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Exploring the use of governance mechanisms in multi-tier sustainable supply chains

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ABSTRACT

The extension of purchasing and supply chain management practices to reach upstream suppliers is critical in ensuring supply chain sustainability and requires the implementation of governance mechanisms. In this study, we investigate the mechanisms used by firms to ensure sustainability in multi-tier supply chains and how this use differs between the supply chain tiers. A multiple case study was conducted using semi-structured interview data from 25 companies covering three supply chain tiers. We identified 12 different governance mechanisms, the classification of which we suggest be based on their structure and purpose. While some differences were found regarding the specific practices used by individual firms, the overall findings indicate no major differences in terms of sustainability management efforts between the supply chain tiers. Thus, in contrast to previous studies, we show that lower-tier suppliers are active in the innovation and facilitation of supply chain sustainability. Also, the results confirm that firms often delegate the responsibility of ensuring sustainability to their direct suppliers.

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Sustainability; governance mechanisms; multi-tier supply chains; case studies

1. Introduction

The commitment to corporate sustainability and responsibility has become increasingly important for companies today, significantly influencing business activities, fulfilling the expectations of customers and stakeholders, and helping to create and manage relationships between different companies. A way in which companies demonstrate their commitment to sustainability and its management at different levels is their implementation of governance mechanisms and practices. In particular, the purchasing and supply management (PSM) function of a firm acts as a gatekeeper of the upstream supply chain and ensures that products coming from the supply chain fulfil sustainability requirements. The PSM function encourages and enforces a high level of sustainability across the entire supply chain to ensure socially and environmentally viable production methods at supplier sites (Pagell and Wu 2009; Foerstl et al. 2010).

Consumers and other stakeholders expect firms to extend their sustainability commitments beyond firm boundaries to include distant upstream suppliers (Barnett and King 2008; Wagner, Lutz, and Weitz 2009), as the most severe social and environmental issues are generated by lower-tier suppliers (Plambeck, Lee, and Yatsko 2012; Tachizawa and Wong 2014). For instance, Plambeck (2012) found that up to 90% of greenhouse gas emissions are caused by lower-tier suppliers. If these suppliers are ignored, firms expose themselves to various risks, including the entrance of unsustainable or

irresponsible raw materials into the firm, a phenomenon leading to negative public attention, which, in turn, can induce consumer boycotts and financial loss. Therefore, there is a growing necessity for PSM to manage both direct first-tier and indirect lower-tier suppliers (Wilhelm et al. 2016b). However, engaging first-tier suppliers in sustainability initiatives is still a rare practice—even more so among lower-tier suppliers (Villena and Gioia 2018). A reliance on lower-tier suppliers brings about many challenges, as they are '*less controllable, riskier to deal with, and often even invisible*' (Villena and Gioia 2018, p. 66).

To ensure a complete overview of the supply chain, an analytical understanding of the multiple supplier tiers is needed (Grimm, Hofstetter, and Sarkis 2014). However, research focused on sustainability within the context of multi-tier supply chains remains limited. Accordingly, scholars have called for more research on how lower-tier suppliers' sustainability initiatives can be managed (e.g. Grimm, Hofstetter, and Sarkis 2016; Villena and Gioia 2018; Wilhelm et al. 2016b). As stated by Villena and Gioia (2018), previous studies, focusing on the buyer's perspective while ignoring the supplier's perspective, have considered a limited set of activities without providing an overall view of how firms manage sustainability throughout their supply chains and networks. However, there are a few studies that have explored the governance mechanisms and sustainability practices used by firms in multiple supply chain tiers and how lower-tier suppliers' sustainability issues are managed. Scholars who have contributed to this topic include

Villena and Gioia (2018), who studied sustainability practices used by focal firms and their direct and lower-tier suppliers, and Grimm, Hofstetter, and Sarkis (2016), who examined practices in the multi-tier context and suggested that firms can improve lower-tier supplier compliance through active management. Focusing on green supply chains, Tachizawa and Wong (2015) explored the interplay between governance mechanisms, environmental performance, and supply network structure and complexity. However, there is still a need for more in-depth empirical research investigating how supply chain sustainability is managed by firms across multiple supply chain tiers (Villena and Gioia 2018; Sauer and Seuring 2019; León-Bravo, Caniato, and Caridi 2021; Tuni, Rentizelas, and Chinese 2020). Thus, this paper aims to investigate the implementation of governance mechanisms at various stages of multi-tier supply chains and identify the types of governance mechanisms that play a key role in extending sustainability along the supply chain. Our research questions are the following:

What governance mechanisms are implemented by focal firms, first-tier suppliers, and lower-tier suppliers to ensure sustainable supply?

Which governance mechanisms are essential in extending sustainability to lower supply chain tiers?

To answer these research questions, we conducted a multiple-case study with 25 case companies spanning three supply chain tiers. In total, we conducted interviews with 44 informants, consisting of representatives from five focal firms, 10 first-tier suppliers, and 10 lower-tier suppliers. The data were gathered from focal firms in Finland and their first- and lower-tier suppliers, encompassing five multi-tier supply chains spread across four countries.

This study contributes to both sustainable supply chain management (SSCM) and the growing literature on multi-tier sustainable supply chain management (MT-SSCM). First, we illuminate governance practices across multiple supply chain tiers by showing that, altogether, firms in different tiers use 12 governance mechanisms to ensure sustainable supply. Based on our findings, we develop a framework for understanding the types of governance mechanisms and categorise them based on their structure—imposed or interactive—and purpose—selection and monitoring or learning and innovation. The findings indicate that some practices, such as third-party certifications, second-party audits, and Codes of Conduct (CoCs) are used across all supply chain tiers, while the use of third-party audits, supplier visits, and continuous and open communication differ between the examined supply chain tiers. However, our results show no significant differences between the supply chain tiers in terms of the use of governance mechanisms. Beyond the supply chain tier as a contributing factor, we recognize several contingency factors that affect the use of these mechanisms. Finally, our findings reveal that governance mechanisms are mainly directed at the immediate supply chain tier, which confirms that firms often delegate the responsibility of ensuring sustainability to their direct suppliers. However, to advance MT-SSCM, it is essential for firms to go beyond direct suppliers and implement a variety of governance mechanisms.

The remainder of this paper is structured as follows. First, the theoretical background of MT-SSCM is explained, followed by a literature review of governance mechanisms and sustainability practices. Next, the methodology and findings of the empirical study are presented. Finally, the theoretical and practical contributions of this study are discussed and potential directions for future research are outlined.

2. Theoretical background

2.1. Management of multi-tier sustainable supply chains

SSCM is defined by Carter and Rogers (2008, p. 386) as *'the strategic, transparent integration, and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains'*. Extending SSCM to multiple supply chain tiers means investigating relations beyond the dyadic ones between buyers and first-tier suppliers (Mena, Humphries, and Choi 2013; Tachizawa and Wong 2014) by also capturing buyers' relations with lower-tier suppliers. Mena, Humphries, and Choi (2013) state that firms extend their reach deeper into the supply chain, while Wilhelm et al. (2016b, p. 196) argue that this phenomenon is *'still the exception rather than the rule'*. The multi-tier perspective enables the analysis of the challenges faced by firms when extending sustainability to lower-tier suppliers (Grimm, Hofstetter, and Sarkis 2014; Mena, Humphries, and Choi 2013; Tachizawa and Wong 2014).

Managers often experience difficulties in managing beyond the first tier of suppliers due to the complexity of sustainability issues (Grimm, Hofstetter, and Sarkis 2016). Due to the global scope of supply relationships, influencing practices beyond direct buyer-supplier relationships is complicated (Seuring et al. 2008). Lower-tier suppliers may be located in countries where regulations regarding environmental and social issues are not as stringent, often making them inclined to violate labour standards and contaminate the environment due to a lack of awareness regarding sustainability practices. Lower-tier suppliers are often invisible to focal firms that lack information such as who the lower-tier suppliers are, where they are located, and the quality of their capabilities and activities (Villena and Gioia 2018; Wilhelm et al. 2016a). The fundamental difference between the management of first-tier suppliers and lower-tier suppliers rests in the complexity in identifying and engaging lower-tier suppliers (Grimm, Hofstetter, and Sarkis 2016).

2.2. Governance mechanisms to ensure sustainability in multi-tier supply chains

SSCM governance mechanisms encompass the relational mechanisms, practices, and initiatives employed by firms to manage interactions with supply chain participants and other stakeholders, with the aim of enhancing sustainability outcomes (Formentini and Taticchi 2016; Gimenez and Tachizawa 2012; Gimenez and Sierra 2013; Koberg and Longoni 2019). Previous

research has categorized governance mechanisms, for example, as contractual and relational mechanisms of supply chain management (Blome, Schoenherr, and Kaesser 2013) or, in the context of SSCM, as formal and informal (Alvarez, Pilbeam, and Wilding 2010; Tachizawa and Wong 2015), internal and external (Akhavan and Beckmann 2017), or direct and indirect mechanisms of coordination (Gimenez and Sierra 2013; Koberg and Longoni 2019). In the SSCM literature, formal mechanisms are control systems and formalized processes aimed at influencing the behaviour of network members and include practices, such as standards, contracts, and audits (Alvarez, Pilbeam, and Wilding 2010; Tachizawa and Wong 2015). Meanwhile, informal mechanisms are coordination mechanisms characterised by relationships, social control, and trust rather than bureaucratic structures, and include elements such as information sharing, culture, values, and social norms (Alvarez, Pilbeam, and Wilding 2010; Tachizawa and Wong 2015).

Moreover, studies have focused on ‘hands-on’ practices—known in the SSCM literature as supplier development (e.g. Gimenez and Sierra 2013; Foerstl et al. 2010; Klassen and Vachon 2009; Reuter et al. 2010). ‘Hands-off’ mechanisms (e.g. requiring third-party certifications) are those that do not require buying firms to invest time and resources in managing relationships with their suppliers. Furthermore, Marshall et al. (2015) developed constructs and measures for both social and environmental supply chain management sustainability practices, including monitoring, implementing systems, new product and process development, and strategy redefinition.

In SSCM practices, one of the most commonly used classifications is assessment and collaboration (e.g. Gimenez and Sierra 2013; Grimm, Hofstetter, and Sarkis 2016; Reuter et al. 2010; Sancha, Gimenez, and Sierra 2016; Sancha, Wong, and Gimenez 2019; Vachon and Klassen 2006, 2008). SSCM practices based on assessment build on contractual formal governance mechanisms that have an indirect management approach and hands-off practices. Collaboration-based SSCM practices, on the other hand, are relational, informal mechanisms with a direct approach and hands-on practices.

Alvarez, Pilbeam, and Wilding (2010) suggest that governance mechanisms within the supply chain should not be treated as fixed variables determined at the beginning of a relationship; instead, firms should adapt the mechanisms to their different relationships. Tachizawa and Wong (2015) argued that the supply network structure and complexity directly affect the success of green supply chain management initiatives depending on the type of governance mechanism used. Other studies have found that applying a combination of formal and informal governance mechanisms may positively affect firms’ performance, as relational cooperation with suppliers can increase trust and compensate for the inflexibility related to contractual governance methods (Blome, Schoenherr, and Kaesser 2013; Huang, Cheng, and Tseng 2014).

2.2.1. Assessment practices

Supplier assessment, the dominant mechanism used by firms in SSCM, refers to the gathering of information by firms to monitor and evaluate the environmental and social performance of their suppliers (Koberg and Longoni 2019). This

enables firms to evaluate suppliers’ sustainability by indicating their level of compliance to their sustainability standards (Grimm, Hofstetter, and Sarkis 2014). One of the most prominent assessment practices is the evaluation and selection of suppliers according to the firm’s sustainability requirements and private standards, such as through codes of conduct (CoC) (e.g. Jiang 2009; Macdonald 2007; Mamic 2005; Pedersen and Andersen 2006). Firms often adopt CoCs when they desire to influence their partners’ practices and provide a baseline of expected standards (Mamic 2005). Firms may also request suppliers to provide proof of sustainability-related third-party certifications and management systems, such as Sedex, ISO standards, and SA8000 (e.g. Boyd et al. 2007; González, Sarkis, and Adenso-Díaz 2008; Hoejmoose and Adrien-Kirby 2012), as well as certifications and labels that are either industry-specific (e.g. FSC) or more general (e.g. Fairtrade) (Ciliberti et al. 2009; Mueller, dos Santos, and Seuring 2009). Moreover, to mitigate risks and align sustainability goals, firms may require their suppliers to perform supplier development actions as early as the supplier pre-selection phase as an alternative to post-selection (Cole and Aitken 2019).

While third-party certifications and standards can help firms assess sustainability across their supply chains using minimum requirements and external verification (Boyd et al. 2007; Delmas and Montiel 2009), they can also reduce information asymmetry and transaction costs between direct suppliers and those located further upstream and downstream in the supply chain (Ciliberti et al. 2009). However, concerns have been reported regarding third-party assessors’ coverage in multi-tier supply chains, as they may only offer limited information about upstream suppliers, thus leaving firms open to sustainability uncertainty (Hannibal and Kauppi 2019). In multi-tier settings, focal firms (usually brand firms) set sustainability expectations for their first-tier suppliers and enforce these expectations in the form of contracts; however, there is no evidence that first-tier and lower-tier suppliers do the same (Villena and Gioia 2018). The practices used by focal firms are often limited to proving lower-tier suppliers’ compliance with standards, CoCs, or certifications, while other initiatives and practices have not been reported (Grimm, Hofstetter, and Sarkis 2016).

Furthermore, several studies (e.g. Andersen and Skjoett-Larsen 2009; Awaysheh and Klassen 2010; Ciliberti et al. 2009; Gualandris et al. 2015) have explored auditing- and monitoring-related practices in SSCM, as evaluating supplier sustainability in this way represents one of the most important practices for many firms. The assessment of suppliers against defined standards requires firms to conduct announced or unannounced third-party audits by independent and accredited auditing companies, second-party audits conducted by buying companies, and first-party audits, which are self-assessments processed by the suppliers themselves (Andersen and Skjoett-Larsen 2009; Darnall, Seol, and Sarkis 2009). In addition, collaboration with external stakeholders can help firms gain access to significant expertise, standardize sustainability requirements, and legitimize sustainability programmes (Gualandris et al. 2015; Villena and Gioia 2018).

In a multi-tier setting, Villena and Gioia (2018) found that some first-tier suppliers used assessment practices similar to those of their focal companies for their own suppliers; however, this finding was rare among lower-tier suppliers. Ciliberti et al. (2009) stated that third-party monitoring activities should be strengthened, especially for lower-tier suppliers. Conversely, Villena and Gioia (2018) found that only a small group of lower-tier suppliers were monitored, and, when they were, they did not suffer negative consequences for non-compliance. The importance of assessment practices increases in complex supply chains (Awaysheh and Klassen 2010), but several studies (e.g. Gimenez and Tachizawa 2012; Sancha, Wong, and Gimenez 2019) have also suggested that formal, unidirectional mechanisms alone are insufficient; instead, firms should also use informal, collaborative mechanisms that are more interactive and multidirectional.

2.2.2. Collaboration practices

Collaborative governance mechanisms involve the communication, knowledge sharing, training, and support provided to firms to improve the capabilities and sustainability performance of suppliers (Koberg and Longoni 2019). Compared to more formal assessment practices, which are based on gathering information and evaluating suppliers' sustainability with a mainly unidirectional focus, collaboration practices include interactions enabling the integration of tacit knowledge and the collaborative development of sustainability-related solutions (Klassen and Vachon 2009; Vachon and Klassen 2006, 2008). Collaboration practices refer to activities that are typically more supportive and aim to improve relationships or develop practices that can produce advantages for a firm (MacCarthy and Jayarathne 2012; Grimm, Hofstetter, and Sarkis 2014). They are particularly important when firms aim to improve sustainability outcomes or address deficiencies revealed by supplier assessments (Koberg and Longoni 2019; Sancha, Gimenez, and Sierra 2016). Collaboration with and the involvement of first-tier suppliers are crucial for managing sustainability in multi-tier supply chains (Grimm, Hofstetter, and Sarkis 2016; Wilhelm et al. 2016a).

Studies suggest that collaboration practices consist of companies working directly with their suppliers by supporting them, enabling information and knowledge sharing, investing in their training, providing workshops, implementing corrective actions, and undertaking joint planning and research (Andersen and Skjoett-Larsen 2009; Gimenez and Tachizawa 2012; Klassen and Vachon 2009; Lee and Klassen 2008; Vachon and Klassen 2006, 2008). Sustainability training, for example, during audits and supplier visits, is vital, as suppliers recognize this as a learning opportunity and a significant driver of their own sustainability agendas (Villena and Gioia 2018). The inclusion of additional strategic partners or third parties in the management of lower-tier suppliers can induce better sustainability outcomes for focal firms and is even more necessary in multi-tier settings than in traditional supplier management (Grimm, Hofstetter, and Sarkis 2016). Focal firms can offer sustainability training for their first-tier and lower-tier suppliers through industry associations (Villena and Gioia 2018), coalitions with other industries, and

the creation or participation in voluntary sustainability initiatives that involve lower-tier suppliers (Peters, Hofstetter, and Hoffmann 2011).

Overall, the previous literature shows that firms can use different governance mechanisms to ensure sustainability in multi-tier supply chains, including contractual formal governance mechanisms with an indirect management approach or relational informal mechanisms with a direct approach. Next, we will empirically explore how these governance mechanisms are used at different levels in different multi-tier supply chains.

3. Methodology

3.1. Research design

We used an inductive, exploratory case study method to examine SSCM governance mechanisms in multi-tier supply chains due to the lack of prior research on the phenomenon. The focus of this study is to investigate differences in firms' sustainability efforts between three supply chain tiers (i.e. focal firms, first-tier suppliers, and lower-tier suppliers), as prior studies have recognized tier-related differences in this regard (e.g. Plambeck, Lee, and Yatsko 2012; Tachizawa and Wong 2014; Villena and Gioia 2018). In this study, these three tiers are represented by 25 individual firms from five different supply chains and varying industries. Thus, this case study employs an embedded design with multiple units of analysis levels within a single study (Eisenhardt 1989; Yin 2009), enabling the consideration of different perspectives and building a holistic understanding of managing supply chain sustainability in the multi-tier context. Specifically, the different tiers in supply chains represent multiple cases, while firms operating in various supply chains are identified as the embedded units of analysis.

First, we selected focal firms from the official ranking of the Sustainable Brand Index (SBI) of 2018. The SBI is an annually conducted independent study that assesses over 1000 brands in the Netherlands and the Nordics countries regarding sustainability, communication, and branding (Sustainable Brand Index 2018). Using the ranking of the top 100 Finnish firms, we identified and reached out to focal firms regarded as sustainability leaders across various industries, with the expectation that they would bring advanced knowledge to the topic. First-tier and lower-tier suppliers were selected for theoretical purposes, as we pursued cases of extremes. Using snowball sampling, the focal firm representatives were requested to identify one to three suppliers of strategic importance, or those with whom they have experienced sustainability-related challenges; these suppliers were then asked to participate in the study. In this same vein, first-tier suppliers were asked to name second-tier suppliers, and so on. During the case selection and data collection processes, we faced challenges conducting interviews with the suppliers with which the buyer firms reported issues, as they hesitated to share information about their supply chains. Nevertheless, we were able to collect data from firms across Europe in multiple supply chain tiers.

To ensure theoretical replication, the study incorporated multiple industries and supply chains. In total, five focal companies, 10 first-tier suppliers, and 10 lower-tier suppliers participated in the study. Figure 1 provides an illustration of the five multi-tier supply chains formed by the case companies, while Table 1 gives information about the case companies related to their supply chain position, industry, supplier-base size, and company size as well as the interviewees' area of expertise and interviewee count per company.

3.2. Data collection

The present study focuses on focal firms in Finland and their European suppliers located in Finland, Italy, Belgium, and Germany. To conduct a rigorous inquiry, we performed semi-structured interviews with 44 informants. The interviews, which were held during 2018–2020, were done either face-to-face or via video calls and lasted from 60 to 90 min. For the purposes of data triangulation, approximately two representatives from each company were interviewed (Eisenhardt and Graebner 2007). However, in the case of some supplier firms, we only interviewed one informant, given their broad experience and depth of knowledge. The informants were chosen based on their proficiency in purchasing and supply (chain) management. This group comprised sourcing managers, purchasing directors, and supply chain managers. To address sustainability-specific questions, corporate social responsibility managers and sustainability coordinators, among others, were interviewed. Sales representatives were also interviewed to bridge the gap between the buying company and its suppliers' supply chain departments. This study considers both the buyers' and suppliers' viewpoints in multiple tiers as well as

the relationship between the suppliers and both downstream and upstream companies in the supply chain.

In addition to the semi-structured interviews, secondary data were gathered from publicly available documents (e.g. sustainability reports, CoCs) and, in some cases, were directly collected from the companies themselves (e.g. internal firm documents, such as supplier guidelines). Two research team members analyzed the secondary data independently. The data provided additional information, for instance, on the firms' sustainability efforts and the governance mechanisms employed, enabling us to support and validate the information gathered from the interview data.

3.3. Data analysis

The interviews were recorded and transcribed, and the data were coded using NVivo qualitative data analysis software. We started our data collection and analysis from focal firms and continued with supplier firms as the data collection progressed. First, the data were categorized into broader themes defined by the interview guidelines. After a close scrutinization of the data, patterns were identified and smaller coding nodes were created. The nodes emerging from the data were coded in NVivo and, additionally, categorized and tabularized in spreadsheets (Eisenhardt and Graebner 2007). The coded nodes were constantly compared and analyzed until suitable categorization was determined. The nodes emerging from the data were discussed between the research team members, and the transcribed data were coded multiple times to ensure a thorough data analysis process. The constructs found in the literature review were considered to provide empirical grounding for the emergent theoretical framework (Eisenhardt 1989); however, this did not limit the present

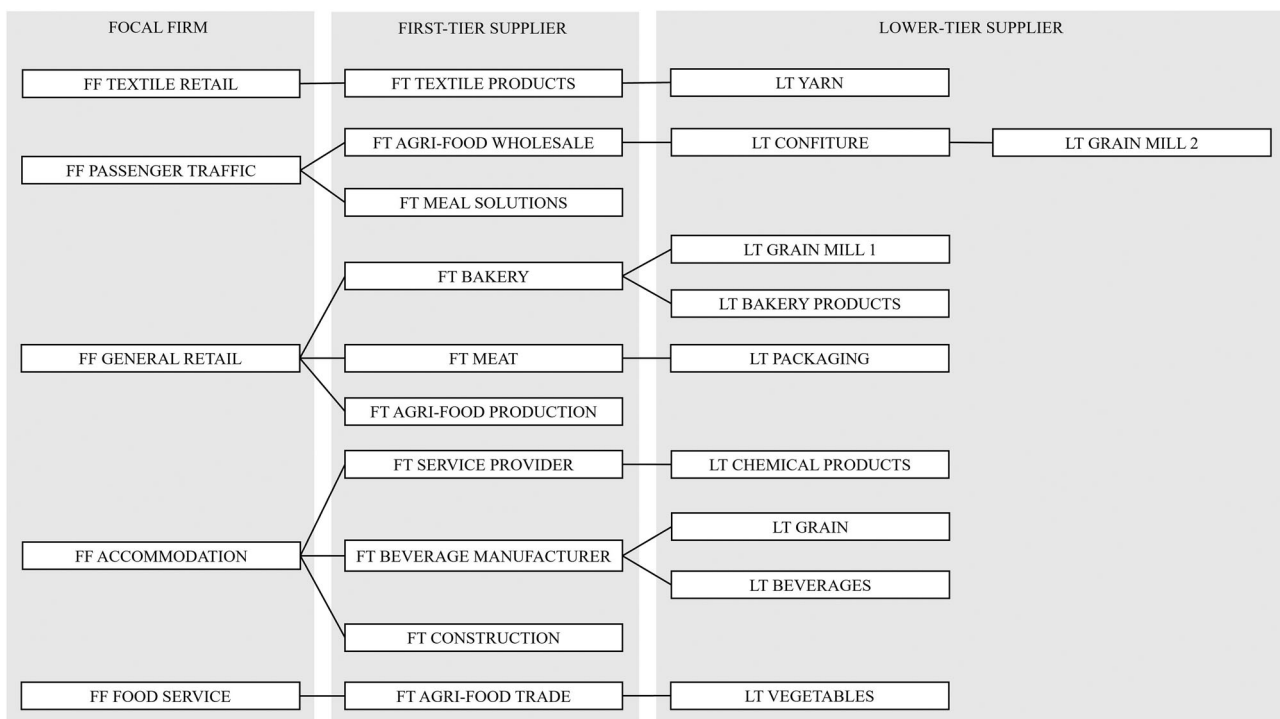


Figure 1. Multi-tier supply chain research design.

Table 1. Case study participants.

Firm	Industry	Suppliers	Employees	Interviewees' areas of expertise and number of interviewees
FF Textile Retail	Wholesale and retail trade	<100	101–1000	Sustainability (1), P&SCM (2)
FF Passenger Traffic	Transportation and storage	5000	1001–10,000	P&SCM (2)
FF General Retail	Wholesale and retail trade	>10,000	>10,000	P&SCM (2)
FF Accommodation	Accommodation and food service	101–500	>10,000	Sustainability (1), P&SCM (2)
FF Food Service	Accommodation and food service	101–500	<100	General/P&SCM (2)
FT Textile Products	Wholesale and retail trade	<100	101–1000	P&SCM (1), Sales (1)
FT Agri-food Wholesale	Wholesale and retail trade	501–1000	101–1000	Sustainability/P&SCM (1), Sales (1)
FT Meal Solutions	Accommodation and food service	101–500	101–1000	General/P&SCM (1)
FT Bakery	Manufacturing	<100	101–1000	P&SCM (2)
FT Agri-food Production	Manufacturing	101–500	1001–10,000	P&SCM (2)
FT Meat	Manufacturing	>10,000	1001–10,000	Sustainability (1), P&SCM (1)
FT Service Provider	Administrative and support service	<100	1001–10,000	General/P&SCM (2)
FT Beverage Manufacturer	Manufacturing	<100	101–1000	P&SCM (2), Sales (1)
FT Construction	Construction	5000	1001–10,000	General/P&SCM (1), Sales (1)
FT Agri-food Trade	Wholesale and retail trade	N/A	<100	General/P&SCM (1)
LT Yarn	Manufacturing	<100	<100	P&SCM (1)
LT Confiture	Manufacturing	>10,000	>10,000	P&SCM (1)
LT Grain Mill 2	Manufacturing	>1000	101–1000	P&SCM (1)
LT Grain Mill 1	Manufacturing	101–500	<100	P&SCM (1)
LT Bakery Products	Wholesale and retail trade	101–500	<100	P&SCM (1)
LT Packaging	Manufacturing	<100	101–1000	P&SCM (1), Sales (1)
LT Chemical Products	Manufacturing	101–500	101–1000	P&SCM (2)
LT Beverages	Wholesale and retail trade	501–1000	1001–10,000	Sustainability (1), P&SCM (1)
LT Grain	Manufacturing, agriculture	101–500	101–1000	General/P&SCM (1), P&SCM (1)
LT Vegetables	Manufacturing	N/A	101–1000	Sales/P&SCM (1), General (1)

study's own construct development process. While the constructs (i.e. assessment and collaboration practices) proved relevant as our study progressed, new categories were also identified as a result of the data analysis. Appendix A presents the construct development process.

We followed the data analysis steps outlined by Gioia, Corley, and Hamilton (2013). After the firm-level analysis, the data were analyzed by supply chain tier to enable the identification of patterns within each level. During the data analysis, comparisons were also made within each supply chain, and between all the supply chains that were examined.

4. Findings

Based on the data analysis, we identified 12 different governance mechanisms (six imposed, six interactive) used by the firms in multiple supply chain tiers to ensure sustainable supply. These governance mechanisms are presented in Table 2, which also displays the mechanisms that were found to contribute to MT-SSCM. The total frequencies of the practices used by the case firms are presented in Figure 2, while Figure 3 shows the relative frequencies of the practices used in each of the supply chain tiers. The following sections are organized in order of the most frequently cited mechanism used for each theme.

4.1. Imposed governance mechanisms in multi-tier supply chains

4.1.1. Third-party certification requirements

Requiring sustainability-related third-party verified certifications to evaluate suppliers was the most common practice among the firms to ensure sustainable supply. This practice was reported by all focal firms, all first-tier suppliers, and

eight of the 10 lower-tier suppliers. The firms requested sustainability-related third-party certifications (e.g. Fairtrade, MSC, GOTS) and standards (e.g. SA8000, ISO14000) from their suppliers as proof to ensure sustainability in their supply chains. The use of third-party certifications was recognized as a straightforward way to assess whether certain sustainability criteria and resources are met by a supplier. Similarly, these certifications were required for an indication of lower-tier suppliers' sustainability capabilities. For example, an informant from FT Meat stated that they cascade sustainability requirements further in the chain by requiring the same third-party certifications from their lower-tier suppliers as they possess themselves. An interviewee from FF Textile Retail stressed the importance of certifications, especially concerning the traceability of raw materials: *'It's a fact that if the origin is not certified, you can never be exactly sure where it comes from'*. Using organic-certified raw materials was reported as the most direct way for FF Textile Retail to increase supply chain transparency, since the origin is easier to trace. However, it was not always possible to source organic raw materials due to availability problems; therefore, firms occasionally had to settle for non-certified options. Certifications were also considered beneficial since third-party verification had been conducted to acquire them: *'This is how we try to safeguard, because we cannot be monitoring all the time at the source how sustainability issues are realised'* (FF Accommodation).

Views on the reliability of third-party certifications and standards varied. An interviewee from FT Service Provider stated, *'After all, certificates tell for the most part that everything is in order there'*; meanwhile, an informant from FF Food Service reported why they audit critical suppliers: *'Our suppliers have certifications in place, but a certification itself does not necessarily guarantee anything'*. The informant from FF Food Service also specified that trusting suppliers does

Table 2. Results: Governance mechanisms for ensuring supply chain sustainability.

Governance mechanisms	Imposed selection and monitoring			Imposed learning and innovation			Interactive selection and monitoring			Interactive learning and innovation			Total by firm
	Third-party certification	Code of conduct	First-party audits	Third-party audits	Second-party audits	Supplier training	Supplier visits	Continuous monitoring	Joint sustainability solution development	Building long-term commitment and trust	Continuous and open communication	Knowledge exchange	
Case firm													
FF Passenger Traffic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
FF General Retail	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
FF Textile Retail	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8
FF Accommodation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
FF Food Service	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
FF Textile Products	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
FT Bakery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
FT Agri-Food Production	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
FT Beverage Manufacturer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
FT Agri-Food Wholesale	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
FT Meat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
FT Meal Solutions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
FT Service Provider	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4
FT Construction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3
FT Agri-Food Trade	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3
LT Beverages	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
LT Confiture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8
LT Grain Mill 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8
LT Chemical Products	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
LT Grain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
LT Vegetables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
LT Yarn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
LT Packaging	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
LT Bakery Products	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
LT Grain Mill 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3
Total Mechanisms	23	20	14	9	20	2	14	12	19	15	13	11	

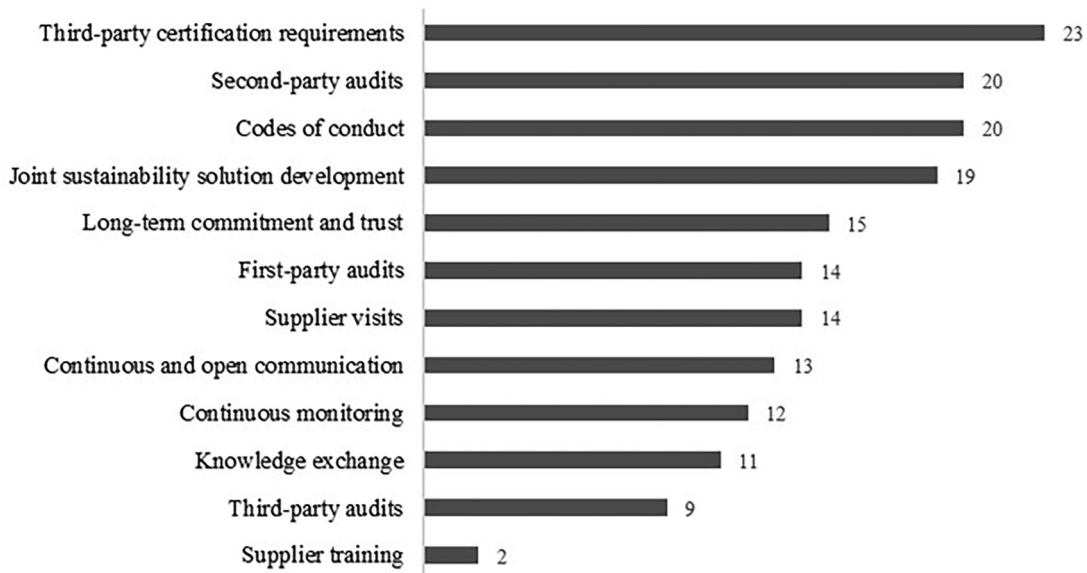


Figure 2. Frequencies.

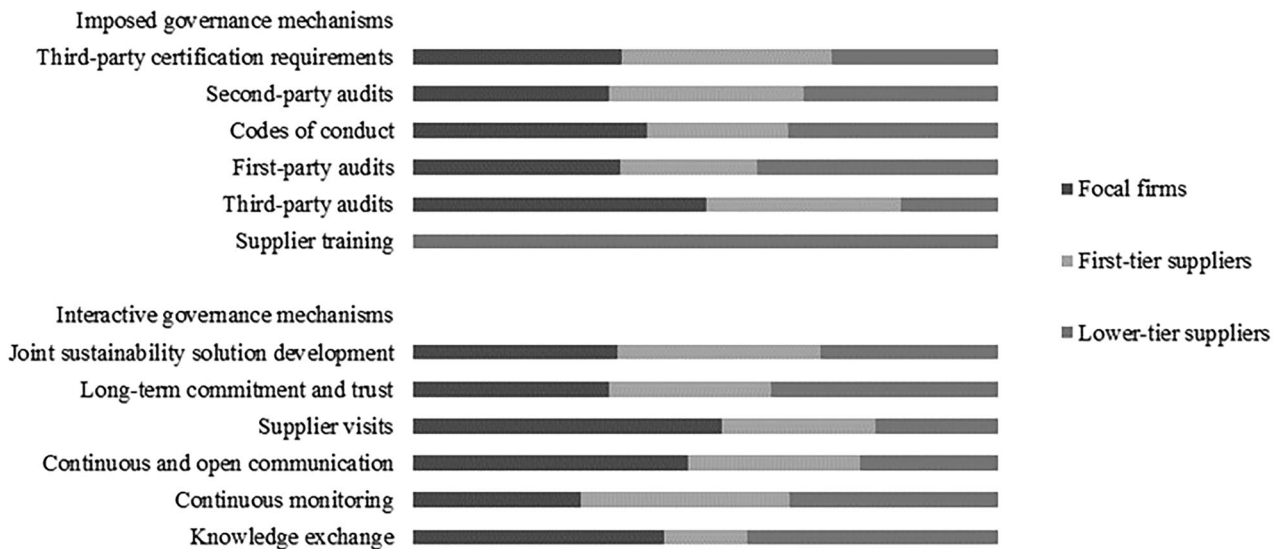


Figure 3. Relative frequencies.

not mean that imposed mechanisms are not needed: *'In a way, through history comes a certain trust or knowledge that some suppliers are stronger. However, it is not enough; we always demand documentation as well'*. Hence, the preferred strategy of this firm was the synergizing of different types of governance mechanisms.

The findings demonstrate that some suppliers felt restricted from using third-party certifications as a part of their SSCM practices. For example, FT Meal Solutions, which offers customized solutions for its customers, requests certified products from their suppliers only if its customers demand them:

We can provide all kinds of sustainable products: all kinds of organic, Fairtrade, or whatever. But, in the end, we have to be aware that this will be more expensive [due to certification] than a regular product. I think we should be at a point where our customers also need to accept that and need to ask themselves:

'How serious are we when we want to make a change?' This has to start, actually, at the [consumer].

4.1.2. Second-party audits

On-site audits conducted by the buying firm were mentioned by four out of five of focal firms, eight out of the 10 first-tier suppliers, and eight out of the 10 lower-tier suppliers. There were no major differences in conducting second-party audits between the examined supply chain tiers. Second-party audits, which were found to be the most frequently used audits, were often described as being combined with other types of audits. FF Passenger Traffic stated that, during their environmental and quality audits, they also evaluated social topics. Furthermore, an interviewee from FT Bakery noted that they had not yet conducted audits that focused purely on sustainability. This was common, particularly among firms

in the food industry, which had a strong focus on food safety.

Instead of conducting third-party audits, an interviewee from FF Accommodation reported a focus on second-party audits, visiting suppliers at regular intervals to verify their promises: *'Sustainability can also be just empty words (...) We send requirements and CoCs, but if they are not monitored or verified in any way, it does not come true in reality (...) What we do to prevent this: we audit our suppliers, even though we are not an official auditor'*.

The firms focused on second-party audits for collaboration, learning, and innovation purposes. An informant from FF Food Service described: *'When we go to a factory, we do not go there as police or an authority to check and demand things. We go there to watch and learn ourselves, and also to express thoughts and ideas'*. Instead of merely demanding improvements, FF Food Service uses a collaborative approach to help their suppliers improve in the area of sustainability. The informant from FF Food Service continued:

At best, the quality or production manager takes it as a learning experience (...) At best, it can be such a push for the factory or supplier; they have something they are not satisfied with themselves either. When someone comes from outside to say, 'fix this', it will be easier for them to go and fix it.

Compared to more passive monitoring methods, such as first-party audits, an informant from FT Bakery found second-party audits more effective due to its facilitation of development and interaction with suppliers. While second-party audits were found useful, firms noted that the resources needed to conduct them are limited. An interviewee from LT Chemical Products reported that, even though they conduct several second-party audits per year, they rely more on long-term supplier relationships: *'We quite rarely can go to the site ourselves and verify something. So, it is based on conversations, questionnaires, their possible certifications, and evaluation of trustworthiness (...) Most of the supplier relationships are so long that we basically trust them'*.

The findings demonstrate that second-party auditing was considered a central practice by the firms for gathering information about lower supply chain tiers. However, the direct auditing of lower-tier suppliers was not common. For FF General Retail, this was relevant in some cases when their lower-tier supplier had a key role in manufacturing a critical product. An informant from LT Confiture viewed the conducting of audits beyond their direct supplier as important but challenging due to their complex supply chains and lack of relevant tools and methods: *'We did audits in such a way that we went to our first-tier supplier, a [nut]cracker, but then we discussed that, of course, the audit should also be carried out right up to the farm (...) It would help us see what the risks are there'*.

4.1.3. Codes of conduct

CoCs emerged as another widespread practice used by firms to communicate minimum sustainability requirements to suppliers, assessing them against set criteria and extending sustainability standards to subsequent supply chain tiers.

The findings showed that all focal firms, six of the 10 first-tier suppliers, and nine of the 10 lower-tier suppliers engaged their suppliers through CoCs as part of their key methods for ensuring sustainability. For instance, the case firms specified that their CoCs served as a prerequisite and set minimum requirements (LT Packaging), were used to engage suppliers (LT Grain) and delegate responsibility to direct suppliers (FF Passenger Traffic), and influenced suppliers to improve sustainability (LT Vegetables).

CoCs emerged as a central mechanism for MT-SSCM, with many firms referring to the practice as the primary approach to cascading sustainability standards to lower tiers: *'We don't normally go for it [managing lower-tier suppliers] other than obligating them [direct suppliers] to fulfil our supplier code of conduct, in which case they take responsibility for that supplier'* (FT Agri-Food Production). Moreover, an informant from FF Passenger Traffic described that their suppliers are required to account for their lower-tier suppliers as if they were their employees or part of their business. An interviewee from FT Bakery gave an example of the successful impact of their CoC in a multi-tier setting:

I have given an indirect purchasing supplier our CoC and told him that he must also take care of his sub-suppliers. This supplier was honest and the lower-tier supplier was honest and did not sign it because the lower-tier supplier could not convince them that they were doing so. Then, we switched [to a different] lower-tier supplier. I thought it was quite cool that they did not just sign it to get ahead in this case.

However, concerns about the effectiveness of CoCs were also expressed, as described by an informant from FT Agri-Food Production: *'If suppliers do not sign it, they will not deliver to us. But the fact that you sign the paper, I do not want to be sarcastic, critical, or anything, but it is easy to write a salesperson's name on that paper without even reading it'*.

We found key differences between the firms regarding their approaches to verifying suppliers' compliance. While some firms explained that they trust that their suppliers to follow the CoC, others expressed the following beliefs: *'It is not just a piece of paper that has someone's name on it. It can be followed up by certifications and audits'* (LT Packaging); *'we will not settle only for the contract'* (FT Agri-Food Wholesale). Moreover, FF Food Service described their logic behind the requirements for fulfilling a CoC:

We automatically ask [suppliers] to sign the CoC, mostly from suppliers outside Europe (...) there may be some human rights or other issues within Europe as well. Outside Europe, a CoC is mandatory. Within Europe, we do ask for it, but things may not fall apart in the case our local bakery does not immediately deliver the CoC to us. We are confident that we can verify through our audits.

Therefore, while the objective of FF Food Service is for all suppliers to sign their CoC, the requirement to sign was reported to depend on the suppliers' capabilities and perceived risk.

4.1.4. First-party audits

First-party auditing based on supplier self-assessment was reported by three out of the five focal firms, four out of the

10 first-tier suppliers, and seven out of the 10 lower-tier suppliers. The performance of first-party audits was mainly described to take place in the supplier selection phase prior to negotiations and as supporting other auditing activities, with the purpose of communicating sustainability and transparency requirements that need to be met and accepted by potential suppliers. The firms use first-party audits for collecting general information about suppliers and supply chains, including raw material sources. This was believed to be beneficial in terms of improving supply chain transparency and traceability. For instance, LT Beverages expects their suppliers to tabularise all their raw material sources for transparency, including lower supply chain tiers. Focusing on environmental sustainability, FT Textile Products reported using Amfori BEPI self-assessment questionnaires. LT Grain Mill 2 explained that, at the farmer level, they conducted annual surveys: *'We have conducted them [first-party audits] many years in a row already to find out the general level of how sustainability is fulfilled by our contract farms'*. LT Grain Mill 2 also sent these surveys to farms that did not deliver to them in order to make industry-level comparisons.

In terms of a supplier's view, an informant from LT Chemical Products added that the number of sustainability surveys they receive from their customers has increased in recent years, which has also affected their own practices. Although useful, first-party audits were not seen as the most reliable source of information for ensuring sustainability by the buyer firms, especially if the supplier wanted to hide problems. As LT Chemical Products explained, *'We send questionnaires to suppliers in which we ask these things, but it is easy to answer how things should be, and not how they really are'*. First-party audits are therefore associated with a degree of trust and uncertainty, as suppliers are expected to answer truthfully, which might not always be the case.

4.1.5. Third-party audits

The least frequently used practice was third-party audits. Three out of the five focal firms, four out of the 10 first-tier suppliers, and two out of the 10 lower-tier suppliers employed third-party audits to ensure sustainability. The most notable differences between supply chain tiers were found in this category. Third-party audits were described by the focal firms as one of the main ways of assessing suppliers and gathering information about supply chains; however, this finding was not common among the supplier firms—mentioned in fewer than a third of the cases.

Third-party audits were described as helpful in detecting improvement areas and gathering information about suppliers across multiple tiers: *'If lower-tier suppliers have not been audited (...) we do not have any information about the supplier's sustainability'* (FF Textile Retail). Three focal firms, two first-tier suppliers, and two lower-tier suppliers had joined an auditing programme (i.e. Amfori BSCI or Sedex) to gain access to auditing resources. For instance, one focal firm specified that around 80% of their suppliers are BSCI-audited, while another mentioned the aim of increasing the number of BSCI-audited suppliers to 100%. Third-party platforms were considered valuable due to available reports and

country risk listings, which enable quick information exchange in the case of political or economic changes. FF General Retail explained: *'The biggest reason why we use BSCI (...) if any operator or supplier finds problems through supplier assessment or auditing, everyone will receive the information through the system'*.

Suppliers' sustainability risk was one of the main issues affecting the use of this mechanism, as auditing efforts were described as mainly focusing on suppliers located in countries with higher risks. For instance, FF General Retail stated, *'We don't do any kind of business with risk country suppliers unless they are on a third-party auditing path'*. In contrast, for FF Textile Retail, which is a relatively smaller firm, this kind of approach was not always possible due to an unfavourable power position in relation to its suppliers.

The firms relied on independent third-party audits due to reasons such as a lack of resources for conducting second-party audits and having a large supplier base. FF Textile Retail reported the following: *'BSCI is what we trust in. I don't have resources for going around to conduct audits in factories (...) It is important to visit suppliers sometimes, meet people, and see how things look, but it does not give you a realistic picture of how things are there'*. An informant from FF General Retail reported to conduct social audits by third-party auditors for similar reasons, as audits conducted by independent third-party auditors were found to be more reliable compared to second-party audits. Third-party auditing was not used by smaller firms with a low number of suppliers; they instead focused on using other imposed and inter-active governance mechanisms.

4.1.6. Supplier training

Only two lower-tier suppliers, LT Beverages and LT Grain, were found to arrange specific sustainability training for suppliers to build their capabilities. For example, an interviewee from LT Beverages mentioned an e-learning course about their CoC that must be completed by all suppliers. They also mentioned training arranged in collaboration with industry partners to support direct and lower-tier suppliers' capability-building in risk-countries: *'We organise training (...) beyond the first tier for producers in countries where there are risks of human rights violations. We arrange training sessions together [with industry partners]'*. The interviewee from LT Beverages also reported successful outcomes of sustainability training:

For many, it has been eye-opening: 'I did not know that these kinds of things are talked about'. We have noticed that, regarding many things, we have to act as a facilitator. Our suppliers are not always aware of such things. Hence, we have taken an active role in informing them in the meantime.

Although sustainability training was found to generate positive effects on suppliers' learning and innovation, it was not commonly used among the case firms. An informant from FT Agri-Food Wholesale explained the reasons behind this insight as follows: *'Of course, our supplier base—we have about 800 of them [suppliers]. Then they are located in different places; they are different sizes and other things. So, for practical reasons, we need to take care of this more on paper'*.

Due to the firm's large, globally scattered supplier base, they did not perceive supplier training as sensible.

4.2. Interactive governance mechanisms in multi-tier supply chains

4.2.1. Joint sustainability solution development

Joint development efforts aimed at improving supply chain transparency and/or sustainability were reported by four out of the five focal firms, eight out of the 10 first-tier suppliers, and seven out of the 10 lower-tier suppliers. These efforts included proactive transparency and sustainability-focused projects and initiatives implemented either together with direct suppliers or as a multi-tier collaboration. The projects identified included sustainable packaging innovations; reducing packaging, CO₂ emissions, and water use; mitigating eutrophication; and the use of blockchain for enhancing supply chain traceability. FT Beverages Manufacturer launched a transparency project with their supplier to communicate the origin of their raw materials to consumers, while an interviewee from LT Vegetables mentioned a project for reducing water consumption and CO₂ emissions:

Not only in the company but also with the farmers in the agricultural area do we want to reduce the CO₂ impact. For that reason, I introduced [focal firms] to co-create a project between the farmers, production, and distribution with LCA to improve the quality level of all the relationships. These kinds of things are not free (...) You have to first study the whole supply chain, and we did [this].

Multi-tier collaboration was perceived as essential for sustainable solution development, as it requires complex and interactive information and transparency across tiers.

Additionally, an informant from FF Textile Retail discussed a transparency project on which they collaboratively worked with an external party by interviewing factory workers at their suppliers' sites, as this information would be otherwise difficult to obtain on their own. The inclusion of third parties in the joint development of sustainability solutions was also noted by other firms. An interviewee from LT Yarn reported on an LCA project on which they worked together with suppliers, an industry organization, and the government to reduce negative environmental impact: *'We have a lot of projects running on sustainability, the use of blockchain, the use of GRS certification and visualizing that (...) we have a lot of investments in buying sustainable products, trying out new raw materials, working with partners on transparency projects, on an environmental footprint project'*.

4.2.2. Building long-term commitment and trust

In terms of the desire to enhance sustainability in supply chains, three out of the five focal firms, five out of the 10 first-tier suppliers, and seven out of the 10 lower-tier suppliers emphasized the importance of building up the long-term commitment and trust of suppliers. This is characterized by firms committing to the long-term development of supplier relationships, common goals, and shared values as well as their accommodating organizational culture that eases the coordination of sustainability-related issues. While recognized

at all tiers, we found the greatest evidence of this practice among the lower-tier suppliers. Efforts aimed at building up long-term commitment and trust were found to be mainly focused on suppliers with strategic and critical products and as compensating for the lack of information about lower-tier suppliers:

There are surely things we do not know about (...) We strive toward choosing our suppliers and partners in a way that we collaborate in the long term to learn from each other and to know their ways of working and, on the other hand, we know the lower-tier suppliers in their supply chains. (FF Accommodation)

An interviewee from FT Beverages Manufacturer highlighted that close, long-term collaboration worked better for them compared to transaction-based relationships: *'Long-term relationships; if we had short-term (i.e. a month or so) deals with whoever offers a certain specification for an even cheaper price, it would not be possible to carry out certain discussions or develop things in a long run'*. Furthermore, LT Yarn stood out because of its strong emphasis on social, family-like ties, organizational culture, and a collaborative approach, which were considered instrumental in ensuring sustainability. According to the interviewee from LT Yarn, their small supplier base enabled them to closely focus on fewer supplier relationships. Moreover, an interviewee from FF Textile Retail stated that, as their sourcing is focused on a few suppliers, it makes it easier to manage supply chain sustainability through collaboration. Limited by their resources, an informant from LT Chemical Products described their approach to ensuring supply chain sustainability as follows: *'The mindset is that we work with trustworthy and long-term partners, which means that the collaboration works and agreed practices are better in place'*. Hence, although LT Chemical Products also used imposed governance mechanisms for selecting and monitoring suppliers, the evaluation of sustainability was mainly based on open discussion and long-term collaboration due to resource limitations.

While building long-term collaboration with suppliers was perceived as effective and important for ensuring sustainability, an interviewee from FF Food Service highlighted that it should not restrict them in seeking the best possible supplier for sustainability: *'It is a bit of a search for balance all the time; we want to nurture long supplier relationships because we see that they are effective, especially regarding ensuring sustainability issues. However, it should not tie our hands'*. Moreover, an informant from FT Agri-Food Production reported difficulties related to MT-SSCM:

In a way, we have to know. We must have full control of our supply chain right up to the very beginning, but, since we do not have the resources, it makes no sense for one of us to go and retrieve those [products] ourselves (...) So, this induces a situation where we have to pursue partnerships and we have to develop the bigger suppliers.

For the case firms, facilitating long-term commitment and partnership among direct suppliers was seen as central in cascading sustainability to the subsequent tiers. However, collaboration efforts were hindered due to a lack of resources. Firms with smaller supplier bases used interactive approaches rather than imposed approaches, efficiently

managing their suppliers, while this practice was difficult for firms lacking resources or larger supply bases.

4.2.3. Supplier visits

Premises visits for the selection and monitoring of suppliers was reported by all the focal firms, five out of the 10 first-tier suppliers, and four out of the 10 lower-tier suppliers. These supplier visits were deemed useful by the case firms in terms of getting to know suppliers and their ways of working: *'We visit their premises to see how they make the substances there, what the facilities are like, how they work'* (FT Service Provider). An interviewee from LT Yarn described the benefits of supplier visits as follows:

I visit suppliers at least once a year. I visit their factories as a customer. They are very open; they show the way they work, the way they handle the workers. They talk about their energy efficiency, their water use. ... It [visiting suppliers] shows a first view on how they are handling the factory. I am meeting the team. I can pose questions to the production personnel.

FT Textile Products noted that it was their responsibility as a buyer to visit and be present at suppliers' sites to ensure sustainability: *'We are present (...) in the cotton countries. Because we want to be close to the raw material (...) We can see that if we are not there, the level will go down'*. While an informant from FT Bakery stated that imposed governance mechanisms are crucial for ensuring sustainability, they also emphasised the importance of interactive supplier visits: *'This is a bit relaxed and soft practice, but I believe this is the most important one—getting to know them'*. They also stated that interaction with their suppliers, such as communication and in-person visits, helps them gather necessary supply chain information for ensuring sustainability.

Moreover, the findings showed that supplier visits are sometimes conducted to monitor suppliers beyond the immediate tier. An informant from LT Beverages mentioned that supplier visits made both by them and their suppliers helped to increase visibility in multi-tier supply chains: *'We make sustainability visits. Our buyers visit the producers, travel and look at the conditions there, and this way we also get to know a lot of producers behind the first tier'*. However, most firms reported rarely visiting their lower-tier suppliers: *'In exceptional cases, I have visited a suppliers' supplier, but we haven't typically visited them, so we cannot quite say what kind of company it is other than based on what information that has been given to us'* (FF Textile Retail).

4.2.4. Continuous and open communication

Four out of the five focal firms, five out of the 10 first-tier suppliers, and four out of the 10 lower-tier suppliers mentioned continuous and open communication as a mechanism for ensuring sustainability in multi-tier supply chains. This practice was emphasized by the focal firms, but also by both first and lower-tier suppliers. An interviewee from FT Meal Solutions stated the following:

If you talk about a consistent supply chain, from feed to fork, you need very open communication throughout the whole supply chain because we need to have the same goal at the end. Only if

we understand each other's goals on every level, we are looking in the same direction. If we are not sharing this with our customers, our suppliers, at least a few of those levels could go in the wrong direction. That's why collaboration for me always means very open communication.

An informant from FT Beverages Manufacturer underlined the importance of active communication for creating more sustainable solutions in supply chains: *'If we do not communicate in that direction what the trends are, what our way of thinking is, and what information we are receiving, we cannot just sit here and assume that they will suddenly bring the solution to us'*. They continued that maintaining open communication was their responsibility and an important part of operating sustainably, as it helps in foreseeing future directions and collaboratively finding new solutions. According to the informant from FT Beverages Manufacturer, the firm benefits from their small supplier base, as it facilitates more frequent discussions with their suppliers: *'We can cover the vast majority [of supply] by 20–30 suppliers, which means that we have an opportunity to have deeper discussions with everyone before anything is agreed on'*. Additionally, an interviewee from LT Yarn, one of the smaller lower-tier suppliers, explained their greater reliance on interactive mechanisms:

You can send auditors to check something, but—when you are like me, in a smaller business—it is important to have good contact with your suppliers. This means you have an open view of what the risk is, what the developments are in the market, and what the response supply is. If you have good communication with your suppliers, I think this is an important one.

In contrast, an interviewee from FT Agri-Food Wholesale, a firm that has a relatively larger supplier base, stated: *'Collaboration and communication are important, of course. However, if we consider how sustainability is realised in our daily life, we have to trust whatever has been agreed on paper (...) the size of our supplier base is huge, and if we want to visit or check or ask something, it is always a small sample'*. Thus, this firm's large supplier base was perceived as a barrier, leading to a situation in which they had to rely more on imposed instead of interactive mechanisms to ensure sustainability in their supply chains.

4.2.5. Continuous monitoring

Continuous supplier monitoring refers to the close, interactive assessment of suppliers' sustainability performance, for example, through on-site observation and analyzing samples. This practice was mentioned by two out of the five focal firms, five of the 10 first-tier suppliers, and five of the 10 lower-tier suppliers. Interactive supplier monitoring was commonly used by firms operating in the food industry and those close to the raw material source. With a greater focus on interactive monitoring instead of imposed audits, an informant from FT Agri-Food Trade stated:

Most customers conduct audits to approve their packaging suppliers, which is, of course, the most common way to check the conditions of suppliers. From my perspective, I would say it is daily monitoring. By working in the food sector, I get daily information about many different producers on the market. I know where there have been problems and what kind of products have problems with the risk of traceability.

A close distance to suppliers was described as benefitting supplier monitoring. For instance, an interviewee from FT Bakery found that sourcing raw materials from as close as possible made it easier to monitor supply chain sustainability: *'The closer they are, the better you can monitor the chain (...) We get limited raw materials from the other side of the world'*.

One of the issues reported as affecting supplier monitoring was the availability of resources or monitoring tools. An informant from FF Passenger Traffic stated that they monitor their suppliers and go through the reports together with them to improve suppliers' sustainability performance. On the other hand, an informant from LT Chemical Products stated that, as they lacked a comprehensive system to gather and update the information from their supply chains, they had to rely on other, mainly interactive practices. Additionally, an interviewee from LT Yarn explained that their limited resources did not mean that they did not pay attention to sustainability issues; they ensured sustainability using other practices: *'It does not mean that you do not track those things'*.

4.2.6. Knowledge exchange

Knowledge exchange refers to the interactive exchange of sustainability knowledge between a buyer and a supplier. This practice was found in three cases of the five focal firms, two cases of the 10 first-tier suppliers, and six cases of the 10 lower-tier suppliers. The focal firms and lower-tier suppliers used knowledge exchange more frequently than the first-tier suppliers. The firms reported arranging interactive seminars, events, and workshops to support supplier learning and encouraging information sharing about sustainability themes. As previously mentioned, we found that only two lower-tier firms arranged imposed training for their suppliers, but the establishing of interactive seminars and workshops that facilitate mutual knowledge exchange and learning were much more used among the case firms. An interviewee from FF Passenger Traffic stated: *'We exchange information, but we do not really have supplier trainings for sustainability (...) We have Supplier Days and information sessions.'* From among the lower-tier firms, an interviewee from LT Grain Mill 2 reported about interactive seminars: *'Seminars for farmers (...) Lately, the content has been 25–75% about sustainability'*. An informant from LT Beverages described the seminar they had organized as not only for suppliers but instead taking on a wider approach: *'We have organized a seminar for producers, suppliers, and other stakeholders as well'*. This illustrates that the lower-tier suppliers are actively advancing knowledge exchange with their own suppliers, organizing interactive seminars and other events to make this possible.

5. Discussion

In this study, we investigated different types of governance mechanism aimed at ensuring sustainable supply and explored how the use of these mechanisms differs between focal firms, first-tier suppliers, and lower-tier suppliers in multi-tier supply chains. We identified 12 governance

mechanisms used by firms across multiple tiers of the supply chain to ensure sustainable supply; these were then categorized based on their structure and purpose. Moreover, we discussed the topic of extending sustainability along multi-tier supply chains.

5.1. Framework on governance mechanisms

Previous research separated SSCM governance mechanisms into two main categories: contractual, formal governance mechanisms with an indirect management approach and hands-off assessment practices and relational, informal mechanisms with a direct approach and hands-on collaboration-based practices (Alvarez, Pilbeam, and Wilding 2010; Gimenez and Sierra 2013; Koberg and Longoni 2019; Tachizawa and Wong 2015). However, our findings show that to fully understand SSCM governance mechanisms, we must understand both their structure and purpose; thus, the traditional categorizations are too simplistic. Based on our findings, we introduce a framework for governance mechanisms that categorizes them based on their structure and purpose. As shown in Figure 4, the *structure* of governance mechanisms can be divided into imposed vs. interactive mechanisms, and the *purpose* of governance mechanisms can be divided into the selection and monitoring of sustainability performance vs. learning and innovation for sustainability solutions.

Imposed mechanisms have a formal structure and are based on control mechanisms. Our findings show that the purpose of imposed mechanisms is more complex than assessment and falls into two categories: a focus on supplier selection and monitoring (e.g. CoC, certifications, first-party audits) and a focus on learning and innovation (e.g. second-party audit, supplier training). With imposed selection and monitoring mechanisms buying firms do not need to invest a lot of time and resources in ensuring suppliers' sustainability. They are similar to assessment mechanisms (Alvarez, Pilbeam, and Wilding 2010; Tachizawa and Wong 2015; Grimm, Hofstetter, and Sarkis 2016) but with a clear distinction: assessment refers to the purpose of the mechanism, while imposed refers to the structure.

Interactive mechanisms are more informal and are based on collaboration. These are similar to the collaboration mechanisms discussed in several studies (Koberg and Longoni 2019; Klassen and Vachon 2009; Vachon and Klassen 2006, 2008). However, we found more complexity in these mechanisms, focusing particularly on their structure (interactive) and the potential for a mechanism to have multiple purposes, as some firms focus on supplier selection and monitoring (e.g. supplier visits, continuous monitoring) while others focus on learning and innovation (e.g. joint sustainability solution development, continuous and open communication, and facilitating long-term commitment and trust). For example, assessment-based second-party audits and supplier training, which are formally imposed upon suppliers, also have a learning and innovation element and are not only focused on monitoring. Supplier visits, on the other hand, are interactive practices that are focused on supplier selection and monitoring suppliers' sustainability. Similarly,

		Purpose	
		Selection and Monitoring	Learning and Innovation
Structure	Imposed	Third-party certification Codes of Conduct First-party audits Third-party audits	Second-party audits Supplier training
	Interactive	Supplier visits Continuous monitoring	Joint sustainability solution development Building long-term commitment and trust Continuous and open communication Knowledge exchange

Figure 4. Framework on governance mechanisms in multi-tier supply chains.

continuous monitoring is interactive, but its key purpose is to monitor suppliers to ensure their sustainability.

5.2. On the implementation of governance mechanisms

To answer the first research question ('What governance mechanisms are implemented by focal firms, first-tier suppliers, and lower-tier suppliers to ensure sustainable supply?'), our study showed that the *focal firms* ensure their suppliers' sustainability performance using imposed governance mechanisms to monitor their suppliers or engage in supplier selection, but they also rely on interactive mechanisms for learning and innovation. Similarly, the *first-tier suppliers* use imposed governance mechanisms for supplier selection and monitoring but also rely on interactive mechanisms for both selection and monitoring and learning and innovation. The *lower-tier suppliers* also use imposed governance mechanisms for supplier selection and monitoring, and interactive mechanisms for learning and innovation. The findings show that imposed governance mechanisms, which do not necessarily require resource deployment from both parties (Zimmermann and Foerstl 2014), were only slightly more frequently used by the firms compared to interactive mechanisms. For example, we found that second-party audits focused on learning and innovation rather than unidirectional audits for selection and monitoring were used the most frequently among the firms in this study.

While some practices, such as third-party certifications, second-party audits, and CoCs, were used across all supply chain tiers, the use of third-party audits, supplier visits, and continuous and open communication differed between the tiers. The *focal firms* prioritized imposed independent third-party audits and auditing schemes, supplier visits for

selection and monitoring, continuous and open communication, and knowledge exchange. In this study, the *first-tier suppliers* relied more on continuous monitoring, joint sustainability solution development, and facilitating the long-term commitment and trust of lower-tier suppliers. Meanwhile, prioritizing governance mechanisms that focus on first-party audits, knowledge exchange, joint sustainability solution development, and the building of long-term commitment and trust was emphasized by the *lower-tier suppliers*. Overall, the findings show that the *lower-tier suppliers* in particular initiated supplier training and multi-tier-wide sustainability projects.

The findings indicate that several factors, such as perceived sustainability risk, size of supplier base in relation to resources for ensuring sustainable supply, product type, position in the supply chain, stakeholder demands, suppliers' sustainability capabilities, and the power dynamics between supply chain members, influence the adoption of governance mechanisms and the ability to extend sustainability to subsequent tiers. Similar factors have been recognized in previous studies focusing on the factors that determine when and how buying firms extend their sustainability strategies to lower-tier suppliers (e.g. Tachizawa and Wong 2014; Grimm, Hofstetter, and Sarkis 2016; Wilhelm et al. 2016b). For instance, a firm that has a large supplier base and greater influence over their suppliers may rely on imposed instead of interactive mechanisms to ensure sustainability in their supply chains. For a large focal firm with many suppliers, especially in high-risk countries, it may seem necessary to use imposed governance mechanisms to gain supply chain visibility and assurance of sustainability. This is similar to the findings of Awaysheh and Klassen (2010) in that the importance of assessment-related practices increases in complex supply chains. On the other hand, firms that lack power,

work with a small number of suppliers, are located close to the raw material source, and have a simple supply chain structure may lean more towards interactive governance mechanisms, as they have trust with suppliers, information, and responsibility sharing and may experience greater visibility regarding risks and opportunities.

5.3. Extending sustainability along multi-tier supply chains

In terms of the second research question ('Which governance mechanisms are essential in extending sustainability to lower supply chain tiers?'), while we found a few examples of how governance mechanisms are used directly with lower-tier suppliers, the results show that managing lower-tier suppliers directly is not common. In line with previous studies (e.g. Wilhelm et al. 2016b), we found that firms tend to delegate the responsibility of sustainability management to the next supply chain tier. Based on the results, the key governance mechanisms for extending sustainability to lower supply chain tiers include CoCs, third-party certification requirements, third- and second-party audits, and joint sustainability solution development. These mainly represent imposed mechanisms, the joint sustainability solution development being the only interactive one. Our findings support the view that the practices used by firms for managing lower-tier suppliers are similar to conventional SSCM practices (Grimm, Hofstetter, and Sarkis 2016). Yet, the firms in this study extended sustainability to lower tiers mainly by using imposed selection and monitoring mechanisms, indicating that the use of governance mechanisms beyond the immediate supply chain tier is still limited.

The results suggest that firms are often limited in their efforts to ensure sustainability, particularly in longer, complex supply chains; this then hinders efforts aimed at promoting both SSCM and MT-SSCM. Based on the findings, firms realise the importance of MT-SSCM but lack the resources, tools, and influence to do so, leading to responsibility delegation. Also, building long-term collaboration and trust is important in the management of multiple tiers, but firms may have too many suppliers to do this effectively or efficiently. First- and lower-tier suppliers located relatively downstream seem to face the greatest challenges, as they are caught between the demands and responsibility abdication of the focal firms as well as the complexity and volume of information needed to ensure sustainability.

Regarding MT-SSCM, our findings provide examples of how different types of governance mechanisms can help firms acquire information, increase supply chain visibility, facilitate multi-tier collaboration, and build suppliers' sustainability capabilities. While firms rely heavily on imposed selection and monitoring mechanisms in ensuring sustainability within multiple tiers, the findings indicate that, in particular, imposed learning and innovation mechanisms can help develop suppliers' sustainability capabilities. Moreover, the implementation of imposed selection and monitoring mechanisms, such as delegating responsibility through CoCs, can lead firms to trust their direct suppliers to cascade their

sustainability practices without guaranteeing sustainable supply. Thus, it is essential for firms to implement both imposed and interactive selection and monitoring as well as imposed and interactive learning and innovation governance mechanisms to facilitate MT-SSCM. The results show that the employment of learning and innovation mechanisms with direct and/or lower-tier suppliers is particularly crucial for extending sustainability to lower tiers. Therefore, our findings reflect and expand the concept suggested in previous studies regarding the importance of using a combination of assessment and collaboration practices in SSCM (e.g. Gimenez and Tachizawa 2012; Lee and Klassen 2008; Sancha, Wong, and Gimenez 2019). Additionally, our findings further support the idea of Silva and Nunes (2022), who suggested that sustainability needs to be realized through shared structures and practices in supply chains.

Overall, the present study shows that firms at each supply chain tier used similar governance mechanisms to ensure supply chain sustainability and these were rarely directed at suppliers beyond the immediate tier. We found no major differences in terms of governance mechanism adoption between the supply chain tiers, but our findings show that lower-tier suppliers are not passive in regard to SSCM, a finding similar to that of Gong et al. (2018) and Kim et al. (2022) but contrary to that of Villena and Gioia (2018). We found that lower-tier suppliers actively adopt sustainability practices and use relatively more innovation practices than focal firms. Indeed, the lower-tier suppliers in this study represented a source of sustainability innovations benefitting the whole value chain; this is a concept from which focal firms can learn. Firms altogether, despite their supply chain tier and location, seem to put effort into managing sustainability; however, there is a clear need for them to advance their practices aimed at extending sustainability across multiple supply chain tiers.

5.4. Managerial implications

Our findings indicate that managers should recognize the importance of a multi-tier perspective in managing supply chains. SSCM should be considered more broadly, because, without a multi-tier perspective, managers might not recognize all the supply chain actors and, thus, expose their company to risks. Therefore, the application of a multi-tier perspective and recognition of the role of lower-tier suppliers in improving the sustainability performance of the whole value chain is essential. It is also important for managers to understand what kinds of governance mechanisms can be used for ensuring sustainability as well as the purpose of these mechanisms. The structure and purpose of governance mechanisms should vary depending on the purchased items and supplier type. Our results show that, usually, both imposed assessment-related practices and interactive collaboration efforts are needed for managing sustainability in multi-tier supply chains.

Our results show that purchasing and supply chain professionals are concerned about the effectiveness of some governance mechanisms—particularly those that are imposed

and monitoring-oriented (e.g. CoCs, first-party audits). This could lead to a reduced willingness to use certain mechanisms, such as engaging suppliers through CoCs. Thus, managers should be aware that enforcing suppliers to sign a CoC does not guarantee that they will do the same with their own suppliers. Accordingly, suppliers should be engaged in other ways as well. For example, implementing learning and innovation mechanisms, such as supplier training, can help firms build their sustainability capacity and gain better control over their supply chains.

Our framework helps managers map their own as well as their suppliers' practices and, accordingly, determine the optimal combination of governance mechanisms for ensuring sustainability. This framework is applicable in relation to governance mechanisms aimed at both direct suppliers and indirect lower-tier suppliers. For example, if a focal firm is relying heavily on imposed monitoring mechanisms, they may be missing out on sustainability innovations with their suppliers. To ensure and advance supply chain sustainability, instead of only imposed selection and monitoring mechanisms, firms should also use interactive learning and innovation mechanisms. Thus, firms should identify the most appropriate combination of governance mechanisms for their situation and evaluate them based on their purpose and structure, as this is vital for developing strategies for the management of supplier relationships and ensuring sustainable supply.

6. Conclusions

This study contributes to the emerging literature on MT-SSCM by conducting a tier-related mapping of governance mechanisms and identifying similarities and differences in their use in different supply chain tiers and at firms in general. We first identified governance mechanisms used by firms at three supply chain levels. Second, we investigated the dynamics between imposed and interactive governance mechanisms. Third, we developed a framework to understand the different types of governance mechanisms based on their structure and purpose, resulting in a comprehensive view of the mechanisms used by firms within multiple supply chain tiers. Finally, we discovered the essential governance mechanisms for extending sustainability along supply chain tiers.

The study is limited to case firms located in Europe; thus, the results should be interpreted within this context. Our research efforts across multiple industries however allow us to provide further future explorations. As a result of this study, we developed a framework that could be applied and tested in different supply chain contexts to further understand which governance mechanisms would be most appropriate for various firms. In terms of future work, the topics of the effectiveness of governance mechanisms and the way in which power dynamics and other contingency factors influence the implementation of governance mechanisms and extend sustainability in multi-tier supply chains could receive more attention. Moreover, future research could be directed towards case studies with empirical multi-tier data, for instance, from different continents and supplier contexts. Finally, future studies could analyze lower-tier supplier

management in complex supply chains with the inclusion of more supply chain tiers and considering the perspectives of upstream suppliers.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

Data are not available due to industry-specific restrictions. Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data are not available.

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Appendix A. Construct development: governance mechanisms in multi-tier supply chains

Structure	Purpose	Governance mechanism	Description	Supportive quotes
Imposed	Selection and monitoring	Codes of conduct	Supplier engagement through Amfort Business Social Compliance Initiative (BSCI), supplier, firm-level, and/or group level code of conduct	<p>"We have Supplier Code of Conduct that every supplier has to sign to convince that they operate in this way. Concurrently, they assure that their sub-suppliers also require this from them." (FT Bakery)</p> <p>"We have made a common code of conduct within the group, which defines both our suppliers' operations and our own operations." (LT Chemical Products)</p>
Imposed	Selection and monitoring	Third-party certification	Requiring sustainability-related certifications (e.g. Fairtrade, MSC, GOTS) or standards (e.g. SA8000, ISO14000) verified by a third-party	<p>"In the first meeting, I require any kind of certifications that can show me the sustainability of working force, working environment, processing, energy and so on. And then after the first meeting, I go to double-check what is declared in the certifications." (FT Agri-food Trade)</p> <p>"Regarding risk countries, we also require certification for social responsibility. This means that a third party has gone through those issues very carefully. Then, in a way, there will be additional verification, so we will not settle only for a contract. Of course, those things are in the contracts as well." (FT Agri-food Wholesale)</p> <p>"Even though we conduct audits (...) if a third party does the verification following a scheme or standard, it is very valuable for me." (LT Beverages)</p>
Imposed	Selection and monitoring	Third-party audits	Audits conducted by independent third parties	<p>"We do not have to go there every year because professionals are going through the production. So, we can count on the fact that a third party has done that audit. We don't have to do that." (FT Agri-food Production)</p> <p>"Some local suppliers or packaging suppliers are not so suitable to report this, so we have to audit them sometimes and check with them what they are doing in the company with our independent auditor." (LT Vegetables)</p> <p>"Sustainability form; we investigate at that point [supplier selection] already where materials come from and how long the supply chain is." (FF Textile Retail)</p> <p>"We have a self-audit questionnaire that has been mostly created based on ISO-standards. We go through the questionnaire, and it works as a so-called pre-audit." (LT Packaging)</p>
Imposed	Selection and monitoring	First-party audits	Questionnaires and surveys for gathering information regarding supply chain sustainability	<p>"One way on the farmer side is that we do an annual survey—we have done already many years in a row—to find out the general level of responsibility on our contract farms." (LT Grain Mill 2)</p>
Interactive	Selection and monitoring	Continuous monitoring	Close, continuous, and interactive supplier monitoring including on-site observations and sample analysis	<p>"We conduct quarter rating supplier assessment; we go through the status of each supplier and they get a scorecard from us. If something is found, meaning that the performance is not at the level that we require, we immediately go through it [with supplier] (...) it is constant doing." (FF General Retail)</p> <p>"In fact, in almost every place we know exactly what it eats, how it grows, whether it is medicated, etc. In a way, we have the whole history of the animal in our hands and that is what we follow closely all the time." (FT Meat)</p> <p>"Auditing is a good thing, but day-to-day business life and observations are more important" (FT Agri-food Trade)</p>
Interactive	Selection and monitoring	Supplier visits	Visits and presence at supplier sites	<p>"We try to visit at regular intervals so that they can show or verify what they have promised." (FF Accommodation)</p> <p>"We make sustainability visits. Our buyers visit the producers; travel and look at the conditions there and this way we also get to know a lot of producers behind the tier one." (LT Beverages)</p>
Imposed	Learning and innovation	Second-party audits	On-site audits conducted by the buying firm	<p>"Every time there is a private label product or other food product in question, a personal audit will be carried out." (FF Food Service)</p> <p>"I go there to conduct check-ups; I read reports from a third party, and then I go to mirror it again. I go and check what is written in the report; I kind of compare and audit that those things are okay." (FT Agri-food wholesale)</p> <p>"We have a big quality department and they do them [audits] on a regular basis. The bigger and more strategic suppliers are audited on a more regular basis, but we try to audit every supplier from time to time at least to get an understanding of how they work and behave." (FT Meal Solutions)</p>

(continued)

Continued.		Governance mechanism		Supportive quotes	
Structure	Purpose	Description			
Imposed	Learning and innovation	Supplier training	Imposed sustainability training for suppliers		"An online course in which they go through our CoC and environmental topics (...). This is demanded from everyone, and we follow that they complete it." (LT Beverages)
Interactive	Learning and innovation	Knowledge exchange	Interactive exchange of sustainability-related knowledge through seminars and events		"Training events in which we can inform [suppliers] more." (LT Grain) "We exchange information, but we do not really have supplier training for sustainability (...). Supplier Days and information sessions." (FF Passenger Traffic) "Seminars for farmers (...). Lately, the content has been 25–75% about the sustainability." (LT Grain Mill 2) "We have organised a seminar for producers, suppliers and other stakeholders as well." (LT Beverages)
Interactive	Learning and innovation	Building long-term commitment and trust	Focusing on building and maintaining long-term commitment and trust to ensure supply chain sustainability		"We hope that that cooperation and relationship will be such that there is mutual trust and that they tell us if something radical happens." (FF Textile Retail) "We have been working with the same company for over 30 years now—we are not shifting because we are a family business, and a lot of those companies are also family businesses. They value the long-term relationship because then they trust you, then you do development together." (LT Yam)
Interactive	Learning and innovation	Continuous and open communication	Active communication with suppliers to ensure sustainability		"The better and the more continuous our communication and cooperation with the supplier is, the easier it will be for us to ensure sustainability." (FF General Retail) "If you are dealing and talking with them and visiting; that's where the information comes from." (FT Bakery) "An important way to mitigate risks is that we actively communicate to farmers what our requirements are, so they also know how to produce grain using the methods that we require." (LT Grain Mill 2)
Interactive	Learning and innovation	Joint development of sustainability solutions	Collaboration aiming to improve supply chain sustainability and/or transparency		"If we can do some kind of project together, then we can develop the whole category together." (FF General Retail) "We are involved in quite a few environmental impact research projects related to primary production." (FT Meat) "We have lots of projects running on sustainability (...). We constantly follow trends, I go a lot to seminars, talk to my suppliers to see what the changes and innovations towards sustainability are." (LT Yam)