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Challenges in collecting sustainability information in Multi-Tier Supply Chains

Impact of EU Corporate Sustainability Due Diligence directive

Operations and Supply Chain Management

Master's thesis

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Sustainable supply chain management (SSCM) is becoming increasingly important to companies. The literature has acknowledged that multi-tier supply chains can have a positive impact on sustainability but expanding the scope of SSCM is challenging as it e.g., decreases management efficiency because of information exchange difficulties and because of the restricted observability of supply chain partners. Stakeholders are extensively requiring the companies to extend their sustainability management practices to the entire, complex multi-tiered supply chains and the proposal of the EU Corporate Sustainability Due Diligence (CSDD) directive is a novel example of that. To answer to the requirements of stakeholders and the directive, firms must collect sustainability information from their supply chains, hence are facing several challenges related to multi-tier sustainable supply chain management (MT-SSCM), transparency and due diligence.

The purpose of this study is to find out what kind of challenges do companies face in collecting sustainability information in multi-tier supply chains and whether the new EU CSDD would bring any additional challenges to them. The aim of the research is also to see if the industry, the existing regulation affecting sourcing, or the company's perceived maturity of sustainability management influence the challenges companies face. The research approach for this study is qualitative. Four semi-structured interviews were conducted in companies included in the EU CSDD scope and analysed using thematic analysis.

The findings of this research indicate that the challenges companies see emerge mainly from supply chain complexity, which brings challenges, such as lack of power, distance, and lack of visibility, that subsequently influence supplier resistance, transparency, company resources and information gathering. Challenges emerging from the EU CSDD are mainly related to the content of the directive and the extra resources needed for complying with the regulation. The nature of the industry where the company operates, regulation and the company's subjective perception of their sustainability management maturity affect how challenging companies saw answering to the directive.

This research concludes that MT-SSCM, transparency and due diligence literature are closely interlinked and that the challenges in collecting sustainability information affect the success in all the three areas. This study fills in the gap on MT-SSCM literature and is especially concentrating on the relations of transparency and due diligence to MT-SSCM. It is also novel research of the challenges emerging especially from EU CSDD. This study provides business leaders understanding of where the challenges are stemming from and helps them to navigate in the dynamic world of changing sustainability requirements. This study also gives suggestions for policy makers on how to build better regulation.

Key words: MT-SSCM, multi-tier sustainable supply chain management, sustainability, transparency, due diligence, supply chain management, EU CSDD, EU Corporate Sustainability Due Diligence, supply chain

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Vastuullinen toimitusketjujen hallinta (sustainable supply chain management, SSCM) on yhä tärkeämpää yrityksille. Multi-tier -toimitusketjujen positiivinen vaikutus toimitusketjun kestävyteen on huomattu myös kirjallisuudessa, mutta SSCM:n soveltamisen laajentaminen pidemmälle toimitusketjuun on haastavaa, sillä esimerkiksi vaikeudet tiedonvaihdossa heikentävät hallinnoinnin tehokkuutta ja näkyvyys toimitusketjun ylävirran toimijoihin on huonontunut.

Sidosryhmät vaativat enenevässä määrin yrityksiä laajentamaan vastuullisuuden hallintaa koko monimutkaisiin multi-tier -toimitusketjuihin, ja EU:n yritysten kestävä toimintaa koskeva huolellisuusvelvoite (EU Corporate Sustainability Due Diligence, CSDD) -direktiiviehdotus on tuorein esimerkki tästä. Vastatakseen sidosryhmien ja direktiivin vaatimukseen yritysten on kerättävä toimitusketjujensa vastuullisuustietoa, mikä tarkoittaa niille useita multi-tier -toimitusketjun hallintaan, läpinäkyvyyteen ja due diligencen suorittamiseen liittyviä haasteita.

Tämän tutkimuksen tarkoituksena on selvittää, millaisia haasteita vastuullisuustiedon kerääminen multi-tier -toimitusketjuista aiheuttaa yrityksille ja millaisia lisähaasteita he näkevät EU:n CSDD:n heille tuovan. Tutkimuksen tarkoituksena on myös selvittää, vaikuttaako toimiala, hankintaan vaikuttava olemassa oleva sääntely tai yrityksen näkemys omasta vastuullisuuden hallinnan edistyksestä yritysten kohtaamiin haasteisiin. Tässä tutkimuksessa on käytetty kvalitatiivista tutkimusotetta. Neljä EU:n CSDD:n soveltamisalaan kuuluvaa yritystä haastateltiin ja tulokset analysoitiin teemoittelulla. Haastattelut olivat puolistrukturoituja.

Tämän tutkimuksen tulokset osoittavat, että yritysten näkemät haasteet johtuvat pääasiassa toimitusketjun monimutkaisuudesta, joka luo haasteita, jotka liittyvät neuvottelupaltaan, etäisyyteen ja näkyvyyden puutteeseen, jotka edelleen vaikuttavat toimittajien luomaan vastarintaan, läpinäkyvyyteen, yrityksen resursseihin ja tiedonkeruuseen. EU:n CSDD:n luomat haasteet liittyvät direktiivin sisältöön ja asetuksen noudattamisen edellyttämiin lisäresursseihin yrityksiltä. Yrityksen toimialan luonne, sääntely ja yrityksen subjektiivinen näkemys vastuullisuuden hallinnan edistyksestä vaikuttavat siihen, kuinka haasteellisena yritykset näkivät direktiivin noudattamisen.

Tutkimus osoittaa, että multi-tier -toimitusketjun vastuullisen johtamiseen (MT-SSCM), läpinäkyvyyteen ja due diligencen liittyvä kirjallisuus liittyvät läheisesti toisiinsa. Se osoittaa myös, että vastuullisuustiedon keräämisen haasteet vaikuttavat kaikkien kolmen osa-alueen tavoitteiden onnistumiseen. Tämä tutkimus pyrkii täyttämään vajeen MT-SSCM -kirjallisuudessa ja keskittyy erityisesti läpinäkyvyyden ja due diligencen vaikutuksiin MT-SSCM:n toteuttamisessa. Se luo myös uutta tutkimusta erityisesti EU:n CSDD:n nouseviin haasteisiin liittyen. Tämä tutkimus antaa yritysjohtajille ymmärrystä siitä, mistä haasteet johtuvat, ja auttaa heitä navigoimaan muuttuvien vastuullisuusvaatimusten maailmassa. Tämä tutkimus antaa myös ehdotuksia poliittisille päättäjille paremman sääntelyn rakentamiseksi.

Avainsanat: multi-tier -toimitusketjut, vastuullinen toimitusketjujen johtaminen, vastuullisuus, huolellisuusvelvoite, EU, läpinäkyvyys, toimitusketju

TABLE OF CONTENTS

1	Introduction	9
1.1	Background and research gap	9
1.2	Research objective and questions	12
1.3	Research structure	13
2	Multi-Tier Sustainable Supply Chain Management	14
2.1	Extending Sustainable Supply Chain Management to MT-SSCM	15
2.1.1	MT-SSCM approaches	15
2.1.2	Choosing the correct practice	17
3	Sustainable Supply Chain Transparency	21
3.1	Elements of transparency	22
3.2	Framework for Sustainable Supply Chain Transparency	24
3.2.1	Sustainable supply chain information	26
3.2.2	Involved stakeholders	29
3.2.3	Perspective	30
4	Due Diligence	33
4.1	EU Corporate Sustainability Due Diligence	34
4.1.1	Background for the directive - frameworks	35
4.1.2	Scope of the CSDD Directive	37
4.1.3	Actions demanded from affected companies	38
4.1.4	Evidence from similar legislation and answering to guidelines	41
5	Literature synthesis and theoretical framework	44
6	Research methods	47
6.1	Research approach	47
6.2	Research design	48
6.3	Data collection	49
6.4	Data analysis	52
6.5	Research quality	53
7	Research findings	55
7.1	Describing the context	55
7.1.1	Company A	55

7.1.2	Company B	56
7.1.3	Company C	57
7.1.4	Company D	57
7.2	Challenges in collecting sustainability information in multi-tier supply chains	58
7.2.1	MT-SSCM	58
7.2.2	Transparency	63
7.2.3	Due Diligence and challenges emerging especially from EU CSDD - directive	64
8	Discussion and Conclusions	67
8.1	Answering to the research questions	67
8.1.1	RQ1: What are the challenges in collecting sustainability information in MT-SC's?	70
8.1.2	RQ2 Would the EU CSDD bring any additional challenges?	74
8.1.3	The effect of industry, regulation and sustainability management maturity	76
8.2	Theoretical and managerial implications and implications for policy makers	78
8.3	Limitations and further recommendations	79
	References	81
	Appendices	89
	Appendix 1 Interview frame	89
	Appendix 2 Codebook	91

LIST OF FIGURES

Figure 1 Lower-tier supplier sustainability management approaches	16
Figure 2 Three-dimensional framework for MT-SSCM	18
Figure 3 Elements of transparency	23
Figure 4 Sustainable supply chain transparency	25
Figure 5 Challenges in collecting sustainability information in multi-tier supply chains	44
Figure 6 Research process	48
Figure 7 Challenges in collecting sustainability information in multi-tier supply chains (updated framework)	69
Figure 8 Relations between the most important found challenges	73
Figure 9 Challenges emerging especially from EU CSDD	75
Figure 10 Challenges in collecting sustainability information in MT-SC's and additional challenges emerging from EU CSDD	76

LIST OF TABLES

Table 1 Sustainable supply chain information typology adapted from	27
Table 2 2nd dimension: Involved stakeholders adapted from	30
Table 3 3rd dimension: Supply chain transparency perspective	31
Table 4 Overview of supply chain regulations from the European Union (EU) and European countries (authors' elaboration)	41
Table 5 Interview schedule	51
Table 6 Distribution of references for coded themes	68

1 Introduction

1.1 Background and research gap

Ensuring sustainability throughout the whole supply chain is coming increasingly important for businesses. An increasingly supported affirmation is, that to maintain their competitiveness, organizations must incorporate all dimensions of sustainability, the economic, environmental and social, into their global operations (Kwon & Lee 2019; Sarkis & Zhu 2018). Customers and investors are requiring suppliers to develop more sustainable, responsible, and traceable products. Sustainable supply chain management (SSCM) is more important to businesses every day as the sustainability activities considering supply chains within and between firms as well as augmentation of research demonstrate (Gimenez and Tachizawa 2012; Schoeggl et al. 2016; Sancha et al. 2016; Singh & Trivedi 2016). Sustainability is also evolving as an attribute possibly leading to competitive advantage (Mena et al. 2013).

Countries are also trying to find ways to ensure the sustainability and responsibility of their businesses supply chains and European countries such as Norway and Germany have already introduced their own due diligence (DD) laws. According to Hoffman (2018), due diligence is a process of gaining knowledge by collecting internal and external information about the supply chain, e.g., the companies, the industry, suppliers. Therefore, it is way for increasing transparency in the supply chain. The Norwegian and the German due diligence laws obligate companies to conduct due diligence. The two obligations have very different characteristics regarding their content. E.g., the conditions for companies included in the scope and the parties of the value chain included. (Krajewski et al. 2021.)

These two laws are examples of a how fragmented the requirements for companies are in different European countries. Therefore, The European Commission has conducted a proposal for a directive on Corporate Sustainability Due Diligence Directive (CSDD) (COM/2022/71 final). The objective of the directive is to ease the identification of adverse impacts in value chains, increase liability of companies regarding their actions, promote respect of human rights and environmental protection, complement other means of addressing sustainability challenges and finally, create harmonized preconditions for companies to operate inside the union. The directive applies to large companies

established or operating in the Union, and under specific conditions, smaller companies operating in high-risk sectors. The due diligence process shall cover the company's own operations, their subsidiaries operations, and their value chains. (European Commission, 2022.)

The directive will likely bring challenges to the companies. Firstly, how will companies detect the possible adverse impacts at their suppliers or in a deeper level, their sub-suppliers'? How will they make sure they are compliant with requirements? To highlight the topicality and value in examining the effects of regulation in the operative level of business, in addition to the proposal for CSDD directive, mandatory sustainability due diligence legislation is currently planned or is in effect in several European countries already (Swiss Coalition for Corporate Justice; Business and Human Rights Resource Centre; ECCJ; Finnwatch).

The CSDD directive will hold companies responsible for the sustainability violations at their sub-suppliers. In this thesis a sub-supplier refers to a second-tier supplier or a lower than second-tier supplier. The visibility to sustainability conditions at supplier or sub-suppliers is not a presumption. The organizations where environmental or social wrongdoing occur are usually those without a direct commercial relationship with the focal company, which emphasizes why specifically the sustainability of the entire multi-tier supply chain should be examined (Choi & Linton 2011; Koplín et al. 2007; Rao 2002). The media has introduced several cases, where the focal company suffers from the acts of their sub-supplier. For example, Nestlé was accused of sourcing palm oil from a sub-supplier that was harming the environment in their operations and was not compliant with the company's sustainability standards. (The Economist, 2010.)

To look further and expanding sustainable supply chain management (SSCM) to multi-tier sustainable supply chain management (MT-SSCM) more than the dyadic relationships with first-tier suppliers must be considered (Mena et al. 2013; Tachizawa & Wong, 2014). Multi-tier supply chains (MT-SC's) have a huge potential to influence the environmental and social aspects of sustainability and it is a research area not yet investigated enough. (Dou et al. 2018; Sauer & Seuring 2018). However, expanding the scope of SSCM brings challenges as it e.g., decreases management efficiency due to information exchange difficulties and restricted observability to supply chain partners and their capabilities (Kembro et al. 2017; Carter et al. 2015; Maestrini et al. 2017). Sub-

suppliers are difficult to manage for instance due to their usually large quantity. In fact, usually supplier strategies to secure compliance with sustainability standards are focused to first-tier suppliers. When considering sub-suppliers, these strategies tend to fail. (Grimm et al. 2016.) Companies might not know their sub-suppliers, the origin of their raw materials and naturally the state of sustainability in their supply chains. (Epstein & Yuthas 2011; Bastian et al. 2013.)

Addressing the challenges in collecting sustainability information in MT-SC's is valuable both for companies and academic literature as increased supply chain transparency can be a part of improving a firm's legitimacy (Bhaduri & Ha-Brookshire 2011; Carter & Rogers 2008) and sustainability data exchange is seen as a tool to foresee and prevent sustainability issues with supply chain partners (Fritz et al. 2017). In addition, to answer the transparency requirements brought by the CSDD directive, organisations must gather sustainability information from their own operations and supply chains to find actual or potential adverse human rights and environmental impacts and to be able to tackle them. Therefore, there is clearly a need for increasing supply chain transparency further up the supply chain.

However, this information must be reliable. Schnackenberg and Tomlison (2016) define transparency as *'the perceived quality of intentionally shared information from a sender'* highlighting the quality of the gathered and shared information. In supply chain context, Schäfer (2022) defines sustainable supply chain transparency three-dimensional, consisting of: sustainable supply chain information, involved stakeholders and perspective of sustainable supply chain transparency. Transparency is fundamental for excelling in the MT-SSCM (Bastian et al. 2013).

To conclude, this study concentrates on answering to the CSDD directive's requirements for the companies regarding their supply chains. Challenges in collecting sustainability information have not been sufficiently examined in the literature before and concentrating the investigation to MT-SC's contributes to the lack of research in MT-SSCM. (Dou et al. 2018; Sauer & Seuring 2018). Examining the challenges holistically between three areas of literature provide new understanding of how these topics are linked. It will also help organizations to navigate inside constantly changing sustainability regulation, by investigating, what are the challenges emerging from the EU CSDD specifically.

1.2 Research objective and questions

The aim of this research is to contribute to the yet scarce literature on MT-SSCM highlighting the aspect of transparency and due diligence. These topics are closely interlinked, but the literature combining them is yet to develop. Although due diligence and transparency have been studied in MT-SC's (Hoffman et al. 2018; Fraser, 2020) the literature remains scarce, and the emerging challenges have not been examined together.

Different MT-SSCM approaches have been found from different industries (Choi & Hong, 2002). This research seeks insights from different type of companies, with different regulatory and sustainability management maturity background, forming a holistic view on the challenges firms might face in collecting sustainability information in their supply chains. It should be noted that in this research sustainability management maturity is considered as the subjective view of the interviewed company, hence explains how advanced they think their sustainability management is.

Furthermore, this research addresses the challenges firms might face considering a specific due diligence -regulation, affecting a large share of companies operating in the European Union. In addition, this research contributes especially to the operative side of conducting due diligence, as for that, firms must gather sustainability information from their supply chains. As transparency and ensuring sustainability in operations are increasingly demanded by regulation, another objective of the study is to find out whether the organisations see challenges in answering to these demands.

To conclude, the purpose of this study is to gain understanding and in-depth information about multi-tier sustainable supply chain management in the selected companies and the challenges firms face in sustainability information gathering and furthermore in achieving transparency, MT-SSCM and conducting due diligence.

These objectives are answered with the following research questions:

RQ1: What are the challenges in collecting sustainability information in MT-SC's?

RQ2: What, if any, additional challenges would the possible CSDD directive bring?

To answer these questions a literature review and a multiple case-study is conducted. The literature review provides background to the empirical study by presenting literature from MT-SSCM, sustainable supply chain transparency and due diligence. A theoretical

framework is be formed from the literature and the empirical findings will be compared against this framework.

1.3 Research structure

This thesis consists of eight chapters: the introduction, three theoretical chapters, literature synthesis, methodology, research findings and finally, discussion and conclusions. Chapters 2-4 form the literature review that combines MT-SSCM, transparency and due diligence literature. The literature will be summarized in chapter 5, where a literature synthesis and the theoretical framework are presented. Chapter 6 introduces the research methods, consisting of the research approach and design, detailed explanation of the data collection, data analysis and evaluation of research quality. Chapter 7 will present the research findings and finally chapter 8 the discussion and conclusions and answering the research questions. Theoretical contribution, limitations and further research recommendations will be presented in the last chapter.

2 Multi-Tier Sustainable Supply Chain Management

This section focuses in explaining sustainable multi-tier supply chain management (MT-SSCM). It briefly explains the concept of sustainable supply chain management (SSCM) and how it is extended to multi-tier sustainable supply chain management (MT-SSCM). Possible approaches to MT-SSCM and the factors affecting the decision on the chosen approach.

Carter and Rogers (2008, 368) define SSCM as strategic and transparent integration of organisation's social, environmental, and economic goals inside the systematic coordination of a single company's and its supply chains economic performance. Their definition is based on Elkington's (1997) triple bottom line (TBL) and the four aspects of sustainability found from the literature review, being: risk management, transparency, strategy and culture. Similarly, according to Seuring and Müller (2008, 1700) SSCM is managing material, information and capital flows and cooperation between the supply chain parties in TBL sustainability -manner derived from stakeholder requirements.

According to Sauer and Seuring (2018) there are two attributes in multi-tiered supply chains, that make the goal of achieving TBL sustainability, the social, economic and ecological sustainability, especially difficult. First, the raw materials stage of the supply chain is where majority of the impacts regarding sustainability usually happen (Mena et al. 2013, 72). Complexity of the supply chains weakens governance and the upper supply chain tier-level suppliers become more difficult to manage because of the focal company's diminished power towards the supplier due to the further distance to supplier, physically and institutionally (Villiers, 2019; Carter et al. 2015; Tachizawa & Wong, 2014; Busse et al. 2016). Complexity can be divided in two types: horizontal complexity (i.e., the number of suppliers in each tier) and vertical complexity (i.e., the number of tiers in the supply chain) (Choi & Hong, 2002, 472).

The literature of MT-SSCM is usually focused on the issue of extending sustainability practices to the upstream of supply chain. It presents the possible management approaches and what to take into consideration when choosing the approach (Mena's et al. 2013; Tachizawa & Wong 2014; Sauer & Seuring 2018; Wilhelm 2016a). There is also literature on what type of approaches are found in what type of business areas (Wilhelm 2016a; Mena et al. 2013). The examined literature will be presented in the next sections.

2.1 Extending Sustainable Supply Chain Management to MT-SSCM

The first natural step when implementing sustainability into a company's supply chain, is to focus on first-tier suppliers. (Miemczyk J. et al. 2012, 479). The means of sub-supplier management resemble the general sustainable supply chain management practices that include assessment (e.g., supplier questionnaires, audits, site-visits) and collaboration (e.g., training and workshops) (Klassen & Vachon, 2003; Vachon & Klassen 2006, 2008). González-Benito et al. (2010) summarize these actions as supply strategies of supplier development, involvement, and integration. The following sub-sections will introduce the MT-SSCM approaches found from literature and the factors affecting the decision of the approach.

2.1.1 MT-SSCM approaches

The theory of MT-SSCM has been built on previous research on multi-tier supply chain management (MT-SCM) and SSCM. MT-SCM has commonly dealt with structures of the supply chain. Mena et al. (2013) introduce three theoretical MT-SC structures, formed with theoretical sampling. These structures are divided into an open triad, transitional triad, and a closed triad. Building on previous literature, Tachizawa and Wong (2014) formed their own mechanisms for lower-tier supplier management, extending the view and focusing on managing sustainability in MT-SC's. They formed propositions that explain the effects of the combination of multiple governance mechanism, approaches, and contingency variables to supply chain sustainability management. Mena's et al. (2013) and Tachizawa's and Wong's (2014) approaches to lower-tier supplier sustainability management are combined in Figure 1.

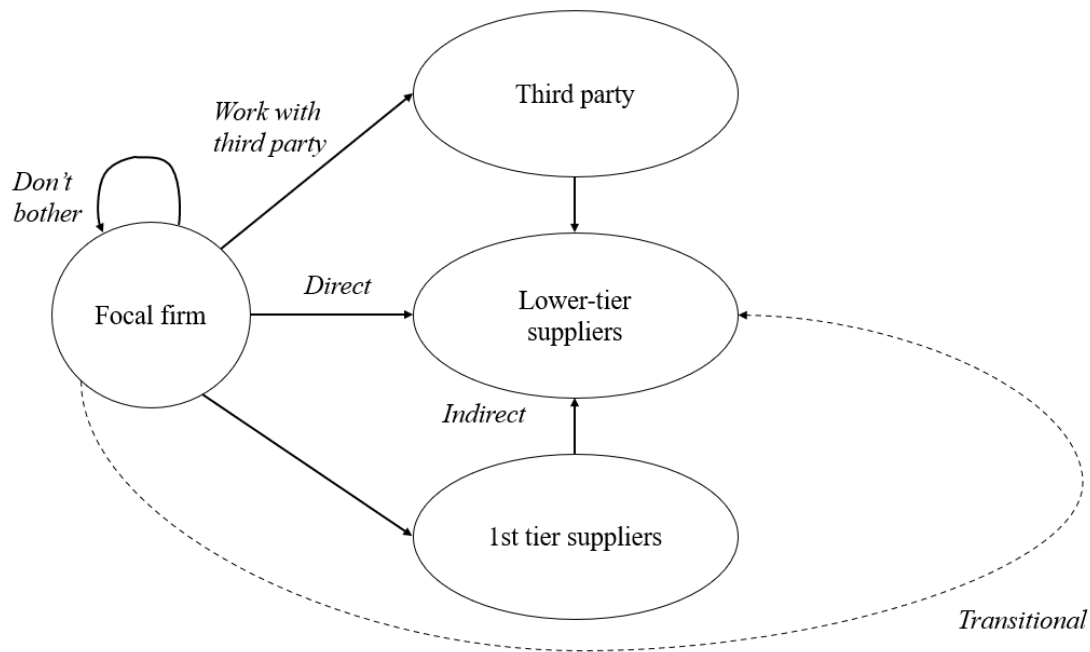


Figure 1 Lower-tier supplier sustainability management approaches (adapted from Mena et al. 2013; Tachizawa & Wong 2014)

First, Tachizawa and Wong (2014) introduce a *don't bother* -approach where the focal company doesn't have information about its lower-tier suppliers and only focuses on the first-tier suppliers. According to Wilhelm et al. (2016a, 207) the “don't bother” -approach is a result from strategy work but arise from uninformed task delegation.

The *indirect* approach is when another supplier is used to establish contact with the lower-tier suppliers. Information and products flow linearly, and the buyer and sub-supplier have no immediate connection between them as the first-tier supplier has the mediating role in the chain. (Mena et al. 2013.) The first-tier supplier can be used for collaboration and monitoring the lower-tier supplier sustainability. They can e.g., be given code of conduct requirements, which they must pass on to the sub-suppliers in order to comply (Tachizawa and Wong, 2014.) In contrast to Mena's et al. (2013) approach, Tachizawa and Wong (2014, 652), also consider aiding the first-tier suppliers on the collaboration and monitoring of lower-tier suppliers a part of this practice. Wilhelm et al. (2016b) studied the conditions where this kind of agent-like behavior occurs.

Moving from indirect to direct approach, is the *transitional* approach where the focal firm and the sub-supplier begin connecting. In this situation, the buyer might e.g., require giving training or assurance to guarantee the desired level of quality (Mena et al. 2013.)

Furthermore, in *direct* approach an absolute direct contact with the lower-tier supplier has been established. The main company can approach the lower-tier supplier in sustainability topics directly, assign requirements, monitor, train, or select lower-tier suppliers directly. The companies are in contact regularly or in an ad hoc basis with each other. (Mena et al. 2013; Tachizawa & Wong, 2014.)

Finally, Tachizawa and Wong (2014) present *working with third parties*, in which the focal firm cooperates or directs responsibilities to other organizations to develop sustainability standards or implementing self-regulation for industry (Prado, 2013). This strategy is used when the focal firm nor its direct suppliers have the required control over the lower-tier suppliers, to be able to pressure, train or monitor them. (Tachizawa & Wong, 2014.) Third parties can be used for example for sustainability assessments, which can be seen as delegating responsibilities to third parties. (Hannibal & Kauppi, 2019; Tachizawa & Wong, 2014, 652).

Tachizawa and Wong (2014, 656) propose that focal firms use one or more of the above-mentioned approaches for sustainability management. The factors affecting the chosen approach(es) are presented in the following sub-section.

2.1.2 Choosing the correct practice

According to Sauer and Seuring (2018, 566) when identifying the correct practice for MT-SSCM, the supply chain must be understood as a relational space where three types of uncertainty exist in the relationship between the focal company and supplier:

1. uncertainty arising from pressures from the supply chain and the sub-supplier's own environment
2. supply uncertainty (S-UC) faced by the focal company
3. demand uncertainty (D-UC) faced by the supplier

The ability and need to control the sub-supplier depend on the balance of these three uncertainties. The first type of uncertainty is related to institutional distance, which means how different the supplier's and the supply chain's environment (legitimacy context) are cognitively, normatively, and resultatively. If the institutional distance is high, the focal firm faces a risk of supplier decoupling. Decoupling is when an organization seemingly adopts new structures without implementing those into practice. Reason for decoupling

is the need to achieve legitimacy among institutional stakeholders, like the focal company, but the attempt is restrained by local circumstances, resource availability and essential knowledge. (Sauer & Seuring 2018, 566; Boxenbaum & Jonsson 2008,4.)

In this context, supply uncertainty is referring to the uncertainty of the supplier's compliance with the focal firm's sustainability requirements. Demand uncertainty refers to uncertainty about the sustainability requirements, as well as the actual uncertainty of demand, since if sustainability requirements change, the level of demand for supplier can also change. (Sauer & Seuring 2018, 565.)

These dimensions are integrated to a three-dimensional cube presented in Figure 2, which describes the three-dimensional framework for MT-SSCM presented by Sauer and Seuring (2018, 567). Their framework is based on arguments from institutional theory and considers the uncertainties in focal company-sub-supplier relationships when assessing the suitability of the MT-SSCM approaches presented above.

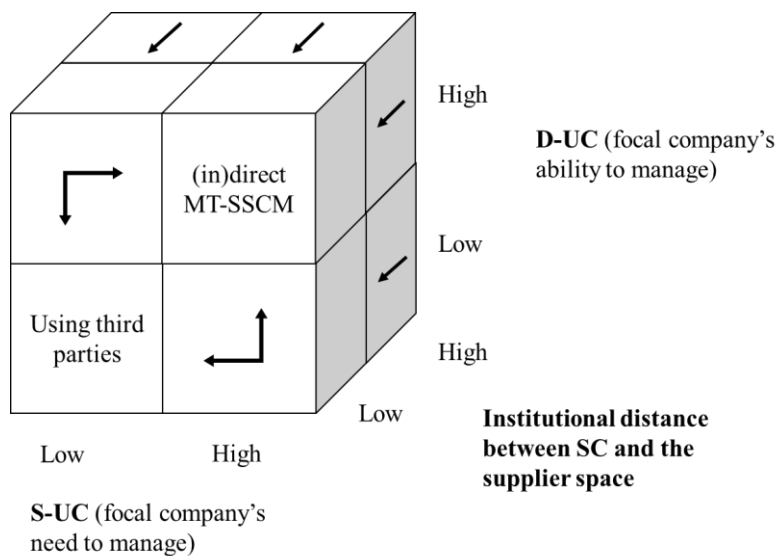


Figure 2 Three-dimensional framework for MT-SSCM (adapted from: Sauer & Seuring 2018, 567)

Sauer and Seuring (2018) demonstrate their framework as a three-dimensional cube. The three dimensions of uncertainty and characteristics are illustrated at the edges and provide the scale for uncertainty. The framework suggests three different practises for MT-SSCM depending on institutional distance and the level of S-UC and D-UC in focal company's supply chain.

S-UC and D-UC determine the focal firm's capability and need to manage the supplier and are interconnected with the institutional distance between the SC's environment and the supplier's environment. For example, if the supplier's institutional distance is high compared to the SC environment, despite the chosen MT-SSCM practice, it would have to make investments to comply with SC requirements. Supplier might lose competitive edge due to higher prices because of investments and would not be in favor among its stakeholders nor industry peers. Which means the demand uncertainty for supplier rises. (Sauer & Seuring, 2016, 567).

Wilhelm et al. (2016a, 207) also state that institutional distance between the focal company and its suppliers is a factor in the MT-SSCM strategy selection. They found the indirect approach only from a highly regulated market. In business areas where sourcing activities situated emerging countries, with a higher institutional distance, the focal firms focused more on the suppliers and placed more effort on sustainability management. Furthermore, according to Wilhelm et al. (2016a, 209) it didn't necessarily mean that they managed sub-suppliers directly, leading to a closed MT-SC. This situation resembles the presented *transitional* approach.

In case of low D-UC and low S-UC a passive approach in management and monitoring is chosen. On the other hand, if both uncertainty levels are high, a more active approach leads to output-maximization. Shortcomings might occur if uncertainty levels differ. The institutional distance is difficult to change, and a higher institutional distance might lead to decoupling of the supplier. (Sauer & Seuring, 2018.)

Wilhelm et al (2016a, 209) developed four main propositions on the MT-SC formation and choosing the correct approach for sustainability management. They examined the focal company sustainability strategies in food, apparel, packaging, and consumer electronics markets, concentrating on second- and upper-tier suppliers. The study identifies three elements that determine the manner and situations where firms stretch their sustainability strategies to sub-suppliers:

1. *Supply chain complexity*
2. *Sustainability management capabilities of the first-tier supplier*
3. *The type of sustainability (environmental, social)*

Wilhelm et al. (2016a, 209) state that supply chain complexity is significant factor when choosing the MT-SSCM practice. This complexity can be divided in two types: horizontal complexity (i.e., the number of suppliers in each tier) and vertical complexity (i.e., the number of tiers in the supply chain) (Choi & Hong, 2002, 472). A high number of suppliers in each tier combined with high institutional distance, brings difficulties to sub-supplier management, which makes using third parties an option. But even a slightly smaller horizontal complexity level in a tier eases the sustainability management. (Wilhelm et al. 2016, 209).

Though, if first-tier suppliers' management capabilities are weak, or they have no information of their upstream activities, this advantage can be lost. But on the contrary, if the tier-1 suppliers' management skills are excellent, the focal firm can rely on them and therefore choose an indirect approach. (Wilhelm et al. 2016a, 209; Fraser 2020.) Tachizawa and Wong (2014, 657) also list knowledge recourses as one of the contingency factors in choosing the MT-SSCM strategy. However, they refer to the focal firm's knowledge resources and not suppliers'. They state lack of expertise might lead into using third parties.

Lastly, Wilhelm et al. (2016a, 209) noticed that despite all firms had a triple bottom line approach to sustainability in their operations, environmental sustainability violations (i.e., pesticide use or CO² emissions of farmers) were more easily detected than social sustainability violations (i.e., child labor, excessive overtime). This led to a situation where it's easier to delegate responsibilities of sustainability management to the first-tier supplier. Therefore, the authors conclude that an easily traceable form of sustainability results to an open MT-SC with more responsibility on the tier 1 -supplier and on the contrary, smaller traceability chances lead to a closed MT-SC. (Wilhelm et al. 2016a, 209.)

The possible approaches, their effectiveness and what to take into consideration when choosing the approach have now been introduced. (Mena et al. 2013; Tachizawa & Wong 2014; Sauer & Seuring 2018; Wilhelm 2016a). There are several factors affecting the decision on the approach and Tachizawa and Wong (2014) recommend that firms choose one or more approaches.

3 Sustainable Supply Chain Transparency

Supply chain transparency is seen as an important topic in supply chain management (Fraser et al. 2020). Bastian et al. (2013) even state that supply chain transparency is a precondition to MT-SSCM. There are many ways for companies to collect and share relevant information on sustainability issues in their supply chains, done in hope to increase transparency and having as much information about suppliers and the conditions in the path of a raw material turning into product. To achieve transparency and implementation of MT-SSCM, firms face the enormous challenge of mapping the fragmented and multi-layered supply chains, discovering who their sub-suppliers are, finding the origin of their raw materials and ultimately figuring out the state of sustainability in their supply chains. (Epstein & Yuthas 2011; Bastian et al. 2013.)

Therefore, there is clearly a need for examining supply chain transparency further up the supply chain. Venkatesh et al. (2020) state that a minimum level of transparency between supply chain partners can affect sub-supplier supplier code of conduct compliance positively. But the supply chain management studies rarely go beyond the first tier (Stevenson & Cole 2018, 83; Grimm et al. 2014). The challenges of collecting sub-supplier information are recognized also in the MT-SSCM literature, as firms can lack power against their direct suppliers, from whom this information can be collected from. (Grimm et al. 2016, 1980). However, sharing sustainability information with the focal company is a precondition to supply chain transparency (Grimm et al. 2014, 167).

In the next section, the concept of transparency will be defined to have a profound understanding of the notion in general. The other section introduces Schäfer's (2022) novel framework for sustainable supply chain transparency. It consists of three dimensions: sustainable supply chain information, involved stakeholders, and perspective. These dimensions represent the multiple different ways transparency has been defined and used in supply chain sustainability context. Transparency literature focuses ultimately on the quality of information. Schäfer's framework defines more specifically what kind of information is sustainability information, who is disclosing or receiving it and what kind of perspectives are there to this information.

3.1 Elements of transparency

Transparency literature reaches many business areas and has been defined differently depending on the field. For example, Bloomfield and O'Hara (1999) studied transparency in the financial market and connect transparency to accurate and publicly available trade and quote information. In monetary policy research, Eijffinger and Geraats (2006) define transparency as the amount of information central banks are disclosing about their policy-making processes. In organizational culture, transparency has been related to visibility within the organisation (Kaptein, 2008). In strategic alliances literature, transparency is essentially about how open partners are towards each other (Larsson et al. 1998). Finally, in accounting research, Bushman et al. (2004) define transparency as the availability of firm-specific information to external stakeholders. To conclude, transparency can be found in multiple research areas and contexts (Schnackenberg & Tomlison 2016, 1788).

Schnackenberg and Tomlison (2016) have formed a definition of transparency, in the domain of stakeholder literature and conclude that on the contrary of what most researchers have typically assumed, transparency is a multidimensional concept. When forming the definition, they take the required broadness of the definition into consideration, to suit different research areas, and on the other hand, the required particularity, for the definition to be used in management practices. According to Schnackenberg and Tomlison (2016, 1788):

‘Transparency is the perceived quality of intentionally shared information from a sender.’

Through themes and conceptualizations arising from the literature, they came into the conclusions that form their definitions of transparency. First, inferring from the literature, transparency is related to information. Second, this information is intentionally shared, as organizations can either hold or share information to alter the level of transparency. Third, transparency is an understanding of the received information. This understanding can be altered through the company's information-sharing habits. Understanding of transparency also varied according to the opinions of the quality of the information. (Schnackenberg & Tomlison 2016, 1789.) Information is therefore the central part of the concept of transparency. The characteristics and qualities of information can be further elaborated as three dimensions of transparency, defined as disclosure, clarity and accuracy of information, the concepts explained in Figure 3.

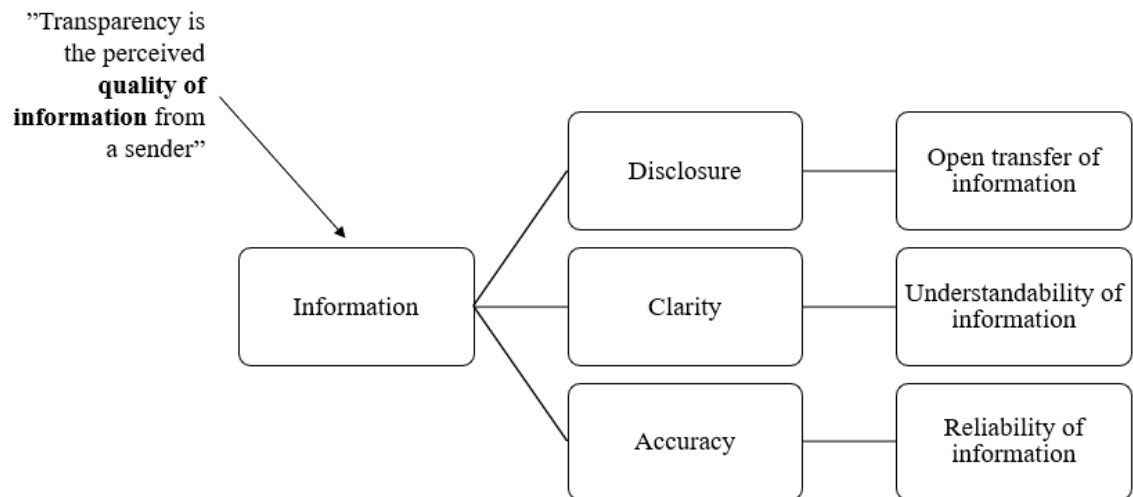


Figure 3 Elements of transparency (adapted from Schnackenberg & Tomlison (2016))

Schnackenberg and Tomlison (2016, 1791) have derived three main elements of transparency, that also contribute to information quality and form a foundation for transparency study: disclosure, clarity and accuracy. Disclosure relates to open transfer of all relevant information; clarity refers to the understandability of the shared information and finally accuracy is related to the reliability of information. All the concepts affect the level of transparency.

This definition offers a foundation for understanding transparency in supply chains and further in the sustainable supply chain context. Supply chain transparency has been defined several ways in the literature. According to Carter and Rogers (2008, 370) transparency is expanding stakeholders' visibility to organization's supply chain. Trienekens et al. (2012) define transparency as the degree to which all company stakeholders can get the product-related information they need without interruption, '*loss, noise, or delay*'. Some studies, however, equate transparency to traceability and state it's the capability to track a product from its source through the whole supply chain. (Doorey 2011; Laudal 2010). Cramer et al. (2008) highlight that being open about the sustainability conditions at suppliers is the key in transparency. Finally, Schouten and Remme (2006) have connected transparency to the financial transactions in the supply chain.

Egels-Zandén et al. (2015) have formed a holistic definition to supply chain transparency which means giving out the following information:

1. names of the suppliers in a company's supply chain

2. state of sustainability at these suppliers
3. the main company's purchasing practices.

To be truly transparent, a company must combine all three dimensions above. Companies might also be transparent in some of the dimensions, while leaving others a secret. (Egels-Zandén et al. 2015.)

Mol (2015) identified four types of supply chain transparency: *management transparency, regulatory transparency, consumer transparency and public transparency*. Specifically in management type of transparency, upstream economic actors in chains are the one disclosing information and the information is disclosed to the downstream economic actors in chains. According to Mol (2015) these types of transparency usually mix.

To conclude, transparency has been defined in several ways in the literature. It can be associated with product information, financial information, actors of the supply chain and many other topics (Trienekens et al. 2012; Egels-Zandén et al. 2015; Remme 2006). The literature of supply chain transparency contains elements of sustainability (Cramer et al. 2008). The next section will present Schäfer's (2022) framework to gain further understanding about transparency in sustainable supply chains.

3.2 Framework for Sustainable Supply Chain Transparency

To connect supply chain transparency and sustainability, a novel framework formed by Schäfer (2022) has been chosen to this study. Schäfer (2022) includes governance to the TBL definition of sustainability and uses this definition as the foundation for their study. Through a literature review of supply chain transparency in sustainability context she defines sustainable supply chain transparency as the 'visibility and disclosure of sustainable supply chain information between actors within and outside the supply chain.'

According to Schäfer (2022) sustainable supply chain transparency has three different dimensions:

1. Sustainable supply chain information
2. Involved stakeholders
3. Perspective of sustainable supply chain transparency.

All three dimensions outline transparency in sustainable supply chains. Combining previous literature about supply chain transparency and sustainability, the framework offers a thorough understanding of sustainable supply chain transparency. Schäfer's (2022) three-dimensional framework is presented in the Figure 4.

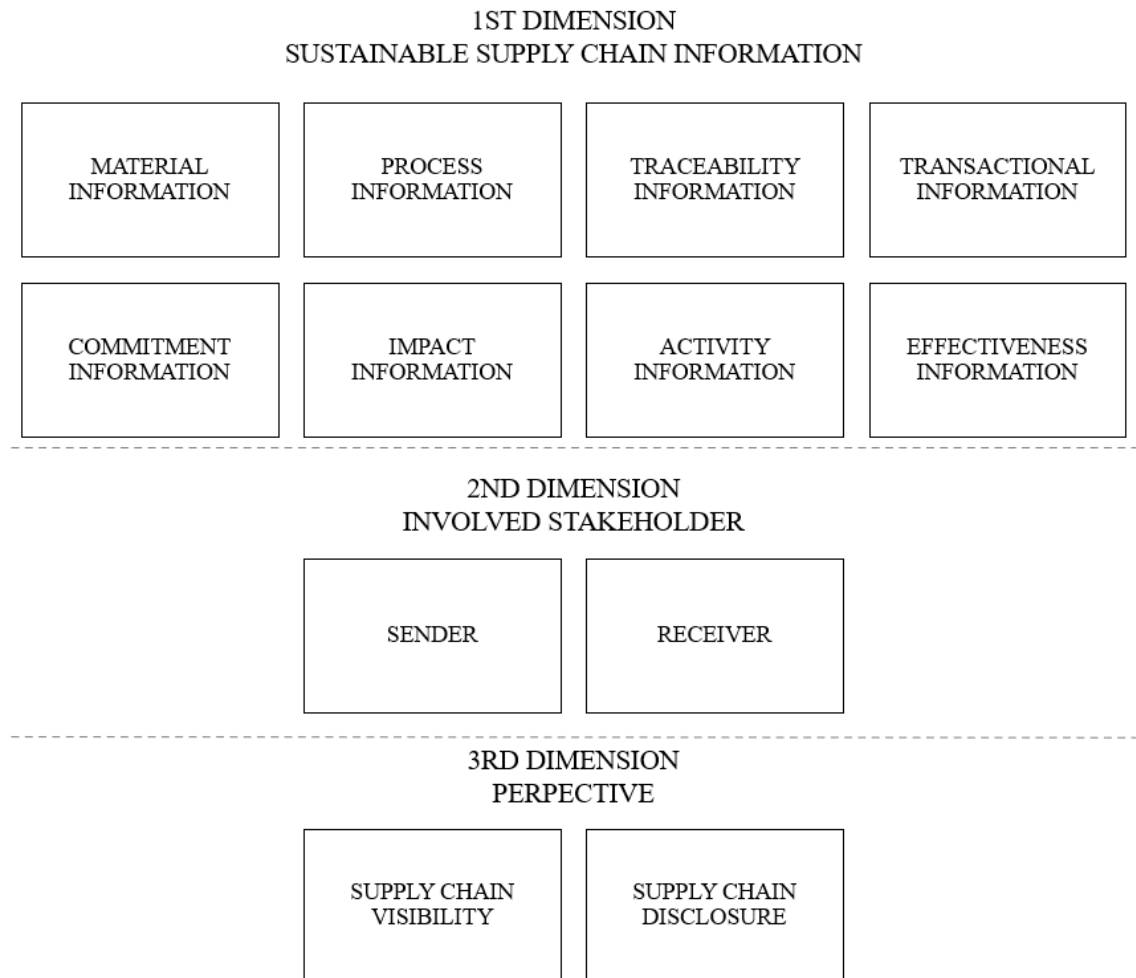


Figure 4 Sustainable supply chain transparency (Schäfer 2022)

All of the three dimensions must be taken into account when explaining the sustainable supply chain transparency. Sustainable supply chain information defines what type of information is included, involved stakeholders define who are the actors contributing to transparency, and perspective explains parts where information is available and how information is disclosed. The content of the next sub-sections has been formed following the structure of Schäfer's (2022) framework.

3.2.1 Sustainable supply chain information

Gardner's et al. (2019) thought on defining the information that we wish to be transparent explains how transparency is ultimately about information. Supply chain information for transparency has been defined and classified in the literature before. Cartier et al. (2018, 216) provide a suggestion in their definition of supply chain transparency, in which transparency refers to the level of availability on company, supplier, sourcing locations, processing conditions information for end customers as well as participants of the supply chain.

In addition, Egels-Zandén et al. (2015) create a basis for the type of information to be collected in their definition of supply chain transparency. Their definition entails three different types of information: the names of suppliers, sustainability conditions and purchasing practices of the buyer company. Gardner et al. (2019, 165) used Egels-Zandén et al. (2015) study as a basis to form a holistic definition of supply chain information and a list of six information types to improve sustainability in global commodity supply chains, being:

1. *Traceability information*
2. *Transaction information*
3. *Impact information*
4. *Policy and commitment information*
5. *Activity information*
6. *Effectiveness information.*

Schäfer (2022, 9), however, found additional categories and complements this list with commitment information and material information. The author has also defined, whether the type of information contributes to the social, ecological, economic or governance dimension of sustainability. The first dimension of Schäfer's (2022, 9) framework, categorization for sustainable supply chain information, is presented in Table 1.

Table 1 Sustainable supply chain information typology adapted from (Schäfer 2022)

Material information	Process information	Traceability information	Transactional information
SOCIAL ECOLOGICAL	SOCIAL ECOLOGICAL	GOVERNANCE	ECONOMIC
Information about <ul style="list-style-type: none"> Used materials Quality of the materials 	Information about the production process	Information about involved suppliers <ul style="list-style-type: none"> Supplier names Suppliers' roles Supplier locations Provenance general 	Information about <ul style="list-style-type: none"> Purchasing practices Financial transactions in general
Commitment information	Impact information	Activity information	Effectiveness information
GOVERNANCE	SOCIAL ECOLOGICAL	SOCIAL ECOLOGICAL	SOCIAL ECOLOGICAL
Information about <ul style="list-style-type: none"> Commitments to comply with laws, regulations, standards Own commitments 	Information about negative sustainable impacts <ul style="list-style-type: none"> Social Environmental 	Information about the sustainability activities taken <ul style="list-style-type: none"> Social Environmental 	Information about the evaluation of the sustainability activities taken <ul style="list-style-type: none"> Social Environmental

Contributing to the social and ecological dimensions, are information about materials, processes, impacts, activities, and effectiveness. Material information includes information about used materials and their quality. Furthermore, process information focuses on the production processes. Impact information focuses on the negative sustainability impacts from social and environmental sustainability areas. Moreover, activity information focuses on the taken sustainability activities, referring to the positive actions within social and environmental dimensions of sustainability. Lastly, effectiveness information refers to the quality of the sustainability activities in the same subject areas. (Schäfer 2022, 9.)

Gardner et al. (2019) studied supply chain transparency in the commodities supply chain. They found out, that generally impact information about the sustainability impacts at producers concentrated on deforestation, leaving other sustainability aspects, also within the environmental category, ignored. The impacts in other parts of the supply chain, like processing facilities and the impacts of transportation and consumption, were additionally ignored. What is more, Gardner et al. (2019) found out that supply chain actors lacked

the methods and data sources for creating sustainability indicators, even though they had the information about the impacts. Though, information about the level of sustainability governance was poor in the studied commodity supply chains.

Das and Teng (1998) (see Gold & Heikkurinen, 2018) state that companies do not, and cannot, have full information about production conditions in their supply chains. According to them, supply chain conditions, complexity, distance and resistance are the obstacles in the path towards improved transparency. They also claim that it is nearly impossible for focal companies to build strong enough relationships to protect supplier and distributor collaboration nor to develop good enough control mechanisms. These means are needed to encourage sustainable business behavior.

The governance dimension in the framework includes information about traceability and commitment. Traceability information is information about supplier names, their roles and locations, origin and other general information regarding traceability. Commitment information focuses on commitments to comply with laws, regulations and standards, the company's own commitments and general commitments. (Schäfer 2022, 9.)

Literature has different opinions about the relationship between transparency and traceability. For example Garcia-Torres et al. (2019) see traceability as the main concept, where transparency is seen a part of. Cartier et al. (2018) however claim that transparency is enabling traceability.

As Schnackenberg and Tomlison (2016) stated, information quality is essential in transparency. Referring to their definition of three-dimensional transparency, the above-described information should be openly shared, clear and reliable. This is not always the case as according to (Mol 2015, 157) particularly environmental information is often made unnecessary complicated, compiled, or difficult to understand, as a part of greenwashing or attempts trying to hide the real environmental effects.

For the Tier 1-supplier to manage their sub-supplier they must be aware of their supply chain. In a study from Fraser et al. (2020) the tier-1 supplier was indeed not up to date and/or was unmindful of its own upstream supply chain.

3.2.2 Involved stakeholders

Stakeholders have an important position in supply chain management, as pressure from stakeholders' direction has been considered as one of the main drivers of sustainable supply chain management (Seuring & Müller, 2008). However, there has also been counter arguments, claiming that stakeholder requirements for responsibility can lead to a *transparency fallacy*. This situation emerges when stakeholders demand responsibility and claim that focal companies know their supply chains and the processes within thoroughly. Supply chain conditions and obscurity are being ignored. (Gold & Heikkurinen, 2018.)

According to Schnackenberg and Tomlison (2016,1788) most of the transparency related articles relate to the organization-stakeholder relationships, both internal (with employees) and external (shareholders, governments and society). Egels-Zandén et al. (2015) highlight the importance of differentiating the two types of transparency. Internal transparency refers to the firm's ability to be transparent to itself, as external refers to being transparent to external stakeholders. Sometimes even supply chain transparency has been divided into two according to stakeholder's placement (James & Montgomery 2017).

For example, in Mol's (2015) typology of four different kinds of transparency: management transparency, regulatory transparency, consumer transparency and public transparency, we can identify the senders and receivers of information. Specifically in management type of transparency, upstream economic actors in chains are disclosing information and the information is disclosed to the downstream economic actors in chains. Regulatory transparency refers to sharing information with the regulators, consumer transparency with consumers and public transparency with the public/society. According to Mol (2015) these types of transparency usually mix.

In Schäfer's (2022) framework, stakeholders are either receiving or sharing supply chain information. This categorization is presented in Table 2.

Table 2 2nd dimension: Involved stakeholders adapted from (Schäfer 2022)

Sender	Receiver
Sustainable supply chain information is sent from <ul style="list-style-type: none"> • Focal firm • Stakeholder <ul style="list-style-type: none"> ○ Supplier ○ Third parties ○ Retailer 	Sustainable supply chain information is sent to <ul style="list-style-type: none"> • Focal firm <ul style="list-style-type: none"> ○ Stakeholder ○ Supplier ○ Public ○ Consumer ○ Regulators ○ Investor

According to Schäfer (2022) a stakeholder can be both a sender and a receiver of information. Sustainable supply chain information sender can be the focal company or a stakeholder like a supplier, a third party or a retailer. The list of receivers is longer and comprises of the focal company, stakeholders like the suppliers, public, consumer, regulators, and investors. General stakeholder is one, that had not been defined clearly in the literature. Supply chain information is highly important for information receivers like regulators to enforce regulation (e.g., embargos, taxes) or order subsidies (Gardner et al. 2019, 168).

According to Mol (2015) there are two conditions for supply chain transparency to have an impact to sustainability. First, the actors intending to use the information must have access and working knowledge of the information. Second, the actors disclosing information must be responsive and willing to take responsibility of poor sustainability performance.

3.2.3 Perspective

The perspective of supply chain transparency refers to a statement that supply chain transparency differs between the users of information and the purpose of transparency (Gardner et al. 2019). Schäfer (2022) divides the perspective of supply chain transparency to supply chain visibility and supply chain disclosure. Supply chain visibility refers to the available specific information about the supply chain. Supply chain disclosure is a

situation where information is intentionally shared within and/or outside the supply chain. It can be divided into voluntary disclosure or mandatory disclosure. The 3rd dimension of Schäfer's (2022) framework is presented in the Table 3.

Table 3 3rd dimension: Supply chain transparency perspective (Schäfer 2022)

Supply Chain Visibility	Supply Chain Disclosure
Visibility is the state where certain information about the supply chain is available at a certain part of the supply chain.	Disclosure is the activity to knowingly pass on supply chain information <ul style="list-style-type: none"> • Voluntary disclosure • Mandatory disclosure

The two dimensions reflect the idea that transparency can be very different, depending on the perspective. As stated, visibility refers to the available specific information about the supply chain (Schäfer, 2022). There have been several different views about supply chain visibility in the literature. Kraft et al. (2022) limit visibility to a situation where information of the specific part of the supply chain is available to another specific actor of the supply chain. Some authors limit visibility to concern information about certain participants in the supply chain (Busse et al. 2016), while some authors include external stakeholders or the public to the term of visibility and talk about visibility to stakeholders (Morgan et al. 2018; Egels-Zandén & Hansson, 2016). Gaining visibility can also be active or passive, depending on the type of attempts to achieve it (Schäfer, 2022). According to Christopher and Lee (2004) improving the 'end-to-end' visibility of the supply chain has a vital part in mitigating supply chain risks.

According to Gold and Heikkurinen (2018) the supply chain conditions like, the complexity of supply chains, the geographic and cultural distance between members of those supply chains, and suppliers' resistance towards measures to achieve transparency, severely limit the degree of transparency that can be achieved. The complexity can for example mean that second- and third-tier suppliers are not visible, nor can the focal company control them. (Wilhelm et al. 2016a.)

Disclosure refers to how information is made available (Schäfer, 2022). Voluntary disclosure is a situation where the firm can freely decide whether to disclose information or not. In this situation, stakeholders like the public or regulatory authorities are not pressurising the company to disclose. Mandatory disclosure means that there is either pressure or a legislative force making it compulsory to disclose information. (Kalkanci &

Plambeck 2020.) The findings of Kalkanci et al. (2016) indicated a firm can gain trust, market share and higher profit by voluntarily, meaning not having a mandatory need to disclose, by disclosing negative information about the social and environmental effects of their suppliers.

We can conclude that sustainable supply chain transparency is a multi-dimensional concept that is fundamentally focused on information. The formation of the definition starts from defining the information that we want to be transparent (Gardner et al. 2019). The involved stakeholders and the perspective for sustainable supply chain transparency are furthermore essential for defining the concept as it can vary depending on these two dimensions.

4 Due Diligence

This chapter will present the definition of due diligence. Due diligence has been defined several ways in the literature. According to Bonnitcha and McCorquodale (2017, 901) due diligence can be divided into two pieces, related to each other: due diligence as a business process and as a standard of conduct. When a business process, it is seen as an investigation process to identify and manage commercial risks. Quite often due diligence is mentioned to reduce risks in mergers and acquisitions, where there are several areas of due diligence in the literature ranging, from legal, tax, market, technology to operational and environmental due diligence (Bhagwan et al. 2018). However, due diligence processes in business are not only limited specifically to mergers and acquisitions, as the term can be used when identifying and managing business risks of any type of process – for example, when partnering with a particular organization, in a hiring process of individuals, making a loan or in investing. (see Spedding, 2007, 36.)

When explaining due diligence as a standard of conduct Bonnitcha and McCorquodale (2017, 905) refer to international law, where due diligence acts primarily as a standard of conduct outlining and limiting the responsibility of a state in relation to the actions/demeanour of third parties. (Hessbruegge 2004, 268.) It sets an external standard for actions to prevent or response to a certain type of harm defined in a specific principle, for example regarding transboundary damage. (Hanqin, 2003.) Finally, according to Hofmann (2018) due diligence is a way for increasing transparency in the supply chain. It is a way to gain knowledge of the company, its industry, financial condition, customers, competitors, suppliers, business processes, technology and management with a process of collecting internal and external information. E.g., human rights due diligence in companies is a process of identifying, preventing and mitigating risks to people, from the negative impacts on human rights that a company may produce itself or contribute to in its operations. They can also be directly associated to its operations, products, or services by its business partnerships. (Torres-Cortés et al. 2020.)

Hoffman et al. (2018) define supply chain due diligence as a method for increasing overall transparency as it enables to trace the origin (of the conflict minerals) and is an approach to identify interconnected social issues and actors in (minerals) supply chains.

Some authors claim that the complexity of global supply chains, can lead to arbitrage situation regarding regulation, meaning governance is weak and has gaps. Weak governance further leads to sustainability violations and corruption. (Villiers, 2019.) To address these challenges, international frameworks and guidelines e.g., the UN Guiding Principles and the OECD Guidelines on Multinational Enterprises have been developed to give companies a guideline to follow in respecting human rights and for responsible business. These guidelines have paved the way for mandatory due diligence legislation in multiple countries as well as for EU Corporate Sustainability Due Diligence (CSDD), which will be introduced in the next section. Prior to that, the above-mentioned frameworks will be introduced.

4.1 EU Corporate Sustainability Due Diligence

The work for the directive on Corporate Sustainability Due Diligence (CSDD) has been going on a few years already. Hearing of the citizens of EU ignited the process, following proposals from the Commission and hearings and comments from the Parliament. The directive has gone through several changes, e.g., regarding its scope and required information to be disclosed. (European Commission, 2.) The latest version of the proposal for the directive has been given by the European Commission on 23.2.2022.

More and more companies in the EU are using due diligence in for risk identification in their value chains, but have difficulties arising from lack of legal clarity, value chain complexity, information deficiencies and costs. An approach based on voluntariness has given wanted results and negative externalities are found within and outside the EU. (European Commission, 2.)

Among other policies, the directive supports the EU Sustainable Finance Disclosure Regulation, where reporting about due diligence policies is voluntary and, in some cases, even mandatory. It also complements the Taxonomy Regulation, which is essentially a transparency tool, that provides a classification of environmentally and socially sustainable investments. (European Commission, 2.)

There are several objectives that the directive is aimed to answer to. Among other things, the Directive will:

1. Enhance corporate governance methods to better incorporate risk management and mitigation procedures for impacts on human rights and the environment, especially those resulting from value chains, into corporate strategies.
2. Avoid disparity in due diligence requirements in different EU countries and contribute to legal assurance on the expectations and responsibility of businesses and stakeholders.
3. Increase businesses' responsibility for adverse impacts and streamline the responsibilities under the existing and suggested EU initiatives on responsible business conduct.
4. improve access to corrective measures for those who suffer from harmful human rights and the environmental impact of businesses.
5. will complement other programs/actions/procedures addressing to particular sustainability challenges in specific sectors mostly within the Union. (European Commission.)

The next sub-sections present the EU CSDD thoroughly. The presentation will specifically focus on the companies affected and what is expected from them regarding the directive. The directive will also create obligations for the member countries, but those obligations are not in the scope of this research, hence left purposely unexamined. The first section will present background and frameworks for the directive, the second section will explain the scope of the directive, the third section explains what kind of actions companies are obligated to take according to the directive and finally the fourth will present evidence from similar legislation in the past.

4.1.1 Background for the directive - frameworks

The CSDD directive is based on the OECD Guidelines on Multinational Enterprises and Due Diligence, which expanded the application of due diligence to environmental and governance topics, and the UN Guiding Principles on Business and Human Rights (UNGP), which acknowledge the responsibility of companies to perform human rights due diligence. (European Commission.)

UN Guiding Principles on Business and Human Rights is a document on implementing the UN '*protect, respect and remedy*'- framework and is based on assumptions that states'

must respect, protect and fulfil human rights and freedom, businesses are actors of society, required to comply with all applicable laws and must respect human right, if rights and obligations are violated, corrective actions must be done. (UNGP 2011, 1.)

The UNGP includes several instructions for states and businesses for human rights, i.e., a requirement for businesses to conduct human rights due diligence process for identification, prevention, mitigation and accounting to clarify how they dedicate to their impacts on human rights. The human rights due diligence must extend to company's own activities, those that might relate to their business relationships, and it must be ongoing. (UNGP 2011, 17.)

The UN Guiding Principles identify four essential components of due diligence:

- 1) identification and assessment of actual and potential human rights impacts
- 2) integration and action upon the findings
- 3) tracking of the effectiveness of the taken actions; and
- 4) communication on how impacts are addressed. (UNGP 2011, 17.)

The OECD Guidelines for Multinational Enterprises (OECD Guidelines) developed due diligence further by extending it to environmental and governance questions. As a crucial component of company decision-making and risk management systems, the due diligence process is defined as identifying, preventing, mitigating, and accounting for how they manage their actual and potential adverse impacts. The adverse impacts in question are caused or linked to the company's actions or their business relationships. Business relationships consider business partners, actors included in the company's supply chain and any other non-state or state entities associated with the enterprises business. Due diligence can be integrated to business risk management systems, making sure that it stretches out to the risks of adverse impacts external to the enterprise itself. (OECD Guidelines, 23.) The contents of due diligence in the EU directive are similar and include the OECD Due Diligence Guidance for Responsible Business Conduct (European Commission, OECD Due Diligence).

4.1.2 Scope of the CSDD Directive

The directive will apply to mainly to large companies and companies operating in high-risk industries. Following type of companies formed in accordance with the legislation of a Member State are affected:

- Large EU companies with over 500 employees on average and their net global turnover over 150 million from the latest financial year.
- Small businesses with over 250 workers, and net global turnover over 40 million euros in the latest financial year and over half of the turnover has been from a high-risk industry e.g.,:
 - Textiles and clothing industry, agriculture, forestry, fisheries and manufacturing and wholesale of raw materials or final food products and the extraction of mineral resources (crude petroleum, natural gas, coal, metals etc.) and industries related to refining of those minerals. (European Commission.)

In addition, the directive reaches companies from third world countries (under their country's legislation) that fulfil one of the following requirements:

- a) net turnover inside the union was over 150 million in the year before the last financial year.
- b) the net turnover generated inside the Union the year before the last financial year was over 40 million but max 150 million, but 50% of the turnover was created from one or more business areas from before. (European Commission.)

Small and medium sized companies are not included in the scope of the directive, however, they are affected by it because of their possible relationships with companies included, therefore possibly facing economical and administrative requirements, resulting from requirements flown from their customer companies. Companies under the scope must support their small and medium sized business partner's if their viability is threatened because of the requirements to fulfil due diligence. (European Commission 2022, 16.)

4.1.3 Actions demanded from affected companies

There are several actions that affected companies must take. Companies under these conditions, must conduct a human rights and environmental due diligence. Covering the similar steps of due diligence that the OECD Due Diligence Guidance for Responsible Business Conduct, the companies must carry out the following actions as a part of due diligence:

1. *integrate due diligence into their policies*
2. *identify actual and potential adverse impacts*
3. *prevent and mitigate potential adverse impacts, bring actual adverse impacts to an end, and minimize their extent*
4. *establish and maintain a complaints procedure*
5. *monitor their due diligence policy and measure effectiveness*
6. *communicate on due diligence publicly.* (European Commission 2022, 53.)

This research focuses on the identification, prevention and ending adverse impacts. Adverse environmental impacts are violations of internationally agreed environmental conventions. An adverse impact can be related to e.g., biodiversity loss, ecosystem degradation, pollution, use of chemicals or waste management. Likewise, adverse human rights impacts are violations of rights and prohibitions included in international human rights agreements. They can be for example violations against people's right to dispose of a land's natural resources, right to life and security, prohibition of torture, inhuman treatment, right to liberty, prohibition of arbitrary or interference with a person's privacy, working conditions, freedom of thought, prohibition of forced labor, right to freedom of association, and right to equal treatment in employment. Environment is also considered in the adverse impacts for human rights, as pollution of water and air, or changes in the soil, can harm people's health or affect ecological integrity (e.g., cause deforestation). (European Commission 2022, Annex, part 1 and 2; European Commission, 2.)

To conclude, the adverse impacts must be identified, assessed, mitigated and ended. These measures have to be conducted to the entire value chain, including the company's own operations, their subsidiaries' operations and established business relationships. An

established relationship can either be direct or indirect and is directly related to the company's value chain. (European Commission 2022, 54.)

To identify the adverse impacts, the companies can use independent reports, and hearing stakeholders and workers. If any (potential) adverse impacts are detected, the companies must act to either prevent, mitigate or bring to an end, the adverse impacts by developing and implementing an action plan with qualitative and quantitative meters, and in a case of ending an adverse impact, neutralize the effects, including payment of damages to the affected persons. (European Commission 2022, 54.)

To prevent potential adverse impacts, focal companies under the scope of the directive must ensure, with contractual assurances, that their direct business partners follow the company code of conduct. If necessary, they must also make a prevention action plan, also by aiming to acquire contractual guarantees from their own partners to the extent that their operations are part of the company's value chain (contractual cascading). Companies must make investments to their own management and production processes and provide support to direct SME (small or medium enterprise) business partners, if their viability is threatened by corrective action plan. (European Commission 2022, 55.)

In addition to contractual assurances, the companies must have means to verify compliance against contract. The companies can use industry initiatives or independent third-party verification. In case of an SME supplier, the focal company shall pay for third-party verification. (European Commission 2022, 55.)

If these measures are not adequate to prevent or mitigate the adverse impacts, the focal company can request to create a contract with the indirect business partner to achieve compliance with the company code of conduct and for implementing mitigation plans. A contract with an SME must be 'fair, reasonable and non-discriminatory' and the fulfillment of this kind of contract must be audited to verify compliance. The company can use industry initiatives or third-party auditors and third-party audits must be paid by the focal company. (European Commission 2022, 55).

If the above-mentioned measures are not adequate for preventing or mitigating the adverse impacts, the company must not continue or extend the relationship with a partner, where adverse impacts have been detected at, and if possible, suspend business relations with the specific partner while pursuing prevention and minimization efforts, or if adverse

impacts are severe, terminate the business relationship. (European Commission 2022, 55-56.)

If potential adverse impacts are found and could not be obviated or sufficiently mitigated, the company is responsible to withheld from starting a new relationship or continuing the existing one with a specific partner in question or with a value chain where the adverse impact has occurred. If the law permits, it should also temporarily hold back on doing business with the partner while pursuing corrective actions, or terminate the relationship in case of a severe adverse impact. (European Commission 2022, 56.)

For potential adverse impacts, the focal companies must create and implement an avoidance action plan in dialogue with stakeholders. If actual adverse impact are found in value chains, they must be neutralized, or their breadth must be minimized. In practice, this can be for example financial compensation to victims. If not possible to bring down immediately, a corrective action plan with timelines must be created and implemented. (European Commission 2022, 56.)

The companies must also make it possible for persons affected by adverse impacts, trade unions and other workers' representatives and civil society organizations, to submit complaints. The companies must also have a procedure for dealing with the complaints. To ensure compliancy with company due diligence, the companies must periodically assess their operations and measures throughout their value chain for monitoring the effectiveness of their due diligence process actions. The matters covered by the directive shall be published in the company website as an annual statement every year. (European Commission 2022, 57)

In addition, The Member States of the European Union must ensure that the companies under the scope of the directive are committed to the Paris Agreement of limiting global warming to 1.5 degrees. The companies must develop and adopt a plan to ensure that their business model and strategy are aligned with the goal. This plan should identify, to which extent is climate change a risk for, or an impact of, the company's operations. (European Commission 2022, 60.)

As mentioned in the beginning of this chapter, companies must incorporate a due diligence policy to their companywide policies. This policy should entail a description of company's approach to due diligence, a code of conduct and a description of

implementation processes for due diligence. It is left for the EU member states to make sure that companies' due diligence policies are updated annually.

To conclude, the possible EU CSDD will set out a great deal of new obligations for companies operating in the EU markets. If the CSDD becomes effective, companies are obligated to know their supply chains in a different level than before. The next sub-section will present evidence on how companies have previously answered to similar demands.

4.1.4 Evidence from similar legislation and answering to guidelines

The EU CSDD is not the first legislative manner in the efforts of forcing companies to take responsibility about their supply chains. This chapter will present examples of similar legislation and answering to guidelines and to help answering the research question of this study, explain how companies have answered to the obligations. The overview of supply chain regulations from the EU and European countries is presented in Table 4.

Table 4 Overview of supply chain regulations from the European Union (EU) and European countries (authors' elaboration) (Schilling-Vacaflor A. & Lenschow, A. 2021).

Year of adoption	Environmental regulations	Year of adoption	Human rights regulations
2008	EU Council Regulation to eliminate illegal, unreported, and unregulated fishing (IUU regulation)	2015	UK Modern Slavery Act
Adopted in 2009, revised in 2018	EU Renewable Energy Directive (EU-RED)	2017	EU Conflict Minerals Regulation
2010	EU Timber Regulation (EUTR)	2017	French Duty of Vigilance law (also covers environmental damages)
		2019	Dutch Child Labor Due Diligence Law

According to Schilling-Vacaflor A. and Lenschow (2021), the above-mentioned regulations (except the French Duty of Vigilance law) are targeting specific sectors and areas of issues, hence create an inconsistent and patchy regulatory framework. Due to limitations of this research, the regulations are not gone through in detail, but are serving as examples of regulation that affects a company's supply chain.

Hofmann et al. (2018) tried to find patterns of supply chain due diligence (SCDD) implementation in practice. They also searched for enablers and barriers of SCDD implementation. They focused on conflict minerals and their study was not based on a specific regulation but identified the same adverse impacts for human rights as does the EU CSDD directive and follows the OECD Guidance for responsible supply chains of minerals from conflict-affected and high-risk areas. A multi-tier perspective is also recognized in the study.

Hofmann et al. (2018) found out that external tools and support systems, internal management's support and power and trust are all enablers of implementing SCDD. According to the interviews conducted, external tools, e.g., for detecting conflict areas, facilitate the movement of standardized exchange of information, a key principle of SCDD. Naturally, having the support of the internal management, eases the implementation of SCDD like any other new obligation. Lastly, having leverage against the suppliers facilitates setting demands for the seller and oppositely, having less power makes it more difficult. (Hofmann et al. 2018.)

In addition to power, gaps in regulation, market structure, complexity and resources and costs were mentioned as barriers for implementation. Some regulations are only applicable for specific geographical areas, leaving others outside of the scope. Regulators were also criticized assuming a static supply chain. Market structure refers to companies having to stick with problematic suppliers or the lack of suitable, sustainable suppliers in the market. All firms interviewed by Hofmann et al. (2018) mentioned complexity as an issue. When more and more actors are involved, it gets increasingly difficult to even map the actors in the chain. Regarding resources and costs, the interviewees mention costs for the focal company for upstream certification and for the suppliers and their capabilities for more paperwork. For new and fundamental mechanisms, the upstream must make substantial investments. (Hofmann et al. 2018.)

Smit et al. (2021) have conducted a study to inform a legal standard and analysed how companies perform human rights due diligence (HRDD) and what is particularly challenging for them while conducting it. According to their interviews, first tier suppliers do not want to give information about their own suppliers and hence protect it. There was also a challenge of suppliers not willing to answer the focal company's questions. It was also commonly argued that tracing human rights effectively wasn't possible because of

the complex supply chains. According to Smit et al. (2021) HRDD must be integrated into relevant processes like the procurement process.

Smit's et al. (2021) interviews revealed that supply chains can take many different forms. While some supply networks consisted of small and medium-sized businesses (SMEs), other supply chains had first-tier suppliers that are themselves multinationals. The same organization might have frequently operated as both a supplier and a buyer, with varying degrees of power in each relationship. Supply chains can evolve as suppliers exit the market and interpersonal dynamics shift. For HRDD purposes, many businesses find it difficult to describe their supply chain and it was difficult for them to conduct same level of due diligence to every supplier, as there were so many of them.

An example of environmental due diligence is the EU Timber Regulation (EUTR) that has a goal of reducing illegal logging by ensuring that only legal timber or timber products can be sold in the EU. The requirement obligates operators importing timber and wood products to the EU market for the first time to prove the legitimacy and source of the timber and to practice due diligence. All subsequent traders in the entire supply chain must also identify the operators or traders who they are buying timber and wood products and, if necessary, the traders to whom they have sold timber and wood products. (European Parliament 2010) During the time of launching the EUTR, Finnish wood industry representatives stated that demonstrating the legality of their timber products and gathering information requires an advanced and coordinated procurement function and more advanced and expensive information systems, especially for SMEs without any operating systems at the time. (Trishkin et al. 2015.)

Regulation can be a facilitator that requires all firms to increase their transparency levels, which can diminish the worries of competitive disadvantage and allow confidential information exchange. (Doorey, 2011; Hannah 2005.) Smit et al. (2021) state that inadequate transparency level is one of the main risks for companies conducting HRDD. Their interviews showed that mapping suppliers and tracking the supply chain is the usual first step of supply chain HRDD. The mapping also contains determination of the last nodes of the supply chain where HRDD can be conducted without serious difficulties.

5 Literature synthesis and theoretical framework

The literature review for this study indicates that gathering sustainability information in company's multi-tier supply chains can be a rather tedious task for companies. This study has gathered and examined literature from multi-tier sustainable supply chain management, sustainable supply chain transparency and due diligence. The literature areas are closely connected as for example to be able to manage sustainability of the multi-tier supply chain and conduct due diligence, companies must first trace their supply chains and then collect information about sustainability conditions within those. The framework based on the theoretical part of this study is presented in Figure 9. Using the framework, the purpose of the study is to find out what are the challenges companies face in collecting sustainability information in their supply chains and whether the EU CSDD-directive will bring any additional challenges.

MT-SSCM

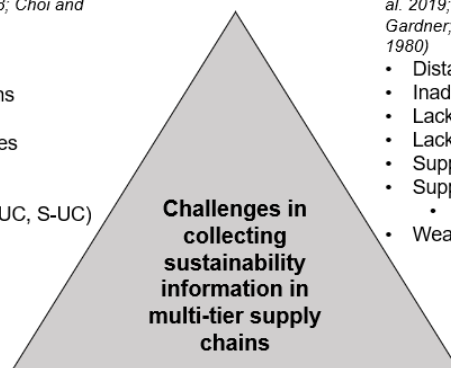
(Wilhelm 2016a; Fraser 2020; Epstein & Yuthas, 2011; Choi and Hong, 2002, 472; Villiers, 2019; Carter et al. 2015; Tachizawa and Wong, 2014; Busse et al. 2016; Grimm et al. 2016; Sauer & Seuring, 2018; Choi and Hong, 2002, 472; Mena et al. 2013, 73)

- Distance (physical, institutional)
- Lack of power
- Location of sustainability violations
- Lack of transparency
- Supplier ignorance and capabilities
- Supply chain complexity
- Type of sustainability
- Uncertainty (SC environment, D-UC, S-UC)

Transparency

(Grimm, et al. 2016; Bastian et al. 2013; Gold and Heikkurinen 2018; Wilhelm et al. 2016; Das & Teng, 1998; Fraser 2020; Epstein & Yuthas, 2011; Gardner et al. 2019; Choi and Hong, 2002, 472; Villiers, 2019; Gardner; Smit 2012; Hoffman 2018; Grimm et al. 2016, 1980)

- Distance (physical, institutional)
- Inadequate control mechanisms
- Lack of power
- Lack of visibility
- Supply chain complexity
- Supplier resistance and ignorance
 - Supplier technical capabilities
- Weak relationships



Due Diligence

(Hoffman 2018; Smit 2012)

- | | |
|-------------------------------|---------------------------|
| • Complex downstream products | • Market structure |
| • Gaps in regulation | • Resources and costs |
| • Lack of power | • Supplier resistance |
| | • Supply chain complexity |

Figure 5 Challenges in collecting sustainability information in multi-tier supply chains

The natural first step to implementing sustainability to supply chains is focusing to first-tier suppliers (Miemczyk J. et al. 2012, 479). Majority of the sustainability violations happen at the raw materials stage of the supply chain and bringing on the multi-tier aspect when trying to achieve sustainability further up the chain brings companies several challenges to overcome (Mena et al. 2013, 72).

Bastian et al. (2013) state that supply chain transparency is a precondition to MT-SSCM. Mapping the supply chains is the first challenge companies face before being able to implement MT-SSCM and is the usual starting point for (HR)DD (Smit et al. 2021; Bastian et al. 2013). In addition, the challenges in achieving transparency are similar to the challenges affecting MT-SSCM approach, which makes it logical to examine these together. To achieve transparency and implementation of MT-SSCM, firms face the enormous challenge of mapping the fragmented, multi-layered supply chains. Companies might not know their sub-suppliers, the origin of their raw materials and naturally the state of sustainability in their supply chains. (Epstein & Yuthas 2011; Bastian et al. 2013.)

The suppliers' attitude towards transparency methods is a key factor in achieving transparency and managing the supply chain sustainability in complex supply chains. First-tier suppliers might not be up to date or can even be unmindful of their own upstream supply chain (Fraser, 2020). They can also have the information about their sustainability impacts but lack the methods and data sources to create indicators for sustainability (Gardner et al. 2019). This affects the quality of information and therefore transparency. (Schäfer, 2022).

Supply chain complexity (horizontal and vertical) rises simultaneously with the the number of suppliers to be managed. (Wilhelm, 2016a.; Choi & Hong, 2002, 472.) Complexity affects achieving transparency in supply chains as collecting and sharing relevant information becomes more difficult and governance weakens. (Epstein & Yuthas, 2011; Villiers). While complexity increases, the power of the focal company further up the supply chain decreases as the visibility decreases and distance (both physical and institutional) to parties increases (Carter et al. 2015; Tachizawa & Wong, 2014; Busse et al. 2016; Grimm et al. 2016, 1980). The institutional distance is difficult to change, and a higher institutional distance might lead to decoupling of the supplier. (Sauer & Seuring, 2018).

In MT-SSCM the challenges companies face, also effect on the approach they take towards sustainability management. According to Sauer and Seuring (2018) The S-UC and D-UC that determine the focal company's capability and need to manage the supplier, are interconnected with the institutional distance between the SC's environment and the supplier's environment. These factors determine whether it's easy or difficult for companies to collect sustainability information throughout their supply chain. Choosing

the approach can also be looked at through supply chain complexity, sustainability management capabilities of the first-tier supplier and the type of sustainability (Wilhelm et al. 2016a, 209) All these factors affect whether it is going to be challenging for companies to manage the MT-SC sustainability and which approach to take on it. For example, the authors conclude that an easily traceable form of sustainability results to an open MSC with more responsibility on the tier 1 -supplier and on the contrary, weaker traceability chances lead to a closed MSC. (Wilhelm et al. 2016a, 209.)

Gold and Heikkurinen (2018) state that the same factors challenging MT-SSCM like, supply chain conditions, complexity, distance and resistance are also the obstacle in the path towards improved transparency. Lack of visibility to the 2nd and 3rd tier suppliers makes transparency work severely more difficult (Wilhelm et al. 2016a). And some authors even claim that it is near impossible for focal companies to build a strong enough relationships to protect supplier and distributor collaboration nor to develop good enough control mechanisms. These means are needed to encourage sustainable business behavior. (Das and Teng, 1998, see Gold & Heikkurinen 2018).

Similar issues from MT-SSCM and achieving transparency follow to the implementation of due diligence. Additionally, to the challenges overlapping between three types of literature Hoffman (2018) lists challenges like gaps in regulation, market structure and resources and costs. Reading of the law can be difficult for companies, data required might be hidden or supply chain perspective is static. Market structure relates to S-UC as firms might have to stick to problematic suppliers because of the market situation. Resources are also a challenge both in the focal firm and in upstream supply chain, as complying with requirements demands extra paperwork or for example certification. Similarly, to other literature areas, supplier resistance towards disclosing information to focal firm is also seen as a challenge (Smit 2021; Hoffman 2018).

As stated in the beginning of this chapter, we can see that the challenges are overlapping between the three fields of literature. The framework will be used in analysis of the empirical findings to see whether the interviewed companies see similar challenges that emerged from the literature.

6 Research methods

The purpose of this study is to examine the challenges companies face regarding supply chain transparency and therefore gathering sustainability information in their supply chains. This study is a multiple-case study, and it follows the Guidelines of the Finnish Advisory Board on Research Integrity (TENK 2012). The next sections will explain the research approach and design, data collection, data analysis methods chosen for this study and will examine the research quality of this study.

6.1 Research approach

The research approach for this study is qualitative. Qualitative approach is taken when the aim of the study is to form a holistic understanding of a specific subject. (Eriksson & Kovalainen 2008, 5). According to Hirsjärvi et al. (2007, 160) the foundation for a qualitative study is to illustrate the real world. Characteristics of a qualitative study include holistic information gathering, humans as a source of data, inductive analysis, qualitative methods, appropriate sample selection, following the research structure and the uniqueness of cases. The purpose of this study is to gain understanding and in-depth information about multi-tier sustainable supply chain management in the selected companies and the challenges firms face in sustainability information gathering, hence in achieving transparent supply chains and conducting due diligence. To help achieve this goal, a theoretical framework has been formed, which is utilized in the analysis of challenges arising from the interviews. In addition, challenges companies face in MT-SSCM, transparency and in conducting due diligence are examples of real-life situations, which makes qualitative approach a justified choice.

This thesis was conducted as a case study. Case studies are used to study real-life phenomenon and to seek information about the individual, group, organization, social or political phenomenon. Case study seeks to answer descriptive and explanatory questions and aims to gain an in-depth understanding of one or more cases in their real-life context (Yin 2009, 4, 9–10; Yin 2012, 4–5.). Case studies can be divided for example to single or multiple case studies. A single case study concentrates to understand a single case thoroughly from within, as the multiple case study aims to find similarities and theoretical generalization by comparing multiple cases. (Eriksson & Kovalainen, 2008,118.) Qualitative case study is a suitable method for researching a yet little examined social

phenomena with an explorative study (Gerring, 2004). The MT-SSCM literature is still rather unexplored and the examined phenomena complex, which supports the need of an in-depth analysis. For this thesis, four different companies from different fields of business have been chosen, which makes it a multiple case study. With this specific selection, the aim is to see if there is a causality in the field of business and the challenges seen.

6.2 Research design

Research design explains the process of conducting the study (Saunders et al., 2016). The research process of this study consisted of six steps, presented in Figure 6 below.

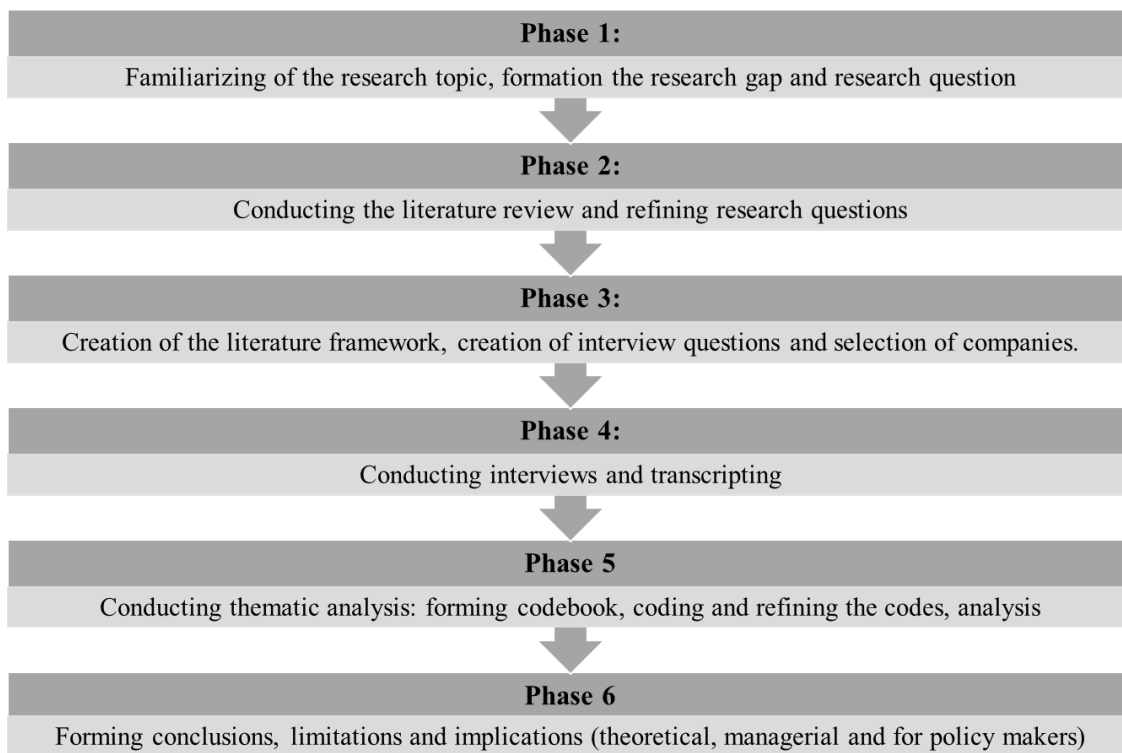


Figure 6 Research process

First, the researcher familiarized with the research topic to gain understanding of the topic in general and what kind of literature is to be collected. From examining the literature, a research gap was formed, and the research questions were developed. After this the researcher conducted the literature review and formed the theoretical framework to be used in the analysis of empirical data. During the literature review, the research questions were also refined as more information about the phenomena was gained. The theoretical framework formed the basis for the interview questions, which was formed

simultaneously with contacting the selected companies. Interviews were conducted quickly after contacting the interview companies and transcripts were written. Before starting the analysis, the codebook from literature framework was formed and the coding began. New nodes were formed, and some old nodes abandoned during the process of going through the empirical material repeatedly. Once the researcher was content with the results and no new nodes emerged from the process, presentation of results could begin following the conclusions, theoretical implications and implications for managers and policy makers and limitations.

6.3 Data collection

In qualitative research, sampling is typically done with careful consideration, looking at accessibility and fit for the research, and not randomly (Eriksson & Kovalainen, 2008; Hirsjärvi et al. 2007, 160). There is no specific limit for the sufficient amount of data needed, but it can be supported with saturation of findings. Saturation is a situation where new samples do not provide new information for the research. (Eskola & Suoranta 1998, 62–63.)

The companies selected for this research were fundamentally chosen because they belong to the scope of the possible EU CSDD directive. The following type of companies were chosen, according to the directive:

- Large EU companies with over 500 employees on average and their net global turnover over 150 million from the latest financial year. (European Commission, 2022.)

The scope also includes small EU companies operating in high-risk industries and third-world countries operating in EU markets (European Commission, 2022). However, to have a stricter criterion for company selection, only large EU companies established in Finland were chosen. Finnish companies were chosen to ease the data collection.

The selected companies are operating in different industries: renewable energy industry, food industry, forestry industry and mining, metal and construction machinery industry. The reason for picking companies from different industries was to see if different industries perceive different challenges in sustainability information collection than others and if the already existing regulation towards the company affects their views. For

example, energy industry is already a highly regulated field and mining industry a high-risk industry, which makes it interesting to choose companies from these fields especially.

As mentioned before, people are usually the data source in qualitative research (Hirsjärvi et al. 2007, 160). Interviews are an important method in case study -approach and their most important goal is to gain as much in-depth information as possible. (Yin 2009, 160; Tuomi & Sarajärvi 2018, 85). The advantages of interviews are the flexibility of having a conversation, asking additional questions, and clarifying both questions and answers for more understanding (Hirsjärvi & Hurme 2008, 34–35; Tuomi & Sarajärvi 2018, 85–86). On the other hand, interviews are expensive and time consuming and can provide irrelevant information, not related to the research topic (Tuomi & Sarajärvi 2018, 86; Hirsjärvi & Hurme 2008, 35–36).

For a successful interview process, Tuomi and Sarajärvi (2018, 85-86) suggest sending the interview questions to the interviewees beforehand, so that they can familiarize with the topic. Equally important is the selection of the interviewees as the interviewee should ideally have knowledge and experience of the phenomena (Yin 2009, 107; Tuomi & Sarajärvi 2018, 86).

For this research the data was collected with interviews to gain in-depth and detailed information about the concrete ways of multi-tier sustainable supply chain management and challenges of sustainability information gathering. The interviewees were experts in the field, being either sourcing and procurement managers, sustainability managers or a combination of both. All the interviewees were higher level employees in the company, having holistic information of their field. The collected interviews and their schedule and duration are listed in the Table 5:

Table 5 Interview schedule

Date	Data Collected	Title of the Interviewee	Duration	Industry
5.9.2022	Interview with Company A	Head of Supply Chain Sustainability	46:09.7	Renewable energy industry
7.9.2022	Interview with Company B	Head of Sourcing Sustainability and Quality	40:54.4	Food industry
8.9.2022	Interview with Company C	Head of Procurement and Logistics	57:43.1	Forestry industry
10.9.2022	Interview with Company D	Head of Procurement – Services	36:24.5	Mining, metal and construction machinery industry

Altogether four interviews were performed. Interviews were performed all in the same week to start the transcription and analysis as soon as possible. The goal of the interviews was to understand the interviewees' role and responsibilities in the company, how mature is sustainability management in their company, how are their suppliers and sub-suppliers managed in terms of sustainability and the challenges perceived in it.

All interviews were conducted as semi-structured interviews. The advantage of a semi-structured interview is that it is systematic, but on the downside, the interviewees can answer very differently to the same questions. It is important for the interviewer to make sure all relevant topic areas are covered. (Eriksson & Kovalainen 2008, 82.) The interview questions were open ended, following a flexible structure where additional questions could be asked, or the order of the questions be changed. However, the structure followed a path of going from big picture towards the details. The interview structure was sent to the participants approximately one week in advance to give them a chance to familiarize with the topic. However, most of the interviewees were already familiar with for example the possible EU CSDD. The interview frame is attached as an appendix to this research.

All interviews were conducted in Finnish, to get as much understanding about the topic as possible, as the mother tongue of all interviewees and the interviewer is Finnish. All but one interview was conducted and recorded in Zoom. The first interview was conducted face-to-face, but the audio was recorded in Zoom. One hour was reserved for

the interviews, but usually they took a little less time. All interviewees were asked if they wish to have the transcript after the interview and if a title of the interviewee and direct quotes could be used in the thesis. Two of the interviewees asked to see the transcript and the quotes in the final text. This resulted to some of the quotes being altered without changing the context.

6.4 Data analysis

There are multiple data analysis methods for qualitative data. Data can be analysed with different techniques like thematic analysis, content analysis, discursive analysis or conversation analysis (Eskola & Suoranta 1998, 160; Hirsjärvi et al. 2007, 219). Thematic analysis is a common technique for qualitative research (Eskola & Suoranta, 1998, 174). Thematic analysis means that the research data is categorized according to different topics, which essentially means highlighting specific themes that contribute to the research questions and problem. The appearance of these themes can be compared with one another, and the method is recommended for solving pragmatic issues. (Tuomi & Sarajärvi 2018,105; Eskola & Suoranta 1998, 174-178). The thematic analysis highlights what has been said in the interviews about a specific topic, and it allows the researcher to identify the most important findings and make further conclusions (Tuomi & Sarajärvi 2018, 105–107; Saunders et al. 2016).

In this study the challenges in collecting sustainability information in multi-tier supply chains were analysed with thematic analysis. Because the issue being dealt with is pragmatic, thematic analysis was found to be a suitable technique. The analysis started already during the formation of the literature framework as the most important themes from the literature were chosen and a code book was formed. The codebook used in this research is attached as an appendix.

The interviews were transcript using Microsoft Word's automatic transcription from an audio file. The revision of the transcript and making needed changes to the transcripts were done afterwards in N-vivo. In N-vivo, first the important themes from the literature were coded as their own individual nodes under the respective literature topic area. The data was then coded into the existing nodes and to the new emerging nodes. Frequently repeated themes were gathered, and new nodes were created. Nodes were both created and deleted in the coding process, to make sure that no overlapping nodes were created inside the same field of literature. Nodes based on the literature view were not deleted

ease the final analysis part to be able to compare the results from the literature and the empirical study.

6.5 Research quality

The role of quality and reliability in research is highly important. Research quality is typically estimated with reliability and validity. Reliability means if the research is replicable, which means if another researcher could achieve same findings and if the interviewees give the similar answers again. Therefore, it is important that the research actions are documented thoroughly. (Eriksson & Kovalainen 2008, 290; Hirsjärvi et al. 2007, 226–228; Yin 2009, 40, 45; Hirsjärvi & Hurme 2008, 186.) In this thesis, the reliability is ensured with a same interview questions and structure to all interviewees. The entire research process from research topic selection to the selection of interviewee companies and the interview process and analysis has been documented in a detailed manner, and the codebook has been attached, so that the research can be conducted the exact same way and same results can be achieved.

Validity assesses whether the conclusions made in the research give a precise description or explanation of the phenomena. It describes if the findings represent the examined phenomena truthfully and if there are evidence for the findings. It is a guarantee that the research and its results are truthful. (Eriksson & Kovalainen, 2008.) Validity can be divided into structural, internal and external validity. Structural validity can be enhanced by using several sources of information, precise research process documentation and letting the interviewees check the research draft. Internal validity is often used in explanatory research when the goal of researcher is to explain phenomena causalities. Internal validity indicates the researcher's approach, when theoretical, conceptual and methodological choices are logically explained. Lastly, external validity strengthens the general applicability of the research findings as the researcher aims to generalize the results to a wider theory. (Eskola & Suoranta 1998, 213; Yin 2009, 40–43.)

In this research, validity was ensured by using several sources of information, precise research process documentations and offering the interviewees to check the research draft and transcript. The interview structure and analysis were based on the theoretical framework created from literature review, which aims to have detailed reasoning and linking the research subject to wider theory. The validity of this research may be hampered due to the interviewees request to leave certain answers private and modify

some quotes. However, after the modifications, the context of the quotes had not changed drastically.

7 Research findings

This chapter will present the research findings. First, the context will be explained through brief introductions of the interviewed companies. After this the challenges they face in gathering sustainability information are presented.

7.1 Describing the context

The companies interviewed for this study are all operating in different fields of business. Different fields of business were selected to see if the field affects how the companies view the challenges for collecting sustainability information. Companies are operating in the following industries: renewable energy industry (Company A), food industry (Company B), forestry industry (Company C) and mining, metal industry and construction machinery (Company D).

The companies are presented in the sections 7.1.1-7.1.4., providing information about their supply chains, the interviewees' subjective evaluation of their company's sustainability management -maturity and if regulation affects their sourcing.

7.1.1 Company A

Company A operates in the renewable energy industry and the Head of Supply Chain Sustainability was interviewed. Sustainability is an integral part of the company's operations, starting from their climate commitments over the years. According to the interviewee, there is a lot of resources allocated for sustainability and it has always been important when the company searches for new raw materials or suppliers. The interviewee feels that the company is rather advanced in sustainability management compared to other companies. There are about one thousand raw material and close to 10 000 indirect suppliers. The number of suppliers varies every year, and they are spread around the globe.

There is regulation affecting to the company's operations, making it mandatory to disclose for example upstream traceability information to customers further down the supply chain. Therefore, the company has the traceability information beyond the first-tier supplier, but knowledge about sustainability conditions focuses on first-tier suppliers, though sometimes the sub-suppliers are under the management practices. Depending on the supplier, the company does public information -audits, desktop-questionnaires, calls

and sustainability audits and use certificates. Signing the supplier code of conduct is also mandatory for suppliers. With the information provided, it is difficult to verify which MT-SSCM practices the company would use, as the method of contacting sub-suppliers is not clear, but we can say that they at least use third-party methods in verification of sustainability because of the use of certificates.

7.1.2 Company B

The company operates in food industry and the interviewee is the Head of Sustainable Sourcing and Quality. Sustainability is embedded into the daily operations and considered in the company KPI's. The interviewee thinks there are more advanced players in the field regarding supply chain sustainability management, like multi-national companies, and describes that they don't have the deepest knowledge but are constantly developing.

Currently, there is no regulation that would affect the traceability requirements. Though, the interviewee mentioned, there is regulation related to food security and customs. The company has over 7000 suppliers, but the tail is long, as their biggest suppliers that supply for example raw materials, limit to only 500 suppliers. According to the interviewee, the top biggest 20% of suppliers deliver almost 50% of their raw materials. There are many actors in the raw-material stage like farmers but going downstream of the supply chain, the number of actors diminishes quickly.

The company does not know the origin nor the supply chain of all of their raw-materials, but there are certain raw-materials that they want to understand better, know the farmers of raw material, know their supply chains and take responsibility of the sustainability within. Hence, they have the visibility to raw material producers regarding some specific materials.

The ways of collecting sustainability information and managing sustainability are for example self-evaluation questionnaire and audits. The self-evaluation questionnaire is mandatory for all new suppliers. Supplier code of conduct defines the basis for these two methods. If the company must contact the second-tier supplier, for example farmer, they always do it through the first-tier supplier. They also sometimes use third-party certificates to verify compliance. It can be interpreted that the company uses indirect and third-party approach in MT-SSCM.

7.1.3 Company C

Company C operates in the forestry industry. The interviewee is the Vice President of Procurement and Logistics, and their responsibility area reaches all procurement excluding direct wood sourcing. Sustainability management of suppliers is also a part of the organisation's responsibilities. Sustainability is part of the company's core strategy, there are strategic sustainability goals, and it is also part of their everyday operations, as everyone has their own assigned sustainability goal, tied into bonuses. The interviewee describes their supply chain sustainability management level as above average, but not at the highest level. They describe they have the basic things under control.

There is no regulation affecting procurement, but for example certificates in the wood sourcing side obligates to for example trace the wood to its origin, and on the procurement side, quality and environmental certificates obligate the company to treat their subcontractors as their own production. In addition, product safety requirements apply to the bought products, which means the selling company must know e.g., which chemicals are used.

The company has a large variety of suppliers. The majority of suppliers are small in spend, and on the other hand the more important ones are divided into partner, key and recommended suppliers. The interviewee didn't have numerical information about their sub-suppliers, as their visibility is limited to direct suppliers. According to the interviewee, if there is information about sub-suppliers it is an exception. The company is currently trying to map their supply chains for certain products. Suppliers must comply with the company ethical principles and supplier code of conduct and the company also collects data with supplier self-assessment questionnaires and do audits.

Their MT-SSCM approach can be interpreted as both indirect and direct. According to the interviewee, they only go directly to the next tier if the main supplier is resistant to disclose information about 2nd tier.

7.1.4 Company D

Company D operates in mining, metal and construction machinery industry. The interviewee is the Head of Procurement for Services business unit of the company, focusing on aftermarket services procurement. Sustainability is part of the corporate

strategy of the company, divided into two parts, own footprint and their clients. Sustainability is considered for example in terms of their emissions, their effects on the nature, logistics, and social aspect in operations. The interviewee explains how they've done a lot of work for supply chain sustainability management, and they have sustainability visibility to key suppliers but not to all suppliers. The maturity of supply chain sustainability management is left somewhat unclear.

The company's supplier base is global, there are about 5000 direct suppliers used per year and their profiles are very different. Some suppliers are only used once a year, and some are considered as key suppliers. There is no global regulation affecting the company, e.g. making it mandatory for them to disclose information. The interviewee highlights that local law affects their business. The interviewee mentions that mining industry is heavily regulated all over the world, but as he is working in Services, he has no knowledge of that. Considering sub-suppliers, the visibility decreases as they go further up the chain. However, they do know some of their sub-suppliers. All suppliers must sign the supplier code of conduct, and the requirements should be passed on to sub-suppliers. Other methods used self-assessment questionnaire, auditing and certificates. Their approach to MT-SSCM can be interpreted as indirect, as the sub-suppliers' compliance is verified from direct suppliers.

7.2 Challenges in collecting sustainability information in multi-tier supply chains

7.2.1 MT-SSCM

Signing the code of conduct, sustainability questionnaires and audits were common ways of sustainability management methods towards suppliers. For some companies, the code of conduct formed a basis for the sustainability requirements and questionnaires had been developed using e.g., a social certification standard. Supplier resistance towards the methods used for managing sustainability emerged in all interviews. It was associated with scarcity of supplier resources in terms of knowledge, frustration against several surveys from different customers and pure unwillingness of sharing information by answering to the surveys or signing contracts. Other types of management like sustainability audits had also received opposition as sometimes it is difficult to find a

suitable time for an audit, which according to the interviewee, might indicate that the supplier wants to make prearrangements at their facility.

“...We have concluded that big companies with hundreds of customers asking the same questions might not be willing to answer every single firm’s same questions again” – Company A

“We have noticed that some companies have policies that they don’t answer to any questionnaires in any (information) system at least, but they can give an interview.” – Company C

“Some companies don’t by principle want to sign another company’s similar document (referring to ethical code of conduct), but if they have their own corresponding one then we’ll go that through.” – Company C

“It varies... We are talking about small firms, that have the knowledge, but at the office side there are not so many skills and knowledge, so there are some challenges in those things.” – Company D

“...Sometimes we bump into a challenge of finding the right time (for an audit), which might be because they want to reassure certain things before the audit.” – Company D

Answering to questionnaires and being audited can be laborious for suppliers and there are many customers working towards sustainability, hence, asking the same questions. Companies did not want to take up too much of their suppliers’ resources, acknowledged this issue and have thought of other methods of verifying sustainability like using certificates. Scarcity of resources affected supplier willingness towards sustainability management practices. Suppliers might not have the time to fill in questionnaires or spend a full day in an audit or they can have several firms asking for same things.

“Some are very co-operative, and some are not. For some the reason is just that they don’t have the resources or time to answer.” – Company A

““I would say, they are sometimes a bit irritated if many customers come and make similar verifications and audits. That indeed takes up a lot of resources from suppliers, when people are tied up with audit the whole day.” – Company B

“But I think that when many firms have their own questionnaires and own things, it can be quite difficult and time consuming to serve every customer.” – Company C

The supplier base for all the companies is vast and heterogenic. Company size varied from large enterprises to small firms and supplier size was mentioned often as a factor that affects suppliers’ willingness to answer to sustainability requirements. Supplier size

was associated with a lack of publicly disclosed information, answering to sustainability questionnaires, and usage of resources.

“There are a lot of small suppliers that might not disclose any (public) information, so in there it’s very important to be specifically asking those questions from them.” – Company A

“It is indeed a lot of work to chase and chase after them (the answers). Maybe especially with smaller companies.” – Company C

Suppliers lacked the understanding for companies’ sustainability management practices. Company A required their suppliers to answer a self-assessment questionnaire and required evidence for policies, principles, and documentation. Their sustainability specialists go through the questionnaires with suppliers as especially small companies don’t generally understand the questions or the meaning of sustainability management actions towards them, there could be language issues, or they don’t have sustainability policies in place.

“Small actors might not have the understanding for all our questions, like what do they mean, then there’s the language issues and difficult terms that what do we mean with that. ... Then big companies have all the policies and principles... but small don’t have so fancy policies and principles... That’s why it’s important to go through the responses directly with the supplier.” – Company A

The scarcity of resources was also visible in the focal company’s side. Lack of resources related to having certain type of specialists, how to use the information gathered, chasing suppliers for answers, systems for utilizing the information and auditing capabilities.

“Some large companies can have people that are specialised in specific topics such as biodiversity or forestry or agronomy etc... Indeed, we don’t have that kind of resources...we manage programs and do some monitoring ourselves and use service providers to audit suppliers.” – Company B

“We don’t collect information, such as energy consumption. In the future it can be that we collect, but right now we don’t have the resources or the systems to utilize the information” – Company B

“We don’t have the resources to audit every sub-supplier, we don’t have the capabilities for that.” – Company D

Companies that have a global supply base faced challenges in explaining their sustainability requirements but also regarding the general difficulty of the market and language issues. Regardless of the issues, collecting sustainability information was seen

important. One interviewee explained how it is more difficult to have (sustainability related) conversations with an American supplier than it is with an Indian or Chinese.

“I assumed, that challenges where the (sustainability) issues most probably are, but biggest challenges in discussing or implementing things are in fact in places where they don’t feel like there are human rights related challenges or other things, so the idea (of sustainability requirements) is very difficult to sell there.” – Company D

“And of course, when we go to a difficult market, where this (collecting sustainability information) is of course important, but in there the language issues and other stuff like that is a challenge.” – Company A

All interviewed companies are based in Finland. Their supply chains are global and complex, having thousands of suppliers and in distant locations. The visibility to the supply chains varied as some companies were required by regulation to know their sub-suppliers, but some companies didn’t have this visibility and had made the decision to focus on their key suppliers. Furthermore, for Company A, some end-products were traced right at the raw material origin.

“We’re going more global and expanding closer to the origins of where the suppliers are from, but we’re currently pretty much focusing on the European region, North America, and then the APAC region.” – Company A

“Supply chains are very long and there are so many actors in the origins. Controlling them is difficult and it’s impossible to have full control. ... and they are so far away, that it’s difficult.” – Company B

“Last year we used about 15 000 suppliers, so quite a big number, and of course, there are many small actors, so the tail is quite long.” – Company C

“Of course, our supplier pool is extensive so you can’t say that we are up to date with every supplier about what is happening there (at their facility) so we have focused on our key suppliers.” – Company D

The companies take a risk-based approach in their sustainability management. Audits were done risk-based and sometimes without notice for high-risk suppliers. Some raw materials posed more challenges regarding sustainability violations than others, and their supply chains were perceived challenging overall. Supplier’s geographical location mattered in the approach.

“When we have started with it (the specific raw material) we have understood that there are (sustainability) challenges.” – Company A

“Our approach (on managing sub-suppliers) depends a lot on the geographical area. We also do this risk based, so in difficult countries, we aim to further in it.” – Company A

“For example, cocoa, is a difficult supply chain and although we and our suppliers have done verifications and monitoring one can still find some critical violations.” – Company B

The companies’ subjective perception about the maturity of their SSCM varied. The perception varied from not having the deepest knowledge but are being better every day to having some visibility and being a forerunner. Company A thought that them being forerunners is also due to the regulation affecting their business, but being a forerunner, the first taking initiative in sustainability was also a challenge for them. There is questioning and resistance from suppliers. An interviewee hoped that firms would see that the focal company is there to help.

“In our case it’s maybe that, as we are forerunners, first to push this forward, ...so there is quite a lot of questioning and resistance on why we are asking this stuff. ... So that is a big challenge, that because we are the only ones, so it would be easier if everyone’s asking the same thing. “– Company A

Sustainability was integrated deeply to all interviewed firms, but challenges were also always related to internal factors. One interviewee wanted more controlled procurement, so that there wouldn’t be loopholes for unsustainable companies to make it as a supplier. Other interviewee has had challenges in implementing sustainability practices in procurement.

“As this is a big corporation and operations in many countries and it hasn't been so controlled, like all the procurement. So, we have, even at the moment, in a way a supplier comes, without us getting involved in the procurement process. They are nothing like raw material suppliers, or anything like big things, but there are potential risks. That kind of a thing, maybe that kind of and internal thing, that you must be gotten under control. -Company C

“Well, the biggest challenge is related to awareness...If you think that we are procurement professionals and talk about euros and cents and all, but then when you have to discuss about something that is not in your comfort zone, then that is. That is a kind of big challenge, especially in this kind of very male dominated heavy industry.” -Company D

To conclude, the answers covered topics like the distance to suppliers, lack of power, complexity of the supply chains, difficulty of certain supply chains, uncertainty, supplier resistance, size and resources and being a forerunner.

7.2.2 Transparency

Transparency related issues are strongly tied into the same issues that there are in the MT-SSCM. These can't be fully separated from each other and the literature of MT-SSCM and supply chain sustainability transparency are often overlapping. Themes highlighted above like supplier resistance, the supplier size and supplier resources related to that were also key challenges in the transparency side. Distance to suppliers and supply chain complexity bring issues like lack of control. The clearly overlapping findings are summarized in the Chapter 8.

As stated before, the interviewed companies have a lot of direct suppliers, and they did have information about their characteristics. Lack of visibility emerged as some companies had no information about the number of second-tier suppliers nor their characteristics. Furthermore, details of the requirements considering possible legislation for visibility are found difficult as there was lack of visibility to the upstream activities in general.

“But when you asked about the next tier, there I have, like our statistics actually end to the first tier, so that kind of numerical information I don't have.” – Company C

“I've heard that there have been thoughts in the EU that you should be able to stop deliveries if there is prove that there has been forced labour in the country of origin. But we can't possibly know as a buyer exactly what is happening in every part of the supply chain, people come and go. So that is difficult.” -Company B

Transparency work required a lot of resources from companies. For some companies, it had taken time to map out the supply chains and origins of raw materials and even after that, all raw material sources weren't visible. Some were more advanced than others, e.g., Company A commonly had visibility beyond the first tier, but Company C was slowly gathering this information, if a possibility for that occurred. For Company B, the mapped raw material sources also changed from year to year, which required extra work to map them out again.

“We require that all those farms are GPS mapped, that is, it is necessary to know exactly where the borders of the farm are, and then monitor that they are outside of the protection zones. In fact, for our cocoa, they have been mapped. But then the ones that are part of Rainforest alliance mass balance, we don't know exactly what the situation is.” – Company B

Regarding the collection of sustainability information, same issues like supplier resistance, lack of power and distance e.g., of chasing the suppliers for information are also tied to supply chain transparency. Interviewees found that controlling the very upstream suppliers demanding and it is not possible to have full control on them. This kind of supply chain complexity brings issues to transparency as the amount of sustainability information also grows. This poses challenges on how this information is managed and how to collect it efficiently.

“Well currently, it is if the number of suppliers increases a lot from this. Like the (amount) of all kinds of information, how it is managed and how it is rationally collected and like collected from the supplier side. – Company A

In conclusion, similarly to MT-SSCM section, the answers covered topics like distance, inadequate control, supplier resistance, lack of visibility and the complexity of supply chains.

7.2.3 Due Diligence and challenges emerging especially from EU CSDD - directive

The EU CSDD regulation requires companies to have a grievance process for the found adverse impacts from their supply chains. Company A stated that possibly rising number of complaints would require extra effort, even though there was a grievance process in place already. Other companies were also considered in the answers as Company B noted that the directive would bring extra costs for everyone.

“We have a pretty extensive grievance process that is also there. ...Well, it's just that they can be quite a chore if there are so many of them. But yes, in principle we have a process for that and then, of course, separating them so that if someone comes up, now we react if an NGO raises a case for us, and quite a lot of effort is put into it, that they are investigated, and we aim to go through them. Like is there any proof for the claim or not? That it is definitely something that needs to be developed even more so that it works better and more efficiently” – Company A

“On the other hand, I thought that I think it's good that there are directives, because it might also make things more difficult, not for responsible companies like us, but for those who really haven't done much of anything yet. What about those operators, if this legislation were to remove them from the market or make them must switch to such certifications. It would be such a good thing for us who have already done this, because at least we will have more costs for this.” -Company B

The requirement of going beyond the company's first-tier suppliers and ensuring the sustainability there is a concrete challenge. Companies were pondering the content of the directive and what responsibilities would it actually bring. Interviewed companies think more responsibility is passed to companies also from their customers if they are also included in the EU CSDD scope.

“Well, yes, I think that what you have referred to here a few times, in a way, that it is not enough is known my own direct suppliers and ensuring their sustainability, so it is the same in a way, that what comes will come, in a certain sense, yes, it adds to it. ... And it's probably the most concrete of them all.” - Company C

“If the directive goes through as it is, that's it, because in a way, our responsibility increases quite a lot, and in fact, if I understood the directive correctly, then our customers are also responsible about our supply chain. In other words, there will be a two-way, like, reporting responsibility, so it will be significant. And what does the due diligence actually mean, what does that directive talk about so precisely, it probably determines quite a lot what the real impact will be, but it sure is (a challenge).” – Company D

...We now ensure from our subcontractors that they follow the same rules, but if the directive comes into force as it is, then we are responsible for them doing it, so it changes it, it changes it quite significantly, the position where we are. In fact, it also comes to us through our customer interface, through those customers who are covered by the EU directives. We have big European customers who we work with, so of course, they also transfer that responsibility to us.” – Company D

Supply chain complexity in terms of the number of suppliers, rising distance to suppliers as well as diminishing power is as much of a challenge in answering to the regulation requirements than they are in terms of traceability and MT-SSCM.

Company A didn't see challenges in answering to the regulation but was worried about the practicalities regarding monitoring, implementation of the regulation and possible loopholes. Implementation was worrying from supplier perspective as well if all customers start asking the same things.

“But the fact that how it is in practice then, so how it is monitored, how it is implemented and what kind of so when what it so when. So of course, it's good if it becomes mandatory for everyone, but then of course it only comes to big companies and then depending on if there are some loop holes in it if you can get around it, then it's not so good in a way.” – Company A

“But how can it be implemented in practice so that it doesn't fully clog it, just like what I mentioned, that everyone gets 20 different surveys in slightly

different formats about the same things, so it makes it difficult to move the matter forward.” – Company A

The EU CSDD requires companies to commit to the Paris Agreement of limiting global warming to 1.5 degrees (European Commission 2022, 60). Interpretation of the directive might pose bigger challenges if emission goals, and temperature rise commitments must be implemented further in the chain. It is easy to know their own impacts on the environment, but more difficult to know about the other actors. Company D also perceived the supply chain emissions and waste management as a challenge as problem points regarding these topics are in the supply chain and managing those brings challenges.

“Of course, when we have thought together about how to interpret this directive as our own strategy should be in line with the 1.5-degree temperature rise and emission reduction goals. We do have a really, an ambitious goal for scope one emissions, because the goal is like zero, but then, in a way, it was thought that it probably also means these scope 2 and 3 emissions, that it is of course a much bigger deal for us as well. Then we are already dealing with, so the scope number one, they are our own factories, there we can by our own investments and decisions to decide what we are doing, what changes are made and understand what it costs and so on. But then when that influence must be done further into that network, it's clearly a bigger deal as well.”– Company C

“Especially smelters create a lot of waste, that requires recycling in many countries. The common way is to dump them into a river or something and we do intervene in these. ... So, regarding the directive the biggest issues are where the manufacturing process waste is handled and also emissions are a big thing, because smelters consume a lot of energy and there are a lot of emissions from processing, so how to manage that then.” – Company D

In conclusion, the answers for challenges emerging especially from EU CSDD related to the content of the regulation, the possible gaps, resources and costs that are needed and result from answering to the demands. Rising responsibility was considered challenging and also the type of sustainability like waste and emission management of the supply chain was perceived difficult.

8 Discussion and Conclusions

This chapter presents the most important findings from the empirical research. The findings from thematic analysis are reflected to the literature and the conclusions are used to answer the research questions. The findings and their relation to previous literature are illustrated in the figures. Lastly, the theoretical and managerial contribution as well as recommendations for policy makers will be presented, and limitations are discussed with opportunities for further research.

8.1 Answering to the research questions

The purpose of this research was to examine the challenges companies face in collecting sustainability information in MT-SC's. In addition, a due diligence perspective was used to examine if the new EU CSDD would bring any additional challenges to companies. The focus was also on finding whether companies experience the challenges differently depending on their industry, whether their procurement was already regulated or not and depending on how they perceived their sustainability management maturity.

A framework of the relevant theoretical literature was constructed in order to answer to the research questions. The literature provided a background for the empirical research consisting of MT-SSCM, sustainable supply chain transparency and due diligence literature. The literature was utilized to distinguish the key challenges companies face in terms of MT-SSCM, transparency and due diligence and whether and how these themes are connected. Four semi-structured interviews were conducted with four Finnish companies that are affected by the EU CSDD.

The empirical findings were analysed with the theoretical framework formed in Chapter 6. A thematic analysis was conducted by using the themes emerging from the literature and by creating new themes emerging from the empirical findings. The codebook, including the new themes that emerged from the empirical data, and the distribution of references are presented in Table 6.

Table 6 Distribution of references for coded themes

Code	Description/Challenge			
MT-SSCM	A	B	C	D
Distance (physical, institutional)	X	XX	-	X
Lack of power		X		
Lack of transparency	-	-	-	-
Location of sustainability violations	-	-	-	-
Supplier ignorance and capabilities	-	-	-	-
Supply chain complexity	-	X	XX	X
Type of sustainability	-	-	-	X
Uncertainty (SC environment, D-UC, S-UC)	-	-	X	-
Supplier resistance (supplier size, knowledge, resources)	xxx	x	xxx	xx
Being a forerunner	x	-	-	-
Transparency	A	B	C	D
Distance (physical, institutional)	X	XX	X	X
Inadequate control mechanisms	-	X	-	-
Lack of power	-	X	-	-
Lack of visibility	-	XX	XX	-
Supplier resistance and ignorance (supplier size, knowledge)	xxxxx	x	xxxxx	xx
Supplier technical capabilities	-	-	-	-
Supply chain complexity		XX	XX	X
Weak relationships	-	-	-	-
Being a forerunner	x	-	-	-
Due Diligence	A	B	C	D
Complex downstream products	-	-	-	-
Gaps in regulation	X	-	X	-
Lack of power	-	-	-	-
Market structure	-	-	-	-
Resources and costs	X	X	X	-
Supplier resistance	X	-	X	X
Supply chain complexity	-	X	-	-
Content of the regulation	-	-	-	XX
Type of sustainability	-	-	-	X
Internal and overlapping	A	B	C	D
Focal company's resources	X	X	X	-
Internal processes and awareness	-	-	X	XX

The most coded themes under all three categories were related to supplier resistance. Physical or institutional distance was a challenge for all the interviewed companies both regarding transparency and MT-SSCM. Company B's answers distributed most widely among the themes. Some themes weren't reflected in the answers, and some appeared in multiple times.

The updated framework is built on top of the existing one. The theoretical findings that were not found from the empirical results are overlined and new themes are marked in bold. The overlapping of the areas illustrates the interconnectedness of the themes, which will be explained further in the next section. Furthermore, the discussion will cover the reasoning for the selected themes in the refined framework.

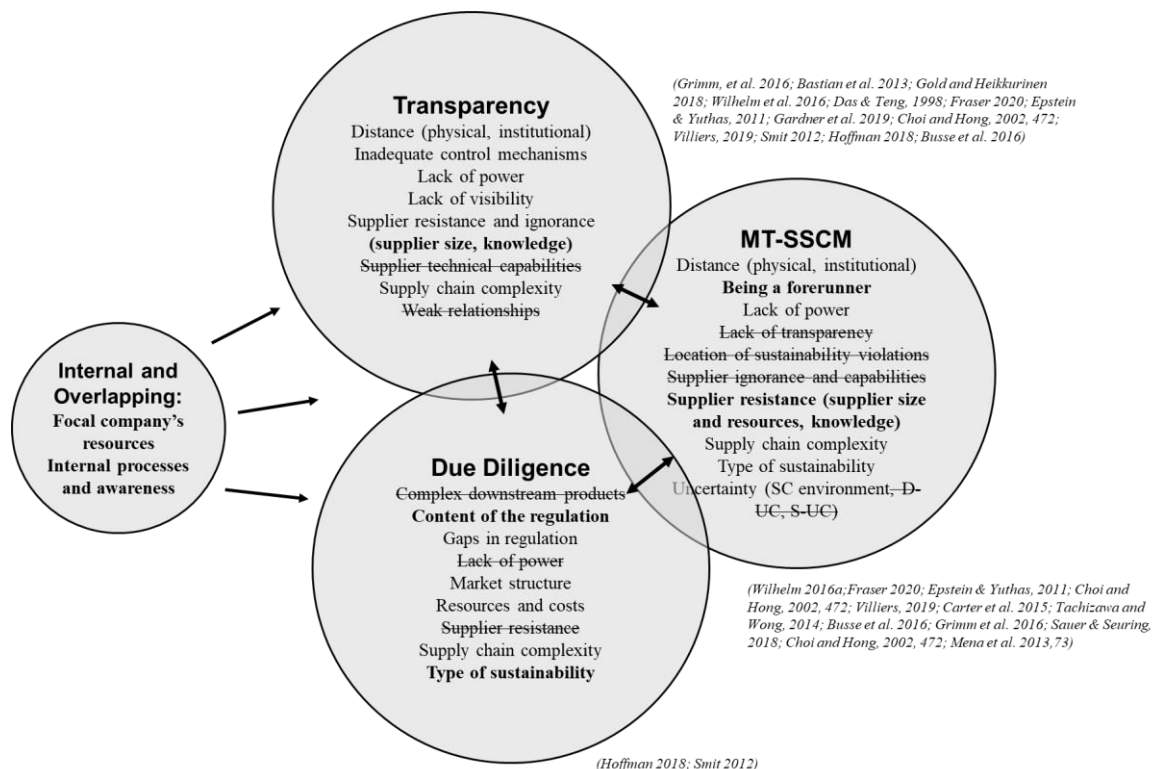


Figure 7 Challenges in collecting sustainability information in multi-tier supply chains (updated framework)

The challenges in collecting sustainability information are presented under the respective literature area. Several themes appear under multiple topic areas, either because of the overlapping literature, or concluding from the researcher's interpretation of a theme belonging under more than one topic area. However, to avoid confusion and to highlight under which topic was a theme originally in, the theme was left under their original topic

area and the interconnectedness is illustrated through overlapping of the figures and can further be seen from the distribution of answers in Table 6. New themes like focal company's resources and internal alignment that emerged from the empirical research, form their own bubble which affects all areas of challenges. Figure 7 above will be elaborated in the next sections as the research questions will be answered.

8.1.1 RQ1: What are the challenges in collecting sustainability information in MT-SC's?

The empirical findings indicate that lack of resources for supply chain sustainability management brings challenges to the interviewed companies. This is a new finding from the empirical study. Lack of resources was related to lacking certain type of sustainability specialist, usage the gathered information, chasing suppliers for answers and having auditing capabilities.

Regardless of the operating industry, all interviewees saw supplier resistance as a challenge in collecting sustainability information. This finding is in line with previous transparency literature as Smit et al. (2021), Hoffman et al. (2018) and Gold and Heikkurinen (2018) have recognized suppliers' resistance towards disclosing information a challenge.

According to the results, supplier resistance is a result of many things, lack of knowledge, lack of resources, and can be seen as unwillingness to sign contracts and reassuring things before audits. Supplier size was also a highlighted topic and raising challenges as smaller suppliers had less understanding for sustainability requirements, didn't have the technical capabilities in the office side or the resources to spend time in filling questionnaires or facilitating an audit. On the other hand, large companies were reluctant to disclose information as they had a large customer base asking the same questions repeatedly. MT-SSCM discusses the topic of collecting sustainability information to be able to manage suppliers, hence according to the empirical findings, supplier resistance overlaps all three fields of literature. MT-SSCM literature had not identified supplier resistance as a challenge before.

Both Companies D and A saw that institutional distance brings difficulties to collecting sustainability information in different ways. For company A, institutional distance meant language issues and handling suppliers that are in difficult markets. As Wilhelm (2016a,

209) stated, in business areas where sourcing activities situated emerging countries, with a higher institutional distance, the focal firms focused more on these suppliers and placed more effort on sustainability management. Company A stated that they place more efforts to difficult markets. Cultural distance is recognized in the literature as a something that can seriously hamper transparency (Gold & Heikkurinen, 2018).

On the contrary, for Company D, the effect of institutional distance was reverse from the traditional. The supplier resistance challenges occurred in similar types of cultures, rather than in different kind of cultures located far away. Sauer and Seuring (2018) talk about the uncertainty arising from pressures from the supply chain and the sub-supplier's own environment, affecting the need and the ability to manage supplier. In the interviewee's case we are talking about a similar SC environment between the focal company and a direct supplier, so the results conflict with the literature. However, the interviewed companies also had cases, where the need to manage suppliers was important because of a different kind of environment. Therefore, we can conclude that resistance can also be seen in similar SC environments.

Supplier resistance directly affected the use of resources as companies had to chase the suppliers for answers or develop other methods of information gathering, for example because of the lack of publicly disclosed information. Lack of company resources emerges in lack of sustainability specialists, laborious work of mapping the supply chains and in collecting and managing information effectively. One of the interviewed companies didn't collect specific information as they didn't have capabilities using the information. Company resources directly affect the transparency of the supply chain.

Supply chain complexity is connected with the challenges regarding institutional distance and company resources. Supply chain complexity can be divided into horizontal complexity, meaning the number of suppliers in each tier, and vertical complexity, meaning the number of tiers in the supply chain (Choi & Hong 2002, 472). All companies highlighted the large number of suppliers that they have. From their answers it can be interpreted that this might cause challenges for them. For instance, Company A stated that if supplier numbers grow, the rising amount of information to be collected and managed will bring difficulties to them. This is in line with theoretical findings as complexity makes collecting and sharing information more difficult and weakens

governance. (Epstein & Yuthas, 2011; Villiers 2019). However, company resources as a challenge in collecting information per se is a new finding.

Supply chain complexity was additionally related to lack of power against upstream suppliers, as there were many small suppliers in the beginning of the supply chain and the firm felt like they couldn't possibly control them (Company B). This corresponds to MT-SSCM challenge found from the literature, e.g., when the power of the focal firm diminishes because of the further distance to supplier physically and institutionally (Carter et al. 2015; Tachizawa & Wong, 2014; Busse et al. 2016) and distance bringing difficulties to sub-supplier management (Wilhelm 2016a, 2017). However, transparency literature talks about lack of power as lacking power against first-tier suppliers (Grimm. 2016, 1980), which was not the case with any interviewed suppliers. Though, the same kind of lack of power described by transparency literature, has been noted as a challenge of inadequate control mechanisms, e.g., difficulties in managing second-and third-tier suppliers (Wilhelm et al. 2016a).

The lack of visibility to the events in the supply chain and the decision to focus on key suppliers indicated that it is challenging to try to know them all thoroughly. Not having statistics about sub-supplier quantity (Company C) and finding it impossible to know what is happening in the supply chain (Company B) can be interpreted as the company having no visibility to their second tier nor the supply chain. These findings are similar to what has been found from the literature. (e.g., Epstein & Yuthas 2011; Bastian et al. 2013; Wilhelm et al. 2016a). Furthermore, lack of transparency is also a challenge for successful MT-SSCM which is fundamentally based on transparency (Bastian et al. 2013).

Company A and B, operating in renewable energy and food industry, had different raw materials that they wanted to focus more on and that bring them challenges regarding sustainability violations. This result indicates that the type of raw material can bring challenges as it requires more efforts from the focal company. Some countries were also perceived more difficult than others, therefore requiring more attention, this is in line with Gold and Heikkurinen's (2018) finding that geographical and cultural distance is a challenge in achieving transparency.

The challenges were not always external. The interviewees had internal challenges of coordination and integration of sustainability practices in procurement. One of the

interviewees said the internal control of the procurement process was something to be developed and another that it is a challenge to create awareness of sustainability in procurement organisation. Previously Hofmann et al. (2018) internal management's support, power and trust are all enablers of implementing SCDD, hence collecting sustainability information.

To conclude, challenges of collecting sustainability information are closely linked with each other. The findings and their relation to each other are illustrated in the Figure 8 below.

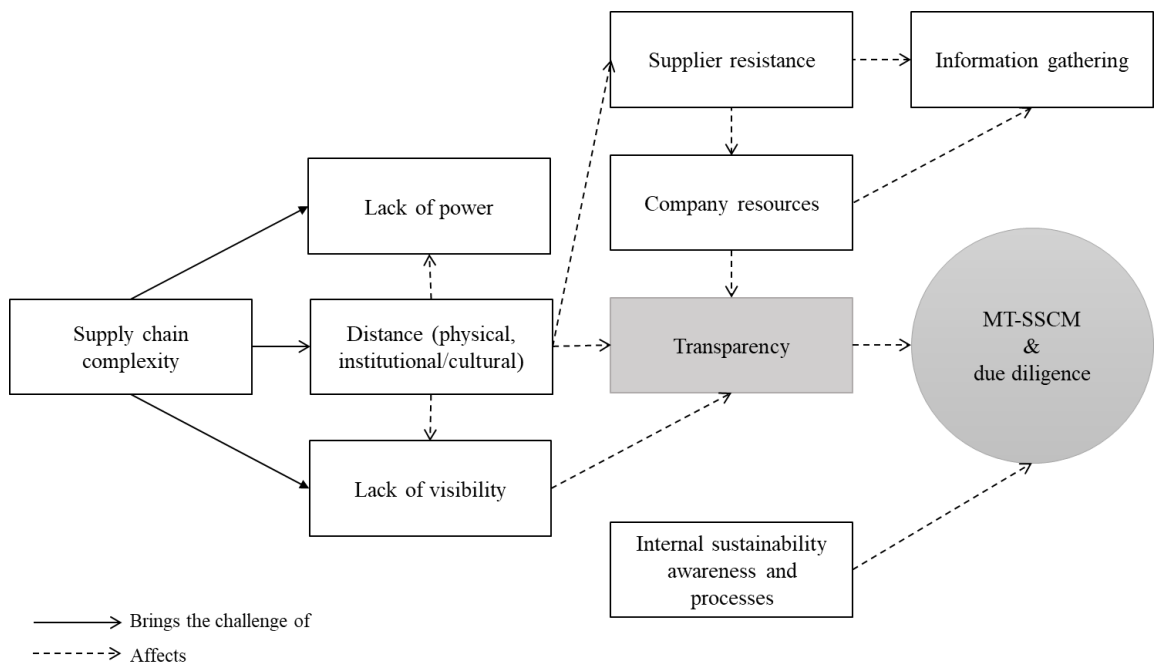


Figure 8 Relations between the most important found challenges

Supply chain complexity brings the challenge of lack of power, distance and lack of visibility. When there are many actors in the supply chain and those are spread around the globe, firms face the challenge of decreased visibility upstream, diminishing power and challenges from cultural and physical distance.

According to the findings, distance affects supplier resistance and transparency. Lack of visibility also severely hampers transparency (Wilhelm et al. 2016a). Supplier resistance makes information gathering more difficult and these two factors require more resources from the company, which again leads to challenges in achieving transparency. The company's internal alignment is affects successful MT-SSCM and DD in general as without internal alignment, these are challenging to conduct.

8.1.2 RQ2 Would the EU CSDD bring any additional challenges?

The companies (B, C, D) that had a poorer visibility to their upstream supply chain clearly saw more challenges in answering the EU CSDD regulation requirements. Company D perceived the company being responsible of their sub-suppliers actions as huge responsibility stemming from the regulation. They also pointed out the two-way reporting responsibility to downstream as they had customers covered by the directive as well. This challenge is recognized as a new challenge, focusing directly on the content of the directive.

Company B saw controlling the upstream suppliers practically impossible, mainly because of the distance to suppliers and their extensive number. This is in line with the findings from the literature as Hoffman (2018) states that high distance to suppliers can leave the focal company incapable of enforcing compliance practices.

Company C thought the sustainability management of the second tier will be the key challenge emerging from the regulation. This challenge is not recognized in the due diligence literature but is in MT-SSCM and transparency. From the interview it can be interpreted as this company had no visibility to their sub-suppliers, excluding a few special cases where the sustainability of sub-supplier was ensured, they would experience challenges related to supply chain complexity, lack of power and resources and costs as mapping the supply chains is usually the first step in SCDD (Smit et al. 2021). Extra work is regarded from this company to comply with regulation, which Smit et al (2021) has concluded as a challenge regarding conducting due diligence.

As stated before, the challenges are not always external. The above-mentioned difficulties regarding internal alignment and coordination can also be considered as a challenges firms face in complying with the EU CSDD as according to Smit et al. (2021) (human rights) due diligence must be integrated into relevant processes like the procurement process.

The above-mentioned challenges emerging from the EU CSDD specifically are closely interlinked with the previously found challenges considering supply chain sustainability information collection in general. However, some new findings emerged. These findings are represented in the Figure 9 below.

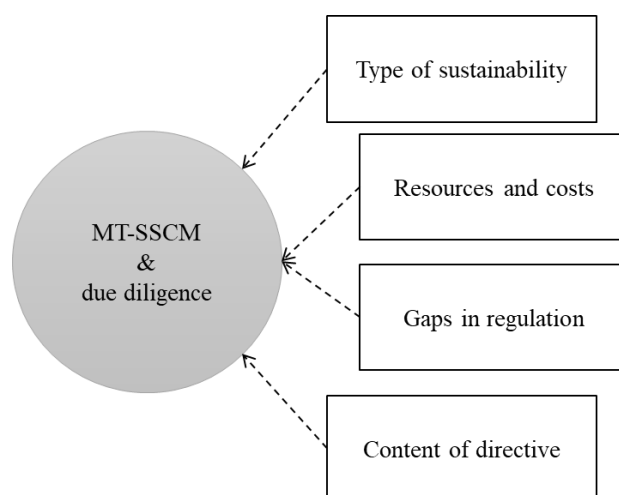


Figure 9 Challenges emerging especially from EU CSDD

The type of sustainability has been recognized as challenge in MT-SSCM literature. Wilhelm et al. (2016a, 209) state that a difficultly traceable type of sustainability like social sustainability would make managing sustainability more difficult. But on the contrary, Company D saw environmental requirements as the biggest challenges in complying with the regulation, as some operations in their supply chain locations are highly polluting. Issues arise if they should manage their supply chain emissions and waste management. Even though location of the sustainability violation was pondered in the interviewee's answer as well as other answers, they were not referring to raw material stage as referred in the literature by Mena et al. (2013, 73).

In addition, The EU CSDD requires companies to commit to the Paris Agreement of limiting global warming to 1.5 degrees (European Commission, 60). Hoffman (2016) has found that unclear guidance of regulation can bring difficulties to companies. Unclear guidance was also visible in the empirical findings as it was unclear to the companies how they should interpret the Paris Agreement -requirement and if they should influence their network regarding this goal. If yes, it would bring cause more extra work for companies. This finding is also reflected in previous literature of due diligence (Smit, 2021).

Extra work will also result from the required grievance process, which worried one of interviewed the companies. They experienced the possible rising number of (EU CSDD) complaints and separating these complaints from other complaints to bring challenges to information management. This finding can be interpreted as a challenge considering

resources and costs as it requires resources for the company to comply with regulation, like Smit (2021) has stated in the literature before.

The updated figure illustrating the challenges in collecting sustainability information gathering in MT-SC's and the challenges emerging from EU CSDD is presented in Figure 10.

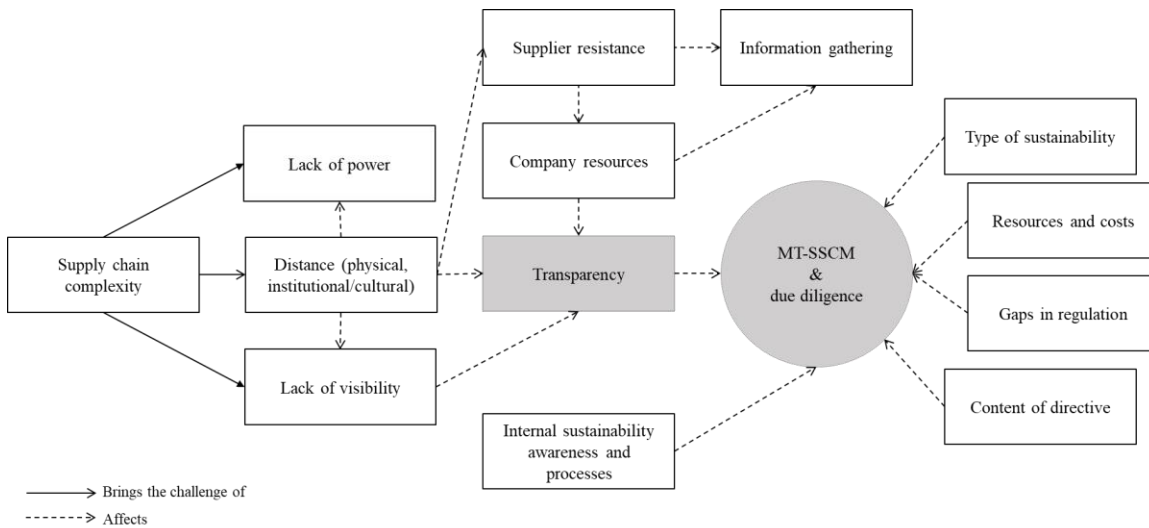


Figure 10 Challenges in collecting sustainability information in MT-SC's and additional challenges emerging from EU CSDD

In conclusion, additional challenges firms see emerging from the EU CSDD are related to the extra resources needed and extra costs, the final content of the directive, possible gaps in the directive and the type of sustainability that the directive obligates the companies to manage. According to the findings the challenges related to transparency similarly affect MT-SSCM and conducting due diligence, hence the themes are firmly connected.

8.1.3 The effect of industry, regulation and sustainability management maturity

In addition to the research questions the goal of this study was to find out if the industry, regulation aimed towards sourcing activities, or the company's perceived supply chain sustainability management maturity would affect what kind of challenges the companies see. In this research sustainability management maturity is considered as the subjective view of the interviewed company, hence explains how advanced they think their sustainability management is. The interpretations answering to these topics will be presented in this section.

All companies operate in different industries. The influence of the industry was clearly visible in Company A, Company B and Company D. Company A was mainly affected because of the regulation related to the industry. Because of the regulation they saw less challenges in complying with the regulation, nor did they see any challenges regarding supply chain visibility, because the already traced supply chains. Company B saw specific raw materials used in the industry challenging for them. And lastly, Company D had highly polluting operations in their supply chain and found it difficult to manage those if the directive so requires.

From the findings it can be concluded that regulation requiring companies to trace their supply chains and collect sustainability information affects if the company sees challenges in answering to the regulation. Company A, which was affected by regulation did not see difficulties in answering to the regulation, other than if information management causes issues if the number of complaints rises and was worried about the practicalities.

Company A was the only one having more than occasional visibility beyond the first tier. Hence, didn't see visibility further up the supply chain an issue. Company B, who only had traceability information for certain raw materials saw that having visibility to the supply chain was practically impossible due to the large number of players in the chain. Company D had decided to focus on key suppliers and company C was only building the traceability and saw knowing their sub-suppliers a challenge in answering to the EU CSDD. Therefore, we can conclude that regulation affects the sustainability requirements influences which challenges are seen.

Company A saw acting as a forerunner demanding because they face a lot of questioning and resistance from the supplier side. They would see it easier, if everyone was doing the same level of sustainability management regarding supply chains. Though, supplier resistance was a common challenge for all companies, regardless of their background.

In conclusion, the nature of the industry, as in nature of the raw materials and characteristics of the industry affected the challenges the companies see. Regulation forcing companies to trace their supply chains upstream has a positive effect on transparency, collection of sustainability information and answering to regulation requirements. Being a forerunner in sustainability can be challenging because of the

constant questioning from suppliers, but it also meant less challenges in answering to the possible directive.

8.2 Theoretical and managerial implications and implications for policy makers

The purpose of this chapter is to summarize the insights of this research project. These perceptions are based on the findings from the literature and the empirical research. The literature of MT-SSCM has concentrated to the different approaches or strategies to MT-SSCM. (See Mena et al. 2013, Tachizawa & Wong 2014, Sauer & Seuring 2018), but there is little information on how companies handle the processes within these approaches. In this research, the issue of collecting sustainable supply chain information was in focus, because it is a vital part of achieving transparency, hence excelling in chosen MT-SSCM approach.

In this research, challenges of collecting sustainability information were collected from MT-SSCM, transparency and due diligence literature. The results of the study reaffirm the previous literature on the fact that these fields of literature are closely interconnected and for example that transparency is a prerequisite for MT-SSCM (Bastian et al. 2013). Several themes overlapped with different fields of literature hence, they couldn't be separated entirely.

According to the research, supply chain complexity brings the challenge of lack of power, distance and lack of visibility. When the supply chain actors are spread around the globe, firms face the challenge of decreased upstream visibility, diminishing power and challenges from cultural and physical distance.

According to the findings, distance affects supplier resistance and transparency. Lack of visibility also severely hampers transparency (Wilhelm et al. 2016a). Supplier resistance makes information gathering more difficult and these two factors require more resources from the company, which again leads to challenges in achieving transparency. The company's internal sustainability awareness and processes affects MT-SSCM and DD in general, as without these two, conducting due diligence and therefore MT-SSCM can be demanding (Smit et al. 2021, Hoffman 2018).

The challenges firms see emerging from the EU CSDD specifically, are related to the extra resources needed and extra costs, the final content of the directive, possible gaps in

the directive and the type of sustainability that the directive obligates the companies to manage.

The nature of the industry, as in nature of the raw materials and sustainability effects of the industry affect the challenges the companies see. Regulation forcing companies to trace their supply chains upstream has a positive effect on transparency, collection of sustainability information and answering to regulation requirements. Being a forerunner in sustainability can be challenging because of the constant questioning from suppliers, but it also meant less challenges in answering to the possible directive.

To be able to tackle these challenges, companies should pay attention to the root cause of the challenges, supply chain complexity. In today's global world, complexity's influence can mainly be tackled by bringing production closer to own operations. But acknowledging the challenge is part of the solution, as we can see from the results, a company with highly complex supply chains thinks they are quite advanced in MT-SSCM and don't find it challenging to comply with the EU CSDD.

In addition, according to the findings of this research, policy makers should pay close attention to the content of the possible directive in question and other regulation. The content of the regulation should be understandable, stating the responsibilities of the companies clearly. It should also be made sure, that there are no gaps in regulation which could create inequality between the affected companies. Integrated systems for information gathering across value chains would also be essential to avoid double work from the actors in the chain.

8.3 Limitations and further recommendations

The limitations of this research regarding the research methods have been analyzed in the methods chapter as well as the ways to mitigate those limitations. Other limitations of the research are related to the researcher's resources, which resulted to a low number of interviewed companies. To form a more holistic view of the challenges companies have regarding collecting sustainability information, it is suggested that a wider study is conducted around the topic.

In addition, not all the interviewees operated in the main business of the company and some of them were part of indirect procurement. Even though MT-SSCM was also conducted in their organizations, to be more precise, further research of the topic should

clearly focus on either main business-related supply chains or procurement. However, as the EU CSDD reaches all operations of the company, the information gained from this research is also valuable in general.

This study also touched upon the differences how regulated and unregulated businesses saw the challenges in sustainability information gathering. However, only one of the companies was considered to operate in a highly regulated field. To have reliable information about the different views, more regulated firms, from different fields of business should be contacted.

Furthermore, more profound research examining more in detail the companies' chosen MT-SSCM practices and their relation to sustainability information gathering challenges would be valuable. An interesting finding from the research was the fact that challenges in supplier sustainability management can also occur in similar types of cultures. This relationship would be an interesting topic to examine.

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Appendices

Appendix 1 Interview frame

Pro gradu/Saara Naukkarinen

Interview questions

Challenges in collecting sustainability information in multi-tier supply chains –
Impact of EU Directive on Corporate Sustainability Due Diligence

Interview frame

1. Company name, interviewee background
 - a. Name of the company:
 - b. Name and title of interviewee:
 - c. Can the title of the interviewee be used in the thesis:
 - d. Can the interview be recorded:
 - e. Does the interviewee want to read the interview text:
 - f. Can quotes be used:
2. What is your responsibility area in the company?
3. What is your first-tier supplier and sub-supplier base like?
 - a. How would you describe the visibility to your sub-suppliers and further, raw materials?
4. How regulated is the business area that you're operating in? Is there a lot of regulation affecting sourcing?
5. How is sustainability taken into account in company operations?
 - a. How mature would you say that the company's supply chain sustainability management is?
6. How is sustainability of your 1-tier suppliers and sub-suppliers managed in the company?
 - a. What kind of sustainability information do you gather and how? (*Social and ecological impact information, and sustainability activity information, related to e.g. human rights, health and safety, environmental management*).
 - i. What kind of tools, processes, or management approaches do have to help in gathering those?

- ii. Is providing information mandatory for both 1-tier suppliers and sub-suppliers? Could you elaborate your approach.
 - b. How would you describe the 1-tier and sub-supplier willingness to answer to sustainability requirements?
 - c. How do you verify sustainability compliance currently? (Audits, surveys, interviews, certificates etc.)
 - d. What kind of grievance processes in place in case of supplier sustainability deviations?
7. Have you identified any actual or potential adverse impacts in your supply chains? (*An adverse impact can be related to biodiversity loss, ecosystem degradation, pollution, use of chemicals, waste management. Likewise, adverse human rights impacts are violations of rights and prohibitions included in international human rights agreements.*) What kind?
- a. How have you monitored your suppliers or co-operated with your them to bring adverse impacts to an end?
8. What do you think affects the effectiveness of managing supply chain sustainability and specifically collecting sustainability information in your company?
9. What are the key challenges related to complying with EU Corporate Sustainability Due Diligence directive?

Appendix 2 Codebook

Code	Description/Challenge
MT-SSCM	
- Distance (physical, institutional)	E.g. decoupling of supplier, difficulties to sub-supplier management (Sauer & Seuring, 2018; (Wilhelm 2016a,207), decreasing power of focal firm due to higher distance (Carter et al. 2015; Tachizawa and Wong, 2014; Busse et al. 2016).
- Lack of power	E.g., diminishing power of the focal firm because of the further distance to supplier physically and institutionally (Carter et al. 2015; Tachizawa and Wong, 2014; Busse et al. 2016)
- Lack of transparency	Transparency is a precondition for MT-SSCM (Bastian et al. 2013) 'Transparency is the perceived quality of intentionally shared information from a sender. (Schnackenberg and Tomlison (2016, 1788)
- Location of sustainability violations	Majority of sustainability violations happen at the raw materials stage of the supply chain (Mena et al. 2013,73)
- Supplier ignorance and capabilities	E.g., First-tier suppliers might not be up to date or can even be unmindful of their own upstream supply chain (Fraser, 2020), weak supplier management capabilities of first-tier supplier (Wilhelm et al. 2016a)
- Supply chain complexity	E.g., challenge of mapping the supply chains (Bastian et al. 2013), decreasing power because of decreasing visibility decreases and distance (both physical and institutional) to parties increases due to complexity. (Carter et al. 2015; Tachizawa and Wong, 2014; Busse et al. 2016; Grimm et al. 2016, 1980). Complexity can be divided in two types: horizontal complexity is "the number of suppliers in each tier" while vertical

	complexity means the number of tiers in the supply chain. (Choi and Hong, 2002, 472).
- Type of sustainability	E.g., Difficultly traceable type of sustainability (e.g. social sustainability) makes management more difficult. (Wilhelm et al, 2016a. 209).
- Uncertainty (SC environment, D-UC, S-UC)	E.g., Uncertainty stemming from differences of SC environment, the ability to manage supplier and the need to manage suppliers (Sauer & Seuring 2018)
- Supplier resistance (supplier size, knowledge)	Supplier resistance caused e.g., by the size of the supplier or their lack of knowledge for sustainability governance.
- Being a forerunner	Being the only one in the market with certain type of sustainability requirements.
Transparency	
- Distance (physical, institutional)	E.g., cultural distance and geographical distance (Gold & Heikkurinen, 2018)
- Inadequate control mechanisms	E.g. the difficulties in managing second- and third-tier suppliers (Wilhelm et al. 2016) Some authors state, that it is impossible for firms to develop good enough control mechanisms (Das and Teng, 1998, see Gold & Heikkurinen 2018).
- Lack of power	Lacking power towards parties disclosing information about sub-supplier. (Grimm et al. 2016, 1980)
- Lack of visibility	E.g., Lack of knowledge about origin of raw materials and state of sustainability in supply chains (Epstein & Yuthas 2011, Bastian et al. 2013), no visibility to second or third-tier suppliers (Wilhelm et al. 2016)
- Supplier resistance and ignorance (supplier size and resources, knowledge)	E.g. first-tier suppliers might not be up to date or can be unmindful of their own upstream supply chain or can resist disclosing information (Fraser, 2020; Smit 2012; Hoffman 2018; Gold & Heikkurinen, 2018), supplier size and resources

	affecting their willingness to answer or lack of knowledge of sustainability governance.
- Supplier technical capabilities	E.g., supplier might lack the methods and data sources to create indicators for sustainability (Gardner et al. 2019).
- Supply chain complexity	E.g., difficulties in mapping the complex supply chains (Bastian 2013), collecting and sharing relevant information becomes more difficult and governance weakens. (Epstein & Yuthas, 2011; Villiers), arbitrage situation regarding regulation, meaning governance is weak and has gaps. Weak governance then leads to sustainability violations and corruption. (Villiers, 2019). Complexity can be divided in two types: horizontal complexity is “the number of suppliers in each tier” while vertical complexity means the number of tiers in the supply chain. (Choi and Hong, 2002, 472).
- Weak relationships	E.g., the impossible task for focal companies to build strong enough relationships (Das and Teng, 1998, see Gold & Heikkurinen 2018).
- Being a forerunner	Being one of the few in the market with certain type of sustainability requirements.
Due Diligence	
- Complex downstream products	Complex downstream products result to a complex “comprehensive analytical fingerprint” (Hoffman, 2018).
- Gaps in regulation	E.g. unclear guidance, regulatory framework only focusing on selected market area, firms included in the scope (Hoffman, 2016)
- Lack of power	E.g., high distance to suppliers, leaving the focal firm incapable of enforcing compliance practices. (Hoffman, 2018)
- Market structure	E.g. Firms having to stick with problematic suppliers because of the market structure (Smit 2012).

- Resources and costs	E.g., Extra work in both for focal firm and upstream required to comply regulation (Smit, 2012).
- Supplier resistance	E.g., Supplier resistance towards disclosing information (Smit, 2012)
- Supply chain complexity	E.g., High distance to suppliers, leaving the focal firm incapable of enforcing compliance practices. (Hoffman, 2018).
- Content of the regulation	Challenges arising from the content of the regulation e.g., scope of responsibilities for supply chain sustainability.
- Type of sustainability	E.g., the type of sustainability information that should be gathered and monitored.
Internal and overlapping	
- Focal company's resources	E.g., lack of sustainability specialists, laborious work of mapping the supply chains and in collecting and managing information effectively.
- Internal alignment	E.g., challenge of creating internal alignment towards sustainability practices.