with the purpose of conforming to external requirements, while Petrini and Pozzebon (2010) stressed the stakeholders engagement in the development of KPIs. To capture the difference in approaches to indicators development, the question “*Which of the following best describes the development of sustainability indicators in your company?*” was asked.

Roth (2008) argues that budgets can be valuable means of communicating sustainability objectives throughout the organization by determining resource allocation. Crutzen et al. (2017) found evidence of budget employment for sustainability purposes in the observed companies, however without providing any additional practical details about budgets application. Less optimistic findings were obtained by Arjaliès and Mundy (2013). The authors found that separate budgets for CSR strategy were assigned in only half of the companies, in other companies additional funds were allocated on a case-by-case basis. A single case study of Bartley et al. (2012) provides a practical use of flexible budgeting for sustainability. The two questions regarding budgets were asked in the survey: “Does the company have a sustainability budget?” and “To what extent is the sustainability budget integrated into the core budget?”

#	Question	MCS/IC	Literature
1	Which indicators does the company use to measure sustainability performance?	MCS - Cybernetic	Arjaliès and Mundy (2013), Crutzen et al. (2017), Durden (2008), Kerr et al. (2015), Lämsiluoto and Järvenpää (2010), Morsing and Oswald (2009)
2	To what extent is economic performance linked to sustainability performance?	MCS - Cybernetic	Arjaliès and Mundy (2013), Crutzen et al. (2017), Lämsiluoto & Järvenpää (2010)
3	How often is sustainability performance evaluated?	MCS - Cybernetic	Herz et al. (2017), Litan (2019)
4	Which of the following best describes the development of sustainability indicators in your company?	MCS - Cybernetic	Arjaliès and Mundy (2013), Petrini and Pozzebon (2010)
5	Does the company have a sustainability budget?	MCS - Cybernetic	Arjaliès and Mundy (2013), Bartley et al. (2012)
6	To what extent is the sustainability budget integrated into the core budget?	MCS - Cybernetic	Arjaliès and Mundy (2013), Petrini and Pozzebon (2010)

*Table 1.4. Mapping survey questions on cybernetic controls with the literature review*

#### 2.2.2.6. Reward and compensation

Reward and compensation systems motivate and increase “the performance of individuals and groups through attaching rewards to control effort direction, effort duration, and effort intensity” (Malmi & Brown, 2008). Previous research

indicates that the use of incentives for sustainability is relatively rare (Arjaliès & Mundy, 2013; Crutzen et al., 2017). In the study of Crutzen et al. (2017) only 4 out of 17 companies used sustainability-related reward and compensation schemes, which were mainly designed for senior management, and only two companies extended the application of a control mechanism to middle management. The authors further elaborated on the two main reasons behind weak development of rewards and compensations for sustainability. The first possible explanation is that management may not have an interest in achieving sustainable development goals that conflict with financial goals (Crutzen et al., 2017). The second reason is that using extrinsic motivation is less necessary and perhaps even counterproductive if employees are intrinsically motivated to contribute to sustainability performance (Crutzen et al., 2017).

The study of Arjaliès and Mundy (2013) also indicated a limited use of compensation programs for employees. The authors enriched the list of reasons proposed by Crutzen et al. (2017) arguing that the incompleteness of diagnostic processes also contributed to the low integration of sustainability into compensation systems. At the same time, Arjaliès and Mundy (2013) highlight that the lack of rewards for sustainability performance may also indicate that managers view sustainability activities as a normal part of the organization's activities. In this case, using monetary rewards for sustainability may actually affect the performance of managers in other areas of the business. In their literature review paper, Lueg and Radlach (2016) distinguish three explanations for the low development of reward and compensation systems for sustainability. They are the lower prioritization of sustainability compared to the main business strategy, the assumption that financial performance reflects sustainability performance, and difficulties in assigning responsibilities.

To capture the extent to which Norwegian firms use reward and compensation systems the following three questions were asked: *“Does the company have any sustainability-related incentives, benefits and rewards for employees?”*, *“To which groups of employees are sustainability-related incentives, benefits and rewards applied?”*, and *“To which departments are sustainability incentives, benefits and rewards applied?”*

#	Question	MCS/IC	Literature
1	Does the company have any sustainability-related incentives, benefits and rewards for employees?	MCS - Reward and Compensation	Arjaliès and Mundy (2013), Kerret al. (2015), Lämsiluoto and Järvenpää (2010), Morsing and Oswald (2009), Petrini and Pozzebon (2010)
2	To which groups of employees are sustainability-related incentives, benefits and rewards applied?	MCS - Reward and Compensation	Crutzen et al. (2017)
3	To which departments are sustainability incentives, benefits and rewards applied?	MCS - Reward and Compensation	Lämsiluoto and Järvenpää (2010)

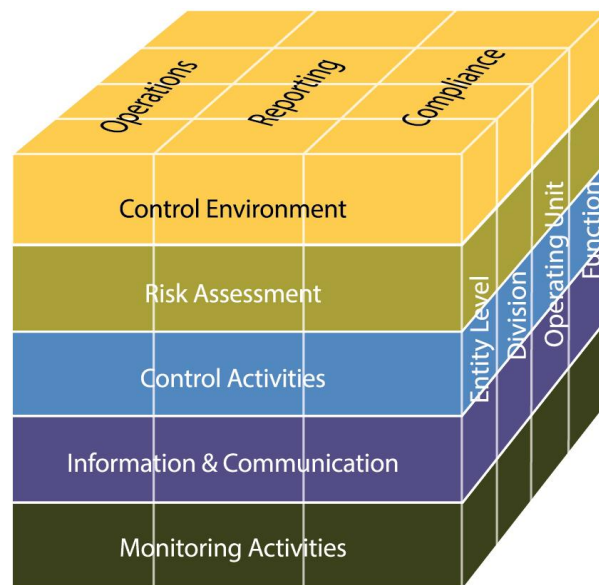
*Table 1.5. Mapping survey questions on rewards and compensations with the literature review*

### 2.2.3. Internal Controls

Technology advancement and globalisation generated the growth of many economies. This created unanticipated, unprepared and uninsured risks (Dionne, 2017), resulting in a growing interest and focus towards internal controls with the main aim to tranquilize potential financial risk (Teck. H. Lee & Azham, 2008). The Committee of Sponsoring Organizations of the Treadway Commission (COSO) was established in 1987 with the intention of limiting and mitigating the impact of risk. The COSO Internal Control – Integrated Framework (COSO framework) officially defines the term “internal control” as “*a process, effected by an entity’s board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance.*” (COSO, 2013). In 1992, the COSO framework was established and for the first time, senior executives were given a unified approach to developing effective controls to help ensure that the organization's objectives for operations, reporting and compliance are met (Martin et al., 2014). Further the COSO issued an article aimed at assisting public companies to comply with Section 404 of the U.S. Sarbanes-Oxley Act of 2002. The article outlines an example of one approach to transitioning to COSO’s 2013 framework from the original framework published in 1992 (Gupta, 2009; Martin et al., 2014). Both COSO framework and SOX Act address the need for more robust internal control, although from different angles. Thus, the COSO framework acts as a tool for managers when designing control environments while SOX Act is a legal requirement for all publicly traded companies (Gupta,

2009; Martin et al., 2014). The Treadway Commission designed the COSO framework with SOX in mind, however the framework goes beyond financial report controls as it is additionally applied to both compliance and operation, as well as non-financial reporting (AuditBoard, 2020).

The COSO framework has been enhanced and revised in 2013 with the aim of improving the system of internal control taking all the considerations of a more diverse and workable model for all organizations in regards to type, size and industry. The revised framework does not change the definition of internal control, but clarifies concepts related to 1) the codification of 17 principles pertaining to the five interrelated elements of the system of internal control, 2) clarification surrounding management's role in relation to objective setting, and 3) the increased relevance of technology in relation to internal control (COSO, 2013). This new and revised framework is depicted in Figure 2 and the 17 principles have various approaches designed to demonstrate how each principle is applied in organizations.



*Figure 2. COSO Internal Control-Integrated Framework (COSO, 2013)*

The COSO framework presents three categories of objectives: operations, reporting, and compliance (COSO, 2013). In operational objectives, internal control assures that the firm uses resources effectively and efficiently for operational business (COSO, 2013). In regards to reporting objectives, internal control helps sustain a reliable, timely, and transparent reporting system for both

financial and non-financial information (COSO, 2013). Finally, for compliance objectives, internal control ensures that the company complies with applicable laws, regulations, and internal policies and procedures (COSO, 2013).

Prior research states that the COSO framework is one of the preferred frameworks in processing and promoting the quality of critical information for decision making (Littan, 2019). The COSO framework is known to be regulatory compliant, and the most widely used framework for internal auditing (Martin et al., 2014). The Chartered Financial Analyst (CFA) report stated that 82% respondents use the COSO framework in their Internal Control over Financial Reporting (ICFR) (Shaw, 2006). The COSO framework has advantages such as supporting business performance and evaluation through ensuring reliable information, so that managers can make sound decisions that will benefit organizations (Littan, 2019). When it comes to avoiding risk, internal controls aid in early or immediate detections of accidental problems or intentional breaches of internal policies (COSO, 2013). Internal controls are various control activities carried out to accomplish an organization's managerial objectives and deliver assurance (COSO, 2013; Koo & Ki, 2020).

The current study mainly considers internal controls for reporting objectives. Sustainability reporting presents a combination of both financial and non-financial information providing a company's sustainability performance. Although sustainability reporting is primarily non-financial in nature, it represents only a subset of the broader category and in some instances overlap with financial information (Herz et al., 2017). There have been obstacles regarding the quality assurance in reported information due to the vast amounts of frameworks and standards (Littan, 2019). The revised COSO framework expanded the concept of reporting, moving away from just financial reporting to two main components of reporting, "internal and external reporting" and "financial and non-financial reporting", making possible its application for enhancing the value of sustainability reporting, both internal and external (Littan, 2019). Littan (2019) stated "*The COSO framework provides a possible roadmap for businesses to adjust their internal processes to enable useful reporting of sustainability*". This enables companies to grow on a sustained basis with confidence in the integrity of all types of information. Implementing these guidelines improve the reliability, relevance, and timeliness of various types of data on ESG performance and its

connection to long-term value (Koo & Ki, 2020; Litten, 2019; Yilmaz & Flouris, 2010).

#### 2.2.4. *Internal Controls for Sustainability*

The relationship between internal control and corporate sustainability is an emerging field of research (Huang & Huang, 2020; Koo & Ki, 2020). Although theoretical background discussed in the previous section leads to the hypothesis that effective internal control increases both the operational efficiency and the reliability of information in the field of sustainability (Koo & Ki, 2020; Litten, 2019), few studies have attempted to empirically test this (Huang & Huang, 2020).

Huang and Huang (2020) study the impact of internal controls on the quality of sustainability-related disclosures. Based on data collected from sustainability reports of companies listed in the Chinese capital market, the researchers identify that the level of internal controls positively affect a company's green information disclosure. The authors also conclude that while all elements of internal control had a positive impact on the quality of disclosures, corporate governance, organizational culture, information and communication, in particular, can improve the reliability of sustainability reporting and promote corporate social responsibility. The study of Guo and Shen (2019), which explores the relationship between ESG ratings and internal controls weaknesses, confirms the results of Huang and Huang's research. The findings indicate that Korean listed companies with weak internal controls have lower ESG ratings, and conversely, firms with effective internal control have higher ESG ratings.

There has been an increasing number of companies issuing sustainability reports from 20% in 2011 to 90% in 2019 in the S&P 500 (Governance Accountability, 2020), with a growing popularity there is still no standardized reporting practice locally or globally (Herz et al., 2017). While some companies are issuing reports to comply with EU regulations, others are reporting voluntarily to respond to stakeholders demands (Litten, 2019). To enable useful reporting of sustainability information, internal processes have to be set up. With growing stakeholders demands, there is an increase of accountability of companies to record concretely



their sustainability activities, and avoid “greenwashing” criticism. This led to the first question for internal controls included in the questionnaire which was “*Does your company report on sustainability?*”. The researchers aimed to determine if companies had a reporting process to begin with, which would enable them to further identify the companies maturity of data collection and internal controls process in the following questions.

Novo Nordisk is an example of a company that established the application of the COSO framework in order to achieve its sustainable business more effectively in regards to reporting (Novo Nordisk, 2020). Its risk based approach included materiality assessments to identify the most crucial areas to be addressed by the framework (Herz et al., 2017). To better align sustainability within the core business strategy, it is important to define clear objectives so that specific risks are identified, also outlined in Principle 6 (COSO, 2013). Sustainability risks are considerably different from historical risks (Yilmaz & Flouris, 2010), and thus materiality assessments are used to identify any known trends of uncertainty (Herz et al., 2017) and create an understanding on specific issues for the companies. This led the researchers to develop the following question, “*Has the company done materiality assessment to identify priority issues for sustainability reporting?*” with the aim to discover whether companies are incorporating specific objectives to determine their precision of sustainability risk assessments and control mechanisms.

Once the right objectives are identified, they can be implemented. Organisations can set policies regarding sustainability objectives and procedures that put these policies into action (Herz et al., 2017) and indicators to evaluate these policies. A necessary element in the internal control system is identifying relationships and aggregating information through the use of indicators (Laedre et al., 2015). This created the following question, “*To what extent are the methods for calculating sustainability indicators formalised?*”. The researchers wanted to identify if the organization deployed control policies to put their procedures into action in order to achieve their sustainability objectives, in line with Principle 12 (COSO, 2013). Once the indicators have been selected, the next step is to operationalise them by clearly stating who will collect them and which tools will be used. Identifying the individual responsible for the data collection is critical in establishing the

operating process to determine the quality of the reporting process, referring to Principles 3 and 5 (WBCSD, 2019). This led to the development of the following question *“To what extent has the company determined who is responsible for each indicator?”*.

Additionally, identifying the tools needed for the data collection and having a structured process for collecting and aggregating data is important, so that reliable data can be used for the decision making process, in line with Principle 11 (WBCSD, 2019). In order to improve data quality, and minimize errors the company can have one consolidated system such as Enterprise Resource Planning (ERP) systems (WBCSD, 2019). This helps in avoiding duplicates, lower implementation costs as there will be only one common platform, and have integrated controls and KPIs stored in the same platform. It has been identified that spreadsheets are also a tool for collecting data but can often leave data vulnerable and more prompt to errors (WBCSD, 2019). The researchers then developed the following question, *“To what extent does the company use the following IT solutions for sustainability reporting?”* with the answer options as *“Separated excel sheets”, “core IT solutions (ERP)”* and *“separated IT solution for sustainability”*.

According to Principle 11, how the organization develops general control activities over technology to support achievement of objectives is crucial. Once tools have been identified, it is important that the technology systems do not operate outside the control environment for financial reporting (Herz et al., 2017). As many organizations do so, this creates insufficient control checks and it is advised that organizations should consider leveraging existing control systems. This led to the following question *“To what extent is the sustainability reporting process integrated into the core financial reporting process?”*. The researchers wanted to understand whether sustainability information is connected to the core performance management systems, in order to have the direct link internally between control activities and sustainability reporting objectives.

A structured process for collecting, processing and reporting data, with the addition of indicators, can enlighten the decision-making process. By communicating and reporting the information utilised, managers can have a better

understanding in managing internal processes successfully and mitigating risks (WBCSD, 2019). The researchers then developed the question “*To what extent sustainability issues are taken into consideration during decision-making?*” with the aim of understanding if companies utilise the data, goals and targets that includes sustainability in strategic decisions making.

Akisik and Gal (2017) explore the impact of third-party assurance services on customer’s and employee’s view of a company. The results of their quantitative study based on CSR reports of North American firms provide evidence that customers and employees will support companies that have third-party reviewed CSR reports and effective internal controls. To add on, a research was conducted with 50 large Danish companies annual sustainability reports, only 22% referred to a third party assurance service (WBCSD, 2019). This possibly can result in low trust and confidence in the information that is reported (Akisik & Gal, 2017). Companies do have the responsibility for integrity and have to use both internal and external processes to check reliability of their data (Arjaliès & Mundy, 2013). This led to the next question in regards to internal controls “*Does the company use services to provide assurance?*”. The options for answering were “internal” and “external” assurance. This question aimed to identify the monitoring activities conducted, and observe if there are separate evaluations in place in the businesses reporting. As highlighted in Principle 16, the organization needs to select, develop and perform separate evaluations (COSO, 2013).

While Akisin and Gal (2017) focus on external assurance services, Ridley et al. (2011) discuss the importance of internal auditing in the field of corporate sustainability. Based on the literature review, the authors theorise that internal audit provides good assurance, consulting and facilitation in regards to corporate responsibility. However, Ridley et al. highlight the limited empirical evidence and call for future research to explore how internal auditors perform their services in the aspects of sustainability. Despite the apparent benefits provided by assurance services, there are arguments about their overall effectiveness and reliability (O’Dwyer, 2011; O’Dwyer & Owen, 2005). It remains difficult to evaluate management's ongoing commitment to sustainability performance, as these independent professional services are typically provided at a given point in time (O’Dwyer, 2011; O’Dwyer & Owen, 2005).

Internal controls and internal auditing represent a complementary relationship as there has to be set matching objectives of both disciplines with the intention to protect shareholders (BakerTilly, 2018). Internal control determines the controls based on which an organization should be managed while the internal audit demonstrates a detective activity, which verifies the implementation of internal controls (BakerTilly, 2018). As mentioned earlier, internal control processes support management in their internal decisions making, and thus timely, relevant and reliable information is key to understanding risks, opportunities and business environments (WBCSD, 2019). Ensuring data quality is the foundation for robust risk and performance management. There is a crucial need for relevant, reliable and timely information, in order for management to effectively identify and evaluate the risk profile of the business (WBCSD, 2019). As a result, the following questions were developed, *“To what extent is sustainability data accurate, reliable, and timely?”*, *“To what extent has the company identified risks to sustainability data quality?”* and *“To what extent has the company developed controls to reduce these risks?”*. The aim is to identify if the organization has developed control activities to their data quality that contribute to the mitigation of risk as referred to Principle 10 (COSO, 2013).

Liu (2018) argues that the current approach to internal controls is static, and a more complex and dynamic framework that takes into consideration the expectations of many stakeholders, should be incorporated. Thus, the author extends the COSO framework (2013) and proposes additional CSR-dimension. In contrast to Liu’s suggestions, Herz et al. (2017) argue that the COSO framework can be applied to sustainability goals without any adjustments. The authors provide a practical guidance that explicitly explains and shows best practices how the framework can be applied to achieve sustainability-related internal controls goals.

Designing internal controls over key sustainability performance means that businesses have to fully integrate risk management to their strategy (Littan, 2019), i.e. to identify and assess risk, and to identify control activities to mitigate those risks. This will not only minimize potential losses but also to exploit new business opportunities arising from the sustainability agenda (Yilmaz & Flouris, 2010).

Internal controls will also provide a holistic view on ensuring effective handling of sustainability risk and improve overall organizational performance (Yilmaz & Flouris, 2010). This led to the following questions “*To what extent has the company identified risks related to the achievement of sustainability goals?*” and “*To what extent has the company developed controls to reduce these risks?*” with the aim of identifying if an established control system has clear indications and assessments of risk relation to sustainability objectives, in line with COSO Principle 6 (COSO, 2013).

One of the important takeaways Herz et al. (2017) is that integrating sustainability and finance can be critical to ensuring reliability of sustainability reporting. While sustainability teams are experts in ESG data, financial reporting teams are experts in building sound control systems over reporting. The combination of increasing interest and lack of confidence in sustainability information enables companies to develop more effective internal controls over sustainability reporting processes (Littan, 2019). By integrating sustainability into existing internal control systems and processes, the company can be truly guided to implement sustainability objectives (Herz et al., 2017; Littan, 2019).

#	Question	MCS/IC	Literature
1	Does your company report on sustainability?	IC	Herz, R.H. et al. (2017)
2	Has the company done materiality assessment to identify priority issues for sustainability reporting?	IC - Principle 6, 13	Herz et al. (2017), Durden, C. (2008), Littan (2019)
3	To what extent are the methods for calculating sustainability indicators formalised?	IC- Principle 12	Herz, R.H. et al. (2017) WBCSD (2019)
4	To what extent has the company determined who is responsible for each indicator?	IC - Principle 3, 5	Herz et al. (2017), WBCSD (2019), Littan (2019)
5	To what extent does the company use the following IT solutions for sustainability reporting?	IC - Principle 11	Herz, R.H. et al. (2017) WBCSD (2019)
6	To what extent is sustainability reporting process integrated into the core financial reporting process?	IC - Principle 11	Herz et al. (2017), WBCSD (2019)
7	To what extent sustainability issues are taken into consideration during decision-making?	IC - Principle 14	Herz et al. (2017), WBCSD (2019)

8	Does the company use services to provide assurance?	IC - Principle 16	Herz et al. (2017), WBCSD (2019), Littan (2019)
9	To what extent is sustainability data accurate, reliable, and timely?	IC - Principle 10, 17	Herz et al. (2017), WBCSD (2019), Littan (2019)
10	To what extent has the company identified risks to sustainability data quality?	IC - Principle 10	Herz et al. (2017), WBCSD (2019), Littan (2019)
11	To what extent has the company developed controls to reduce these risks?	IC - Principle 10	Herz et al. (2017), WBCSD (2019), Littan (2019)
12	To what extent has the company identified risks related to the achievement of sustainability goals?	IC - Principle 6, 9	Herz et al. (2017), Littan (2019)
13	To what extent has the company developed controls to reduce these risks?	IC - Principle 10	Herz et al. (2017), WBCSD (2019), Littan (2019)

*Table 1.6. Mapping survey questions on internal controls with the literature review*

#### 2.2.5. Connecting MCS and IC

This study considers management and internal control as complementary mechanisms. To justify this approach, several arguments have been found and considered in favor of the relationship between the two concepts.

The Three Lines Model (2020), a position paper of the Institute of Internal Auditors (IIA), explains how key organizational roles work together to facilitate strong governance and risk management. The model considers operational management as the first line of defence, the actions of which include both management and internal control. The Three Lines of Defence Model (2013), the previous version of the Three Lines Mode (2020), clearly demonstrates this (Figure 3). According to the model (2020), these are operational managers who own and manage risks, guide the development and implementation of internal policies and procedures, and ensure that activities are aligned with goals and objectives. Operational management naturally serves as the first line of defense, since controls are built into the systems and processes under their guidance. Following the proposed logic of the model, management and internal controls are

inextricably linked, and this is the first argument to consider two concepts together.

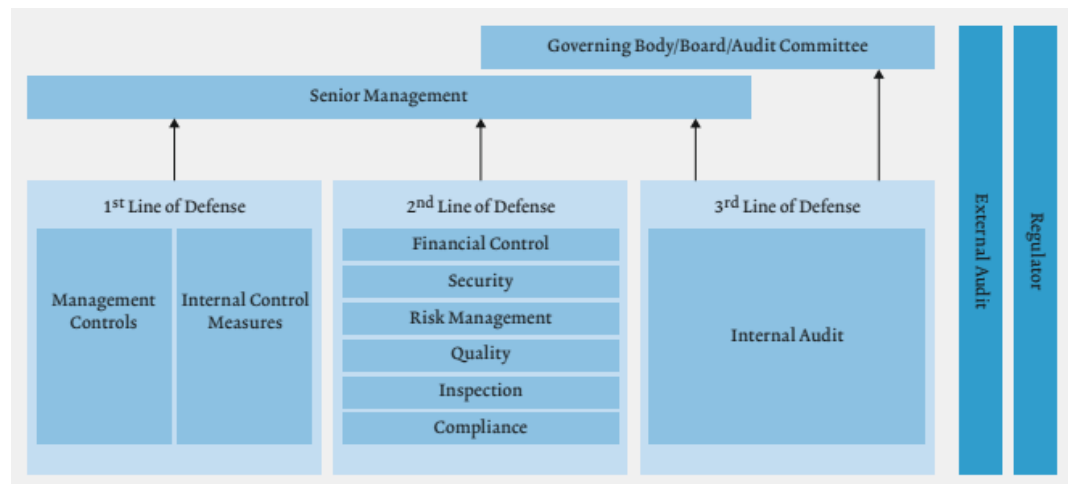


Figure 3. Three Lines of Defense Model (The Institute of Internal Auditors, 2013)

From the perspective of management controls, internal controls can be seen as part of the boundary system (Simons, 1995) or administrative controls (Malmi & Brown, 2008). Management uses boundary systems as well as internal controls to constrain and define acceptable employee behaviour (Simons, 1995). Both types of control systems support managers to identify and manage risks in order to achieve company goals (Simons, 1995). In addition, boundary controls employ mechanisms inherent for internal controls, such as organizational structure and governance, policies and procedures (COSO, 2013; Simons, 1995). The common goal and the similarity of the mechanisms of two concepts is the second argument in favour of considering two systems together.

Finally, the internal control concept can enrich the management control frameworks by providing tools for decision-making processes and linking the company with the external environment it operates in. This is particularly important for working with sustainability issues, as they are associated with a high level of uncertainty, compliance requirements, and multiple stakeholders groups that might have conflicting interests (Herz et al., 2017; Hörisch et al., 2014; Littan, 2019). In addition, reliable information is vital for business (Herz et al., 2017; Littan, 2019; WBCSD, 2019). From one side, it supports management in making decisions that help the company achieve its strategic objectives (COSO, 2013; Herz et al., 2017; Littan, 2019). From another side, it provides investors and

other capital providers with knowledge of how resources are deployed in the business as well as the company's broader value creation model (Herz et al., 2017; Littan, 2019; WBCSD, 2019). To conclude, Otley and Soin (2014) identify both corporate governance and risk management as emerging trends within the field of management control.

### **3. Methodology**

This section provides an overview of the research methodology employed to conduct the current study. First, the research design developed to achieve the study purpose is described. Then, the section continues by explaining the data collection and companies selection processes, a major part of which is devoted to the online survey development. The section is wrapped up with the discussion of the research validity and reliability followed by the presentation of ethical considerations.

#### **3.1. Research design and method**

A research design is the “procedures for collecting, analyzing, interpreting and reporting data in research studies” (Creswell, 2014). It is an overall plan for connecting the empirical research with an abstract research problem (Bryman et al., 2018). Which design to choose depends largely on the nature of the research problem. The organizational controls for sustainability is a relatively comprehensive and yet under-researched topic despite the growing relevance (Crutzen & Herzig, 2013; Gond et al., 2012; Lueg & Radlach, 2016). When asking the question “What controls are Norwegian companies using to achieve sustainability goals?”, there is still a high uncertainty about the outcome. At the same time, the prior exploratory research has already established the groundwork that the current study relies upon, particularly, the Malmi and Brown's framework (2008) and COSO Internal Control-Integrated framework (2013). Based on this reasoning, the mixed research design was used for conducting this study. The descriptive design was applied to gather more information about the topic, while the exploratory design was used to explore the patterns of control application for sustainability in Norwegian firms.



### *3.1.1. Research approach*

The choice of exploratory and descriptive research designs indicates the use of both deductive and inductive generation of theory, as well as a mixed research method (Bryman et al., 2018). In the study, two theoretical frameworks were tested in regards to their ability to embrace sustainability issues, which represents deductive approach. Then the findings were analyzed in order to develop theoretical explanations and identify patterns to build in the theory, which resembles an inductive approach yet within deductive reasoning. A mixed research method combines both qualitative and quantitative methods. Quantitative method focuses on measuring and testing a theory, while the qualitative method is associated with interpreting and developing it (Bryman et al., 2018). The mixed approach helps to build a holistic picture and to overcome the disadvantages of using only one method in isolation (Cameron & Price, 2009). However, there are two main arguments against this method: the idea that the research method carries epistemological commitment and that quantitative and qualitative research are separate paradigms (Bryman et al., 2018). Despite this criticism, a mixed method has become an increasingly common and accepted approach to conducting business research (Bryman et al., 2018). For the purposes of the study, the mixed approach was chosen as more pragmatic and practical.

### *3.1.2. Research strategy*

Research strategy is a detailed plan for answering the research question (Saunders, 2015). For this study, the data collection was performed in two consecutive phases. In the first phase, the data was collected through an online survey, and then analyzed using descriptive statistics. In the second phase, the semi-structured interviews developed based on quantitative data were conducted to collect qualitative data. The rationale behind this research strategy is that survey data and its subsequent analysis provide a general understanding of the research problem, while interviews explore participants' views in more depth (Bryman et al., 2018). One of the advantages of the applied method is an opportunity to explore the quantitative results in more detail (Bryman et al., 2018). This design can be especially useful when unexpected results arise from a quantitative study (Morse & Field, 1995). The limitations of this design are lengthy time and additional resources required to collect and analyze both types of data (Bryman et al., 2018).

To overcome this disadvantage, an online survey was chosen as a main method, and the number of semi-structured interviews was limited to three.

One of the important arguments towards the use of survey data collection method was its limited application in prior research. The performed literature review revealed that most studies use an in-depth single case study design (e.g., Durden, 2008; Morsing & Oswald, 2009; Riccaboni & Leone, 2010). Thus, Crutzen and Herzig (2013) call for survey studies in order to produce more generalisable findings. The choice of survey data collection method aims to provide a broad picture of management controls practices of numerous companies rather than an individual company. The combination with interviews was necessary to ensure quality of collected data by grasping a viewpoint that is not displayed behind the survey. The use of the survey also provides a comparison point for future studies, an opportunity which has been lacking in prior research (Crutzen & Herzig, 2013).

### *3.1.3. Time horizon*

Time is an important constraint that determines the research design. Studying the phenomenon at a particular time is best suited for the master's thesis project due to the time constraint of one semester. Most prior studies also take a snapshot of existing corporate practices at a particular time (e.g. Arjaliès & Mundy, 2013, Morsing & Oswald, 2009; Riccaboni & Leone, 2010), while very few studies examine the development of control systems for sustainability in the long run. Acknowledging the gap in prior research in regards to longitudinal studies, the research was designed in a way to allow the use of research findings in possible future longitudinal studies.

## **3.2. Data collection**

### *3.2.1. Online survey*

The online survey represents the largest part of this research, in terms of both the volume of the research process and the contribution to answering the research question. This section describes in detail the process of designing the online survey from developing the questionnaire to distributing the survey.

### 3.2.1.1. *Questionnaire development*

Questionnaire construction is one of the most time-consuming and critical activities of this study. A well-made questionnaire contributes to the research success and has several key attributes (Lee, 2006). First, the questionnaire should meet the research objective (Lee, 2006). Second, it should contribute to obtaining the most complete and accurate information possible. The well-organised and clear questionnaire gives higher chances that respondents fully understand the questions and are not likely to refuse to answer or answer illogically (Lee, 2006). Finally, a well-arranged questionnaire with a natural flow of questions keeps the respondents interested and encourages them to complete the questionnaire (Lee, 2006). According to Peterson (2000), several actions are required to develop an effective questionnaire. When constructing the research questionnaire the steps proposed by Peterson were followed.

#### **Step 1. Review the information requirements necessitating a questionnaire**

The first step was to search and review literature on the problem area. The theory and previous research on MCS and IC were the major sources of the information and presented in the section [2.2 “Control Systems”](#).

#### **Step 2. Develop and prioritize a list of potential questions that will satisfy the information requirements.**

In order to develop a list of potential questions the following actions were performed:

1. A list of articles related to MCS for sustainability was formed. The list included articles focused on MCS for sustainability as a package and articles focused on a particular element of MCS for sustainability.
2. A working file to construct a questionnaire was developed. The file contained tabs for each type of management controls according to Malmi and Brown's framework (2008): Cultural, Administrative, Planning, Cybernetic, Rewards and Compensations.
3. Each article was carefully reviewed to extract the elements of MCS for sustainability. Each identified element was put in a tab related to a

particular type of management control and summarised in the table with the following information: code of the article, author(s), element of management controls, description of the control mechanism.

4. Based on the collected data, questions were developed aiming to identify a particular management control, that, in turn, contribute to answer the research question “What control mechanisms are used by Norwegian companies to achieve sustainability goals?”
5. A list of articles related to IC for sustainability was formed. A tab for IC was added in the working file.
6. Each article was carefully reviewed to extract the IC elements for sustainability. Each identified element was summarised in the table with the following information: code of the article, author(s), component (control environment, risk assessment, control activities, information & communication, monitoring activities), principle (17 principles of COSO), description of internal control.
7. Based on the collected data, questions were developed aiming to identify a particular internal control that, in turn, contribute to answering the research question “What control mechanisms are Norwegian companies using to achieve sustainability goals?”
8. As was discussed earlier, there are intersections of MCS and IC. In the process of questionnaire development these intersections were also faced. At this stage the goal was to merge the questions from MCS and IC. As a result, a summary table of unique potential questions was prepared. This constituted the first draft of the questionnaire.

### **Step 3. Assess each potential question carefully**

The researchers performed the screening process of the questionnaire considering each potential question with respect to (1) how the answers to the question will be analyzed, (2) the expected information the question will provide, and (3) how the received information will be used (Lee, 2006). The questionnaire was put in the Google form and sent for the assessment to the supervisor and two other professors, who are also faculty members of the Center for Sustainability and Energy from BI Norwegian Business School. The received feedback was used for

the questionnaire improvement. The main decisions made are discussed in the section [3.2.1.2 “Questionnaire consideration”](#).

#### **Step 4. Determine the types of questions to be asked**

The closed-ended questions were chosen for the questionnaire. Closed-ended questions are suitable for questionnaires designed for analyses and evaluations because of uniformity of responses and easy administration (Lee, 2006), which is beneficial for the chosen research design. In addition, closed questions are easier and quicker for respondents to answer (Lee, 2006). One of the main disadvantages of closed questions is a loss of spontaneity in respondents' answers (Bryman et al., 2018). This possible problem was solved by including a response category “Other, please specify” allowing respondents to propose an answer that applies to them (Bryman et al., 2018).

The following response formats were used in the questionnaire:

- Yes/No - 10 questions, from which 2 are consent questions;
- Multiple choice questions - 14 questions, from which 3 questions allowed one answer, 11 questions - multiple answers;
- Rating scale questions - 20 questions with Likert scale. The slide bar was used for the Likert scale (from 0 to 100). Verbal labels were added to clarify the meaning of scale points to respondents (0 meant very low extent, 100 - very high extent). In addition, grid lines (25, 50, 75) were added to the slide bar to divide it in five distinctions and provide to respondents a middle alternative in the scale.

#### **Step 5. Decide on the specific wording of each question to be asked**

Each question was assessed by the researchers using the following criteria (Lee, 2006):

- simple, clear, and short questions;
- specific and precise questions;
- use of appropriate language (avoiding of jargon, slang, technical terms, and abbreviations; where it was impossible to avoid such terms, the definitions were added);

- ability of respondents to answer questions;
- avoidance of biased and sensitive questions;
- avoidance of questions that include more than one topic or idea;
- avoidance of negative and double-negative questions.

When finalizing the wording of the questions, the feedback from the professionals who conducted the pilot testing of the questionnaires was taken into account.

#### **Step 6. Determine the structure of the questionnaire**

The initial flow of the questions was based on the types of controls and followed the structure of frameworks used. However, continuous self-assessment has shown that the flow is not smooth and should be revised to have a more logical order. The revised sequence can be found in the final questionnaire (Appendix 1).

#### **Step 7. Evaluate the questionnaire.**

The final version of the questionnaire was sent to two practitioners and one PhD student researching on MCS for sustainability. The feedback was taken into consideration and related mainly to the language.

#### *3.2.1.2. Questionnaire consideration*

During the questionnaire development process, several important decisions were made. This section provides important considerations for designing a questionnaire.

One of the challenges faced during the survey development was to limit the amount of questions in order to increase the likelihood that the respondents would complete the survey. In order to decide which questions to exclude, the researchers critically assessed the scope of the study and the relevance of each question to the research question. As a result, 17 questions were excluded. The final questionnaire includes 44 questions, 2 out of which are consent-type questions. The pilot testing showed that the completion of the questionnaire took about 15 minutes which was in line with the Qualtrics estimate (13.7 minutes).

When evaluating the questionnaire, one of the important considerations was an ability of respondents to answer questions. This was a challenging criteria since the questionnaire included diverse topics, like operations, risk management, finances, and corporate governance. Considering that respondents might have different levels of knowledge and different degrees of involvement in sustainability-related processes, it was decided to add the option “do not know” to all of the questions except consent-questions. The “do not know” answer may be less desirable for the research (Bryman et al., 2018), however there are several advantages to using this option in the questionnaire. First, this option allows researchers not to force respondents to guess or choose an inaccurate answer (Bryman et al., 2018). In addition, a specific lack of knowledge can be identified by analyzing the “do not know” answers (Bryman et al., 2018).

A considerable time was spent on the flow and layout of the survey. It was decided to ask one question on each page. A progress bar was placed at the bottom of each page so that respondents could see how far they had come and how many questions remained. To provide respondents with additional flexibility, the following survey options were chosen. First, all questions except the consent question have been made non-mandatory. Second, the back button to the survey to allow respondents to review answered questions was available. Finally, respondents were allowed to leave the survey and re-enter to finish it later.

#### *3.2.1.3. Choice of firms*

To answer the research question, a survey was sent to 100 companies that are engaged in sustainability development in Norway. Norwegian firms are known to be leaders in driving sustainability compared to other European countries (Global Sustainability Hub, 2020). The selection of Norwegian firms for the study increases geographic diversity of the prior research, as most previous studies focused mainly on companies in Western Europe and North America (Lueg & Radlach, 2016).

Time and cost are large considerations that affect sample size, and the right sampling size is always crucial to any research (Bryman et al., 2018). Nonetheless, increasing the size of the sample increases the cost and time

necessary for the research, while providing only a small increase in accuracy (Biau et al., 2008). When considering the sample size, the population size was first considered. For the current study, Norwegian companies that are actively engaged in implementing sustainability strategies form the research population. No data source was found that could accurately determine how many Norwegian companies are active in the field of sustainability. Two main resources were considered to define the population. The first source was the report of the Governance Group<sup>3</sup> that assessed the sustainability reporting of the 100 largest companies on the Oslo Stock Exchange (Appendix 8). The second source was the list of companies that are members of S-HUB, a network for sustainable business in Norway (Sustainability Hub Norway, 2021).

The collaboration with S-HUB was beneficial for the research in regards to access the contact information of companies. This is known as convenience sampling which is defined as “one that is simply available to the researcher by virtue of its accessibility” (Bryman et al., 2018). To begin with, non-Norwegian companies and companies with F-ratings were excluded from the 100 listed companies. Then, the remaining list crosschecked with the S-HUB membership list. As a result, 57 listed companies with ratings from A to E were included in sampling. In regards to unlisted companies, the list was evaluated with the founder of S-HUB to identify companies that are suitable for the research purpose. The main criterias were Norwegian companies that actively implement sustainability strategies and have sustainability reporting. Companies proposed by S-HUB were additionally screened by researchers to ensure that they comply with the sampling requirements. When choosing the companies, the criteria of industry diversity was also considered. As a result, 43 unlisted companies were included in the sampling.

The final sampling size included 100 companies. The decision was partially influenced by the ESG report which also had 100 companies. In addition, the goal was to maximize the number of surveys sent out given the availability of time and resources, as well as maintain a certain guarantee of accuracy with low sampling errors. The sampling list included listed and unlisted firms in Norway, ranging

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<sup>3</sup> The “Oslo Stock Exchange report on ESG” started in 2016. It analyzes 100 largest listed companies in Norway receiving score ratings of “A+ to F” to demonstrate those who have succeeded in providing specific sustainability like the assessment of the company’s ability to set specific goals for sustainability, with an overall reporting in strategy, risk and results performance; in addition to the three dimensions in the ESG criteria.



from medium to large enterprises, and represented 11 industries such as Materials, Energy, IT, Real Estate, Industrials, Communication Services, Finance, Construction, Food, and Consumer staples. Choosing listed companies is important as they are subjected to rules on the reporting on corporate responsibility (European Commission, 2020). Including companies that are unlisted gives a better view of the Norwegian business sector as it mostly comprises SMEs. Over the years, SMEs have played a crucial role in developing the Norwegian economy in various industries such as manufacturing and agribusiness, focusing on the particular challenges of sustainability (Ditlev-Simonsen et al., 2015). Collectively, these diversity of firms contribute the most in the Norwegian economy, and they play a role in leading the sustainability march in businesses (Aarstad & Jakobsen, 2020) so it is crucial to also identify them in our research.

Gentles and Vilches (2017) arguably states that in order to avoid ambiguities in research, a systematic method should be implemented to provide a clear and coherent understanding of the topic investigated. Starting the sample list from the Oslo ESG report had advantages such as ensuring objectivity, preventing researcher bias. Additionally, with the second selection of samples, we were able to cover more industries. Since this was a non-probable sample, it removed the ability to create any statistically significant generalisation to the whole population of Norwegian companies that incorporate sustainability. Finally, if only the 100 listed companies would have been chosen, it would have only represented the top few percent of Norwegian firms, giving a less diversified sample and representation of companies in Norway.

#### *3.2.1.4. Survey tools*

An online survey was chosen to conduct the survey. It was the best option for the research for the following reasons. First, online surveys are less time consuming for both collecting and analyzing data (Bryman et al., 2018). It was a critical point due to time limitations of the research project. Second, online surveys are conducted without physical contact which is of high importance during COVID-19 period. Finally, online surveys are easier to use for participants and more flexible in terms of formatting, which is likely to contribute to a higher response rate (Bryman et al., 2018).

The two survey tools were mainly considered for online survey: Google forms (<https://www.google.com/forms/>) and Qualtrics (<https://www.qualtrics.com/>). The choice was made to use Qualtrics due to its professional appearance with high-quality graphics and good layout that is likely to improve accuracy and completeness, help respondents to fill out the questionnaire, and get a higher response rate. Among others, the following benefits were also considered:

- Flexibility and advanced technological possibilities to make the questionnaire neat, understandable and easy to use. For example, the skip logic<sup>4</sup> feature was used to improve the questionnaire flow, the coding was used to add pop-up definitions to the questions, the slide bar was used for rating questions, etc.;
- Possibility to optimize questions for mobile to make survey mobile-friendly;
- ExpertReview functionality. ExpertReview is a digital reviewer for surveys made in Qualtrics. It helps ensure that surveys collect data of the highest quality. The functionality was used for additional questionnaire assessment;
- Data protection and confidentiality. Qualtrics is an external data processor for data processed in the system on behalf of BI. BI has signed a data processing agreement with Qualtrics (BI, 2020). All information is treated confidentially.

#### 3.2.1.5. *Distribution of survey*

The survey was distributed through personalised emails. Emails contained a name of a potential respondent, the name of the company he/she is working in and a personalised link to the survey. Personalised emails were chosen as a distribution method because it is assumed that respondents are more likely to respond to them (Bryman et al., 2018). The auto generated email feature called Mail Merge was used. This feature is used with a combination of Microsoft Word and Microsoft Excel.

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<sup>4</sup> Skip logic allows a researcher to send respondents to a future point in the survey based on how they answer a question.

An introductory statement was included in the distribution email (Appendix 2). It contained information about the general purpose of the project, researchers, why a respondent has been chosen for the survey, a personalised link to survey, the expected time for completing survey, statement about voluntary participation and confidentiality. An introductory statement was designed in compliance with Norwegian Center for Research Data (NSD) requirements and consent form was attached to the first mandatory question of the survey (Appendix 3). In addition, in order to motivate respondents to take part in the survey it was decided to share with them a summary of survey results. The following statement was added “*As a thank you, we will send you a summary of survey results this fall*”. Also, 2 weeks after the start of the survey, a reminder was sent to those who did not complete the survey. The reminder email was different from the distribution email and was intended to encourage further participation in the survey (Appendix 4).

### 3.2.2. Interviews

The conducted interviews are semi-structured as it promotes standardization of both asking questions, recording of answers and having more flexibility in order to get more insight on the interviewees own perspective (Bryman et al., 2018). The interviews are aimed to contribute towards answering the research question and a tool for improving the survey, by supplying more in-depth, open-ended answers (Bryman et al., 2018). The interview questions were developed based on the survey results, and this enables us to dive deeper to the survey answers which could be elaborated more on why they had certain control mechanisms in place. The questions were tailored to each respondent and ensured to cover planning, administrative, cybernetic, cultural, rewards and compensations, and internal controls (Appendix 6). The questions were formulated and asked in an open and unbiased manner however not followed strictly when conducting the interviews. This allowed us to modify the questions during the course of the interview, as the semi-structured interview resembles “guided conversations rather than structured interviews” (Yin, 2009)

The interviewees were chosen from those respondents who expressed their desire to take part in a follow-up interview (the last question of the survey). Due to time and resources limitations, three companies were chosen for the interviews. The base of choice was to include both listed and unlisted companies with the answers

that deviated most from the average. The invitation to participate in the interview was sent to the chosen companies (Appendix 6). After the first interview invitation was sent, an email following up with the date for the interview with a zoom invitation link and a consent form was sent to each interviewee. The consent form was written following the NSD requirements (Appendix 5). A master interview guide was created and sent to the interviewees before the interview (Appendix 6).

The interviews were held on-line via Zoom mainly due to COVID-19 restrictions (Table 2). When starting the interview, the interviewees were informed broadly about the purpose of the thesis and the researchers' backgrounds. The interviews were recorded with permission of the interviewees at the start of each interview. This allowed us to transcript certain quotes with accuracy. In addition, notes were taken from each researcher during the interviews and were later on cross checked with the recordings. The recordings were deleted after the full transcription of the interview which was no later than one week after the interview.

Interviewee	Form	Date	Duration
Manager A	Semi-structured via Zoom	09/06/2021	30 min
Manager B	Semi-structured via Zoom	15/06/2021	45 min
Manager C	Semi-structured via Zoom	18/06/2021	60 min

*Table 2. Summary of conducted interviews*

### *3.2.3. Secondary data*

The secondary data was used to obtain information on the topic and improve overall understanding of the context the companies under study operate (Bryman et al., 2018). In addition, the secondary data was used to triangulate the findings from questionnaires and interviews (Bryman et al., 2018). Secondary data was mainly presented with companies' internal documents from corporate websites (sustainability and annual reports) and various reports on sustainability, such as Oslo Stock Exchange ESG rating report, Circularity Gap report, S-HUB State of Sustainability reports, and etc. For the companies being interviewed, further internet search was conducted in order to map out the interview questions and provide more credibility in assessing the data gained from the interviews.

### 3.3. Data analysis

The following section will explain the analysis process of surveys using descriptive analysis and interviews using transcribing and content analysis.

#### 3.3.1. Survey

Collected data was analysed through descriptive statistics with the intent to summarize it in a more compact manner and to identify the existence of control mechanisms, namely: cultural, administrative, planning, cybernetic, rewards and compensations, and internal controls. The data was exported from Qualtrics to Microsoft Excel. The following approach was used to measure answers in the questionnaire:

- Yes/No - “Yes” = 1, “No” = 0;
- Rating scale questions - from 0 to 1;
- Multiple choice questions. Each option was put into a separate row. For each option the results were calculated. If an option was chosen - 1, if not chosen - 0.

Univariate analysis, referring to analysing one variable at a time (Bryman et al., 2018) was the primary method of analysis used. The outlined approach was using tables to show the different types of variables and their measures of distribution and dispersion (Bryman et al., 2018). The data set included the following information: company name, industry, ESG ranking, job position, type and choice of questions. To summarise the data for each variable, the following measures were calculated: 1) mean and median (for all types of questions); 2) maximum and minimum values, variance and standard deviation (only for rating scale questions). Unanswered and “Do Not Know” questions were excluded from the calculations of above measurements, however, a total of unanswered and “Do Not Know” questions were calculated separately. The measures were calculated for the total sample in order to define what controls Norwegian companies are using to facilitate sustainability. In addition, the same analysis was performed for listed and unlisted companies as well as for each industry in order to define the pattern in sustainability controls.

When describing the findings for individual controls, the following labels were used: *Very Low* ( 0 to 0.14), *Low* (0.14 to 0.28), *Moderately Low* (0.20 to 0.42), *Moderate* (0.42 to 0.57), *Moderately High* (0.57 to 0.71), *High* (0.71 to 0.85) and *Very High* ( 0.85 to 1).

Subsequently, a directed content analysis of the data was carried out (Hsieh & Shannon, 2005). First, in-depth analysis was undertaken, examining each company's control package in detail (Appendix 9). Secondly, comparative analyses were performed to identify similarities and differences between the companies. This led to the proposition of five typical packages for sustainability (Table 10). Finally, these analyses served to identify patterns and theorize the path towards a complete control package for sustainability (Figure 4).

When performing package analysis, a more practical approach was used in regard to scaling. The following labels were: *Low* (0 to 0.33), *Moderate* (0.34 to 0.67) and *High* (0.68 to 1).

### 3.3.2. Interviews

The process of interview development is presented in section [3.2.2. Interviews](#) and contributes to the interview analysis process. First, each interview was transcribed to ensure the accuracy of information received. The transcripts were then analysed to define relevant information for the research (Saunders, 2015). Then the next step of the analysis was to code the transcriptions of the interviews. Defined by Bryman et al. (2018) coding is breaking down data into component parts which are given names. The coding for the interview was predetermined (as described in the section [3.2.2. Interviews](#)) to define the type of controls discussed in the interview. Having questions linking to the controls beforehand made the coding process easier and faster. This was an advantage in regards to time limits, which is one of the most common disadvantages of qualitative data analysis (Bryman et al., 2018).

## 3.4. Credibility of findings

### 3.4.1. Validity

The term “validity” can be defined as a phenomenon concerned with whether what is measured is what was intended to be measured (Bryman et al., 2018). For this research study, the following tests of validity performed (Bolarinwa, 2016):

- **Face validity:** the extent to which a questionnaire measures the content of the concept in question (Bryman et al., 2018). Regardless of its subjective nature, the face validity of the questionnaire was reasonably assured through the piloting. Four academics and two practitioners involved in sustainability or/and control systems piloted the questionnaire.
- **Content validity:** the extent to which a questionnaire represents all facets of phenomena (Bryman et al., 2018). The questionnaire was developed only after the literature review had been conducted (see the section [2.2. Control Systems](#)), which made it possible to achieve content validity. The five control elements of Malmi and Brown’s framework (2008) (planning, administrative, cultural, cybernetic, rewards and compensation) together with internal control mechanisms were covered by the questions asked in the questionnaire.
- **Construct validity:** the extent to which a questionnaire measures a characteristic that cannot be directly observed as it is assumed to exist based on patterns in people’s behaviour (Bryman et al., 2018). The construct validity of the questionnaire was assured by ensuring that all questions asked were as clear as possible, as simply stated as possible, unambiguous, non threatening and not misleading. The definitions of the terms that respondents might not be familiar with were added to the questionnaire as pop-up windows (mission statement, corporate values, organizational culture, cascaded, formalised, materiality, accurate, reliable, timely, assurance). Moreover, construct validity was also assured by piloting the questionnaire.

In addition, the validity of the research was increased through triangulation with other methods (Bryman et al., 2018). Secondary data was used for cross-checking findings. Semi-structured interviews were used for testing validity of the questionnaire.

### 3.4.2. *Reliability*

Reliability is known as the consistency of measurement and whether the results of the study are repeatable (Bryman et al., 2018). To take the replicability of a research study into account is important for any study (Remenyi et al., 1998). For this mixed approach research, the following reliability methods have been utilised.

For the qualitative research conducted, consistency was measured by using triangulation, i.e. utilizing multiple sources to perform verification and cross reference from the data findings. Triangulation was also conducted for the quantitative study, which has proved to improve confidence in findings (Webb et al., 1966). As previously mentioned, the survey questions most frequently used were Likert scale (45%), and the data collected from these questions were tested for consistency with Inter-Observer reliability also known as internal reliability, to assess the degree to which respondents have consistent estimates of the same phenomenon (Bryman et al., 2018). Inter-Observer reliability is when the observation or translation of data is judged subjectively and agreed upon by more than one observer (Bryman et al., 2018). This was conducted when the two researchers agreed on the similar notion on what gathered results observed.

It is important to note that the pilot test which was run for validation purposes also contributes to reliability, as there was the use of standardized information collection instruments and survey procedures, together with error checks that were designed to enhance consistency.

## 3.5. **Ethical consideration**

It is important that every research is conducted in a fair, unbiased and humane manner (Collis & Hussey, 2013) This ensures trust between the researcher, institution and participants (Collis & Hussey, 2013). This research conducted under BI Norwegian Business School was performed in line with the ethical guidelines formulated by National Research Ethics Committee for Social Sciences and Humanities (NESH). Ethical considerations are the collection of values taken into account during a research process. For this research, the four ethical principles were followed (Bryman et al., 2018) :



- **Protection from harm:** The types of facets to harm can be physical, participants development, stress or career prospects (Bryman et al., 2018). Online interviews and questionnaires ensured all respondents safeguard from physical harm, and providing each respondent with anonymity ensured protection from harm to career prospects.
- **Informed consent:** Before agreeing to participate, each respondent was informed of the purpose of the study through the introduction of the survey (Appendix 2) and interview email (Appendix 6). A consent form for the participation in the survey that was created following the NSD guidelines was attached to the first mandatory question of the survey (Appendix 3). A consent form for the participation in the interview was attached to the email and signed by interviewees (Appendix 5). The consent forms described the research study and relevant contact information of the researchers and institution.
- **Right to privacy:** To ensure data protection and anonymity for each respondent, the data collection and processing was treated in line with the General Data Protection Regulation (GDPR). The researchers reported to the Norwegian Centre for Research Data (NSD) and received approval for conducting the survey (Appendix 7). Participants were not identifiable (directly or indirectly) in the publications from the project. Each participant was informed of their right to privacy and anonymity through the survey email (Appendix 2) and consent forms (Appendix 3, 5). The names and contact details of participants were replaced with a code. The list of names, contact details and respective codes were stored separately from the rest of the collected data, the access was secured with the password. All personal information was deleted once the research was completed.
- **Voluntary participation:** Each participant had to communicate his/her willingness to participate in the survey by answering the first mandatory question in the survey with a consent form (Appendix 3). This was a yes/no question to agree on the participation. Before agreeing to participate, participants were also informed that their participation is voluntary, and that they have the right for withdrawal at any time if there is any feeling of inconvenience through the introduction of the survey

(Appendix 2) and consent forms (Appendix 3, 5). Also, each interviewee had to communicate his/her willingness to participate in the interview by signing a consent form prior to the interview (Appendix 5).

The research was conducted in collaboration with S-HUB. Following the ethical standards, a non-disclosure agreement (NDA) was signed between the S-HUB and the researchers.

#### **4. Findings**

The following section presents findings from both the survey and the interviews. The purpose of this section is to provide an overview of control mechanisms which Norwegian companies participated in the survey are using to achieve sustainability goals. The section begins with presenting the findings on the existence of individual control mechanisms following the structure of Malmi and Brown's framework (2008) and the designed questionnaire (Appendix 1), and then continues with the discussion of aggregated findings. All the information presented in the section was obtained from the conducted survey and interviews, therefore, no secondary sources were used, except for section [4.2. Aggregated findings](#), where findings were compared and supported with prior research. The findings contribute to answering the first research question and also serve the basis for further analysis of control patterns in Norwegian firms, which is the second research question discussed in section [5. Discussion](#).

## 4.1. Findings for individual controls

### 4.1.1. Cultural controls

Question	Mean	Median	Var	StDev
Is sustainability integrated into company's mission statement?	0.90	1.00		
Is sustainability integrated into core corporate values?	0.86	1.00		

Table 3.1. Findings for cultural controls

Extensive evidence of the application of cultural controls was obtained in all 21 researched companies. Integration of sustainability in mission statements and corporate values is a widely-adopted approach for promoting sustainability advocacy in the observed companies. 90% of the companies have integrated sustainability into mission statements and 86% of the companies have integrated sustainability into core corporate values. When discussing cultural controls of Company A, the interviewee elaborated on the importance of including sustainability in the mission statement: “[...] *the statement of purpose of the company [...] really tells you right from the get go a lot about the identity, the company, what's important to us. This is the first thing that we say about ourselves, this is sustainability.*”

Question	Mean	Median	Var	StDev
To what extent are the following communication channels used to increase employees' awareness of sustainability?				
<i>Intranet</i>	0.76	0.76	0.06	0.25
<i>Sustainability-related e-mails, newsletter</i>	0.28	0.26	0.09	0.31
<i>Internal reports on sustainability</i>	0.49	0.47	0.13	0.36
<i>Sustainability-related events, campaigns, programmes</i>	0.47	0.49	0.11	0.33
<i>Sustainability champions or ambassadors</i>	0.49	0.50	0.12	0.35
<i>Sustainability-related posters and other physical evidences (e.g. green building)</i>	0.28	0.30	0.08	0.27

Table 3.2. Findings for cultural controls

The use of an intranet platform as a means of increasing employees' awareness was the most widely used communication channel. Communication through the

intranet was complemented by a moderate use of other channels developed specifically for the purpose of communicating sustainability information to employees (95% of companies used three and more communication channels). Examples of communication channels included the use of sustainability champions or ambassadors (mean score of 0.50), sustainability-related events, campaigns, programs (mean score of 0.49) and internal sustainability reporting (mean score of 0.47). Sustainability emails and newsletters, as well as posters and other physical evidence such as green building, did not find widespread use in the researched companies (mean scores of 0.26 and 0.30, respectively).

An additional communication channel was mentioned by Manager A during the interview. To engage employees Company A launched a volunteer program aimed to solve different sustainability-related challenges. Anyone within the organization could volunteer to join the program, regardless of their level of experience, background or education. According to the Manager A, the volunteer program “*turned out to be a roaring success*”. First, the program gave people an opportunity to be engaged “*in an issue which they would not otherwise have been engaged with*” as well as “*to team with people from across the world*” and “*to shine bright.*” Second, it gave the company an opportunity to assess the real employees' engagement in sustainability. Finally, the program gave the company additional capacity to deal with sustainability issues, “*that otherwise [it] wouldn't have been able to deal with*”. As a result of the campaign, the company got “*really valuable reports*”, which have been further used for the decision-making process.

Question	Mean	Median	Var	StDev
To what extent is senior management committed to sustainability?	0.82	0.82	0.03	0.18
To what extent does organisational culture support the implementation of the sustainability strategy in your company?	0.76	0.75	0.03	0.17

*Table 3.3. Findings for cultural controls*

According to the respondents, senior management is highly committed to sustainability (mean score of 0.82). The high commitment of senior management

is consistent with the finding that aspiration of top management is one of the main reasons behind developing the sustainability strategy (mean score of 0.73). The interviewee A emphasised the importance of CEO's engagement: "[...] if the CEO is looking at [sustainability], you can be pretty sure that there's a lot of other levels in the organization who are also paying attention". Manager B added to that: "the most important [ambassador] is CEO."

Overall, the organizational culture of the surveyed companies supports the implementation of the sustainability strategy to a high extent (mean score of 0.76) which is consistent with the high integration of sustainability into cultural controls. When discussing the overall organizational culture, interviewees emphasised the role of employees to facilitate the integration of sustainability into organizational culture. Manager A commented: "The nice thing [about] the culture within the organization is that you're pushing against an open door. People welcome it. This makes business sense. You don't have to convince people [...]. They understand. [...] the value of [sustainability] is just self-evident". In contrast, Manager B discussed employees' attitude: "I think we're kind of like most companies. [...] If you see [...] a broad spectrum, we have those who are extremely passionate and they want to work with this [...]. Then we have the reluctant ones as well, [...] like climate deniers and who [...] think this is just nonsense. But the largest parts are the ones in the middle that are like, okay, I understand that we should do this, but I don't think it affects my job. Kind of like irrelevant." This is in line with their survey responses. While Manager A claimed that organizational culture supports implementation of the sustainability strategy to a very high extent (0.90), Manager B responded to a moderately low extent (0.42).

#### 4.1.2. Administrative controls

Question	Mean	Median	Var	StDev
Does the company have a formal sustainability management structure?				
Yes, centralised Sustainability Department	0.62	0.60		
Yes, decentralised Sustainability Departments	0.14	0.15		
No, sustainability issues are allocated within all departments	0.14	0.15		

To whom does the Head of Sustainability Department report?				
<i>Board of Directors</i>	0.17	0.18		
<i>CEO</i>	0.39	0.35		
<i>Top management (excl. CEO)</i>	0.61	0.64		

Table 4.1. Findings for administrative controls

76% of companies had a formal sustainability management structure, predominantly in the form of a centralised Sustainability Department (62%), and only 14% of the companies have established a decentralised structure. Another 14% of companies claim that sustainability issues were allocated within all departments without a formal sustainability management structure. One company chose the “Other” option to specify that they have both centralized and decentralized teams, while one company chose “Other” to provide the response “one dedicated person is head of sustainability”. 61% of companies have subordinated the Head of Sustainability Department to top management below CEO, 39% - to CEO, and only 17% - to the Board of Directors (2 out of 15 listed companies in the study). In three companies, two reporting lines were identified: in two companies, the Head of Sustainability Department reported to both CEO and other top management below CEO, while in one company, the Head of Sustainability Department reported to both the Board of directors and CEO.

Question	Mean	Median	Var	StDev
Does the company have sustainability-related policies and procedures?				
<i>Code of ethics (sustainability issues are integrated)</i>	0.62	0.65		
<i>Code of conduct (sustainability issues are integrated)</i>	0.86	0.85		
<i>Sustainability policy</i>	0.71	0.75		
<i>Sustainability purchasing policy</i>	0.52	0.55		
<i>Environmental policy</i>	0.67	0.65		
<i>Whistle blowing procedure</i>	1.00	1.00		
<i>None</i>	0.00	0.00		
What sustainability-related management systems are implemented in the company?				
<i>ISO 9001</i>	0.38	0.35		
<i>ISO 14001</i>	0.43	0.40		
<i>EMAS (Eco-Management and Audit Scheme)</i>	0.00	0.00		
<i>ISO 45001</i>	0.19	0.15		

<i>None</i>	0.24	0.25		
To what extent does the company carry out an examination of sustainability-related activities of its suppliers and customers?				
<i>Suppliers</i>	0.64	0.62	0.05	0.23
<i>Customers</i>	0.41	0.41	0.03	0.18

*Table 4.2. Findings for administrative controls*

The existence of administrative controls was observed with regards to policies and procedures. All of the sample companies had sustainability-related policies and procedures in place. These varied in nature: whereas all companies had a whistle blowing procedure, 86% of the companies had code of conduct, 71% - sustainability policies, 67% - environmental policies, 62% - code of ethics, 52% - sustainability purchasing policy. Five companies have established all of the above policies and procedures. One company commented in the “Other” option that there are “many related policies on specific themes.”

In addition, environmental and social management systems were observed throughout the sample. The most widely-used system is ISO 14001 (43% of companies) and ISO 9001 (38% of companies). In 8 out of 10 cases, companies certified according to one ISO management standard were also certified according to another. Using the “Other” option, six companies (29%) added Eco-Lighthouse (ELH) certification, which is Norway’s most widely used environmental management system (Miljøfyrtårn, 2020). The benefit of using ISO 14001 was mentioned by Manager A when discussing the mechanism for translating and cascading strategic sustainability goals. “[ISO] 14001 [...] was an environmental management system standard, however the management principles [...] lend themselves pretty effectively to being deployed on a broader scale of things [i.e. sustainability]. So we found that that’s a good approach.”

In addition, companies in our study carry out an examination of suppliers to a moderately high extent (mean score of 0.64) and customers - to a moderately low extent (mean score of 0.41). This was the question that the largest number of respondents did not answer (6 respondents in total; 2 - suppliers; 4 - customers). Manager C mentioned the Ethical trade initiative, which promotes responsible

business conduct in supply chains. Due diligence of suppliers is part of the initiative. First, a company's supplier must sign to the code of conduct to indicate that it has received, understood and committed to it. Then the company follow-up the requirements through audits and improvement programs together with suppliers.

Question	Mean	Median	Var	StDev
Does the company have trainings related to sustainability?	0.81	0.81		
Which groups of employees have had sustainability training?				
<i>New hires</i>	0.88	0.87		
<i>Top management</i>	0.82	0.81		
<i>Middle management</i>	0.71	0.69		
<i>Operational level employees INVOLVED directly in sustainability</i>	0.82	0.81		
<i>Operational level employees NOT INVOLVED directly in sustainability</i>	0.76	0.81		

*Table 4.3. Findings for administrative controls*

Training and learning support the appreciation of the policies (Lueg & Radlach, 2016) and are important control mechanisms for changing behavior toward sustainability (Dechant & Alman, 1994; Petrini & Pozzebon, 2010). As expected, 81% of the companies claimed that they have training related to sustainability. Overall, companies aim to train all groups of employees with the highest attention to new hires (88% of companies), operational employees directly involved in sustainability (82% of companies) and top management (82% of companies). The smaller number of companies focus on middle management education (71%) and operational employees who are not directly involved in sustainability (76%). When discussing training, Manager B highlighted that in the industry his/her company operates in “*most people have never even heard the word circular economy, [...] in general, the awareness and the competence and mindset is very low.*” He/she also added that “*everyone should improve their expertise*” related to sustainability.



#### 4.1.3. Planning controls

Question	Mean	Median	Var	StDev
Does the company have a sustainability strategy?	0.90	1.00		
To what extent is the sustainability strategy translated into specific goals?	0.85	0.84	0.04	0.20
To what extent is the sustainability strategy integrated into the core business strategy?	0.78	0.77	0.06	0.23
How often does the company review the sustainability goals?				
<i>Less frequent than the core business strategy cycle</i>	0.14	0.15		
<i>Within the core strategy cycle</i>	0.67	0.66		
<i>More frequently than core strategy cycle</i>	0.19	0.20		

Table 5.1. Findings for planning controls

Having sustainability in the agenda starts with a designated strategy (Crutzen et al., 2017), as expected 90% of the companies claimed that they had a sustainability strategy, which represents 19 out of 21 companies. Additionally, projecting sustainability through objectives and ensuring that goals are set provides meaningful direction for companies (Eccles et al., 2012). It can be seen that sustainability strategy is translated into specific goals to a very high extent (mean score of 0.85). When planning for sustainability, it is important to link it to the core business strategy (Eccles et al., 2012), and it is observed that the companies integrated sustainability planning into the core business to a high extent (mean score of 0.78). Furthermore, when it comes to reviewing the sustainable strategy, 67% of the companies review it within the core strategy, while the rest review it more frequently or less frequently than the core business strategy (19% and 14% respectively).

Question	Mean	Median	Var	StDev
To what extent does the following describe the main reasons behind developing the sustainability strategy in your company?				
<i>Compliance</i>	0.61	0.61	0.11	0.33
<i>Engagement with stakeholders</i>	0.72	0.77	0.08	0.27
<i>Efficiency</i>	0.57	0.65	0.07	0.26
<i>Competitive pressures</i>	0.59	0.53	0.08	0.28
<i>Top management aspiration</i>	0.73	0.77	0.05	0.22

Which approach does the company use to develop sustainability planning?				
<i>Top-Down</i>	0.10	0.10		
<i>Bottom-Up</i>	0.00	0.00		
<i>Mixture of Top-Down and Bottom-Up</i>	0.86	0.86		
To which level are sustainability goals cascaded within the company?				
<i>Company level</i>	0.90	0.90		
<i>Divisional level</i>	0.57	0.57		
<i>Business Unit level</i>	0.62	0.62		
<i>Department level</i>	0.43	0.43		
<i>Team</i>	0.19	0.19		
<i>Employee</i>	0.24	0.24		

Table 5.2. Findings for planning controls

There were multiple motivations chosen behind developing a sustainability strategy. Top management aspirations together with engagement with stakeholders were key leading motivators (mean score of 0.73 and 0.72 respectively). These were both emphasised during the interviews, as Manager A stated "*People don't just want a good career, they increasingly want to work with companies who contribute to a greater good. There are a number of ways to do that and sustainability is key.*" Manager B mentioned top management aspiration "*the new sustainability strategy was initiated by the CEO [...]*" together with the bad publicity experience "*[sustainability] got even more attention when we had this greenwashing campaign*". Following this is compliance (mean score of 0.61), competitive pressures (mean score of 0.59) and efficiency (mean score of 0.57).

The approach used to develop sustainability planning can affect commitment and employees' behaviours in working towards achieving the goals set (Malmi & Brown, 2008). No company had a Bottom-Up approach, but rather a mixture approach of Top-Down and Bottom-Up was leading, with an average of 86% and a lower observation of an average of 10% for the Top-Bottom and only one company left this question unanswered. Organizational factors such as aligning goals across the company can contribute to the level of applications of sustainability goals (Wisner et al., 2006). Most of the goals were cascaded to more than one level in the organization, with 17 companies having two tier levels. The

company level was leading with the mean score of 0.90, followed by the business unit level with a moderately high extent (mean score of 0.62), divisional level and department level with a moderate extent (mean scores of 0.57 and 0.43 respectively), employee level with a low extent (mean score of 0.24) and team level with a very low extent (mean score of 0.19).

#### 4.1.4. Cybernetic controls

Question	Mean	Median	Var	StDev
Which of the following best describes the development of sustainability indicators in your company? Indicators were				
<i>Selected from existing external requirements without modification</i>	0.19	0.19		
<i>Selected from existing external requirements with some modification</i>	0.38	0.35		
<i>Developed in partnership with external stakeholders</i>	0.24	0.25		
<i>Developed internally to reflect company's sustainability activities</i>	0.71	0.70		
Which indicators does the company use to measure sustainability?				
<i>Financial indicators (e.g. renewable business revenue, operational cost savings)</i>	0.48	0.45		
<i>Non-financial indicators (e.g. CO2 emission, % gender mix of male and female)</i>	0.95	0.95		
<i>Hybrid systems (e.g. balanced scorecard, management by objectives)</i>	0.29	0.26		

Table 6.1. Findings for cybernetic controls

To evaluate performance, organizations must establish indicators to measure targets (Lueg & Radlach, 2016). The various cybernetic controls were observed in all 21 companies and the non-financial indicators were seen to have an extensive application to a high extent (mean score of 0.95), followed by financial indicators to a moderate extent (mean score of 0.48) and lastly hybrid systems to a moderately low extent (mean score of 0.29). Manager A elaborated that “*the main measurement of sustainability has been non-financial performance but recently the expectation of merging financial indicators in planning for sustainability has*

*been a central part.*”. Total of 3 companies had all three measurement systems in place while the rest had mainly non-financial measurement systems.

In regards to approaches employed to develop sustainability indicators, “*the indicators were developed internally to reflect companies sustainability activities*” was used by the companies to a moderately high extent (mean score of 0.71), followed by *from existing external requirements with some modification* (mean score of 0.38), and low extent of two other options: *in partnership with external stakeholder*, and *selected from existing external requirements without modification* (mean scores of 0.24 and 0.19 respectively). Manager A commented on how they use external guidelines such as Task Force on Climate-related Financial Disclosures (TCFD) to guide development of sustainability-related financial indicators while Manager C highlighted partnerships with Ethical trade Norway and other sustainability initiatives.

Question	Mean	Median	Var	StDev
Does the company have a sustainability budget?	0.58	0.56		
To what extent is the sustainability budget integrated into the core budget?	0.90	0.90	0.03	0.17
To what extent is economic performance linked to sustainability performance?	0.54	0.52	0.08	0.27
How often is sustainability performance evaluated?				
<i>Daily</i>	0.05	0.05		
<i>Weekly</i>	0.05	0.05		
<i>Monthly</i>	0.24	0.21		
<i>Quarterly</i>	0.52	0.50		
<i>6 month</i>	0.05	0.05		
<i>9 month</i>	0.00	0.00		
<i>Yearly</i>	0.43	0.41		
<i>Never</i>	0.00	0.00		

*Table 6.2. Findings for cybernetic controls*

Budgets summarize the company's activities and are used to allocate resources needed to plan activities (Malmi & Brown, 2008). There was a moderate number of companies (58%) who had sustainability budgets. Those who had sustainability budgets argued that the sustainability budget was integrated into the core budget , to a very high extent (mean score of 0.90). Putting sustainability goals into

measurements provides the actions needed to be performed in accordance with the strategy and communicates the goals in a more comprehensive manner (Roth, 2008). The extent to which economic performance is linked to sustainability performance is moderate (mean score of 0.54). Manager B highlights the importance of attaining the right KPIs for performance reporting stating .. “*we need more numbers on our sustainability performance to track where we are and where we are moving in the right direction [...] but it seems to be difficult to find KPIs in the circular economy which is more difficult than measuring CO<sub>2</sub>*”. Furthermore, there were 2 companies that did not respond to this question, however a moderately high spread of 0.27 was noted which means some results observed had the lowest choice of 14% integration while the highest was 100% of integration. When observing how often sustainability performance is evaluated, there were 5 out of 21 companies that reviewed the performance more than once. Performance was evaluated quarterly and yearly to a moderate extent, (mean score of 0.5 and 0.43 respectively), monthly to a low extent (mean score of 0.24), then equally spread between daily, weekly and 6 months to a very low extent (mean score of 0.05).

#### 4.1.5. Rewards and compensations

Question	Mean	Median	Var	StDev
Does the company have any sustainability-related incentives, benefits and rewards for employees?	0.43	0.45		
To which groups of employees are sustainability-related incentives, benefits and rewards applied?				
<i>Senior Management</i>	0.78	0.76		
<i>Middle Management</i>	0.22	0.21		
<i>Operational level employees</i>	0.22	0.23		
<i>None</i>	0.00	0.00		
To which departments are sustainability incentives, benefits and rewards applied?				
<i>Sustainability</i>	0.33	0.33		
<i>HR</i>	0.22	0.23		
<i>Commercial(Sales)</i>	0.33	0.33		
<i>Marketing</i>	0.22	0.23		
<i>Logistics</i>	0.33	0.32		
<i>Finance</i>	0.22	0.23		
<i>IT</i>	0.11	0.12		
<i>None</i>	0.00	0.00		

*Table 7. Findings for rewards and compensations*

Rewards and compensations influence decision making and ensure accountability (Malmi & Brown, 2008). Rewards system was the rarest applied control system. Only 9 out of 21 companies (43%) have implemented a set of incentives, benefits and rewards sustainability. Manager B elaborated more on this by stating “..we are aiming to connect KPIs to our bonus incentive systems [...] there are so many incentives for how we behave, why we do what we do, and we need to get all those systems and processes to work together..”

Incentives were distributed throughout different levels and departments within the companies. Most of the incentives fell within the senior management (mean score of 0.78) while the rest shared equally between middle management and operational level employees (mean score of 0.22). The Sustainability, Commercial and Logistics departments had the highest score (mean score of 0.33), followed by the HR, Marketing and Finance departments (mean score of 0.22) and ended with the IT department (mean score of 0.11).

#### 4.1.6. Internal controls

Question	Mean	Median	Var	StDev
Has the company done materiality assessment to identify priority issues for sustainability reporting?	0.95	0.95		
To what extent has the company identified risks related to the achievement of sustainability goals?	0.69	0.68	0.05	0.21
To what extent has the company developed controls to reduce these risks?	0.62	0.61	0.03	0.18
To what extent has the company determined who is responsible for each indicator?	0.82	0.81	0.04	0.21
To what extent are sustainability-related responsibilities defined in job description?	0.50	0.51	0.08	0.29

*Table 8.1. Findings for internal controls*

While materiality assessment to identify priority issues for sustainability reporting is conducted by 95% of the companies, the extent to which companies identified risks related to the achievement of sustainability goals is only moderately high (mean score of 0.69). To the same extent companies have developed controls to

reduce these risks (mean score of 0.62). Clear definition, documentation and communication where authority and responsibility lie may contribute to the goals achievement (COSO, 2013). In regards to sustainability, companies determined who was responsible for each indicator to a high extent (mean score of 0.82), while sustainability-related responsibilities were defined in job descriptions only to a moderate extent (mean score of 0.50). Regarding the guidelines on risk management related to sustainability, Manager C emphasised the importance of TCFD guidelines: *“I think TCFD is an extremely important tool just on its own from the perspective of managing corporate risk and then being able to quantify. It is also a tool for better planning or strategic direction”*.

When discussing risk management with Manager B, he/she claimed that the company had *“sustainability as an integrated part of our risk management when it comes to regulations, access to raw materials, [...] campaigns, bad publicity.”* He/she then elaborated on the importance of risk management for sustainability: *“I also see that it is quite a good way to get attention and awareness in the company because people are used to handling risks, but we definitely need to move those risks higher up on the agenda. I mean the access to metals, minerals and resources. I do think that many companies [...] will get a shock when it hits them.”*

Question	Mean	Median	Var	StDev
To what extent is sustainability reporting process integrated into the core financial reporting process?	0.69	0.68	0.05	0.21
To what extent does the company use the following IT solutions for sustainability reporting?				
<i>Separated Excels sheets</i>	0.70	0.69	0.08	0.28
<i>Core IT solutions (e.g. ERP)</i>	0.38	0.36	0.14	0.38
<i>Separated IT solution for sustainability</i>	0.39	0.37	0.15	0.39

Table 8.2. Findings for internal controls

According to the respondents, sustainability reporting is integrated into the core financial process to a moderately high extent (mean score of 0.67). When it comes to technical integration of sustainability information, mostly separated Excel sheets were used (to a moderately high extent with a mean score of 0.7). The integration of sustainability data into core IT solutions like ERP was moderately low (mean score of 0.38), as well as the use of separated IT solutions for

sustainability reporting (mean score of 0.39). While most of the companies used Excel in combination with other IT solutions, 4 companies used only an Excel solution.

The discussion of the reporting process with Manager C generated a lot of interest as it was an unlisted company in the consumer industry with just over 100 employees. The company focuses on annual external reporting on two initiatives which it is a member of. This includes reporting on CO<sub>2</sub> emission and compliance with Ethical trade. Being part of initiatives provides the company an opportunity to learn: *“This is a huge work [...] for [...] small and big companies and we need to learn from each other. So learning from [companies], how they're doing it and also benchmarking so that we measure the same way, with the same parameters and also that we're able to track improvements”*. Overall, regarding reporting Manager C added *“I think we're best at doing stuff and not so good at measuring it. [...] We have the numbers here and there, but we really haven't put it together.”* Lack of time was defined as one of the obstacles to more holistic sustainability reporting: *“We're working on aspects. You know, time just flies doing all this stuff.”*

Question	Mean	Median	Var	StDev
To what extent is sustainability data accurate, reliable, and timely?				
<i>Accurate</i>	0.83	0.82	0.03	0.17
<i>Reliable</i>	0.82	0.81	0.03	0.16
<i>Timely</i>	0.73	0.71	0.04	0.22
Does the company use services to provide assurance?				
<i>Internal assurance service (e.g. Internal Audit)</i>	0.15	0.11		
<i>External assurance service (e.g. External Audit)</i>	0.60	0.58		
<i>None</i>	0.20	0.20		
<i>Do not know</i>	0.10	0.11		
To what extent are the methods for calculating sustainability indicators formalised?	0.74	0.76	0.06	0.24
To what extent has the company identified risks to sustainability data quality?	0.59	0.58	0.06	0.25
To what extent has the company developed controls to reduce these risks?	0.65	0.64	0.05	0.25
To what extent sustainability issues are taken into consideration during decision-making?	0.67	0.66	0.04	0.19



*Table 8.3. Findings for internal controls*

The respondents claim that sustainability data is accurate, reliable and timely to a high extent (mean scores of 0.83, 0.82 and 0.73, respectively). The high quality of data can be explained with the high use of external and internal assurance services (75% of the companies in study). 60% of companies use third-party assurance services, while 15% rely on internal assurance services. The level of data quality is also supported with the respondents responding that the methods for calculating sustainability indicators are formalised to a high extent (mean score of 0.74). At the same time, the extent to which the companies identified risks to sustainability data quality and developed controls to reduce these risks is only moderately high (mean scores of 0.59 and 0.65, respectively). According to respondents, sustainability issues are taken into consideration during decision-making to a moderately high extent (mean score of 0.67).

#### **4.2. Aggregated findings**

All control mechanisms were observed throughout the sample (Table 9), which is in line with prior research (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Riccaboni & Leone, 2010), albeit to a varying extent. Cultural and planning controls were the most widely-applied types of control. They were observed to a high extent in 17 out of 21 companies (81%). While the development of advanced systems of planning controls were observed in all reviewed prior studies (e.g., Arjaliès & Mundy, 2013; Crutzen et al., 2017), high reliance on formal controls was more arguable. While single in-depth case studies indicated the development of cultural controls and highlighted the importance of informal control systems to ensure a successful implementation of sustainable business practices (Morsing & Oswald, 2009; Riccaboni & Leone, 2010), the multiple case study of Crutzen et al. (2017) theorised that formally-established management controls were suitable for sustainability management, which is not supported with the findings of the current research.

57% of companies in the study established strong administrative and internal controls. It is worth noting, there were no companies with weak internal controls. The widespread use of administrative controls was also recognised in prior

studies, particularly when it comes to organizational structures and policies and procedures (Arjaliès & Mundy, 2013; Crutzen et al., 2017). The use of internal controls was discussed in the paper of Arjaliès and Mundy (2013) though mainly from a risk management perspective, as such, no opportunity for the comparison with the prior studies is presented. Novo Nordisk A/S is the company that appeared in both management controls and internal controls research (Herz et al., 2017; Morsing & Oswald, 2009). From the study of Morsing and Oswald (2009) it is observed the application of administrative controls to a high extent in Novo Nordisk A/S, while from the paper of Herz et al. it is seen a high reliance on internal controls, Novo Nordisk A/S case was presented as an example of best practices. Thus, indirectly, the combination of administrative and internal controls can be found in prior research.

Less evidence was identified for the advanced use of cybernetic controls for sustainability. Only 6 companies (29%) employed them to a high extent, while 7 companies (33%) were at the beginning stage. This is in line with findings of prior research (Arjaliès & Mundy, 2013; Crutzen et al., 2017). Crutzen et al. (2017) highlight that the level of sophistication of cybernetic controls was different in the observed companies, distinguishing a basic cybernetic system which is “a loose package of financial or non-financial indicators” and a complex system consisting of sustainability balanced scorecards and material flow cost accounting. Arjaliès and Mundy (2013) highlight the limited use of follow-up procedures in the design of cybernetic controls, as well as the low level of application of budgets for sustainability. The establishment of rewards and compensation controls was a challenge for most of the companies in the study. 13 companies (62%) used this type of control to a low extent, 6 companies (29%) had a presence of this mechanism to a moderate extent and only 2 companies claim they developed sustainability-related rewards and compensation to a high extent. This challenge was also identified in prior research (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Lueg & Radlach; 2016).

Extent	Cultural	Administrative	Planning	Cybernetic	Reward & Compensation	Internal Control
High	17 (81%)	12 (57%)	17 (81%)	6 (29%)	2 (10%)	12 (57%)

Moderate	3 (14%)	8 (38%)	3 (14%)	8 (38%)	6 (29%)	9 (43%)
Low	1 (5%)	1 (5%)	1 (5%)	7 (33%)	13 (62%)	0 (0%)

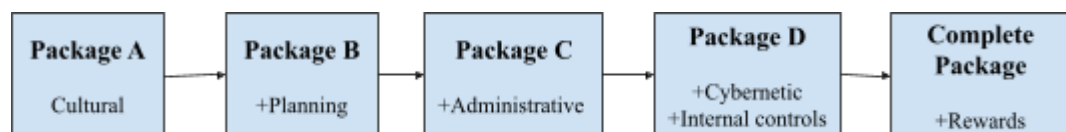
*Table 9. Aggregated findings*

## 5. Discussion

The above observations provide a better understanding of control mechanisms that Norwegian companies are using to achieve sustainability goals. However, the additional interest of the research is to explore organizational controls as a package, rather than individual mechanisms. Further in-depth analysis of the management practices of the surveyed companies (Appendix 9) revealed that not all companies relied on the same types of controls. The study identifies five distinctive packages (Table 10) and also theorizes the path towards developing a complete control package (Figure 4).

Number of companies		Cultural	Administrative	Planning	Cybernetic	Rewards & Compensation	Internal Control
H	H+M						
1	3	●	●	●	●	●	●
5	3	●	●	●	●		●
3	1	●	●	●			
2	0	●		●			
2	0	●					

*Table 10. Five types of control packages for sustainability*



*Figure 4. Theorizing the path towards a complete control package for sustainability*

As was discussed in the prior section, most companies have developed strong cultural controls. This includes not only formal inclusion of sustainability in mission statements and core values, but also broad communication of sustainability through multiple channels and, most importantly, high commitment and engagement of both senior management and employees. Advanced cultural controls are in line with expectations, since sustainability can already be seen as part of the national culture (Witoszek, 2018), sustainable development initiatives are supported and promoted at the government level (Alfsen & Greaker, 2007; Global Sustainability Hub, 2020), and public awareness is relatively high (Hellevik, 2008). Cultural controls are recognised as the most powerful as they provide the basis for understanding the concept of sustainability and the formal control mechanisms (Durden, 2008; Lueg & Radlach, 2016; Malmi & Brown, 2008). The first type of control package (Package A), in which cultural controls are highly developed and formal controls are relatively weak, was identified in two companies.

The existence of such a control package is likely to be specific to Norwegian companies that are just getting started with sustainability issues. The explanation was also supported by the study of Crutzen et al. (2017), who recalled the theoretical paper of Gond et al. (2012) and proposed that *“companies can be confronted with different kinds of barriers during this process (technical, organizational or cognitive barriers) and thus may not yet have progressed very far.”* Manager B, who works for a company that is at the beginning of its sustainability journey, discussed this: *“[...] to communicate sustainability and to increase awareness between employees that’s the first step to work. We need to tell why, what and how, so we’re still kind of on the why part.”* Thus, it can be expected that these companies are likely to develop and implement further formal controls. Crutzen et al. (2017) theorise other two explanations, which, however, are not supported by the results of this study. One is management's limited awareness of the importance of implementing management controls for sustainability, the other is that managers may simply be willing to maintain the

firm's image and reputation, rather than really operationalise sustainability and develop reliable control mechanisms (Crutzen et al., 2017).

The second configuration of controls (Package B), identified in two companies, is based on cultural and planning controls. Transition from a pure cultural package to a combination of cultural and planning controls can be explained with the following considerations. Culture is a powerful tool to direct employees' behaviour (Malmi & Brown, 2008; Simons, 1995). The intrinsic motivation of employees in combination with awareness and relevant knowledge might lead to a development of innovative ideas in the field of sustainability, and as a result, the emergence of new business models and strategies that are part of planning controls (Devloo et al., 2014; Langfield-Smith, 1997; Svensson & Funck, 2019). At the same time, relying solely on informal control may lead to management uncertainty or confusion concerning the importance assigned to sustainability issues if they are not formally recognised (Durden, 2008). Thus, communicating sustainability through goals provides meaningful direction to employees (Crutzen et al., 2017; Morsing & Oswald, 2009) and increases the probability that they assume responsibility which generally improves results (Meyer, 1994). In addition, as mentioned by Manager A, a culture itself, in order to be sustainable, requires actions in accordance with its values and belief system: *"[...] the first thing we say about ourselves [is] sustainability. And we try to hold ourselves true to it as well. [Sustainability] cascades out through all of what we do, it pervades our culture. Once you have that in place you must follow through with actions."* The study proposes that Package B is the second possible step towards developing a complete control package.

During interviews, several challenges towards development of long-term plans were discussed. Sustainability issues often require innovation and new business models (Evans et al., 2017). For example, it is a great challenge for the companies in the consumer market that try to apply the circular economy principles and switch its business from selling to providing services. Manager C reflects on this: *"We can do a lot of things backwards in the value chain, [...] but we do need to do more [...] towards making the products last for longer, and that's why we launched this concept with [...] circular services. So just starting out, not really having a great plan or a strategy behind it, but just really trying to test out on a small scale"*

*[...] but that's how we learn and get experience and see if we can evolve and scale up. [...] Our goal is to make these [sustainability]services profitable and that they will be real business models for the future”* Manager B added to this: *“We need to explore new business models maybe instead of just selling new products, we have to maybe rent them or resell them and move into the secondhand market and design products differently. [...] It will completely change how we make money and that's the hardest message to get across.”* Among critical challenges in adopting a circular economy, Manager C mentioned lack of awareness and knowledge among consumers, lack of proper infrastructure for delivering services (for example, repairment, renting) together with high logistics costs resulting from this, and insufficient government incentives and support. Similar challenges were found in the survey “The Growth of the Circular Economy” (2020) conducted by GreenBiz Group<sup>5</sup> (GreenBiz, 2020; Han et al., 2020).

The use of the third package (Package C), which includes administrative control in addition to cultural and planning control, was found in four companies. Administrative controls reinforce cultural controls and facilitate implementation of long-term and short-term goals in several ways (Malmi & Brown, 2008). The inclusion of sustainability in a formal organizational structure emphasises the priority of sustainable development for a company (Morsing & Oswald, 2009; Petrini & Pozzebon, 2010; Riccaboni & Leone, 2010). Though there is no one-size-fits-all structure (Quinn & Dalton, 2009), the benefits of having a formal structure for sustainability were highlighted in prior research (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Morsing & Oswald, 2009; Riccaboni & Leone, 2010), as well as during discussions with Managers. Thus, the role of a sustainability manager as a communicator, facilitator, pusher, and, importantly, a source of knowledge was underlined. In addition, as discussed in the prior section, ambassadors, who are seen as a communication channel, also contribute to the learning process and in some way represent a decentralized structure for sustainability. Originally designed for cultural purposes, this control mechanism enhances administrative control. The subordination of the Sustainability Department within the company also demonstrates the company’s attitude to sustainability issues (Arjaliès & Mundy, 2013; Crutzen et al. (2017). The

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<sup>5</sup> GreenBiz Group is a media and events company that accelerates the just transition to a clean economy

subordination to the Board of Directors and/or CEO is likely to signal that sustainability issues are in the spotlight (Crutzen et al., 2017; Hertz et al., 2017).

Various sustainability-related policies, procedures and management standards are widely-adopted by the observed companies to direct employee's behavior. A company's commitment to sustainable development initiatives also determines the desired behavior (Albelda Pérez et al., 2007; Witjes et al., 2017) and, in addition, provides a learning opportunity (Witjes et al., 2017), which is of high importance for SMEs that do not possess the resources available to large companies (Albelda Pérez et al., 2007; Witjes et al., 2017). Witjes et al. (2017) argued that SMEs with the triple certification are in a strong position to ensure sustainability integration, this was observed in the current study, where 8 companies were certified according to more than one management system. In the study Manager C, whose company is a member of a sustainable initiative specific for the industry it operates in, commented on the importance of joining it: *"[...] we are working together because that's where a lot of companies like ourselves. [...] It is a huge work [...] for small and big companies, and we need to learn from each other. [...] So learning from [large companies], how they're doing it and also benchmarking so that we do measure the same way, with the same parameters and also that we're able to track improvements."* This is an example, how it might be challenging to develop cybernetic controls without administrative controls in place.

The fourth configuration of control systems, the most common one (in 8 companies out of 21; 5 companies with strong development, 3 - in the transition), enriches the previous package with both cybernetic and internal control systems. The simultaneous development of both controls is not accidental. While cybernetic controls enable quantification of sustainability (Arjaliès & Mundy, 2013; Crutzen et al., 2017) and, together with administrative controls, lead to internal and external reporting, internal controls<sup>6</sup> are essential to provide assurance regarding the quality of sustainability-related information and reporting processes (COSO, 2013). The relatively widespread use of this package is in line with expectations, as the sample consists mainly of the most ambitious companies in the field of sustainability. It is worth noting that there were almost no

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<sup>6</sup> most questions on internal controls related to the quality of information and reporting process

companies with advanced cybernetic control systems which would include financial and hybrid measurement systems, which was also highlighted in the previous research (Arjaliès & Mundy, 2013; Crutzen et al., 2017).

The lack of hybrid systems may explain a weak link between economic performance and sustainability performance (Crutzen et al., 2017). For example, the use of balanced scorecards, a hybrid measurement system, was found as an effective tool for strengthening the link between sustainability issues and economic performance (Kerr et al., 2015; Lämsiluoto & Järvenpää, 2010; Morsing & Oswald, 2009). In addition, the difficulties involved in measuring the financial benefits of sustainability may be the reason for the absence of dedicated sustainability budgets in almost half of the companies, which was also proposed by Arjaliès and Mundy (2013). The authors further theorised that the lack of operational level sustainability budgets may force operations departments to focus their efforts primarily on activities that can be directly measured, such as cost-cutting actions, rather than longer-term investment opportunities. The incompleteness of cybernetic control systems is likely to prevent companies from incorporating sustainability performance into the rewards and compensation programmes (Arjaliès & Mundy, 2013).

Discussions with interviewees revealed several obstacles related to the transition from package C to package D. Regarding cybernetic controls, the lack of relevant knowledge and experience is the first obstacle (Arjaliès & Mundy, 2013). As was discussed above, memberships in relevant initiatives and professional networks can contribute to the learning process and facilitate the development of sustainability-related measurement systems (Albelda Pérez et al., 2007; Witjes et al., 2017). The second possible challenge is the lack of resources, particularly, in SMEs (Albelda Pérez et al., 2007; Witjes et al., 2017). A great example of overcoming this obstacle was provided by company A, when employees participated in the volunteer program to gather sustainability-related data that was further used for decision-making and policy development. In addition, two companies mentioned the use of external consultants for collecting data and calculating measures, like CO<sub>2</sub>. The third obstacle relates to the intangible character of some activities, for example, engagement in regulatory affairs (Arjaliès & Mundy, 2013). In terms of internal controls, the main obstacle is likely



to be the integration of sustainability into core IT solutions and core financial reporting processes that could enable cross-functional collaboration between sustainability and finance teams (Herz et al., 2017; Littan, 2019).

The complete package was identified in one company and three companies were considered as in a transition phase to the complete package. An obstacle to the development of this package lies in the area of rewards and compensations. The study finds support for the two possible reasons theorised in previous research (Arjaliès & Mundy, 2013; Crutzen et al., 2017) for the low level of incorporation of sustainability performance into rewards and compensation. First, as discussed above, the weak development of rewards and compensations can be associated with the limited use of financial and hybrid performance measurements, as well as budgets (Arjaliès & Mundy, 2013; Crutzen et al., 2017). In addition, this leads to the fact that the relationship between sustainability and economic performance remains a challenge for most companies (Arjaliès & Mundy, 2013; Crutzen et al., 2017). The second possible reason is associated with high reliance on cultural control systems and intrinsic employee motivation (Crutzen et al., 2017). Crutzen et al. (2017) proposed that using extrinsic motivation is less necessary and perhaps even counterproductive if employees are intrinsically motivated to contribute to sustainability performance. Arjaliès and Mundy (2013) highlight that the lack of rewards for sustainability performance may also indicate that managers view sustainability activities as a normal part of the organization's activities. In this case, using monetary rewards for sustainability may actually affect the performance of managers in other areas of the business.

The current study, in line with the most prior research (Arjaliès & Mundy, 2013; Durden, 2008; Morsing & Oswald, 2009; Riccaboni & Leone, 2010), theorizes that both formal and informal controls are necessary in order to achieve sustainability goals. The two control dimensions are expected to be mutually reinforcing (Durden, 2008; Malmi & Brown, 2008). Embedding one dimension alone may not be sufficient and can potentially limit or jeopardize the control package in regards to the achievement of sustainability goals (Durden, 2008). Informal control is a powerful tool to direct employees' behaviour (Malmi & Brown, 2008; Simons, 1995). It conveys the role of sustainability within the business and the attention that employees should pay to it. However, relying

solely on informal control may lead to management uncertainty or confusion concerning the importance assigned to sustainability issues if they are not formally recognised (Durden, 2008).

Formal controls signal to managers that stakeholders and sustainability goals are considered prominent and relevant within the organisation (Arjaliès & Mundy, 2013; Crutzen et al.; Durden, 2008). They recognise the need for explicit measures and a systematic monitoring approach that reflects the progress towards sustainable development (Durden, 2008; Malmi & Brown, 2008). As was shown in the above discussion, each mechanism of control systems reinforce another (Malmi & Brown, 2008). For example, strategic planning is a necessary antecedent of measuring performance against the intended goals (Lueg & Radlach, 2016). Administrative systems enhance cultural and planning controls leading to the development of cybernetic controls and internal controls, which in turn reinforce them through a feedback loop (Hertz et al., 2017; Malmi & Brown, 2008).

Overall, the theorizing of control packages is different from the study of Crutzen et al. (2017), and can be potentially explained by the use of cultural controls as foundation of control systems package in the observed companies. The difference in design may be specific to a geographic location, Norway and overall Scandinavia. The study of Morsing and Oswald (2009) who explored control systems in Novo Nordisk A/S, a Danish multinational pharmaceutical company, and the research of Svensson and Funck (2019) who studied three companies in Sweden, support the high importance of cultural controls in the observed companies.

The results of the study reveals the possibility of considering internal controls as part of a control systems package for sustainability. In addition to arguments discussed in section [2.2.5. Connecting MCS and IC](#), the research theorizes the following factors. First, when constructing the questionnaire for the study, cultural and administrative elements of both COSO framework (2013) and Malmi and Brown's Framework (2008) were found to overlap. Both frameworks see them as a basis for the further development of additional control mechanisms (COSO, 2013; Malmi & Brown, 2008). Secondly, the specificity of the concept of

sustainability, particularly its complexity and the requirement to engage stakeholders and communicate the progress towards sustainable development, signal the need for incorporation of internal controls into the package. Finally, the results indicate that the companies in the study are likely to simultaneously develop cybernetic and internal controls, after developing cultural, planning and administrative controls. This shows that internal control and MCS do not operate in isolation, but rather reinforce each other, the argument proposed by Malmi and Brown (2008) for the package approach. Thus, the study proposes the following configuration of controls systems package for sustainability (Figure 5).

Cultural Controls			
Planning Controls	Cybernetic Controls	Internal Controls over reporting	Reward & Compensation
Administrative Controls			

Figure 5. Control Systems package

## 6. Conclusion

The thesis aimed to empirically investigate control mechanisms employed by Norwegian companies in achieving sustainability goals and explore possible sustainability control patterns. The results of this study provide a better understanding of the use and design of control systems for sustainability and draw conclusions about the patterns of modern corporate practice in Norway.

In answering the first research question “*What control mechanisms are Norwegian companies using to achieve sustainability goals?*”, the study identifies that all control mechanisms were deployed in the researched companies, albeit to a varying extent. Cultural and planning controls were the most widely-applied types of control, while establishment of rewards and compensation controls was a challenge for most of the companies in the study. The findings support the prior research, which emphasises that formal and informal controls are both necessary in order to really operationalize sustainability and achieve sustainability goals (Durden, 2008; Lueg & Radlach, 2016; Morsing & Oswald, 2009; Riccaboni & Leone, 2010).

In answering the second research question “*What are the patterns of sustainability controls employed by Norwegian companies?*”, the study identifies five distinct control systems packages and theorizes the path towards developing a complete control package, discussing obstacles to moving from one package to another and, where possible, how to overcome them. Although arguments for the existence of each package were found, it is theorised that, in the long run, companies are likely to revert to the Package D, which excludes only the rewards and compensation controls, or to the complete package. The research highlights the interactive and dynamic character of control systems for sustainability and emphasises the focus on a control systems package rather than isolated control mechanisms as proposed by Malmi and Brown (2008). As argued by Crutzent et al. (2017) relying on only one type of management control, either formal or informal, “*involves a risk of internal organizational conflicts*”.

In addition, the results of the study reveal the possibility of considering internal controls as part of a control systems package and propose to extend the Malmi and Brown’s framework (2008) when applying to sustainability issues. Several arguments in favor of this approach are theorised. First, cultural and administrative elements of both COSO framework (2013) and Malmi and Brown’s framework (2008) were found to overlap. Secondly, the specificity of the concept of sustainability, particularly its complexity and the requirement to engage stakeholders and communicate the progress towards sustainable development, signal the need for incorporation of internal controls into the package. Finally, the results indicate that the companies in the study are likely to simultaneously develop cybernetic and internal controls, which shows that internal control and MCS do not operate in isolation, but rather reinforce each other.

## **7. Practical implication**

Companies are increasingly concerned about sustainability. The current study offers several insights for practitioners. Firstly, the proposed classification based on the frameworks of Malmi and Brown (2008) and COSO (2013) supports managers in analyzing the control packages they have adopted so far. In addition, the questionnaire designed for this research can serve as a guidance or self-assessment tool for practitioners to understand the position of their companies in regards to the development of individual control systems, as well as a package.

The condensed knowledge on contemporary practices obtained from the literature review together with the finding of modern management practices in Norway can contribute to additional insights and the learning process. As a result of the assessment, companies can allocate their resources on those control mechanisms that fulfill the achievement of their sustainability goals most efficiently and/or effectively.

Secondly, the research highlights the interactive and dynamic character of control systems for sustainability. Thus, the focus on a control systems package rather than isolated control mechanisms is emphasised. Although cultural and planning were the dominant controls in the observed companies, the current study highlights that both formal and informal controls are likely to be necessary in order to achieve sustainability goals. In addition, the study theorizes the path towards developing a complete control package, discussing the characteristics of each package, as well as obstacles to moving from one package to another and where possible, how to overcome them.

## **8. Limitations and future research**

The study contains several limitations which indicate that caution should be exercised in relying on these results without conducting further research. First, while the use of a questionnaire is a useful way to identify control mechanisms for sustainability used in a group of companies (Arjaliès & Mundy, 2013), the current research design limits the detailed understanding of control practices in individual companies along with interactions between control systems, barriers to integrating sustainability into traditional management systems, and opportunities to overcome them. Although interviews were conducted to explore participants' views in more depth, there were only 3 interviews, which means that the views of 18 individuals were excluded from consideration and may also impact the theorising of patterns for control packages. In addition, the survey had a low response rate of 21%, meaning that the results do not represent a whole sample of Norwegian firms. This limits the generalization of findings and increases the risk of biasness (Bryman et al., 2018). Despite the limitations of the design, the call for future survey studies remains relevant (Crutzen et al., 2017) to produce more

generalisable findings and provide a broad picture of management practices in the field of sustainability.

Second limitation is associated with the difficulties to determine the population (Bryman et al., 2018): while the population of companies listed in Oslo Stock Exchange and engaged in sustainability is likely to be complete, no data source was found that could accurately determine how many other Norwegian companies are active in the field of sustainability. In addition, the final sample was very diverse and included different industries, business ownership, companies sizes, and roles of the respondents which can be advantageous but also limiting as it could make the sample less representative and the results less generalizable.

Potential future research could be conducted with a larger sample size focusing on either listed or unlisted companies possibly from one industry. Despite its limitations, the study highlights some of the characteristics of SMEs, in particular the lack of resources, and, as a consequence, a limited knowledge, which can affect the design of the package. Consideration of sustainability control packages for SMEs could be a fruitful avenue for further research. Of additional interest may be how companies of this type overcome the obstacles identified. The specificities of Norwegian context in regards to sustainability suggest that different results might be obtained (e.g., Crutzen et al., 2017). Thus, it would be interesting to conduct similar studies in different countries.

Another limitation is the ability of respondents to answer questions, given that respondents may have different levels of knowledge and different degrees of involvement in processes related to sustainable development. This was additionally challenged by the fact that the questionnaire included diverse topics, like operations, risk management, finances, and corporate governance. The limitation of the knowledge was evidenced by the fact that some of the questions were left unanswered or the answers “do not know” were given. The findings of the study show that sustainability goes beyond just the Sustainability Department, but rather is cascaded to different organizational levels and allocated between all departments within the company. Most of the respondents and interviewees were sustainability managers; thus, not considering the point of view of other roles engaged in sustainability limits the research (Gomez & Rodriguez, 2011; Testa et

al., 2014). It may be useful for future research to involve managers with different roles, such as Chief Financial Officers or other process owners, to gain a holistic view and capture the perspectives of all departments involved in sustainability.

Most prior studies take a snapshot of existing corporate practices at a particular time (e.g. Arjaliès & Mundy, 2013, Morsing & Oswald, 2009; Riccaboni & Leone, 2010), while very few studies examine the development of control systems for sustainability in the long run. The current study also studied the phenomenon at a particular time that was best suited for the master's thesis project due to the time constraint of one semester. Thus, conducting longitudinal studies is of high interest. The longitudinal research could provide a better understanding of how organizations adapt different types of controls and how the control systems interact within the time. Future research could also shed light on the issue of how long it takes to arrive at a complete controls package for sustainability, and how organizations cope with any obstacles occurring during the integration of sustainability into traditional control systems. Longitudinal studies are necessary in the field of sustainability because its integration occurs over a considerable period of time (Contrafatto & Burns, 2013).

Finally, future research can consider further investigation of interaction of control systems for sustainability, potentially employing the proposed control systems package that includes both MCS and internal controls (Figure 5). Given the novelty of this topic, further research can explore if there is a change in the control package over time and if the development towards a full package is necessary for the achievement of sustainability goals. In addition, future research could explore contextual factors that determine the design of control systems packages; as discussed earlier, contextual factors can include industry, geographic locations, cultures, companies size, ownership, etc. Thus, future researchers have many options to theoretically interpret the relationships between control practices and their context. Lastly, developing a statistical model to study the influence of package design on the sustainability performance may be of research value. This potentially can create data-driven models that can be tested for predictive accuracy and allowing quantitative results in explaining relationships between control mechanisms and sustainability success.

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## Appendixes

### Appendix 1: Questionnaire

Q1 I have received and understood [information](#) about the project. I give consent to participate in this survey and for my personal data to be processed until the end date of the project:

☐ Yes

☐ No

Q2 Is sustainability integrated into company's mission statement?

☐ Yes

☐ No

☐ Do not know

Q3 Is sustainability integrated into core corporate values?

☐ Yes

☐ No

☐ Do not know


Q4 Does the company have a sustainability strategy?

☐ Yes

☐ No

☐ Do not know

Q5 To what extent does the following describe the main reasons behind developing the sustainability strategy in your company?

Strategy in your company?		Very low	Very high	Do not know		
		0	25	50	75	100
	Compliance					
	Engagement with stakeholders					
	Efficiency					
	Competitive pressures					
	Top management aspiration					

Q6 To what extent is the sustainability strategy integrated into the core business strategy?

	Very Low		Very High		Do not know
	0	25	50	75	100



Q7 How often does the company review the sustainability strategy?

- ☐ Less frequently than the core business strategy cycle
- ☐ Within the core business strategy cycle
- ☐ More frequently than the core business strategy cycle
- ☐ Do not know

Q8 Does the company have a formal sustainability management structure?

- ☐ Yes, centralized Sustainability Department
- ☐ Yes, decentralized Sustainability Departments
- ☐ No, sustainability issues are allocated within all departments
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

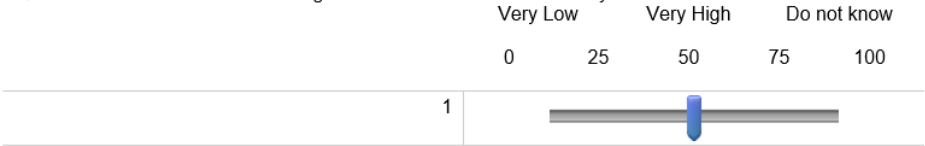
Q9 To whom does the Head of Sustainability Department report?

- ☐ Board of Directors
- ☐ CEO
- ☐ Top management (excl. CEO)
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

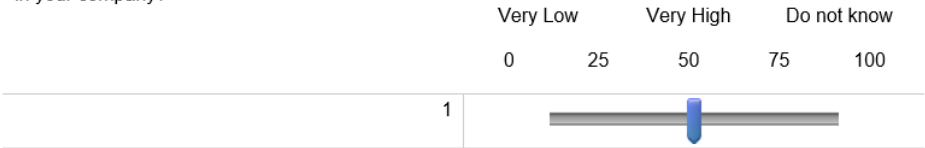
Q10 Does the company have sustainability-related policies and procedures?

- ☐ Code of ethics (sustainability issues are integrated)
- ☐ Code of conduct (sustainability issues are integrated)
- ☐ Sustainability policy
- ☐ Sustainability purchasing policy
- ☐ Environmental policy
- ☐ Whistle blowing procedure
- ☐ None
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

Q11 To what extent is senior management committed to sustainability?



Q12 To what extent does organizational culture support the implementation of the sustainability strategy in your company?



Q13 To what extent is the sustainability strategy translated into specific goals?

Very low      Very high      Do not know  
0      25      50      75      100



Q14 To which levels are sustainability goals cascaded? Cascading goals are goals that are translated from one level of an organization to the next within the company?

- ☐ Company level
- ☐ Divisional level
- ☐ Business Unit level
- ☐ Department level
- ☐ Team
- ☐ Employee
- ☐ Do not know

Q15 To what extent has the company identified risks related to the achievement of sustainability goals?

Very Low      Very High      Do not know  
0      25      50      75      100



Q16 To what extent has the company developed controls to reduce these risks?

Do not know

0      25      50      75      100



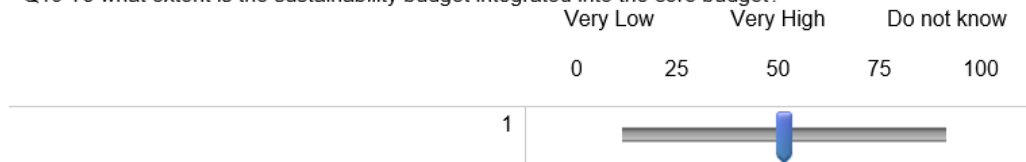
Q17 Which approach does the company use to develop sustainability planning?

- ☐ Top-Down
- ☐ Bottom-Up
- ☐ Mixture of Top-Down and Bottom-Up
- ☐ Do not know

Q18 Does the company have a sustainability budget?

- ☐ Yes
- ☐ No
- ☐ Do not know

Q19 To what extent is the sustainability budget integrated into the core budget?



Q20 Which indicators does the company use to measure sustainability performance?

- ☐ Financial indicators ( e.g. renewable business revenue, operational cost savings)
- ☐ Non-financial indicators (e.g. CO2 emission, % gender mix of male and female)
- ☐ Hybrid systems (e.g. balanced scorecard, management by objectives)
- ☐ Other, please specify \_\_\_\_\_

Q21 What sustainability-related management systems are implemented in the company?

☐ ISO 9001

☐ ISO 14001

☐ EMAS (Eco-Management and Audit Scheme)

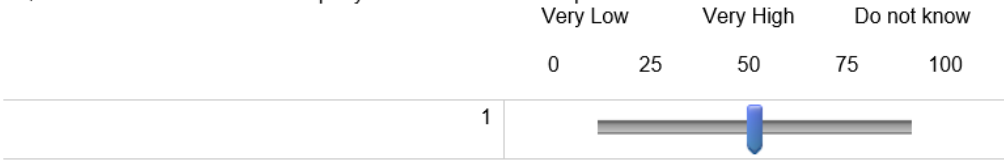
☐ ISO 45001

☐ None

☐ Do not know

☐ Other, please specify \_\_\_\_\_

Q22 To what extent has the company determined who is responsible for each indicator?



Q23 To what extent are the methods for calculating sustainability indicators formalised?



Q24 How often is sustainability performance evaluated?

☐ Daily

☐ Weekly

☐ Monthly

☐ Quarterly

☐ 6 month

☐ 9 month

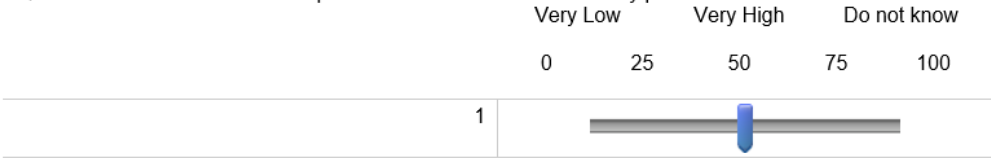
☐ Yearly

☐ Never

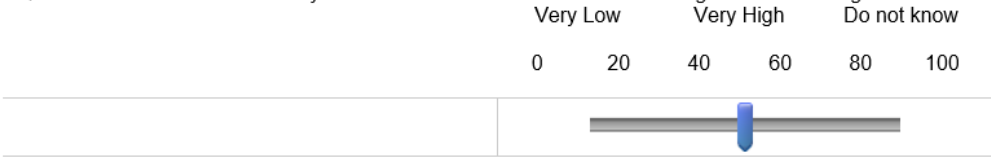
☐ Do not know

☐ Other, please specify \_\_\_\_\_

Q25 To what extent is economic performance linked to sustainability performance?



Q26 To what extent sustainability issues are taken into consideration during decision-making?





Q27 To what extent does the company carry out an examination of sustainability-related activities of its suppliers and customers?



Q28 Which of the following best describes the development of sustainability indicators in your company?

- ☐ Indicators were selected from existing external requirements without modification
- ☐ Indicators were selected from existing external requirements with some modification
- ☐ Indicators were developed in partnership with external stakeholders
- ☐ Indicators were developed internally to reflect company's sustainability activities
- ☐ Do not know

Q29 Does your company report on sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

Q30 Has the company done materiality assessment to identify priority issues for sustainability reporting?

- ☐ Yes
- ☐ No
- ☐ Do not know

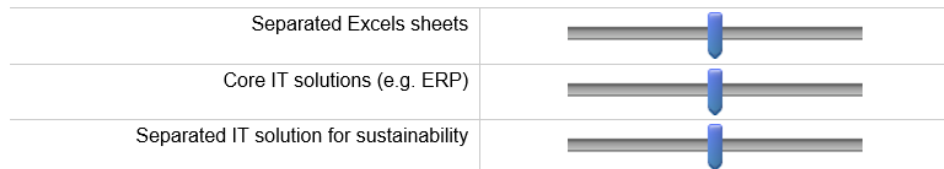
Q31 To what extent is sustainability reporting process integrated into the core financial reporting process?

Very Low      Very High      Do not know  
0      25      50      75      100



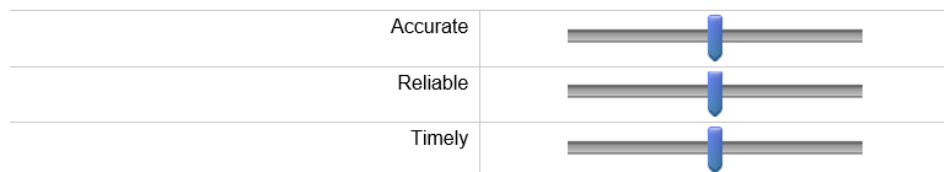
Q32 To what extent does the company use the following IT solutions for sustainability reporting?

Very low      Very high      Do not know  
0      25      50      75      100



Q33 To what extent is sustainability data accurate, reliable and timely?

Very Low      Very High      Do not know  
0      25      50      75      100



Q34 To what extent has the company identified risks to sustainability data quality?

Very Low      Very High      Do not know  
0      25      50      75      100



Q35 To what extent has the company developed controls to reduce these risks?

Very Low      Very High      Do not know  
0      25      50      75      100



Q36 Does the company use services to provide over reported sustainability information?

- ☐ Internal assurance service (e.g. Internal Audit)
- ☐ External assurance service ( e.g. External Audit)
- ☐ None
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

Q37 Does the company have any sustainability-related incentives, benefits and rewards for employees?

- ☐ Yes
- ☐ No
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

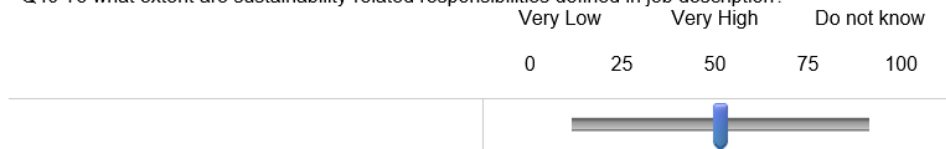
Q38 To which groups of employees are sustainability-related incentives, benefits and rewards applied?

- ☐ Senior management
- ☐ Middle management
- ☐ Operational level employees
- ☐ None
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

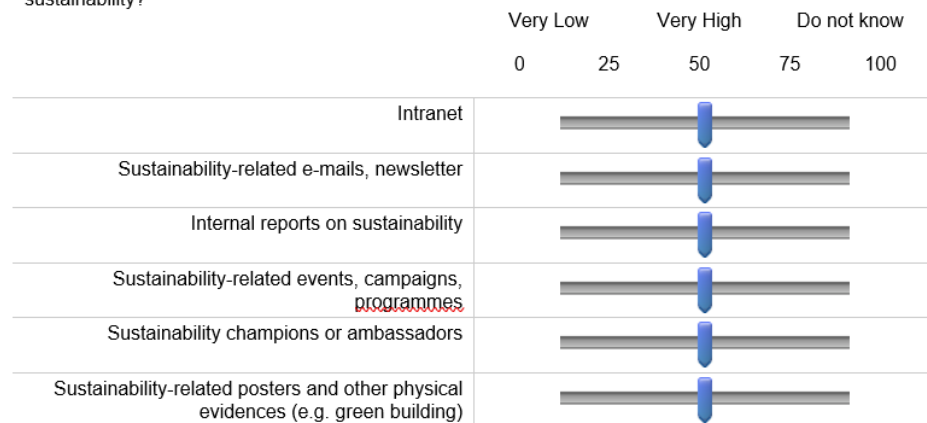
Q39 To which departments are sustainability incentives, benefits and rewards applied?

- ☐ Sustainability (CSR)
- ☐ HR
- ☐ Commercial (Sales)
- ☐ Marketing
- ☐ Logistics
- ☐ Finance
- ☐ IT
- ☐ None
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

Q40 To what extent are sustainability-related responsibilities defined in job description?



Q41 To what extent are the following communication channels used to increase employees awareness of sustainability?



Q42 Does the company have trainings related to sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

Q43 Which groups of employees have had sustainability training?

- ☐ New hires
- ☐ Top management
- ☐ Middle management
- ☐ Operational level employees INVOLVED directly in sustainability
- ☐ Operational level employees NOT INVOLVED directly in sustainability
- ☐ None
- ☐ Do not know
- ☐ Other, please specify \_\_\_\_\_

---

Q44 Would you like to take part in an interview to follow up this survey? Participants and companies will not be recognizable in publications.

- ☐ Yes
  - ☐ No
-

## Appendix 2: Survey Invitation Email



Dear «First\_Name»,

While companies' interest in sustainability has grown globally, management controls for sustainability are still under development. BI Norwegian Business School Master students in collaboration with Sustainability Hub Norway are conducting research to explore controls that Norwegian companies use to manage sustainability. By identifying the strength and weaknesses of modern corporate practice, we aim to reveal best practices to accelerate sustainable development.

For this thesis study, we are focused on the most ambitious companies and frontrunners in sustainability marathon. We invite you to participate in our survey because we strongly believe that «Company» is among these companies. As a thank you, we will send you a summary of survey results this fall.

**[Complete Survey Here.](#)**

*The survey should take around 15 minutes. Your participation is completely voluntary. You may leave blank any questions you do not wish to answer. Please be assured that your responses are completely confidential and any personal data will not be used for other any purposes than the research itself.*

Thank you in advance for the participating in this effort.

Sincerely yours,

**Sherina Rendini & Evgeniia Kochubei**  
Master Students  
BI Norwegian Business School

**Andreas Friis**  
Founder & Executive Director  
Sustainability Hub Norway

## Appendix 3: Survey Consent Form

### Who is responsible for the research project?

BI Norwegian Business School is the institution responsible for the project. The research project is conducted in collaboration with Sustainability Hub Norway.

### Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

### Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The individuals who will have access to personal data is the project group: Sherina Rendini and Evgeniia Kochubei (Master students of BI Norwegian Business School) and Flemming T. Ruud (supervisor of the project and Professor of BI Norwegian Business School)

We will replace your name and contact details with a code. The list of names, contact details and respective codes will be stored separately from the rest of the collected data, the access will be secured with the password. Participants will not be identifiable (directly or indirectly) in the publications from the project.

The following data processors will be used to collect and store data: Qualtrics (BI), online survey provider, and Microsoft OneDrive (BI), cloud service provider.

### What will happen to your personal data at the end of the research project?

The project is scheduled to end 01.07.2021. The personal data will be deleted at the end of the project.

### Your rights

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

### What gives us the right to process your personal data?

We will process your personal data based on your consent.

Based on an agreement with BI Norwegian Business School, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with data protection legislation.

### Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- BI Business School via Flemming T. Ruud, [flemming.ruud@bi.no](mailto:flemming.ruud@bi.no); Sherina Rendini via [sherina.s.rendini@student.bi.no](mailto:sherina.s.rendini@student.bi.no) and Evgeniia Kochubei [evgeniia.kochubei@student.bi.no](mailto:evgeniia.kochubei@student.bi.no)
- Our Data Protection Officer: Vibeke Nesbakken [vibeke.nesbakken@bi.no](mailto:vibeke.nesbakken@bi.no)
- NSD – The Norwegian Centre for Research Data AS, by email: ([personvermtjenester@nsd.no](mailto:personvermtjenester@nsd.no)) or by telephone: +47 55 58 21 17.

## Appendix 4: Survey Reminder Email



Dear [ first name],

We are pleased to share with you that we have received great feedback from survey participants. They've expressed their interest in the final results to gain a broader view of sustainability in Norway.

Aimed to contribute to sustainable development, we would like to improve even more the results by hearing from more companies!

We would like to hear from you and kindly invite you to participate in our survey. We strongly believe that [ company ] is a key player for sustainability future in Norway, and your participation will greatly help in shaping the sustainability roadmap for all of us.

[Complete Survey Here.](#)

*The survey should take around 15 minutes. Your participation is completely voluntary. You may leave blank any questions you do not wish to answer. Please be assured that your responses are completely confidential and any personal data will not be used for other any purposes than the research itself.*

Thank you in advance for the participating in this effort.

Sincerely yours,

**Sherina Rendini & Evgeniia Kochubei**  
Master Students  
BI Norwegian Business School

**Andreas Friis**  
Founder & Executive Director  
Sustainability Hub Norway



## Appendix 5: Interview Consent Form

### Consent form

- ▲ This is an inquiry about participation in a research project where the main purpose is to explore corporate sustainability practices among Norwegian companies. In this letter we will give you information about the purpose of the project and what your participation will involve.

▲

#### ▲ Purpose of the project

While companies' interest in sustainability has grown globally, management controls for sustainability are still under development. BI Norwegian Business School Master students majoring in Accounting and Business Control in collaboration with Sustainability Hub Norway are conducting research to explore controls that Norwegian companies use to manage sustainability. By identifying the strength and weaknesses of modern corporate practice, we aim to reveal best practices to accelerate sustainable development.

#### Who is responsible for the research project?

BI Norwegian Business School is the institution responsible for the project. The research project is conducted in collaboration with Sustainability Hub Norway.

#### Why are you being asked to participate?

For this study, we are focused on the most ambitious companies and frontrunners in sustainability marathon. We invite you to participate in the interview because we strongly believe that *Company X* is among these companies.

#### Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

#### Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The individuals who will have access to personal data is the project group: Sherina Rendini and Evgeniia Kochubei (Master students of BI Norwegian Business School) and Flemming T. Ruud (supervisor of the project and Professor of BI Norwegian Business School)

We will replace your name and contact details with a code. The list of names, contact details and respective codes will be stored separately from the rest of the collected data, the access will be secured with the password. Participants will not be identifiable (directly or indirectly) in the publications from the project.

Microsoft OneDrive, cloud service provider, will be used to store data.

**What will happen to your personal data at the end of the research project?**

The project is scheduled to end 1.07.2021. The personal data, including any digital recording, will be deleted at the end of the project.

**Your rights**

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

**What gives us the right to process your personal data?**

We will process your personal data based on your consent.

Based on an agreement with BI Norwegian Business School, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with data protection legislation.

**Where can I find out more?**

If you have questions about the project, or want to exercise your rights, contact:

- BI Business School via Flemming T. Ruud, [flemming.ruud@bi.no](mailto:flemming.ruud@bi.no);
- Sherina Rendini via [sherina.s.rendini@student.bi.no](mailto:sherina.s.rendini@student.bi.no) and Evgeniia Kochubei [evgeniia.kochubei@student.bi.no](mailto:evgeniia.kochubei@student.bi.no)
- Our Data Protection Officer: Vibeke Nesbakken [vibeke.nesbakken@bi.no](mailto:vibeke.nesbakken@bi.no)
- NSD – The Norwegian Centre for Research Data AS, by email: ([personverntjenester@nsd.no](mailto:personverntjenester@nsd.no)) or by telephone: +47 55 58 21 17.

*Sincerely yours,*

***Sherina Rendini & Evgeniia Kochubei***

*Master Students of BI Norwegian Business School (BI)*

**Consent form**

I have received and understood information about the above-described project and have been given the opportunity to ask questions. I give consent:

- ☐ to participate in an interview
- ☐ for my personal data to be processed until the end date of the project, approx. 01.07.2021

(Signed by participant, date)

## Appendix 6: Interview Guide

### Interview Invitation Email

Hello [name],

Thank you so much for taking interest in our survey and we are glad to invite you for a 1 hour interview to hear your more on your insights. We are hoping there is a possibility to set a date and time in the next week?

Once confirmed, we will send you more information regarding questions and formality.

The recording will only be available to the interviewer and BI Norwegian Business School. The recording will in no way be used for any other purpose than for the analysis of this research and will be deleted after the thesis deadline of 1<sup>st</sup> July 2021. In the resulting thesis, your participation will be anonymized by default.

Kind Regards,  
Sherina Rendini & Evgeniia Kochubey

### Interview Semi-structured question Email

#### Manager A

Hello [name],

Thank you for your confirmation, [Date, time] sounds very good! We have sent an invite for the zoom interview. Please sign **the consent form attached**.

The interview guiding questions are

1. Can you describe the elements of the *company's X* culture that support the implementation of sustainability strategy?
2. Can you describe the organizational structure regarding sustainability?
3. Which instruments does the company use to cascade sustainability goals from top to down?
4. *Company X* only uses non-financial indicators for measuring sustainability performance, please elaborate on this?
5. How is the process of risk assessment and internal controls developed?

The recording will only be available to the interviewer and BI Norwegian Business School. The recording will in no way be used for any other purpose than for the analysis of this research and will be deleted after the thesis deadline of 1<sup>st</sup> July 2021.

In the resulting thesis, your participation will be anonymized by default. Looking forward to the interview.

Kind Regards,  
Sherina Rendini & Evgeniia Kochubey

|

## Manager B

Hello [name],

Thank you for your confirmation, [Date, time] sounds very good! We have sent an invite for the zoom interview. Please sign **the consent form attached**.

The interview guiding questions are

1. Please tell us *Company's X* history on sustainability
2. What are the obstacles towards setting sustainability strategy goals?
3. What are the obstacles towards sustainability strategy implementation in the company ?
4. Overall, is risk management well developed in the company?
5. Can you tell us more about the reward and trainings systems for employees on sustainability in the company?

The recording will only be available to the interviewer and BI Norwegian Business School. The recording will in no way be used for any other purpose than for the analysis of this research and will be deleted after the thesis deadline of 1<sup>st</sup> July 2021.

In the resulting thesis, your participation will be anonymized by default. Looking forward to the interview.

Kind Regards,  
Sherina Rendini & Evgeniia Kochubey

## Manager C

Hello [name],

Thank you for your confirmation, [Date, time] sounds very good! We have sent an invite for the zoom interview. Please sign **the consent form attached**.

The interview guiding questions are

1. Can you briefly explain the sustainability journey of *Company X*?
2. Can you describe what are the obstacles in implementing circular economy in *Company X*?
3. How does the company carry out an examination of sustainability-related activities of its suppliers and customers?
4. How is sustainability reported in your company?
5. Can you tell us more about the reward and trainings systems for employees on sustainability in the company?

The recording will only be available to the interviewer and BI Norwegian Business School. The recording will in no way be used for any other purpose than for the analysis of this research and will be deleted after the thesis deadline of 1<sup>st</sup> July 2021.

In the resulting thesis, your participation will be anonymized by default. Looking forward to the interview.

Kind Regards,  
Sherina Rendini & Evgeniia Kochubey

## Appendix 7: NSD approval



### Melding

15.04.2021 19:16

Behandlingen av personopplysninger er vurdert av NSD. Vurderingen er:

Our assessment is that the processing of personal data in this project will comply with data protection legislation, so long as it is carried out in accordance with what is documented in the Notification Form and attachments, dated 15.04.2021. Everything is in place for the processing to begin.

## Appendix 8: ESG 100 ranking

Norsk Hydro	A+	Kongsberg Automotive	B	Fjordkraft Holding	D
Yara International	A+	Kværner	B	Norwegian Air Shuttle	D
Aker Solutions	A	Norske Skog	B	Norwegian Finans Holding	D
Borregaard	A	Norwegian Property	B	Ocean Yield	D
Entra	A	Shelf Drilling	B	Sbanken	D
Equinor	A	SpareBank 1 Nord-Norge	B	Selvaag Bolig	D
Europris	A	SpareBank 1 SMN	B	SpareBank 1 Ringerike Hadeland	D
Gjensidige Forsikring	A	Sparebanken Vest	B	SpareBank 1 Østfold Akershus	D
Grieg Seafood	A	Subsea 7	B	Sparebanken Møre	D
Mowi	A	TietoEVRY	B	Axactor	E
Orkla	A	XXL	B	B2Holding	E
Scatec Solar	A	Golden Ocean Group	B-	Bonheur	E
Telenor	A	Norway Royal Salmon	B-	Bouvet	E
Aker BP	A-	Wilh, Wilhelmsen Holding	B-	Crayon Group Holding	E
Atea	A-	Avance Gas Holding	C	DNO	E
Bakkafrost	A-	Borr Drilling	C	Medistim	E
DNB	A-	BW LPG	C	Norwegian Energy Company	E
Kongsberg Gruppen	A-	FLEX LNG	C	NTS	E
Lerøy Seafood Group	A-	Frontline	C	Olav Thon Eiendomsselskap	E
Nordic Semiconductor	A-	Hexagon Composites	C	PCI biotech	E
SalMar	A-	NRC Group	C	Protector Forsikring	E
Schibsted	A-	Odffell Drilling	C	RAK Petroleum	E
SpareBank 1 Østlandet	A-	PGS	C	Salmones Camanchaca	E
Storebrand	A-	SATS	C	Self Storage Group	E
TGS-NOPEC Geophysical Company	A-	SpareBank 1 BV	C	Solon Eiendom	E
Veidekke	A-	Stolt-Nielsen	C	VoW (Scanship Holding)	E
Elkem	B+	Tomra Systems	C	Komplett Bank	F
SpareBank 1 SR-Bank	B+	Wallenius Wilhelmsen	C	NEL	F
Adevinta	B	Aker	D	Northern Drilling	F
AF Gruppen	B	AKVA Group	D	Otello Corporation	F
Akastor	B	Arcus	D	Pareto Bank	F
Austevoll Seafood	B	Arendals Fossekompani	D	Treasure	F
BW Offshore Limited	B	Data Respons	D		
Høegh LNG Holdings	B	Fjord1	D		

(Governance Group, 2020)

## Appendix 9: Summary of each company's control packages

N o#	Listed/ Unlisted	Industry	Cultural	Administrative	Planning	Cybernetic	Rewards & Compensation	Internal Control
1	L	Energy	H	H	H	H	L	H
2	U	Consumer Goods	M	M	H	L	M	M
3	U	Consumer Goods	H	M	H	L	L	M
4	L	Finance	H	H	H	H	M	H
5	L	Constructi on	H	H	H	H	L	H
6	L	Marine	M	H	H	M	L	H
7	L	Other	H	H	H	M	M	H
8	U	Consumer Goods	H	H	H	M	L	M
9	L	IT	H	H	H	M	L	H
10	L	IT	H	M	H	M	L	H
11	L	Finance	H	H	H	L	L	M
12	L	Energy	H	M	H	M	H	H
13	U	Consumer Goods	H	H	H	H	H	H
14	L	Energy	H	H	H	H	M	H
15	L	Constructi on	M	M	H	M	M	H
16	L	Consumer Goods	H	M	M	L	L	M
17	L	Marine	H	M	M	L	M	M
18	L	Constructi on	L	M	L	L	L	M
19	U	Consumer Goods	H	H	H	M	L	M
20	U	Consumer Goods	H	H	H	H	L	H
21	L	Energy	H	L	H	L	L	M

### Appendix 10: Literature search strategy

Parameters	Subject terms
Language	English
Database and search Engine	Google scholar Oria (Online BI library) ScienceDirect ProQuest Springer ResearchGate
Search terms and keywords	Management Control Systems CSR sustainability Sustainable development Internal controls Sustainability in Norway Circular economy Triple bottom line Control Systems Reporting Control Packages Sustainability Management Control Systems Sustainable Reporting ESG COSO framework Malmi and Brown's framework
Literature Type	Journal articles Websites Annual reports Reports Newspaper articles/ blogs Books Theses
Publication period	1965 - 2021