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Management control practices for the sustainability transformation in the European construction industry

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Abstract

Purpose – While research on sustainability reporting in the construction industry has already provided comprehensive findings, the purpose of this paper is to answer the question of how construction companies anchor the topic of sustainability in their strategic and operative management control practices. The implementation of sustainable business models and sustainability strategies requires proper management control instruments or mechanisms that support the transformation process or make it possible in the first place.

Design/methodology/approach – A qualitative content analysis based on deductive and inductive procedures was conducted. 39 sustainability reports published by the largest construction companies in the EU were examined.

Findings – Valuable insights are provided by showing which control instruments and mechanisms are used to improve corporate sustainability performance as well as how these are linked systematically. The results show that the focus is on strategic planning, cultural and administrative controls, while short-term targets, which could set out the path to achieving the long-term sustainability goals set, are often not reported. Strategic stakeholder theory and legitimacy theory provide explanations for the use of management control practices identified.

Originality/value – Previous studies often focus on selected single control practices and miss holistic approaches for investigating corporate sustainability in construction companies. Furthermore, theoretical perspectives with instrumental and socio/political views on corporate sustainability help us explain the control practices applied. Moreover, practitioners, standard setters and legislators can use the findings for sustainability management or for developing standards and legislation.

Keywords Content analysis, Construction industry, Corporate sustainability, Management control systems, Sustainable development, Sustainability reporting

Paper type Research paper

1. Introduction

Developments such as advancing industrialization, urbanization and the associated sharp rise in resource consumption have increasingly highlighted the relevance of advancing

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sustainable development (SD) in recent years (Whang and Kim, 2015). The construction industry has a particularly significant role in this regard due to the effects of its activities on the physical and biological environment, as well as on progress in social and economic matters (Jiang and Wong, 2016; Xia *et al.*, 2018; Petera *et al.*, 2019). Companies in the construction industry carry out building construction and civil engineering activities (Eurostat, 2008). These business areas and the related activities will inevitably have a substantial impact on SD. The 17 sustainable development goals (SDGs) adopted by the member states of the United Nations in 2015 to promote SD also make it clear that the construction industry is particularly relevant in this context. SDG 9 and SDG 11 explicitly refer to the importance of sustainable cities and infrastructure, two areas in which the construction industry plays a central role (Pandit *et al.*, 2017; Dar *et al.*, 2021; United Nations, 2024). Given this pivotal role, construction companies have been devising and implementing sustainability strategies, hence reshaping business models to embrace sustainability (Banihashemi *et al.*, 2017; Olawumi and Chan, 2020; Rehman *et al.*, 2020). They have also begun to publish reports on their commitment to sustainability in the form of sustainability reports, not least due to societal or stakeholder expectations regarding the transformation towards sustainable business practices or legal requirements. Ideally, these reports aim to transparently communicate a company's commitment to and performance in corporate sustainability (CS) (Godha and Jain, 2015; Le Roux and Pretorius, 2019).

However, the mere formulation of sustainability strategies and reporting on the current CS performance do not suffice; companies must also implement appropriate management control (MC) instruments or mechanisms to execute the sustainability strategies and report on it to make progress toward transformation and illustrate how they ensure that CS performance will be improved (Arjaliès and Mundy, 2013; Asiaei *et al.*, 2021). In this vein, sustainability reporting should not only serve as a communication tool but rather demonstrate which management practices are being taken. Otherwise, the reporting may be perceived as a well-intentioned attempt by the company (Whang and Kim, 2015) or worse, as impression management (Martins *et al.*, 2020) or greenwashing (Khan *et al.*, 2021). To avoid this and to ensure that the formulated strategies are implemented and that CS performance improves, proper MC practices for sustainability management are crucial (Lueg and Radlach, 2016; Beusch *et al.*, 2022). They not only provide a structured approach for achieving sustainability objectives but also enhance the integrity of sustainability reporting. Using MCs, such as strategic planning and performance measurements, variances and discrepancies between reported sustainability achievements and actual performance can be identified (Traxler *et al.*, 2020). Therefore, the risk of greenwashing or reports being perceived as impression management can be minimized by ensuring that sustainability reports reflect transparently a company's social, environmental, and economic impact and the implemented MC practices in this context.

While many studies in non-sector-specific literature already deal with MC practices in the area of CS and SD (e.g. Asiaei *et al.*, 2021; Beusch *et al.*, 2022; Traxler *et al.*, 2023), the literature in the construction industry on this topic is still sparse. Notably, previous literature deals quantitatively with the relationship between integrated management systems and financial performance of construction companies in Malaysia (Rahman *et al.*, 2022), examines the environmental dimension of sustainability management systems (Rehman *et al.*, 2020; Schmidt and Osebold, 2017) in specific divisions of construction companies (Mustapha and Ab Whadid, 2021), or examines business model innovation in the context of circular economy (Ruiter *et al.*, 2022). Yet, the specific forms and types of employed MC practices by construction companies to improve CS performance remain underexplored. This gap is especially significant given the construction sector's central role

in advancing SD and the transformation toward a sustainable society and economy (Pandit *et al.*, 2017; Dar *et al.*, 2021; United Nations, 2024), and is also emphasized by several authors as a need for research (Isaksson and Rosvall, 2020; Asiaei *et al.*, 2021).

To address this research gap, a qualitative content analysis of 39 sustainability reports published by the largest construction companies in the European Union (EU) was conducted. As engagement toward sustainability is strongly shaped by the institutional environment (Matten and Moon, 2008; Liao *et al.*, 2018; Ye *et al.*, 2020; Ye *et al.*, 2022), an examination of companies acting under similar conditions makes sense. Regarding SD, the EU can be seen as a pioneer. This is not only expressed through the general commitment to SD and pronounced ambitious political goals but is also reflected in concrete regulations for companies, such as the implemented reporting obligations concerning sustainability (Directive 2014 / 95/EU; Directive 2022 / 2464/EU) as well as the EU Supply Chain Act or the EU Taxonomy.

Our study makes several contributions to the academic debate. While existing literature has already covered MC practices in CS for SD in general (Lueg and Radlach, 2016; Beusch *et al.*, 2022) and across various sectors (Roos and Guenther, 2020; Slacik *et al.*, 2022) this research fills a specific gap by focusing on the construction industry. Through a holistic focus on MC practices, the study underscores the relevance of the consideration of sustainability topics across various control types to promote SD and ensure integrity and transparency of sustainability reporting. This research further examines the interconnectedness of various control types and practices, showing how a cohesive system of controls drives progress in SD in EU construction companies. By conducting a qualitative content analysis of sustainability reports from the largest EU construction companies, this study allows for a detailed examination of MC practices, moving beyond mere quantitative metrics. The study was conducted within the specific institutional environment of the EU, recognized as a pioneer in promoting SD and introducing sustainability reporting obligations. The findings can help to inform practitioners, standard setters and legislators about the status quo and potential areas for improvement of sustainability MC practices and reporting of construction companies.

The paper is organized as follows. Section 2 *Literature review and conceptual framework* provides an overview of the existing literature and introduces the conceptual and theoretical perspectives for our study. Section 3 *Research method and sample* presents the sample and details the methodology used before presenting and discussing the results of our study in Section 4 *Results and discussion*. This is followed by a conclusion in Section 5 *Conclusion, limitations and further research*.

2. Literature review and conceptual framework

2.1 Sustainability reporting in the construction industry

The construction industry not only contributes to the economic growth in different countries and regions, but also bears substantial environmental impacts because of its activities such as resource consumption, land degradation, and waste production. Studies such as those by Jiang and Wong (2016) and Xia *et al.* (2018) have highlighted the industry's characteristics and impacts, including its activities in the area of corporate social responsibility (CSR), and underscored the industry's critical role in pursuing SD.

Despite growing awareness about SD and the related companies' commitments and achievements presented in sustainability reports, criticisms persist regarding the state of sustainability reporting. On the one hand, the literature points to a lack of uniformity in reporting standards and practices, which affects the comparability and transparency of reports (Evangelinos *et al.*, 2016; Siew, 2017). On the other hand, there is a tendency toward

positive reporting, where companies often highlight sustainability achievements while neglecting areas requiring improvement and sensitive topics such as e.g. anti-corruption, anti-discrimination (Evangelinos *et al.*, 2016; Siew, 2017). This selective reporting pattern undermines the accountability and transparency of sustainability reports and may raise suspicions about greenwashing and impression management (Whang and Kim, 2015; Evangelinos *et al.*, 2016; Loosemore *et al.*, 2018).

The phenomena of greenwashing and impression management in sustainability reporting extend beyond specific sectors and reflect challenges in CS performance efforts made. Greenwashing refers to the practice where companies mislead stakeholders about their environmental management measures or benefits of a product or service (Lyon and Maxwell, 2011). This practice is often facilitated through sustainability reporting that overemphasizes positive environmental actions while omitting negative impacts (Delmas and Burbano, 2011). Impression management in the area of sustainability involves strategically shaping the perceptions of stakeholders to enhance a company's image and reputation without necessarily making substantial changes to sustainability practices (Diouf and Boiral, 2017). In the construction industry, the risk of reporting being perceived as greenwashing or impression management is particularly high due to the significant environmental impact. Hence, stakeholders could feel misled about the actual progress toward SD (Johnsson *et al.*, 2020). In response to these challenges, scholars argue for the implementation of effective MC practices to ensure that sustainability strategies and activities are not only articulated but also implemented or executed and transparently reported (Arjaliès and Mundy, 2013; Asiaei *et al.*, 2021).

2.2 Sustainability management control practices

Implementing and adapting MC practices can serve to avoid greenwashing and impression management by promoting transparency, accountability, and performance improvement in sustainability practices (De Villiers *et al.*, 2016; Schmidt and Osebold, 2017). Thereby, the implemented sustainability MC practices should be embedded as components of a MC system (MCS), which supports the transformation process toward more sustainable business models, makes it feasible, and helps to ensure that sustainability objectives are incorporated into a company's overall strategy and executed at the operative level (Johnsson *et al.*, 2020; Lapidus and Abramov, 2020; Ruiter *et al.*, 2022). A MCS provides a structured framework for setting objectives, measuring performance, and ensuring that sustainability initiatives are integrated into all levels of an organization's operations (Simons, 1995; Malmi and Brown, 2008). Embedding a MCS that comprises sustainability objectives, organizational processes and mechanisms requires the collection, analysis, and reporting of concise sustainability data (Beusch *et al.*, 2022) and can thus prevent greenwashing practices and impression management.

Studies on the construction industry have so far mostly examined MC practices used to manage CS performance separately, although many authors call for a holistic approach under consideration of practices being embedded in a MCS (Mansell *et al.*, 2020; Mustapha and Ab Whadid, 2021; Rahman *et al.*, 2022). However, the literature on individual control practices or topics such as strategic planning, human resources, and cultural management (Banihashemi *et al.*, 2017; Olawumi and Chan, 2020; Rehman *et al.*, 2020; Oladinrin and Ojo, 2022; Ruiter *et al.*, 2022) suggests that the chosen control instruments and mechanisms are crucial for improving a company's CS performance. Several authors also discuss challenges in implementing sustainability MC practices. For instance, difficulties with economic, technological, administrative, and market issues were mentioned (Bon and Hutchinson, 2000; Häkkinen and Belloni, 2011; Hinze

et al., 2013; Opoku *et al.*, 2019; Gurmu *et al.*, 2022). Additionally, the consideration of the entire value chain is complicated (Abadzhiev *et al.*, 2022) and the real impact of sustainability measures is not always evident (Chang *et al.*, 2021).

Yet, a holistic approach to the investigation of MC practices embedded in a MCS to manage CS performance in the construction industry is missing. Hence, the current literature underscores the need for research in the field of sustainability MCS in the construction industry and the related reporting about it. Against this background, our study aims to holistically investigate which MC practices construction companies use and how they employ them. In doing so, our study begs the following research questions:

RQ. How are management control practices being used for sustainability transformation in the European construction industry?

(A) Which management control instruments or mechanisms do European construction companies use to manage or increase their corporate sustainability performance?

(B) How are these control instruments or mechanisms systematically interconnected?

2.3 Management control system as a conceptual framework

In the literature, different approaches to a systematic consideration of control practices can be found, such as Simons' Levers of Control (Simons, 1995), MCS by Merchant and Van der Stede (2007), and MCS by Malmi and Brown (2008). While the authors mentioned above all created comprehensive frameworks for MCS, in this paper, Malmi and Brown (2008) MCS framework serves as the foundation for exploring sustainability MC practices within the construction industry. Malmi and Brown's framework comprises formal and informal controls as well as institutional and procedural elements, consolidates other existing MCS conceptualizations and can be seen as one of the broadest approaches (Günther *et al.*, 2016). Recent literature underscores the relevance of Malmi and Brown's framework for CS management. For instance, Lueg and Radlach (2016), Traxler *et al.* (2020) and Traxler *et al.* (2023) base their research on the MCS package by Malmi and Brown (2008) and emphasize on the applicability and comprehensiveness of the framework, especially in the field of SD. Moreover, Tu Le *et al.* (2024) argue that the framework also has a strong influence on the research of MC of SD.

Looking closer at the framework itself, Malmi and Brown (2008) introduced a concept of MCS as a package, which suggests that more than one type of control should be employed to achieve the set corporate objectives. Within their MCS package approach, they distinguish between cultural controls, planning, cybernetic controls, reward and compensation, and administrative controls. The idea is that the different control types work together to create a comprehensive system that can be effectively utilized to achieve the organizational objectives and goals (Malmi and Brown, 2008).

From a theoretical perspective, different motives can be identified for the use of MC practices regarding CS, which also suggest a different design of them (Hansen and Schaltegger, 2016). Strategic stakeholder theory suggests that the interests of the strategically relevant stakeholders must be considered to ensure long-term success of the company (Donaldson and Preston, 1995; Freeman *et al.*, 2004; Freeman, 2010). In this vein, companies that qualify the improvement of their CS as a strategic advantage will try to implement a holistic control approach to manage and improve performance, especially in the

areas that are important to the strategically relevant stakeholders. They will also report comprehensively on the measures taken and the progress made so that these are recognizable to the stakeholders. The strategic benefits that can arise from the improved performance are many and varied, such as a positive impact on stock market performance (Duong *et al.*, 2021) or making the company more attractive to potential employees (Petera *et al.*, 2019). Many authors (Rodriguez-Melo and Mansouri, 2011; Bal *et al.*, 2013; Liao *et al.*, 2018; Zhang *et al.*, 2022) believe that stakeholder engagement in the construction industry is one of the most important and crucial aspects for CS because it enables the impacts of the construction industry on society and ecology to be identified more thoroughly. Through human resource management, value chain management, but also collaborations and cooperation with organizations inside and outside the construction industry, stakeholders are considered within MCS (Banihashemi *et al.*, 2017; Olawumi and Chan, 2020; Oladinrin and Ojo, 2022).

In contrast to an instrumental perspective, a socio-political one, such as the legitimacy theory, suggests a different motive for employing or reporting MC practices (Hansen and Schaltegger, 2016) which is more in line with the critical voices in this regard. Legitimacy theory considers the prevailing societal expectations in general. Thereby, companies need to demonstrate that their actions are consistent with societal norms, beliefs, and values. When a significant discrepancy occurs between actions and expectations, legitimacy is threatened (Lindblom, 1993; Suchman, 1995). To demonstrate that societal expectations are being met, construction companies publish sustainability reports in which they disclose information about their CS performance and the MC practices in place (Le Roux and Pretorius, 2019; Xie *et al.*, 2020). In contrast to the instrumental view, however, companies do not see the strategic value of improved CS performance or rate it as low and thus will use sustainability reporting mainly for accountability or legitimacy purposes (Evangelinos *et al.*, 2016; Petera *et al.*, 2019). In this vein, they do not aim to fully exploit the potential of MC and reporting in terms of promoting SD. Accordingly, MC instruments or mechanisms to improve CS performance are only introduced to the extent necessary to ensure organizational legitimacy or regulatory compliance (Traxler *et al.*, 2023).

3. Research method and sample

3.1 Methodological approach

This study employs a qualitative content analysis of 39 sustainability reports published by EU construction companies, following Mayring's (2015) systematic qualitative content analysis method. The methodological approach enables the examination of a broad spectrum of data in the sustainability reports, providing a comprehensive overview of sustainability management practices in the construction industry. Mayring (2015) comprises two main procedures of deductive and inductive category building for qualitative content analysis and therefore differs from quantitative content analyses. This allows for a thorough exploration of the data, aligning with the study's objectives to both contribute to existing theories or concepts and uncover new insights. Deductively, the study begins with a predefined set of categories derived from the MCS framework by Malmi and Brown (2008). These categories serve as the basis and lens through which the sustainability reports are initially analyzed so that it is possible to examine how the reported content can be assigned to the different MCS types. Inductively, the data analysis then progresses to the formation of subcategories from the text passages themselves, thereby uncovering insights directly from the data.

To guarantee precision and reliability in the categorization process, anchor examples were established for each category and subcategory. One author coded all clearly allocable

text parts and marked those that required a consensus in the team of authors. If there were discrepancies regarding the assignment and formation of new categories, the inclusion rules for the individual categories were specified to ensure the reliability of the evaluation. The following Table 1 shows the applied categorization:

By using the MCS framework of Malmi and Brown (2008) as a conceptual basis, which was discussed in Chapter 2 Literature review and conceptual framework, the analysis follows other studies that use this framework in the field of sustainability management control like Lueg and Radlach (2016), Traxler *et al.* (2020), Slacik *et al.* (2022), or Traxler *et al.* (2023) as well as for other issues in the context of management control, e.g. Frei *et al.* (2022).

Data analysis was performed using MAXQDA software, a leading tool in qualitative and mixed methods research (Kuckartz and Rädiker, 2021). The software comprises many features designed to facilitate in-depth analysis, organization, and coding of qualitative data. The sustainability reports were uploaded to MAXQDA using the import feature, the deductive categories according to Malmi and Brown (2008) were defined in the software and then supplemented by the inductive categories. Comments and rules for coding were defined and, once categorization was complete, the content was downloaded in the form of editable documents [1]. In a further step, after a successful reduction and interpretation of the respective contents within the categories, the results could be written down.

3.2 Sample

The reports included in the study were taken from Deloitte's ranking in the report "Global Powers of Construction 2020". This report comprises the construction companies with the highest revenue worldwide and provides an analysis and ranking of the largest global construction companies based on their sales performance, market presence, and financial metrics (Deloitte, 2020).

Due to similar legal/institutional framework conditions (Directive 2014/95/EU; Directive 2022/2464/EU; Whitley, 1999; Matten and Moon, 2008; Liao *et al.*, 2018; Ye *et al.*, 2020; Ye *et al.*, 2022), we focused on the largest construction companies by revenue within the EU included in the Deloitte's global ranking, resulting in a sample of 39 companies. UK construction companies included in the sample pertain to the period preceding the country's exit from the EU. Our sample therefore comprised the largest companies in the EU, in terms of revenue since these organizations hold significant experience in non-financial reporting

Main categories (Malmi and Brown, 2008)	Subcategories (inductive)
Cultural controls	Corporate culture and the value system
	Mission, code of conduct and corporate policies
Planning controls	Strategic planning
	Action planning
Cybernetic controls	Reporting and accounting
	Performance management and budgeting
Reward and compensation	Monetary rewards
	Non-monetary rewards
Administrative controls	Governance and structure
	Management programs
	Policies and guidelines
	Communication and collaboration

Source: Created by authors

Table 1. Applied categorization for content analysis

and have thus established sustainability reporting as a well-institutionalized practice (Petera *et al.*, 2019; Ye *et al.*, 2020).

The reports are predominantly from 2020, with a few companies combining two years for the sustainability report, thereby looking at 2019 and 2020. The average revenue of the sample is $8,13 Mn. and the average number of employees is 31,892.

24 of the 39 companies published their sustainability report in the form of an integrated report. 13 companies published a stand-alone sustainability report, and two companies published a report or information on sustainability together with the annual financial report, but did not include any other reports or information (e.g., general governance topics or risk management topics), which is why these were categorized as annual reports and distinguished from the integrated reports. The average number of pages in the reports is 188. More than half of the companies (22) base their reports on the GRI framework or standards. Particularly in companies from the UK, the Companies Act 2006 is regarded as a frequent standard, and SASB is also used by some companies for the preparation of sustainability reports. Six reports did not follow any framework or standard for report preparation.

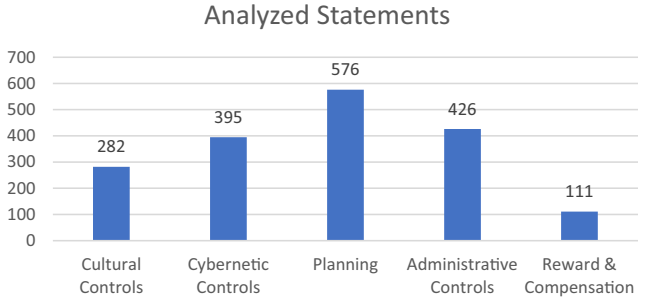
4. Results and discussion [2]

A total of 1,790 statements from 39 sustainability reports of construction companies out of our sample were analyzed and included in the presentation of the results. The majority of the statements can be assigned to planning, administrative and cybernetic controls (see Figure 1).

With regard to the reported content within these control types, a detailed explanation of the results follows:

4.1 Cultural controls

4.1.1 Corporate culture and the value system. Companies mostly report the establishment of a corporate culture with a strong focus on sustainability. Thereby, sustainability is mentioned as a strategic value in companies, considering the balancing of economic values and the creation of a sustainable and high-quality development of the company (15 of 39). However, also other cultural focal points or values and attitudes are mentioned that are conducive to SD. In this vein, responsibility (7 of 39), transparency (7 of 39), integrity (6 of 39), innovation and loyalty (4 of 39), health and safety (10 of 39), zero tolerance for corruption and criminal activities (4 of 39), openness, honesty, and inclusion (6 of 39) are named. Furthermore, it is stated that corporate culture should encourage diversity to motivate and



Source: Created by authors

Figure 1.
Analyzed statements

support people to do the right things (5 of 39), achieve a lot, and create positive added value (6 of 39). One company describes the added value of a culture shaped by diversity as follows:

> Diversity constitutes an important element of competitiveness: the more diverse the companies, the better their capacity is as regards attracting talent, innovating and increasing the levels of satisfaction of their workers, which increasingly meets the expectations of customers, investors, and society itself. [Our action] is guided by principles such as the fight against discrimination, the fostering of gender equality and equal opportunities and the promotion of a culture of openness, with recognition of the importance of leaving no one behind, as an ethical imperative and part of a socially responsible conduct. (C23)

It is also emphasized that management is not only responsible for shaping the culture, but also for ensuring that it is lived (3 of 39).

4.1.2 Mission, code of conduct and corporate policies. The values, behaviors or attitudes also require formalized documentation and communication. The companies use for this purpose, for example, a mission statement (4 of 39), a Code of Conduct (17 of 39), Human Rights Policy (11 of 39), Health and Safety Policy (3 of 39), Sustainability Policy (2 of 39), Code of Ethics (6 of 39), or Corporate Guidelines (5 of 39). Thereby, the formalized instruments or documents are coordinated with each other, with the basic direction being given by the mission or vision and the values specified therein, as expressed by one company as follows. Our code is aiming"

> [. . .] at establishing the grounds for responsible behaviour, general duties and rules of an ethical and business nature that must govern the conduct of all workers and managers of the Group regarding the performance of their duties at work, in compliance with the Mission, Vision and Values that integrate the organisational culture [. . .] (C23)

Overall, there was comprehensive information presented in the reports on cultural controls. Construction companies try to demonstrate their sustainability commitment through cultural controls by publicly communicating sustainability values and often formalizing them in various documents. The theoretical perspectives suggest that this could be motivated by the intention of strengthening the brand and reputation, thus achieving strategic advantages through this positioning or ensuring legitimacy.

4.2 Planning controls

4.2.1 Strategic planning. Companies report setting strategic goals (usually 3–10 years) in all three dimensions of sustainability. Strategic goals are a prerequisite to formulating operational and short-term goals and are necessary to control the strategic direction of the company. One company describes the importance of strategic objectives in the context of sustainability as follows:

> Another important development in our positioning is that we are getting involved in planning processes at an increasingly early stage, so we can provide advice on area development with an eye for nature, people and health. This gives us an opportunity to have an even greater impact on our mission: creating a healthy living environment. (C18).

Thereby, companies often describe their planning of sustainability activities and investments toward the principles of the EU taxonomy (4 of 39). Companies are furthermore guided by the SDGs of the United Nations (23 of 39). Looking at the single sustainability dimension, economic development is the cornerstone of all objectives for many companies, with strategic goals set e.g. for a solid balance sheet development and steady growth and profit (16 of 39). A strong focus in strategic planning is set on corporate governance whereby strategic risk management is in the center followed by social issues such as human rights,

ethics, health, and workplace design (12 of 39). Diversity plans are developed to include and promote vulnerable groups and accessibility and reduce inequality (21 of 39). With reference to the industry specifics, companies strive to set and maintain the highest standards in the area of health and safety (28 of 39). With regard to the fulfillment of other stakeholder interests, companies mentioned the importance of generating returns for shareholders, fostering relationships between management and employees, the generation of societal value, the creation of affordable housing, and focusing on customer orientation and the supply chain (28 of 39). Regarding digital transformation companies present big data, machine learning and information security strategies and goals (9 of 39).

4.2.2 Action planning. Action planning (a period of usually one year) in companies is tailored to the respective organizational areas and departments (3 of 39). Companies are setting short-term goals for economic development, such as cost and efficiency savings (8 of 39). Regarding environmental goals, companies are focusing on renewable energies, water consumption and emission reduction measures (11 of 39). Considering social goals or targets, companies design training and further education opportunities (6 of 39), set goals for workplace design, fluctuation and absentee rates, and equality in the workforce (3 of 39).

Short-term goals further include the preparation of reports (13 of 39), and communication with customers, suppliers, subcontractors, local communities, and other stakeholders (4 of 39).

An example of *ad hoc* short-term planning is the rapidly implemented safety measures due to the pandemic such as testing employees and social distancing measures (14 of 39). Other measures included developing business continuity plans, an adaptation of the risk management system, and communication channels with customers (9 of 39).

The results were able to show that corporate practice attributes high importance to strategic planning, as strategic alignment was detectable in all sustainability dimensions and is often supported by embedding strategic goals in a long-term sustainability plan as well as by directly linking them to the SDGs. Literature suggests that it is particularly important for companies to consider sustainability within strategic planning (Banihashemi *et al.*, 2017; Rehman *et al.*, 2020) which can be confirmed by our findings.

Although the majority of companies speak of a focus on economic indicators in strategic as well as action planning, which may be related to the recognized economic challenges to SD (e.g. Häkkinen and Belloni, 2011; Opoku *et al.*, 2019; Gurmu *et al.*, 2022), the consideration of social and environmental dimensions in planning can also offer advantages (Kinnunen *et al.*, 2022) and even lead to positive reactions on the stock markets (Duong *et al.*, 2021). Companies take up this idea, especially in their strategic considerations, by trying to gain competitive advantages through stakeholder engagement, high-quality project implementation and innovation in the course of digital transformation. However, there is often a subsequent lack of further breakdown of strategic goals into short-term goals, which makes further consideration within cybernetic controls through operationalization of the goals unattainable. A holistic MC approach regarding sustainability and reporting on it is essential, especially from the perspective of the strategic stakeholder approach. If, for example, topics are only documented in the mission statement, but no indication is given of how these are to be achieved, this can give the impression that the company is responding to societal pressure and reporting on it to remain legitimate but is failing to take concrete action to make progress on them. Even if actions in this vein have been taken but are not published as part of the reporting.

4.3 Cybernetic controls

4.3.1 Reporting and accounting. Out of strategic planning, action planning, and conducted materiality analyses, companies derive indicators that enable appropriate operationalization

of the selected performance dimensions and report on them (5 of 39). For this purpose, cross-functional collaboration is key to collecting all data needed for sustainability reporting (4 of 39). Within the economic dimension, companies report on their financial situation through conventional indicators (22 of 39). Environmental reporting includes for example emission measures like scope 1, 2 and 3 amounts (16 of 39), energy indicators (10 of 39), indicators for material and water use (9 of 39), measures on generated or recycled waste (8 of 39), and biodiversity measures but mostly with missing key figures for measuring impacts, e.g. the analysis of conservation of plants and wildlife (8 of 39). Looking at the social dimension of sustainability, health and safety indicators are most frequently presented (24 of 39) with figures on accidents, absenteeism, and health checks (15 of 39). Regarding human resources and diversity indicators, companies report on e.g. knowledge transfer and further training, employee turn rate, women in management positions, and reincorporation of women after maternity leave (6 of 39).

4.3.2 Performance management and budgeting. In the field of performance management and budgeting, companies compare their last measured values with current values and use them to make statements or decisions regarding the achievement of goals and if necessary, take corrective actions (17 of 39). As a result, performance management and budgeting represent important control practices through comparisons and, in a broader sense, are usually linked to action or strategic planning, since goals are maintained or adjusted through the analysis (4 of 39).

Several companies refer to common rankings, indices, and certificates to measure and control their sustainability performance. Examples include Ethibel Sustainability Index, Dow Jones Sustainability Index, and the Bloomberg Gender-Equality Index (25 of 39). However, some companies resort to results out of company-specific indices such as employee satisfaction indices (6 of 39), customer satisfaction ratings (8 of 39), or specific performance assessments (8 of 39). In this regard one company describes its approach as follows:

> We carry out an annual engagement survey, further surveys throughout the year and consult with our Workforce Forum. The feedback received is used to drive continual improvements. Employee engagement remains a key measure of our success and we are pleased to have maintained UK upper quartile performance in our engagement survey for the seventh consecutive year. (C4)

To compare themselves with competitor companies or internally with other corporate divisions, evaluations are carried out based on e.g. ISO certifications (6 of 39), and the contributions to the SDGs (3 of 39), ultimately a ranking is made (11 of 39). Furthermore, companies carry out internal and external audits and use the results to adapt their performance management (14 of 39).

However, after analyzing the data in strategic planning and cybernetic controls, it became apparent that in many areas such as biodiversity, or the advancement of women and diversity in the workforce, there is a lack of short-term planning and operationalization according to cybernetic controls as also mentioned in the literature (Opoku *et al.*, 2019; Isaksson and Rosvall, 2020; Khalil *et al.*, 2021), or, that no information is published in this regard. These findings can therefore be confirmed. Further, there is a lack of more detailed indicators in the area of specific environmental information (e.g. scope 3 emissions, indicators on transport routes) which would be necessary for a transparent consideration of emissions in the industry. The challenge of considering the entire value chain in the construction industry is also described by Abadzhiev *et al.* (2022).

4.4 Reward and compensation

4.4.1 Monetary rewards. Companies often mention objective-based compensation, where individual performance is measured and the compensation is designed according to the goals achieved (14 of 39). In addition, pension plans and employee share programs or bonus programs are frequently presented (7 of 39). However, information on remuneration in reports mainly relates to managers or directors (14 of 39). Thereby, some companies already link performance in specific sustainability areas to bonus payments to managers or directors, such as health and safety performance or ESG metrics in general (5 of 39).

4.4.2 Non-monetary rewards. In the area of non-monetary rewards, companies often offer their employees benefits (9 of 39) like international medical insurance, meal vouchers, and childcare. Additionally, companies want to create a sustainable work environment with free fruits, promotion of sustainable mobility for the way to work, additional days of paid leave, end devices and flexible work designs which can contribute to improving CS performance (9 of 39). Training programs are sometimes viewed as non-monetary remuneration, as employees are given an opportunity to continue their personal development (8 of 39). Diplomas or other certificates are awarded for achievements or long-term affiliation with companies (12 of 39). Furthermore, companies mention job awards, annual safety competitions, health and safety awards, or just positive recognition to reward desired behavior of employees (7 of 39).

In summary, the reports contained the least information on the control type rewards and compensation, frequently focusing on the remuneration of board members or directors rather than on employees. Specifically, in the realm of non-financial rewards, only in isolated cases connections between rewards and sustainability efforts were identified.

4.5 Administrative controls

4.5.1 Governance and structure. Construction companies often see a decentralized structure as best for maximizing profitability, ensuring excellence and fostering innovation (32 of 39). In this sense, companies are frequently characterized by an agile organizational structure that encourages the adoption of new technologies and the adaptation to changing environments (11 of 39). Thereby, to foster SD, companies formed departments for coordinating CS (cf. C33, C39). Furthermore, companies established committees responsible for sustainability issues (12 of 39). Moreover, different committees for specific issues like auditing, compliance, health and safety, which are also conducive to sustainability, are formed (20 of 39). In addition, separate departments are set up at the management board level for sustainability and responsibilities are defined, which in turn illustrates the relevance that companies attach to the topic.

4.5.2 Management programs. Among the most institutionalized management programs or systems is risk management in companies (30 of 39) which involves developing plans for risk minimization and the reduction of costs (6 of 39). Special management systems or programs are used for training (often in relation to health and safety), recruitment processes, personnel management models (22 of 39), anti-corruption, crime prevention, tax risks, due diligence regulations, finance and ethics (9 of 39) or talent management and programs for the advancement of women (8 of 39).

Furthermore, internal control systems are applied in companies in decentralized units (25 of 39). Internal regulations for control are independently developed, checked, evaluated, and adjusted to ensure the unit's best performance (11 of 39) and in many cases, they are linked to risk management. To ensure the highest quality, companies report about quality/site visits which are conducted to check compliance with specified group standards and seek certifications (7 of 39). In addition, supply chain management systems are applied to extend

the requirements for SD to the supply chain (12 of 39). Looking at management programs used for digital transformation, companies present the development of apps, platforms, software, and communication channels to improve e.g. procurement processes, consumption quantities, and time management (22 of 39). Especially, data management and organization-wide documentation systems play an important role (9 of 39).

4.5.3 Policies and guidelines. Companies develop and adapt various policies to manage sustainability issues (6 of 39). Thereby, corporate policies adhere to international standards, frameworks and legal requirements (22 of 39). Often mentioned in this context are risk policies, health and safety, environmental, and remuneration policies as well as compliance guidelines (19 of 39), which are used within the related management systems. One company describes this as follows:

> To ensure compliance with legal and regulatory requirements and the high standards that we set for ourselves, we have adopted internal governance rules for the Group, as well as processes for monitoring compliance with external and internal rules by all business units and departments within the organization. (C34).

4.5.4 Communication and collaboration. Many companies network with organizations and institutions to foster their CS performance (21 of 39). In general, companies attribute great importance to stakeholder engagement in order to maintain relationships and gain knowledge about the information needs (12 of 39). Therefore, companies use listening groups, different communication channels and surveys (10 of 39). One company described the special importance that communication can have as follows:

> Communication is an essential element in [our] activities and in ensuring that the organisation runs smoothly, because good communication makes the business more competitive, makes it easier for it to adapt to environmental change, helps it achieve the objectives it has set for itself, satisfies both its own and its stakeholders' information requirements; at the same time, it serves as a tool for the motivation, commitment, responsibility, involvement and participation of its employees, thereby building and strengthening its corporate identity. (C32)

The strong focus on stakeholder engagement is also apparent in the literature. Many authors (Murtagh *et al.*, 2016; Pero *et al.*, 2017; Zhang *et al.*, 2022) describe stakeholder engagement as a crucial factor for SD in the construction industry. The results of this study show more far-reaching relationships with stakeholder groups than previously described in the literature. For example, there are collaborations with various research institutes and professionals, which are intended to help companies, especially with technical challenges (as also described by Opoku *et al.*, 2019). Maintaining relationships with customers is targeted through e.g. developed information and communication channels and measured through surveys (as also mentioned by Bamgbade *et al.*, 2019). Communication with internal stakeholders is intensified through regular feedback and a strengthening of relationships between management and employees. In the area of cooperation with the supply chain, companies describe their own supply chain management systems, which serve to maintain compliance with corporate guidelines.

4.6 The package idea of Malmi and Brown (2008)

To pursue the holistic idea of a MCS, we followed the package thinking by Malmi and Brown (2008) through our second research question. The package thinking refers to the idea that an effective MCS is not just employing a single control type or instrument but a comprehensive collection of various control instruments and mechanisms that an organization uses to achieve its objectives and implement its strategies. According to Malmi and Brown (2008), these controls work together cohesively as a package. The authors argue

that relying on a single control type is less effective and therefore recognize the diversity of control instruments and mechanisms needed to manage different aspects of organizational performance such as the promotion of SD. Based on this idea, the reported content was checked for occurrence in different control types and any existing links between the different control practices. This makes particularly holistically managed sustainability topics visible and, conversely, areas that are only considered by certain control instruments and mechanisms, or where only selective use is reported.

Based on the framework, in the following, we show illustrative examples of mentioned links between the control types within individual sustainability areas.

4.6.1 Planning controls. Connections based on planning include, on the one hand, intra-category linkages of strategic and action planning. On the other hand, numerous links with administrative controls can be observed, for example through cross-departmental cooperation for strategic goals and the consideration of goals in risk management. Frequently, values and corporate culture are addressed, for example when diversity or health and safety plans are developed. The planning in companies sometimes includes budget allocations and is underpinned by specific indicators that are monitored and controlled, thus creating a link with cybernetic controls. In the event of goal achievements, some companies planned incentives, thus addressing control through reward and compensation.

4.6.2 Cybernetic controls. Linkages between cybernetic controls and planning include indicators which are derived from long-term and short-term goals, which in turn form the basis for performance management. In addition, data collection often requires communication and cooperation with internal (e.g. cross-functional teams) and external stakeholders (e.g. customer surveys), which creates a link with administrative controls. Particularly in the area of employee health and safety, references are made to cultural controls, which one company describes as follows:

> An important key to structurally embedding safety in our DNA also lies in the way we gather and use management information. We tend to look only at indicators - such as the number of incidents and the IF figure - that show what is going wrong. Of course, these indicators provide important insights, but we must realise that we then manage based on what has happened and not on indicators that may predict the future. In addition to looking at the existing management information, we want to focus on matters we do not see as a direct result, but that do contribute to a safer working environment. (C18)

Companies further refer to the awarding of certificates or bonus payments when specific values are achieved, thus presenting a link with the control type reward and compensation.

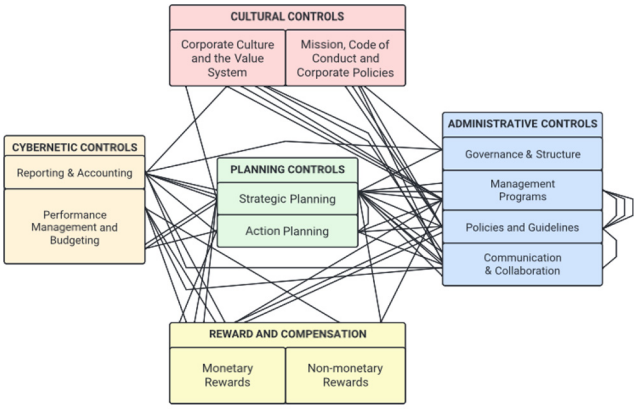
4.6.3 Administrative controls. Within administrative controls, a large number of intra-category linkages were identified. For example, policies are derived from management programs such as risk management, which in turn requires communication and cooperation with stakeholders like investors. Management programs, especially risk management and human resource programs, are based on strategic and short-term goals and thus on planning. There are also strong references to cultural controls in the context of establishing e.g. safety programs or anti-discrimination training. Sometimes links are made to financial compensations, e.g. regarding remuneration policies.

4.6.4 Cultural controls. Cultural controls show connections with administrative controls through the application of a code of conduct, which should regulate cooperation with the value chain and partners through a common ethical mindset. Training programs and communication channels are also frequently mentioned for establishing and maintaining a corporate culture and guiding values.

4.6.5 Reward and compensation. Rewards and compensation of employees and managers are often regulated by policies, thus presenting a link to administrative controls. Furthermore, training programs are seen as an incentive, therefore, also establishing a link to administrative controls. Individual performance assessments, which are based on cybernetic controls, play an important role for the control through rewards and compensation and the achievement of specific goals, which presents a link to planning controls.

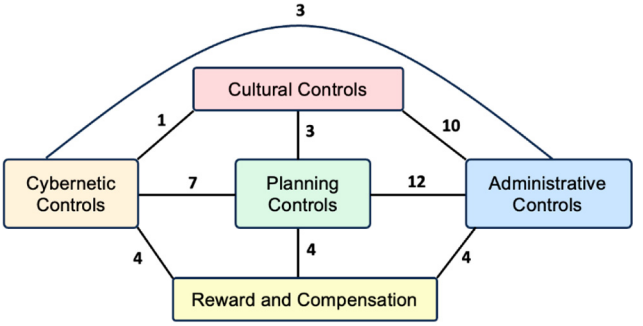
The following Figure 2 is based on the MCS framework of Malmi and Brown (2008) and shows the links between the individual instruments and mechanisms. All analyzed links between control instruments or mechanisms are represented by a line. Figure 3 shows the number of links between the control types.

There are strong links between planning, administrative and cultural controls. On the one hand, this allows conclusions to be drawn about companies' awareness of the relevance and advantages of linking different control types, on the other hand, about a corporate culture that is lived due to a close coupling of strategic planning with cultural controls. By strongly linking these control types, adjustments to the environment can be made quickly by directly supporting strategic objectives with administrative processes. This is particularly important



Source: Created by authors

Figure 2.
Links between individual control instruments and mechanisms



Source: Created by authors

Figure 3.
Number of links between control types

for construction companies with regard to SD, as strategic objectives often entail significant changes in the areas of procurement, project management, processing, and collaboration with stakeholders (Oladokun *et al.*, 2021). The link to cultural controls provides the basis for these adaptations by creating a culture that allows for goal setting, adaptation and transformation.

Many links between control types are particularly evident in the area of training and education: comprehensive information was obtained from the sustainability reports and confirms findings in the literature of Olawumi and Chan (2020) and Oladinrin and Ojo (2022). The construction companies deal with training measures through all MC types. On the one hand, strategic goals were set and on the other hand, the short-term planning, administrative, cybernetic, and cultural controls were adapted to these strategic goals by setting up training systems and programs, measurements through e.g. completed training hours, and the anchoring of knowledge acquisition and training in the corporate culture. In addition, training indicators are described by the companies as a prerequisite for the remuneration of managers and directors. Furthermore, some companies see training as a non-monetary reward for employees. Thus, an embedding into the control type of reward and compensation is presented.

Hence, our results not only showed that different MC practices are used to increase CS performance but also that they are systematically linked in the sense of the package thinking. In turn, this suggests that companies consider increased CS at least in certain areas to be a strategic advantage. This also becomes clear when topics regarded as important by strategically relevant stakeholders are addressed in particular. Health and safety issues are very important in construction companies. Hinze *et al.* (2013) argued that the need for strong health and safety considerations can be a challenge for companies. Nonetheless, companies recognize the requirement to implement health and safety plans and measures as highly crucial which is illustrated by a systematic integration into all control types.

Companies also focus on the advancement of women and diversity in the workforce, which has received less attention in the literature. While Banihashemi *et al.* (2017) state that MCS must necessarily include human resource aspects for positive contributions to SD, the results of this study can enrich previous research findings. For example, in the area of strategic planning, separate diversity plans are being developed, and in cultural control in particular, there is a strong emphasis on the added value of a diverse, open culture. However, when looking more closely at short-term planning or cybernetic controls, there is a lack of reported measures to achieve strategic goals and support cultural controls. Hence, there is room for improvement to follow a holistic MC approach. These findings may confirm the gap described by Mansell *et al.* (2020) between the perceived relevance of sustainability goals and actual performance and capabilities related to knowledge and action. Yet, it is this holistic embedding of control instruments and mechanism, as seen for example in the area of health and safety management, that would be important if the full potential in terms of enhancing CS performance should be exploited or in other words for taking up the package idea (Kucukvar and Tatari, 2013; Bui and De Villiers, 2017; Johnstone, 2019).

5. Conclusion, limitations and further research

Our study aimed to fill the research gap regarding the MC practices used for sustainability transformation in the European construction industry. To this end, the sustainability reports of the 39 largest European construction companies were used and a qualitative content analysis with deductive analysis steps based on the framework of Malmi and Brown (2008) and inductive thematic category formation was carried out (Mayring, 2015). The results reveal that construction companies already use a variety of different MC instruments and mechanisms, drawing on the full range of Malmi and Brown (2008) MCS package. However, variations were

identified between the different control types, as can be found in the literature. Not only do the companies use different MC practices to varying degrees, but there are also differences regarding the diverse topics of sustainability. In addition, the reported content was examined for a holistic MC approach and links and interconnections between control instruments and mechanisms were analyzed. Therefore, our results not only showed that different MC practices are used to increase CS performance but also that they are systematically linked in the sense of the package thinking of Malmi and Brown (2008). For some topics, such as health and safety and training and development, it was possible to identify holistic MC approaches. In this context, however, it must also be noted that in some areas, such as health and safety, companies can draw on many years of experience, whereas this is not the case in other areas in the context of sustainability. If the results are taken as a whole, it can be assumed that companies see increased CS as a strategic advantage, at least in certain areas, or in areas that are considered important by the strategically relevant stakeholders such as employees.

As with any study, this study is subject to limitations. First, it refers to the largest construction companies in the EU for the empirical investigation. Sustainability reporting and control strongly depend on institutional framework conditions, which need to be considered when trying to transfer the results to other regions. Moreover, the largest construction companies were examined, since they have already institutionalized sustainability reporting and, beyond that, employ control instruments and mechanisms for managing sustainability. However, this means that the results cannot be transferred to small and medium-sized construction companies, as there are legal, structural, and organizational differences. For this study, sustainability reports were used to analyze the control instruments and mechanisms, since extensive information on sustainability is presented by companies due to legal requirements as well as institutionalized practices over many years. However, this means that all results are based on the publicly presented content of the companies and, therefore, control practices that are applied but not reported on were not taken into account.

Future research could focus even more on the linkages between individual control practices and investigate their effectiveness within individual areas, for example through case studies. By following and observing individual companies over a longer period, it would be possible to conduct an in-depth analysis of control instruments and mechanisms and the development over time could be examined. In addition, it would be useful to investigate the MC practices of small and medium-sized companies.

Notes

1. For further information about the software MAXQDA, please visit www.maxqda.com
2. For the following presentation of quotations, the companies were numbered, whereby the numbering does not correspond to the ranking according to revenues to ensure anonymity.

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