Stakeholder management in sustainable supply chains

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Twenty years ago, I got the recommendation to visit the Hauptschule (lower secondary school in Germany). Since my parents and I considered a teacher's educational judgment as valid, I followed this recommendation. But I made my way through the educational system until finishing my Ph.D. time, and I am more than happy for my family's support. Although the last several years have been a wonderful time of my life, this dissertation would not have been possible without the support of a range of people for which I am very grateful.

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List of abbreviations

CEO	Chief executive officer
CmiA	Cotton made in Africa
CR	Corporate responsibility
CSR	Corporate social responsibility
DC	Dynamic capability
DNA	Deoxyribonucleic acid
IT	Information technology
NGO	Non-governmental organization
MSI	Multi-stakeholder-initiatives
NRBV	Natural resource-based-view
l.	Line
OEM	Original equipment manufacturers
RBV	Resource-based view
R&D	Resource and Development
SC	Supply chain
SCM	Supply chain management
SDS	Supplier development for sustainability
SME	Small and medium-sized enterprises
SSC	Sustainable supply chain
SSCM	Sustainable supply chain management
TBL	Triple bottom line
WCED	World Commission on Environment and Development
WoS	Web of Science

Abstract

This dissertation examines stakeholder management in the context of sustainable supply chain management. Since ecological deterioration and social discrepancy keep increasing, sustainability is considered one of the most significant challenges in our current time. Due to the growing public awareness of the environmental and social sustainability issues, multiple stakeholders drive the need to implement sustainability into SCs and hold the focal firms responsible for the actions of the entire SC. Stakeholder management thus plays an essential role for focal companies in incorporating sustainability into SSCM. Because of the continuous change of stakeholder interests, companies need specific capabilities to realign their practices and the associated resource composition continuously. The interface between stakeholders and SSCM is relatively undifferentiated researched. This dissertation addresses this intersection by answering the following two overall-research questions:

1) How can SSCM practices be applied in a dynamic environment with changing stakeholders and sustainability issues?

2) How can stakeholders contribute to achieving a more sustainable SC, and how can they be integrated?

These two overarching research questions are answered in a combination of structured literature studies and empirical case studies. While the literature studies seek to synthesize and comprehensively analyze the current scientific discourse, the case studies allow an in-depth examination of phenomena in an empirical context, understand them, and draw appropriate conclusions.

For addressing the complexity of the phenomena of DCs in the SSCM context, this dissertation analyzes for the first time the evolution of DCs in the SSCM literature for two different industries from a temporally isolated perspective (see 1st research question). This new methodological approach of analyzing literature samples based on a temporal perspective represents a possible further development of the previously used structured literature analyses for the DCs field and the entire SSCM discourse.

Furthermore, the previous academic discourse treats stakeholder management as an undifferentiated and broad construct. This thesis elaborates and specifies this theoretical construct in more depth and proposes that corresponding practices exist at the internal and external levels of the company. These practices can be structured along two dimensions, "practices to address stakeholder requirements" and "practices in which stakeholders are integrated." For example, stakeholders can provide access to knowledge and other resources

to develop suppliers according to sustainability requirements. Thus, focal companies should not only build structures and develop necessary capabilities to communicate with stakeholders, but they should also proactively integrate them into business processes.

In addition, this thesis addresses stakeholders' roles to contribute to a more sustainable supply chain (see 2nd research question). This thesis suggests that stakeholders at both the internal and external corporate levels can actively participate in the sustainable transformation of SC. For example, stakeholders can help focal companies engage with suppliers out of their reach due to limited visible horizons along their SC.

Moreover, this paper shows that in the current SSCM discourse, stakeholders and their possible roles have been considered in a relatively undifferentiated way. Future research projects could address this. For instance, a more differentiated view would create a better understanding of how stakeholders can contribute to a more sustainable SC. Regarding this research gap, the thesis elaborates on possible stakeholder roles in the SSCM context and offers empirical insights into a possible realization of stakeholder integration.

This thesis contains limitations regarding the chosen methodology and the theoretical models. For example, the predominantly qualitative approach can be criticized for common limitations of validity, reliability, and generalizability, although measures have been taken to minimize these limitations. For example, each of the present studies is based on established theoretical constructs and thus follows a theoretically grounded research question. This theoretical grounding provides the opportunity to interpret and classify results accordingly.

As a further consideration regarding this thesis, a cross-case research design would be interesting, which could help clarify the theoretical implications of the view and examine the extent to which they are merely idiosyncratic to the initial case study. Ultimately, more research is needed to fill the identified research gaps in the SSCM discourse and thereby address current environmental and social sustainability problems.

Deutsche Zusammenfassung

Die vorliegende Dissertation untersucht Stakeholder Management im Kontext eines nachhaltigen Lieferkettenmanagements. Nachhaltigkeit wird als eine der größten aktuellen Herausforderungen angesehen, da die ökologische Krise und die soziale Diskrepanz kontinuierlich zunehmen. Aufgrund des wachsenden gesellschaftlichen Bewusstseins für die ökologischen und sozialen Nachhaltigkeitsprobleme drängen zahlreiche Interessengruppen (eng. Stakeholder) darauf, Lieferketten (eng. Supply Chain, SC) nachhaltiger zu gestalten. Gleichzeitig machen sie die fokalen Unternehmen für die Auswirkungen der gesamten SC verantwortlich. Das Management von Stakeholder-Interessen (eng. Stakeholder Management) nimmt somit für fokale Unternehmen eine wichtige Rolle in der Inkorporation von Nachhaltigkeit in das Lieferkettenmanagement (eng. Sustainable Supply Chain Management, SSCM) ein. Durch die kontinuierliche Veränderung der Stakeholder-Interessen bedarf es seitens der Unternehmen gewisser Fähigkeiten (eng. Dynamic Capability, DC), um ihre Praktiken und die damit verknüpfte Ressourcenkomposition fortwährend neu auszurichten. Diese Schnittstelle zwischen Stakeholdern und SSCM ist verhältnismäßig undifferenziert erforscht. Die vorliegende Dissertation setzt an dieser Schnittstelle an und beantwortet die folgenden zwei Forschungsfragen:

1) Wie können SSCM-Praktiken in einem dynamischen Umfeld mit wechselnden Stakeholdern und Nachhaltigkeitsaspekten verlässlich angewandt werden?
2) Wie können Stakeholder zu einer nachhaltigeren SC beitragen und wie können sie optimal integriert werden?

In einer Kombination aus strukturierten Literaturstudien und empirischen Fallbeispielen werden diese zwei übergeordneten Forschungsfragen beantwortet, um damit den bisherigen wissenschaftlichen Diskurs zu synthetisieren sowie umfassend zu analysieren. Ausgehend von den Ergebnissen der bisherigen Forschung bieten die untersuchten Fallbeispiele die Möglichkeit, Phänomene im empirischen Kontext tiefgehend zu betrachten, zu verstehen und entsprechende Konsequenzen daraus zu ziehen.

Um der Komplexität von dynamischen DCs-Phänomenen im SSCM Kontext gerecht zu werden, analysiert die Dissertation zum ersten Mal die Entwicklung von DCs in der SSCM-Literatur für zwei unterschiedliche Industrien aus einer zeitlich isolierten Perspektive heraus (siehe 1. Forschungsfrage). Dieses neue methodische Vorgehen, Literaturstichproben anhand einer zeitlichen Perspektive zu analysieren, stellt nicht nur für den DCs-Bereich eine mögliche

Weiterentwicklung der bisher genutzten strukturierten Literaturanalysen dar, sondern auch für den gesamten SSCM-Diskurs.

Weiterhin behandelt der bisherige wissenschaftliche Diskurs den Begriff „Stakeholder Management“ als undifferenziert und zu weit gefasst. Die vorliegende Thesis elaboriert und präzisiert dieses theoretische Konstrukt tiefgehender und schlägt vor, dass entsprechende Praktiken auf der unternehmensinternen und -externen Ebene existieren. Diese Praktiken können anhand der zwei Dimensionen „Praktiken, um Stakeholder-Anforderungen zu adressieren“ und „Praktiken, in denen Stakeholder integriert sind“ strukturiert werden. Beispielsweise können Stakeholder Zugang zu Wissen und weiteren Ressourcen bieten, um Zulieferer entsprechend den Nachhaltigkeitsanforderungen zu entwickeln. Somit sollten fokale Unternehmen nicht nur Strukturen aufbauen und notwendige Fähigkeiten entwickeln, um mit Stakeholdern zu kommunizieren, sondern diese sollten ebenso proaktiv in Unternehmensprozesse integriert werden.

Darüber hinaus thematisiert diese Dissertation, welche Rollen Stakeholder einnehmen können, um zu einer nachhaltigeren Lieferkette beizutragen (siehe 2. Forschungsfrage). Diese Arbeit legt nahe, dass Stakeholder auf der internen wie auch externen Unternehmensebene aktiv an der nachhaltigen Transformation der SC mitwirken können. Zum Beispiel können Stakeholder fokale Unternehmen dabei unterstützen, Lieferanten zu erreichen, die aufgrund des limitierten, sichtbaren Horizonts entlang ihrer SC, außerhalb deren „Reichweite“ liegen.

Weiterhin zeigt diese Ausarbeitung, dass im bisherigen SSCM-Diskurs Stakeholder und deren mögliche Rollen eher undifferenziert betrachtet wurden und dies in zukünftigen Forschungsarbeiten berücksichtigt werden sollte. Eine differenzierte Berücksichtigung würde ein besseres Verständnis schaffen, in welcher Form Stakeholder zu einer nachhaltigeren SC beitragen können. Hinsichtlich dieser Forschungslücke elaboriert die Thesis mögliche Stakeholder-Rollen im SSCM-Kontext und bietet empirische Einblicke in eine mögliche Realisierung einer Stakeholder-Integration.

Die vorliegende Arbeit beinhaltet sowohl Grenzen hinsichtlich der gewählten Methodik wie auch der theoretischen Modelle. So kann der überwiegend qualitative Ansatz hinsichtlich der gängigen Einschränkungen der Gültigkeit, Zuverlässigkeit und Generalisierbarkeit kritisiert werden, auch wenn Maßnahmen ergriffen wurden, um diese Limitierungen zu minimieren. Beispielsweise basiert jede der vorliegenden Studien auf etablierten theoretischen Konstrukten und folgt somit einer theoretisch begründeten Fragestellung. Dadurch ergibt sich die Möglichkeit, Ergebnisse entsprechend zu interpretieren und einzuordnen.

Als weiterführende Überlegung hinsichtlich dieser Arbeit wäre ein fallübergreifendes Forschungsdesign interessant, das dazu beitragen könnte, die theoretischen Implikationen der Dissertation zu klären und zu überprüfen, inwiefern sie nur idiosynkratisch für die erste Fallstudie sind. Letztlich bedarf es noch weiterer Forschungsvorhaben, um die aufgezeigten Forschungslücken im SSCM-Diskurs zu schließen und dadurch einen Beitrag zu der Bewältigung der aktuellen ökologischen und sozialen Nachhaltigkeitsprobleme zu leisten.

List of contributions included in the dissertation

Published peer-reviewed articles

Land A, Gruchmann T, Siems E, Beske-Janssen P (2022) Dynamic capabilities theory, In: W. L. Tate, L. M. Ellram, & L. Bals (Eds.), *Research handbooks in business and management series. Handbook of theories for purchasing, supply chain and management research*. Cheltenham, UK, North Hampton, MA, USA: Edward Elgar Publishing, https://doi.org/10.4337/978-1-83910-450-3.

Siems E, Seuring S, Schilling L (2022) Stakeholder roles in sustainable supply chain management: A literature review. *Journal of Business Economics.* https://doi.org/10.1007/s11573-022-01117-5.

Siems E, Land A, Seuring S (2021) Dynamic capabilities in sustainable supply chain management: An inter-temporal comparison of the food and automotive industries. *International Journal of Production Economics* 236:108128. https://doi.org/10.1016/j.ijpe.2021.108128.

Siems E, Seuring S (2021) Stakeholder management in sustainable supply chains: A case study of the bioenergy industry. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.2792.

Menke C, Hüsemann M, Siems E (2021) Stakeholder Influence on Sustainable Supply Chain Management: A Case Study of a German Apparel Frontrunner. *Frontiers in Sustainability* 2. https://doi.org/10.3389/frsus.2021.735123.

Relevant conference presentations

Siems, E. (2021), "Stakeholder Roles in Sustainable Supply Chains: A Literature Review", Herbsttagung der wissenschaftlichen Kommission Nachhaltigkeitsmanagement des Verbands der Hochschullehrer für Betriebswirtschaft e.V., October 30-November 01, Lüneburg, Germany

Siems, E. (2021), "Stakeholder Roles in Sustainable Supply Chains: A Literature Review ", 28th EurOMA Conference 2021, July 05-07, Berlin, Germany.

Siems, E. (2021): Stakeholder Roles in Sustainable Supply Chains: A Literature Review, 8th International EurOMA Sustainable Operations and Supply Chain Forum 2021, March 22-23, La Rochelle, France.

Siems, E., Seuring, S. (2019), "Stakeholder management in sustainable supply chains: The case of Chile", 26th EurOMA Conference 2019, June 17-19, Helsinki, Finland.

Siems, E., Seuring, S. (2018), "Stakeholder management in Chilean biomass supply chains", 25th EurOMA Conference 2018, June 24-26, Budapest, Hungary.

1 Introduction

In a world where ecological deterioration and social discrepancy keep increasing, sustainability is identified as one of the biggest challenges (Jakhar et al. 2020). Because of raising society's awareness for these sustainability issues, multiple stakeholders drive the need to implement sustainability into supply chains (SCs) and hold the focal firms responsible for the actions of the entire SC (Maas et al. 2018; Hartmann und Moeller 2014). Companies' consideration of SC can be seen as a progression towards a more comprehensive sustainability adaption since SCs encompass the product from the initial raw material exploration down to the end customer (Ansari und Kant 2017a; Hofmann et al. 2014). Due to globalization, these different SC stages can be spread over different countries across the world.

However, a comprehensive sustainability integration "that meets the needs of the present without compromising the ability of future generations to meet their own needs" (The United Nations World Commission on Economic Development (WCED) 1987, S. 16) is a challenging task, as it requires the acknowledgment and integration of different stakeholders and their demands at the economic, environmental and social dimension. This requirement leads to a complex and multifaceted stakeholder and business environment for globalized SCs (Rebs et al. 2017; Fritz et al. 2018; Pagell und Wu 2009). Furthermore, continuously changing stakeholder sustainability expectations accelerate the environmental dynamic and therefore shape the companies' SC sustainability alignment. Since companies worldwide compete in a complex and dynamic environment, they are continually requested to adapt to changing parameters (Beske et al. 2014; Hong et al. 2018). Thus, companies require capabilities and practices twofold. First, they need to manage these stakeholders' sustainability expectations (i.e., stakeholder management) to maintain legitimacy to do business (Hofmann et al. 2014; Jakhar et al. 2020). Second, companies need to implement appropriate sustainability practices and particular capabilities – also known as dynamic capabilities (DCs) – to continuously align these practices with the changing stakeholder expectations (Chowdhury et al. 2019; Beske et al. 2014). According to Singh et al. (2021), integrating stakeholders' capabilities can be considered as pivotal for this alignment.

Thus, this dissertation seeks to contribute to the sustainable supply chain management (SSCM) debate and, particularly, to the management of stakeholders and their roles when aiming for a more sustainable SC. Several researchers proposed to conduct more research on the debate around stakeholders and DCs in SSCM (e.g., Busse et al. 2017; Silva und Schaltegger 2019; Chowdhury et al. 2019). Above all, theorizing in (S)SCM has received considerable

critical attention and, therefore, underlines the value of the present dissertation's contribution, which will be elaborated in more detail in Section 1.3 and Section 1.4. By starting from the research motivation, the introduction is divided into four further parts. While the first section elaborates the theoretical background, the basic terminology, and derives research gaps, the second section presents the overall research questions treated in this dissertation. The third section outlines the research strategy, followed by the research design and scope in the fourth section. This chapter is complemented by a description of the structure of the entire thesis

1.1 Theoretical background and research motivation

1.1.1 Sustainable supply chain management

The United Nations World Commission on Environment and Development (WCED) published their report "Our Common Future" in 1987; since then, the worldwide discussion has shifted towards the issue of sustainable development with an intra- and intergenerational justice (The United Nations World Commission on Economic Development (WCED) 1987). Consequently, there has been an increasing agreement in society that organizations should tackle sustainability issues in their business operations (Sharma und Henriques 2005; Wolf 2011). The triple bottom line (TBL) approach merged these issues by focusing not only on economic performance but also on environmental and social performance (Elkington 1997). These sustainability discussions are also connected to shaping the field of supply chain management (SCM).

According to Mentzer et al. (2001, S. 18), SCM is "[…] the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole." Instead of focusing on a single company, SCM deals with the entire SC, its customers, and suppliers together with up-and downstream material, information, and financial flows (Handfield und Nichols 2002; Mentzer et al. 2001). Due to required raw material exploitation, SCM impacts the environmental dimension (Wolf 2011). Additionally, Siegel (2009) claimed that companies should not act sustainably just for "moral" reasons or as a response to external pressure, but rather for reacting to the legitimate demands of stakeholders. Therefore, the performance of the SCs is evaluated by economic criteria and their social and ecological impact (Pagell und Wu 2009; Seuring und Müller 2008). A sustainable SC is then one that performs well on all three perspectives: the traditional economic, the social, and the natural perspectives

(Pagell und Wu 2009). Hence, SSCM augments traditional SCM by considering sustainability dimensions, as proposed in the TBL approach (Beske und Seuring 2014; Seuring und Müller 2008). Even though several definitions have been provided for SSCM, most of them contain similarities (Ahi und Searcy 2013). For example, Seuring und Müller (2008, S. 1700) proposed that SSCM is "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements." This definition emphasizes that stakeholders play a crucial role when seeking a more sustainable SC.

SSCM provides several fruitful approaches to deal with challenges from the social, environmental, and economic dimensions communicated by stakeholders (Ahi und Searcy 2013). The current research rather examines how sustainability practices can address different stakeholder claims and how those strategies might impact an organization's TBL performance (e.g., Busse et al. 2017; Maas et al. 2018). Yet, the intersection between stakeholders and the SC itself and how stakeholders may contribute to a more sustainable SC are rarely analyzed or defined. For example, scholars have quite recently identified the link between stakeholders and sustainable risk management in SCs as a major research opportunity for the future (Reefke und Sundaram 2017). Furthermore, Silva und Schaltegger (2019) and Rebs et al. (2019) suggested conducting more research on using stakeholder theory in the context of SSCM. Thus, applying a stakeholder approach in SSCM is in a comparatively early research stage (Ehrgott et al. 2011; Silvestre 2015).

1.1.2 Stakeholder theory in sustainable supply chain management

In general, stakeholder theory describes how companies deal and interact with their stakeholder groups (Freeman 2010). The core idea is that business operations are only successful when having legitimacy, which "is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman 1995, S. 574). Freeman (1984, S. 25) defined stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives." However, multiple definitions exist to identify stakeholders. These are either broad and inclusive or narrow and pragmatic (Donaldson und Preston 1995; Freeman et al. 2013). Donaldson und Preston (1995, S. 85) define stakeholder(s) as "[…] person or groups with legitimate interests in procedural and/or substantive aspects of corporate activity." In other words, an actor needs a legitimate claim or stake in the organization to be considered as a stakeholder (Ruf et al. 2001). Governmental bodies, non-governmental

organizations (NGOs), associations, residents, consumers, or citizens are a few examples of possible stakeholders for sustainable SCs (Meixell und Luoma 2015). Yet, multiple authors have assigned a substantial role to stakeholders and the management of their issues in SSCM (Meixell und Luoma 2015; Wolf 2011). Therefore, stakeholder management is highly relevant in sustainability management (Hörisch et al. 2014). This also holds for the successful implementation of SSCM (e.g., Meixell und Luoma 2015). Although Hofmann et al. (2014) or Ahl et al. (2018) mentioned that stakeholder (issue) management as a SCM function might embrace communication and knowledge exchange practices, the authors present no information on how stakeholder management can be organized. Furthermore, various SSCM studies adopt a stakeholder pressure or driver perspective rather than an integrative approach with a differentiated view. For example, Meixell und Luoma (2015) explored stakeholder pressure in the context of being aware, adopting, and integrating SSCM practices by conducting a literature review. Fritz et al. (2018) proposed an iterative stakeholder identification process focusing on SCs. By engaging with stakeholders, the process aims to understand and address further stakeholder concerns. However, Liu et al.'s (2018a) study is one of the few studies which adopted a broader stakeholder perspective and explored different stakeholder roles in the SSCM context.

Nevertheless, their study focused on supplier development as just one sub-component of SSCM (Beske und Seuring 2014). Thus, considering stakeholder roles through a more differentiated view in SSCM is a worthwhile contribution. In a nutshell, SSCM and stakeholder theory can complement each other and enable a more comprehensive understanding and explaining of specific phenomena.

1.1.3 Dynamic capabilities in sustainable supply chain management

As mentioned above, more and more companies adapt certain sustainability practices, such as green product design or collaboration with suppliers, along their SC as a response to market or stakeholder sustainability requirements. Because these sustainability requirements are steadily changing (Hong et al. 2018), companies need unique management capabilities, also known as dynamic capabilities (DCs) (Teece 2007), to continuously realign their practices and resource composition (Beske et al. 2014). According to Helfat et al. (2007, S. 4), a DC is "the capacity of an organization to purposefully create, extend or modify its resource base." Thus, the company intentionally changes its resource base to gain and keep a competitive advantage (Helfat et al. 2007; Teece 2007). Teece (2007) stated that those DCs could be categorized into (1) sensing capabilities to identify opportunities and risks (e.g., changes in available technologies, customer behavior or innovations by competitors or suppliers), (2) seizing

capabilities to make use of the identified opportunities, and (3) transformation capabilities to recombine the resource base for managing threats and opportunities. However, interest in sustainable SCs has been growing for over a decade and has become mainstream in the academic discourse (Ansari and Kant, 2017; Beske, 2012). Therefore, it is surprising that only a few studies have discussed DCs within SSCM, in particular, when considering the mutual complements (e.g., organizational and environmental context/characteristics) (Beske et al. 2014; Hong et al. 2018). For example, Beske (2012) proposed a conceptual framework that links SSCM practices to the following DCs groups: "knowledge assessment," "partner development," "SC re-conceptualizing," co-evolving," and "reflexive control." This conceptual framework was later on successfully applied to the food context for further validation (Beske et al. 2014). According to Chowdhury et al. (2019), DCs are essential to continuously reconfigure and extend the SSCM practices to meet changing stakeholders' requirements. Moreover, Amui et al. (2017) used a systematic literature review to analyze the intersection between DCs and corporate sustainability and identified the need for more research on the theory of this intersection.

By taking this into account, this dissertation seeks to contribute to the SSCM debate, particularly to the management of stakeholders and their roles when aiming for a more sustainable SC since researchers proposed to conduct more research on this discourse around stakeholders and DCs in SSCM.

1.2 Overall research questions

This dissertation aims to contribute to theorizing in SSCM by elaborating and discussing established constructs from the DCs and the stakeholder debate by filling the above-described research gaps. Thus, the following two overall research questions will be answered:

1. How can SSCM practices be applied in a dynamic environment with changing stakeholder and sustainability issues?
2. How can stakeholders contribute to achieving a more sustainable SC, and how can they be integrated?

1.3 Research strategy

Even though theorizing in SCM has recently received increased attention (Craighead et al. 2016), several researchers call for more research to put forward theorizing in (S)SCM because various aspects remain unclear (Seuring et al. 2021; Carter und Liane Easton 2011). Dubey et

al. (2017, S. 333) stated that “the concept of a sustainable supply chain is poorly understood from both theoretical and managerial points of view.” Furthermore, Craighead et al. (2016) and Chen et al. (2013) put forward the debate around (S)SCM as a mid-range theory rather than aim for a grand theory. Grand theories take an abstract theoretical view and can be used to explain a wide range of phenomena (Frese 2005; Bell et al. 2019). Because phenomena in SSCM as a social science approach can normally be interpreted from different perspectives and theoretical angles, using a Grand Theory (such as Resource-Based View or DC Theory) as a starting point can help to understand better the observed patterns and phenomena (Frese 2005). Thus, they can guide and facilitate the theorizing process.

However, conclusions by a grand theory are usually rigorous, too complex, and impractical for organizations, and their practical value is limited (Craighead et al. 2016; Frese 2005). According to Craighead et al. (2016, S. 242), a mid-range theory is a ”context-specific conceptualization that provides theoretically grounded insights readily applicable to an empirical context.” Hence, framing SSCM as a mid-range theory yields the potential to contribute to theorizing in SSCM but also maintain practical contiguity under the limited scope of a thesis.

Seeking for theorizing, Fisher und Aguinis (2017) distinguish between the three approaches theory testing, theory generation, and theory elaboration, admitting that a rigorous exclusion from each other might be hard. Table 1.1 provides an outline of how to contrast these three approaches.

Table 1.1: Contrasting theory generation, theory testing, and theory elaboration (Fisher und Aguinis 2017, S. 442)

	Theory generation	**Theory testing**	**Theory elaboration**
Input	Unexplained phenomenon; little to no existing theory	Formal hypotheses derived from extant theory	Partially explained phenomenon; an existing conceptual model and/or ideas
Process and tactics	Induct constructs and relationships from data or develop and derive new concepts and relationships using logical, well-reasoned arguments	Collect and analyze data to assess whether they provide evidence supporting hypothesized relationships	Use existing concepts and models to collect and organize data to contrast, specify, and structure theoretical constructs and relations so as to refine existing theory
Output	New testable propositions; new constructs	Accept or reject hypotheses derived from extant theory	Refinement of existing theoretical ideas; refined contextual factors, constructs and/or relationships

According to Fisher und Aguinis (2017), theory generation begins with having unspecified phenomena and entails extracting new constructs, relationships or concepts from empirical data and finally leads to develop novel (testable) prepositions. Theory testing uses extant theories to

obtain hypotheses and seeks to reject or confirm these based on data. Fisher und Aguinis (2017, p. 441) define theory elaboration as "the process of conceptualizing and executing empirical research using preexisting conceptual ideas or a preliminary model as a basis for developing new theoretical insights by contrasting, specifying, or structuring theoretical constructs and relations to account for and explain empirical observations." Thus, theory elaboration embraces the three typification's contrasting, specification, and structuring. Contrasting can be carried out vertically (i.e., between distinct contexts) or horizontally (i.e., between distinct analysis levels) to contrast different observations to thereby enhance their reasonableness. The specification of a particular construct identifies the need for defining new constructs or splitting a vague construct in order to improve its validity and scope. Third, structuring means redefining the relationship between two or more constructs to provide more precise predictions and explanations.

1.4 Research design and scope

This cumulative dissertation follows Craighead et al.'s (2016) call to conduct more research on (S)SCM as a mid-range theory by applying a theory elaboration approach. However, a study can contain several elements of each approach (see Table 1.1). By considering research gaps outlined in section 1.2, existing theoretical constructs will be elaborated and refined. While the stakeholder theory is frequently used and has received considerable attention in the SSCM discourse (Touboulic und Walker 2015), using the DC theory in SSCM to explain phenomena is somewhat uncommon (Beske et al. 2014; Amui et al. 2017). Thus, Chapter 2 introduces the DC theory in general and points out intersections with the SSCM field in particular, thereby serving as a starting point for the dissertation (see Figure 1.1).

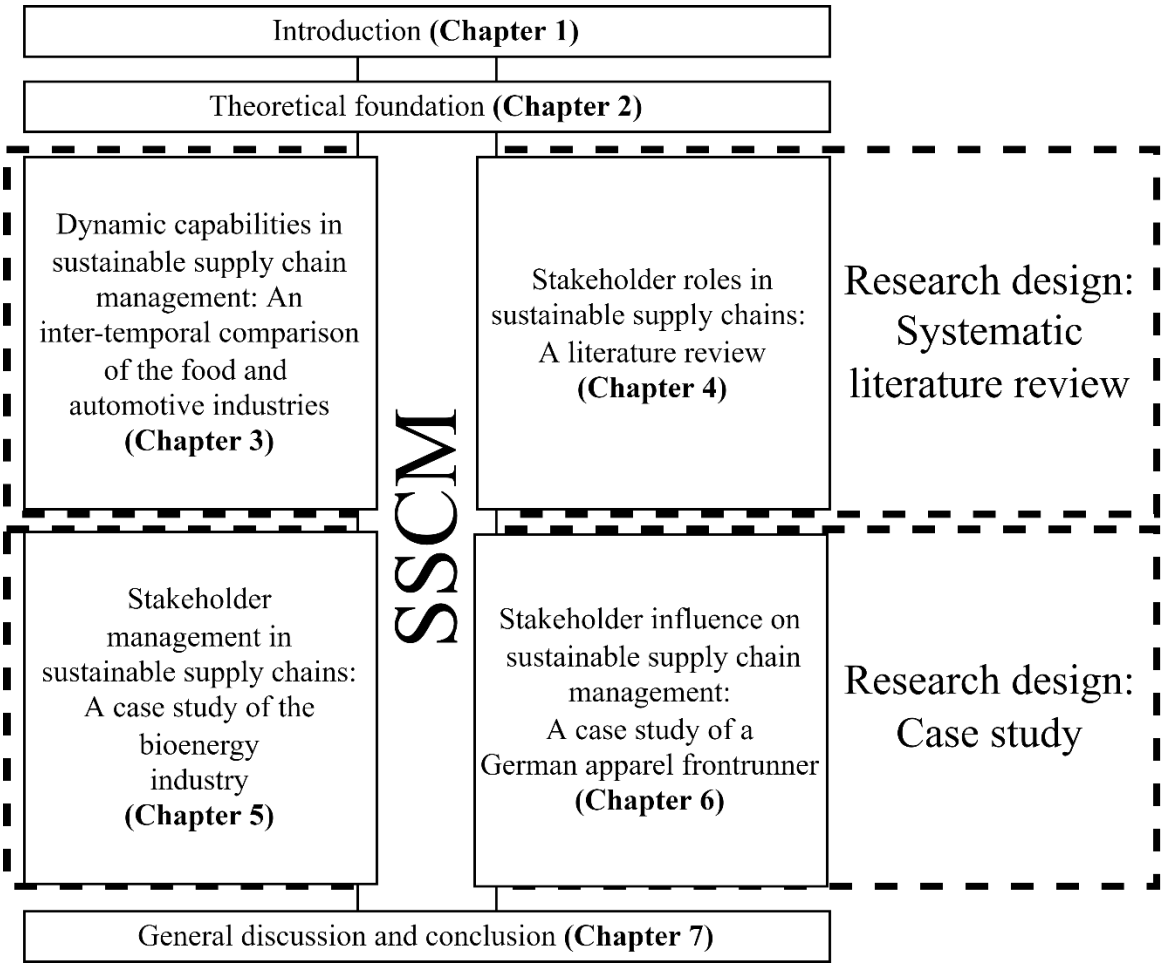

Figure 1.1: Overview dissertation

The following four chapters mainly use an explorative approach to answer the two overall research questions based on this theoretical chapter. While Chapters 3 and 4 adopt a structured literature review, Chapters 5 and 6 use a case study design to complement the literature-based findings with a profound empirical grounded analysis.

A systematic literature review is known for its replicable and transparent research process. Fink (2019, S. 6) describes it as "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work." Therefore, both chapters seek to move the current SSCM debate further by synthesizing it and, thus, becoming the starting point for more research (Seuring et al. 2021) by following the suggestions of Seuring und Gold (2012).

In general, a structured literature review is a recommended way to anchor a research idea in the body of existing knowledge (Seuring und Gold 2012). Additionally, it is also a valid tool for consolidating and developing an existing theory by, e.g., outlining current research gaps (Carter und Washispack 2018). Based on the systematic literature review material, a qualitative content analysis was applied (Seuring und Gold 2012; Mayring 2015). This expedient approach

encompasses a systematic, rule-governed, and reproducible design while being guided by theory with the objective to identify, evaluate and interpret the existing body of literature (Mayring 2015; Seuring und Gold 2012). For adding further insights to these more qualitative results, a quantitative contingency analysis is applied. According to Gold et al. (2010, p. 235) a contingency analysis seeks to extract "association patterns between categories, i.e. […] pairs of categories which occur relatively more [or less] frequently together in one paper than the product of their single probabilities would suggest."

Thus, studying the development of a particular academic debate on SSCM allows for a profound analysis and, therefore, the identification of distinct (underrepresented) theoretical constructs.

While both chapters (3 and 4) use SSCM categories and practices by Beske und Seuring (2014) as a starting point, Chapter 3 also considers established DCs constructs (e.g., Beske et al. 2014; Kırcı und Seifert 2015) and Chapter 4 considers stakeholder constructs additionally.

Therefore, Chapter 3 is titled "Dynamic capabilities in sustainable supply chain management: An inter-temporal comparison of the food and automotive industries" and aims to analyze DCs in SSCM. As the title suggests, the analysis contains two modifications compared to classic qualitative content analysis-based literature reviews. For meeting the dynamic character of DCs, (1) it compares two industries (i.e., automotive and food) and (2) adds a temporal perspective by contrasting two time periods (2002–2013 and 2014–2018). Splitting samples from different industries into disparate periods enables a deeper, more comprehensive, and necessary study of SSCM literature from a time-isolated view focusing on the phenomena of DCs.

The qualitative interpretation of the literature allows an understanding of how DCs evolve and are distributed in the SSCM field by extending Beske et al.'s (2014) framework in an abductive way. Thus, it elaborates DC and SSCM constructs across different contexts. While some (food) studies have indicated integrative stakeholder approaches, most of the SSCM studies for the two industries neglected to apply a more differentiated stakeholder perspective or consider stakeholder constructs at all. In particular, the core element of SSCM, the stakeholder management, appeared too unspecific and broad in the analyzed SSCM debate (e.g., Ahl et al. 2018; Hofmann et al. 2014).

Consequently, Chapter 4 is entitled "Stakeholder Roles in Sustainable Supply Chains: A Literature Review" and focuses on the intersection of stakeholders and their roles related to SSCM practices in the current academic debate. This structured literature review enables "a synthesis on the current state" (Seuring et al. 2021, S. 2) of stakeholder constructs in the SSCM

debate. It applies a structured approach to elaborate the relations between stakeholders, their roles adapted from Liu et al. (2018a) and the SSCM practices suggested by Beske und Seuring (2014). Thus, it seeks to improve the explanatory adequacy of the relationships between those constructs (Fisher und Aguinis 2017). As a subsequent step, the tactics of horizontal contrasting are used to explore and elaborate the stakeholder perception across the SSCM debate. The results suggest multiple relationships between stakeholders in all three roles (i.e., driver, facilitator, and inspector) and different SSCM practices. Further, a more differentiated view of stakeholders and their roles in the SSCM context yields promising research opportunities.

Based on the results of the conducted literature reviews from Chapters 3 and 4, the following two chapters (5 and 6) apply a case study design to target the identified gaps and echo the findings of the literature-based studies. A case study allows an in-depth understanding of a specific and real phenomenon in which the boundaries between the phenomenon and its context are indistinct by using different data sources to gain, inter alia, the knowledge for further interpretations and applicability (Saunders et al. 2016; Stuart et al. 2002). It investigates a real-world phenomenon, meaning that the context of the case is crucial and uncontrollable (Yin 2018), such as the issues of SCs (Seuring und Müller 2008). In this respect, case-based research cures a "weak and limited understanding of the body of knowledge as a whole" (Stuart et al. 2002, S. 421–422). Case studies not only serve to capture a phenomenon and develop from their richness of observation, but also refute or extend existing theories as this thesis aims to do. Here, semi-structured interviews with various experts may provide direct access to practical experiences and different views in the target field, leading to new ideas and fresh insights by identifying what and why something is happening (Yin 2018).

By taking this into account, Chapter 5 seeks to contribute to the stakeholder debate in SSCM and is entitled "Stakeholder management in sustainable supply chains: A case study of the bioenergy industry." This chapter adopts a qualitative case study approach to elaborate on the broad stakeholder management construct. A case study allows a comprehensive analysis of a particular and real phenomenon to lay the foundation for additional interpretations and applications (Yin 2018; Gibbert et al. 2008). Furthermore, disclosing the theoretical item enables identifying underlying causal relations in a real-world setting and bridging the "gap between research and industry" (Hong et al, 2016, p. 18), thereby providing meaningful insights for practitioners (Eisenhardt und Graebner 2007).

Drawing on 28 interviews with SC members and further stakeholders from the SC environment, the analysis reveals multiple underlying practices at the SC's internal and external levels. Moreover, the results of Chapter 5 propose to structure these practices against the two

dimensions: “practices to address stakeholder requirements” and “practices whereby stakeholders are integrated.” Chapter 5 follows the logic of construct specification by splitting the initial broad construct into more precise constructs (for the SSCM debate) (Fisher und Aguinis 2017).

The results of Chapter 5 also indicate the valuable role of stakeholders within the process towards a more sustainable SC. Therefore, Chapter 6, entitled “Stakeholder influence on sustainable supply chain management: A case study of a German apparel frontrunner,” aims to analyze stakeholders and their roles related to SSCM in the apparel industry using a case study design. The case study is the logical choice here because it allows an in-depth investigation of the complexity of both stakeholder relationships and SSCM. Yet, the industry is shaped by complex SCs across multiple countries with a diverse set of stakeholders (Khurana und Ricchetti 2016). Further, the SCs are vulnerable to disruption and often criticized by stakeholders (e.g., the media or NGOs) for sustainability-related aspects (Köksal et al. 2017). Enlightening stakeholder roles in the context of sustainability frontrunners yield promising research insights, as shown by Brix-Asala et al.’s (2018) study with a similar case study design on Fairphone.

Based on the single exploratory case design, the study elaborates SSCM and stakeholder constructs (i.e., Clarkson 1995; Liu et al. 2018a; Seuring und Müller 2008) by (re-)structuring the underlying relationships (Fisher und Aguinis 2017). Despite the theoretical contribution, the chapter also has practical implications by providing best practices to learn from noteworthy companies in the SSCM context (e.g., Köksal et al. 2017; Silvestre 2015). Therefore, Chapter 6 contributes to theorizing in SSCM by applying an elaborating approach and provides managerial implications as called for by Wickert et al. (2021).

In Summary, the literature-based studies are complemented by the two case studies, which allowed an in-depth investigation of stakeholders in the dynamic empirical SSCM context.

By taking this into account, the thesis has been structured in the following way (see Figure 1.1). Chapter 2 begins by outlining/defining the theoretical ground. Chapters 3 and 4 analyze the targeted academic body using a structured literature review while considering the overall research questions. Based on that, chapters 5 and 6 apply a case study design to explore the research questions further. The seventh chapter concludes the thesis by summarizing the core findings, discussing limitations, and outlining further research avenues.

2 Dynamic capabilities theory

This chapter is a book chapter the author of this dissertation, Anna Land, Tim Gruchmann, and Philip Beske-Janssen.

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2.1 Abstract

The core underlying assumption of dynamic capabilities theory is the interaction between the resource base of a company and its capabilities to extend and modify existing resources or create new ones to maintain or achieve a competitive advantage. The body of literature on dynamic capabilities has grown rapidly in the last two decades, leading to an intensively studied and complex management theory. This chapter will focus on three of the most relevant research topics related to supply chain management and how dynamic capabilities are employed in these contexts. Key variables for dynamic capabilities will be introduced, including nature, role, context, building, outcome, and heterogeneity. The domains of supply chain resilience, business models, and sustainable supply chain management are described where the dynamic capabilities theory applies. Relationships between the key variables are discussed with theoretical predictions for future applications.

Keywords: Dynamic capabilities, Supply chain management, Resilience, Business models, Sustainability, Theory

2.2 Introduction

Organizations face continuous challenges associated with disturbing familiar practices by replacing them with new ones (Fallon-Byrne und Harney 2017). Thus, the emergence of the dynamic capabilities' theory is considered an important step in framing and conceptualizing organizational change processes by building upon concepts such as organizational learning and knowledge management (Easterby-Smith et al. 2009). Introduced in the seminal paper by Teece et al. (1997) the body of literature on dynamic capabilities has grown rapidly in the last two decades, leading to an intensively studied and complex management theory (Barreto 2010), also

conceptualized and applied in supply chain management (SCM) research today. Furthermore, dynamic capabilities theory has been extended for various industry contexts, such as the automotive, food, and logistics industries (for example, Beske et al. 2014; Land et al. 2015; Gruchmann und Seuring 2018).

The concept of dynamic capabilities was derived from the transformation of the resource-based view (RBV) and the natural resource-based-view (NRBV) and proposed for more dynamic settings and applied to more complex systems such as supply chains (Beske 2012). The (N)RBV considers firms to consist of a bundle of resources, which if rare, valuable, hard to imitate, and non-substitutable, can lead to a long-term competitive advantage assuming that the firm's environment stays relatively unchanged (Barney 1991). However, most firms do not operate in such stable environments and need to adapt to changes. The core underlying phenomenon to be studied through dynamic capabilities' theory is thereby the interaction between the resource base of a company and its capabilities to extend and modify existing resources or create new ones (Helfat et al. 2007). Defined by (Teece et al. 1997, S. 515) as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments," dynamic capabilities provide a relatively new lens to study strategic renewal (Kindström et al. 2013).

This chapter presents an overview of dynamic capabilities theory, shedding light on its origins and evolution in the SCM context. Key variables for dynamic capabilities theory, such as their nature, role, context, building, outcome, and heterogeneity, are introduced (Teece et al. 1997). The chapter also focuses on three of the most relevant research topics in SCM and how dynamic capabilities are employed in these contexts. These lie within the domains of supply chain resilience (Brusset und Teller 2017), business models (Teece 2018), and sustainable supply chain management (SSCM) (Beske 2012). Relationships between key variables are discussed, and theoretical predictions for future applications are made. A particular focus is on the theoretical applications for SSCM, as sustainability has become a business imperative. We posit that key SSCM practices, such as orientation, continuity, collaboration, risk management, and pro-activity, might be more successfully implemented through dynamic capabilities related to knowledge management, partner development, co-evolvement, supply chain re-conceptualization, and reflexive control.

2.3 Dynamic capabilities microfoundations and key structural dimensions

Based on Teece's (2007) theoretical underpinnings, dynamic capabilities can be aggregated into three distinct analytical activities: (1) sensing opportunities and threats (for example from changed consumption patterns or technological innovations), (2) shaping/seizing opportunities (for example through the design of new sustainable business models), and (3) maintaining competitiveness by the reconfiguration and transformation of the resource base. Labeling these corporate-level activities as "microfoundations," they build the organizational basis of dynamic capabilities theory.

2.3.1 Sensing opportunities and threats

Even though sensing for new opportunities (and threats) means having access to knowledge, it also embraces the ability to recognize, sense, and shape the development of new opportunities (Kırcı und Seifert 2015). Hence it is, on one hand, a process of understanding the relationship between the users' needs and existing as well as potential solutions, which are identified/detected within a continuous process of scanning the narrow and broad environment (Helfat und Peteraf 2015; Teece 2018). On the other hand, sensing new opportunities is related to direct (R&D) resources and specific processes such as changing the customers' behavior (Teece 2007).

2.3.2 Shaping/seizing opportunities

According to Teece (2007), the traditional elements of business models such as tangible asset ownership, cost control, and inventory optimizations are not sufficient for long-term competitive performance. Thus, seizing opportunities through novel solutions (products, processes, or services) can require the adaptation of the underlying business model. Despite pure financial investments in the right physical assets and technologies, organizational adaptation of routines is required to exploit the identified chances (Helfat und Peteraf 2009). For staying competitive, the ability to recognize and to steer essential resources and competences, so-called "choke points," along the value chain is thereby a critical strategic element (Teece 2007).

2.3.3 Maintaining competitiveness by reconfiguration and transformation

Transformation processes, in turn, embrace capabilities to orchestrate existing resources (tangible and intangible assets) and organizational routines towards new patterns and,

hopefully, a superior resource configuration (Teece 2018). Therefore, the company actively and intentionally works for the modification of the resource base to gain and keep a higher economic value than the competitors (Helfat und Peteraf 2009).

2.3.4 Key structural dimensions

Complemented by the dynamic capabilities' microfoundations, (Teece et al. 1997, S. 516) define dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments." To date, several authors, however, have offered alternative definitions and conceptualizations (Barreto 2010). Based on Teece et al.'s (1997) main structural dimensions of dynamic capabilities, namely, nature, role, context, building, outcome, and heterogeneity, the alternative perspectives of dynamic capabilities in the literature are introduced in Table 2.1.

Table 2.1: Dynamic capabilities' structural dimensions (adopted from Gruchmann and Seuring, 2018, p. 1261)

Structural dimensions	Explanation	References supporting
Nature	Several authors followed Teece et al. (1997) argumentation, describing the nature of dynamic capabilities as ability (respectively capacity) or process (respectively routine) to create, extend, and reconfigure the firm's resource base. Others, like Makadok (2001), see dynamic capabilities rather as a special type of resource responsible for the improvement of the productivity of other resources. Accordingly, resources do not by themselves lead to an improved outcome since the performance is dependent on how they are leveraged.	(Eisenhardt und Martin 2000; Helfat et al. 2007; Makadok 2001; Teece et al. 1997; Winter 2003; Zahra et al. 2006)
Role	According to Easterby-Smith et al. (2009), dynamic capabilities can take on different roles in the firm such as changing resource allocations and organizational processes, knowledge development and transfer, as well as decision making. In this line, some authors introduced a certain hierarchy of capabilities. For instance, Wang und Ahmed (2007) describe a similar hierarchical order distinguishing between zero-order, first-order, second- and third-order capabilities. Similarly, Winter (2003) distinguishes between ordinary capabilities allowing a firm to run its business in the short term and can be seen more as "administrative" routines and operations, substantive capabilities to solve problems and dynamic capabilities to change ordinary capabilities.	(Easterby-Smith et al. 2009; Teece 2018; Wang und Ahmed 2007; Winter 2003)

Context	According to Eisenhardt und Martin (2000), dynamic capabilities vary depending on the context, particularly depending on the degree of market dynamics. Here, some researchers see dynamic capabilities as being exclusively valuable in rapidly changing or unpredictable market environments while others acknowledge its relevance in both stable and dynamic market environments. Eisenhardt und Martin (2000) suggest analytical routines relying on existing knowledge in rather moderately dynamic markets with predictable changes while experiential routines relying on situation-specific or new knowledge are more appropriate in high-velocity markets with non-linear changes.	(Barreto 2010; Eisenhardt und Martin 2000; Zahra et al. 2006)
Building	According to Makadok (2001), dynamic capabilities creation and development can be distinguished. Considering the creation of dynamic capabilities, many authors follow an evolutionary economics perspective emphasizing learning mechanisms such as structuring R&D, information technology support as well as problem-solving and knowledge-sharing processes. Additionally, top management can guide the building and creation of dynamic capabilities. Considering the development of dynamic capabilities, existing operational capabilities can be shaped to obtain more mature dynamic capabilities.	(Easterby-Smith et al. 2009; Makadok 2001; Winter 2003; Newey und Zahra 2009)
Outcome	In line with Teece et al. (1997), many authors assume a direct relationship between dynamic capabilities and company performance, explaining business success particularly through achieving competitive advantages. In contrast, other researchers question such a direct relationship stressing that company performance depends on the specific resource configuration. Nevertheless, the creation of a new resource base might affect intermediate outcomes on company performance, such as related and unrelated diversification.	(Teece et al. 1997; Barreto 2010; Eisenhardt und Martin 2000; Helfat et al. 2007; Makadok 2001; Zollo und Winter 2002)
Heterogeneity	According to Barreto (2010), there are generally two perspectives about the degree of heterogeneity. On the one hand, it is assumed that dynamic capabilities are essentially company specific and unique. On the other hand, some authors assume that dynamic capabilities have at least a few commonalities across companies. Most of the authors are skeptical about these commonalities, arguing that dynamic capabilities are more than just best practices.	(Barreto 2010; Easterby-Smith et al. 2009; Eisenhardt und Martin 2000; Makadok 2001; Teece et al. 1997)

These structural dimensions from Gruchmann und Seuring (2018) are presented as "variables" (element 1) in Figure 2.1 below. Elements 2 through 4 are presented in the following sections. The unit of analysis is the organization, as dynamic capabilities can be uniform across the firm; however, they might also differ between functions depending on the capabilities being reconfigured (Pavlou und El Sawy 2011).

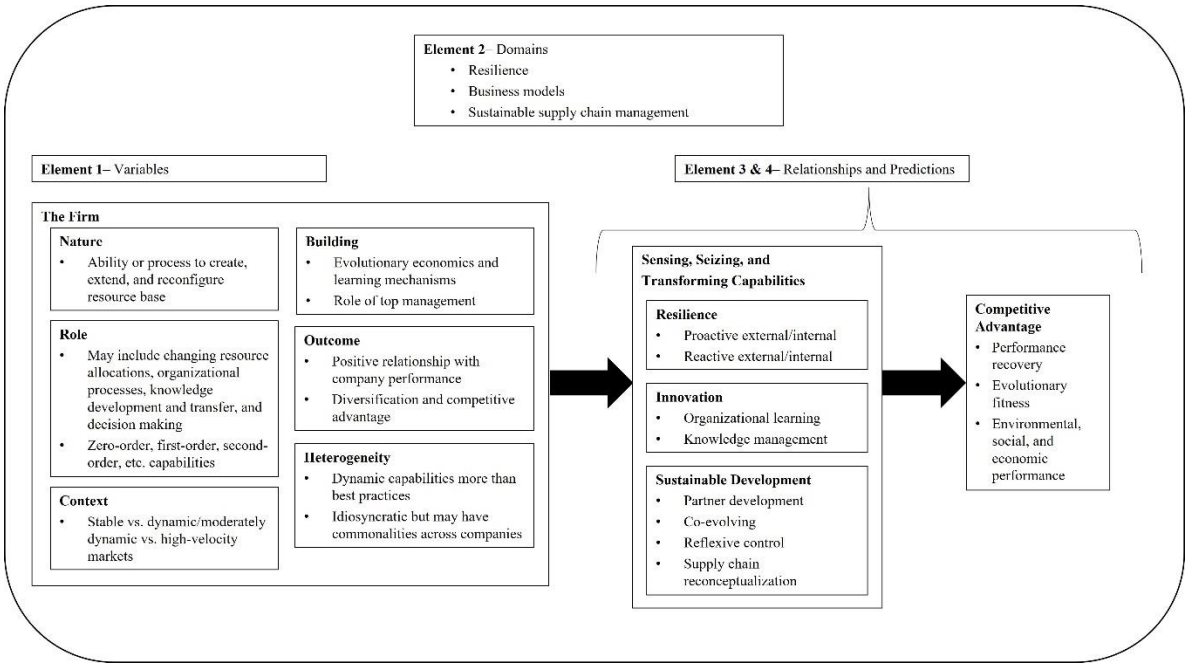

Figure 2.1: Overview of dynamic capabilities theory elements

2.4 Dynamic capabilities in the resilience domain

2.4.1 Resilience

The concept of resilience emerged from ecology in the early 1970s (Holling 1973) and has since evolved across many disciplines (Manfield und Newey 2018). In Holling's (1973) study focused on ecological stability, resilience was proposed as the ability of a system to maintain and adapt its essential structure, function, and relationships in the face of disturbance or change. In the context of organizations, Luthar et al. (2000) have defined organizational resilience as the capability to resist and recover from shocks or disasters that could affect an organization or system either internally or externally. It should be noted that the concept has been portrayed quite differently across various studies (Linnenluecke 2017). Based on the literature review of Ma et al. (2018, S. 255) that analyzed the conceptual similarities and differences of organizational resilience across streams, a common understanding about organizational resilience should include that a) "organizational resilience is a capability to cope with crisis under discontinuous and emergent environment," b) it "emphasizes on survival, adaptability, the ability to bounce back, and improvement under disruptive situations," and c) it "is a multi-level concept and is related to organizational resources, routines, and processes." Ma et al. (2018, S. 255) explicitly define organizational resilience as "a multi-level, dynamic capability." Others have argued for supply chain resilience, which may be an additional level added to Ma

et al.'s (2018) propositions. Ponomarov und Holcomb (2009) and Ponis und Koronis (2012) dedicate their entire studies to defining supply chain resilience.

2.4.2 Resilience in supply chain management

The concept of supply chain resilience emerged around the early 2000s (Jüttner et al. 2003). Since then, supply chain resilience has received sizeable attention by both practitioners and scholars because of promising approaches to cope with disruptions, caused by external events (for example, pandemic diseases, natural disasters) or internal events (for example, human error or machine failure) (Ma et al. 2018). Ponomarov und Holcomb (2009, S. 131) define supply chain resilience as "the adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function." Therefore, contrasting to ordinary supply chains, more resilient supply chains contain the continual readiness to be prepared for unanticipated events and having the resources to respond to those due to purposefully managed agile and flexible processes, also considered adaptive capabilities (Ponomarov und Holcomb 2009).

To build supply chain resilience, Christopher und Peck (2004) propose the four core elements: (1) a purposeful supply chain design (that is, reengineering), (2) a high degree of collaboration between the supply chain members to detect and treat risks, (3) an agile supply chain network to respond quickly to changing environment, and (4) a risk management awareness in the entire organization. Within this approach, attributes such as visibility, agility, availability, efficiency, flexibility, redundancy, and velocity were considered as secondary factors. However, other studies have identified that those secondary factors are critical for building supply chain resilience and should be classified as higher-order capabilities, also known as dynamic capabilities, rather than lower-level capabilities (Hendry et al. 2019; Mwangola 2018). Therefore, we argue that analyzing supply chain resilience through the lens of the dynamic capabilities theory provides fruitful insights.

2.4.3 Resilience as a dynamic capability in supply chain management

There are particular parallels between the dynamic capability theory and the resilience approach. For example, the latter assumes that the possession of adaptive capabilities, which enable an organization to prepare for, to counter, and to recuperate from disruptions, can lead to resilience and hence a competitive advantage (Hendry et al. 2019; Ponis und Koronis 2012). Similarly, dynamic capabilities are concerned with the continuous process of sensing threats

and opportunities and exploiting those by a reconfiguration of the existing resources or the creation of new ones. While Brusset und Teller (2017) stated that resilience is rather an operational capability than a dynamic capability, Eltantawy (2016) framed resilience as a higher-level, multifaceted, dynamic capability.

In fact, multiple studies indicate that the concept of resilience includes various capabilities and dimensions. For example, Mwangola (2018) has proposed agility and visibility as two dimensions of resilience. Furthermore, the empirical study by Chowdhury und Quaddus (2017) showed that resilience could be grouped into (1) proactive capabilities, such as flexibility, visibility, redundancy, integration, financial strength, or efficiency, and (2) reactive capabilities, such as supply chain response (that is, mitigating disruptions as fast as possible while seeking low impact) or recovery (that is, minimizing recovery time, cost, disruption absorption, and impact). Brusset und Teller (2017) confirmed that "integration and flexibility capabilities" have a positive impact on supply chain resilience. Dabhilkar et al. (2016) take these two classifications a step further by positing supply-side resilience as four dynamic capabilities: proactive-internal, proactive-external, reactive-internal, and reactive-external. However, Golgeci und Ponomarov (2013, S. 606) posit supply chain resilience as a "crucial, responsive capability" and, therefore, being more reactive than proactive. Nevertheless, we would argue that more recent literature recognizes both the proactive and reactive routines of supply chain resilience and adopt Dabhilkar et al.'s (2016) table to show examples of dynamic resilience capabilities from updated sources (see Table 2.2).

Table 2.2: Examples of proactive and reactive resilience capabilities from the literature

	Source										
Resilience routines	**Eltantawy (2016)**	**Hendry et al. (2019)**	**Souza et al. (2017)**	**Birkie et al. (2017)**	**Mwangola (2018)**	**Brusset und Teller (2017)**	**Ma et al. (2018)**	**Chowdhury und Quaddus (2017)**	**Su und Linderman (2016)**	**Golgeci und Ponomarov (2013)**	**Mandal et al. (2017)**
Proactive capability routines											
Internal											
Trained/experienced employees			X	X			X	X		X	X

Learning from previous disruptions and near misses	X	X	X	X	X		X				
Established recovery process		X	X	X	X	X	X	X	X	X	
External											
Alternative sourcing bases		X		X		X		X		X	
Scanning environment for detection of symptoms of disruption				X	X	X	X		X	X	
Customer-supplier long-term relationship cooperation		X	X	X	X	X	X	X			X
Reactive capability routines											
Internal											
Task force for recovery				X				X			
Clear identification of responsibility				X		X					
Coordination within a firm	X		X	X			X			X	X
Support from top management	X			X							
External											
Coordination among firms	X	X		X	X	X	X	X	X	X	X
Information dissemination to relevant organizations		X	X	X	X	X		X			X

Resilience capabilities are considered to be bundles of practices. Similar to Dabhilkar et al.'s (2016) findings, Table 2.2 reveals that most of the recent papers on supply chain resilience belong to more than one practice bundle category. It is also noteworthy that many studies apply supply chain resilience dynamic capabilities as the dependent variable (for example, Golgeci und Ponomarov 2013; Jiang et al. 2019), while others view it as a precursor or independent variable for other constructs, such as weighted performance (Birkie et al. 2017; Mandal et al. 2017) and supply management sustainability performance (Eltantawy 2016).

2.5 Dynamic capabilities in the business models domain

Business models have been extensively discussed and defined in the literature (Zott et al. 2011). Linked to the strategy and innovation literature, the business model concept describes the ways in which a business "creates, delivers, and captures value" (Osterwalder 2013, S. 14). The elements of business model design generally include features embedded in the product/service, that is, determination of the benefit to the customer from consuming/using the product/service, identification of targeted market segments, and confirmation of the revenue streams and design of the mechanisms to capture value (Teece 2018). Business model innovation is a key activity to innovate value creation, delivery, and capture mechanisms in order to stay competitive (Baden-Fuller und Morgan 2010; Teece 2009). Relevant dynamic capabilities should create, refine, and transform the business models leading to new customer offerings and revenue streams (Bocken und Geradts 2020; Teece 2007). While lower-level dynamic capabilities as repeatable actions allow the operationalization of the current business model (Winter 2003), higher-level capabilities enable companies to adjust, recombine, and create ordinary capabilities (Teece 2018). Although the link between dynamic capabilities to sense, seize, and transform business strategy and related resources clearly points to business model innovation, business model literature only recently started to address the question on how organizational designs and business models affect dynamic capabilities and vice versa (Fjeldstad und Snow 2018; Teece 2018). As organizational (co-)evolution builds on components such as strategy, structures, processes, incentives, and people (Bocken und Geradts 2020), dynamic capabilities theory uses overlapping constructs such as routines, capabilities, and resources (Barreto 2010; Eisenhardt und Martin 2000; Teece et al. 1997). To illustrate sweet spots between business model innovation and dynamic capabilities, this subsection elaborates on organizational learning and knowledge management as well as (open) innovation capabilities from both perspectives.

2.5.1 Impact of business model design on dynamic capabilities' development and vice versa

Organizational design is found to be an antecedent for dynamic capabilities building and vice versa (Teece 2018; Zahra et al. 2006; Zollo und Winter 2002). For instance, Zahra et al. (2006) proposed a link between organizational age, knowledge, and dynamic capabilities pointing to knowledge management as an important feature of mature organizations. In turn, Zollo und Winter (2002) studied how dynamic capabilities contribute to the coevolution of organizational learning mechanisms. More recently, researchers claim that change and

innovation requirements concerning the development of an organization encompass not only managerial capabilities but also individual and collective (learning) capabilities. For instance, Bocken und Geradts (2020) empirically found the development of individual capabilities through training and development programs as operational drivers for sustainable business models. Fallon-Byrne und Harney (2017) conceptualized learning opportunities as an element of the organizational innovation strategy to foster an innovation climate and related dynamic capabilities building. Accordingly, organizational structures enabling innovation, for example, through incentives, can be seen as antecedents for capability development within human resources which mobilize necessary forces for business model transformation (Bocken und Geradts 2020).

Generally, the firm's dynamic capabilities help to leverage the profitability of a business model design while lacking dynamic capabilities limits the feasibility of particular strategies (Teece 2018). Accordingly, companies have to develop higher-level capabilities beyond operational routines which help to integrate, build, and reconfigure internal competences (Teece et al. 1997; Teece 2007). For instance, capabilities that foster managerial decision-making under uncertainty are seen as one of these higher-order capabilities which guide the reconfiguration of business models to better suit a changing business environment and, at the same time, to support the realization of a certain corporate strategy (Teece 2018). Taking the theoretical stance of sensing and seizing, the learning function of an organization supports the successful incorporation of new technologies into the business model, for example, using artificial intelligence algorithms in platform business models of sea freight brokers (Gruchmann et al. 2020). Taking the theoretical stance of transforming an organization's overall design and structure, so-called strong or higher-order capabilities support the freeing up of resources which can be devoted to developing future business models (Teece 2018).

2.5.2 Dynamic capabilities for market and supply chain transformations

Taking an evolutionary economics perspective and, thereby, the theoretical stance of transforming, the processes of varying, selecting, and retaining business models through dynamic capabilities may also induce market transformation (Schaltegger et al. 2016). Accordingly, dynamic capabilities have to tackle also meso and macro factors in supply chains and entire industries (at least indirectly), as most of the factors combined into the scenarios lie outside the control of the organization itself. Thereby, meso and macro factors describe the current trends not only from an economic or technological point of view but also cover social and environmental aspects, which must be incorporated in current business models. Hence,

dynamic capabilities support potential pathways for the diffusion of businesses models in the industry promoted by retention processes and strategies of growth, replication, mimicry, and mergence (Schaltegger et al. 2016). In order to quickly grow and, thereby, capture a sufficient share of the available profits, pioneers with new and innovative business models have to be fast learners accompanied by monitoring capabilities as imitation by others might occur (Teece 2018). Therefore, pioneering new business models through start-up initiatives is just one possible option. In particular, mimicry strategies of copying business model elements of niche businesses and incorporating them in a modified way into a mass-market player's business models are often applied. For the logistics industry, for instance, start-up businesses with a city logistics focus provide the potential for replication and mimicry as they allow for alternative transportation modes such as cargo bikes or public transportation. Accordingly, pioneers have to couple their business models with strategies and capabilities that make imitation difficult such as through new (digital) technologies as well as consumer empowerment (Gruchmann et al. 2018).

More generally, companies may use strategic management to enhance their innovation potential for (sustainable) transformations of their business model (Kindström et al. 2013). In this line, competitive advantage is linked with internal and external innovation processes, while dynamic capabilities can have a significant effect on the innovation performance (Lee und Yoo 2019). Moreover, open innovation capabilities allow companies to overcome internal barriers and quickly respond to external changes by absorbing external knowledge (Chesbrough 2003). Therefore, knowledge management capabilities transform the information gained from the outside by fusing it with existing, internal knowledge. By collecting information on market and technological changes, open innovation capabilities enhance the evolutionary fitness to the environment utilizing existing resources as new resources (Pavlou und El Sawy 2011).

2.6 Dynamic capabilities in the SSCM domain

Since social and environmental issues have become a large concern to the public, companies face the challenge to integrate sustainability into their supply chains (Busse et al. 2017); hence the interest for SSCM has increased by both practitioners and scholars (Touboulic und Walker 2015). Even though there already have been answers to the calls for strengthening the robustness of developed frameworks and for promoting the building of more comprehensive theory in (S)SCM, the need for theoretical, grounded research in SSCM is still not saturated (Touboulic und Walker 2015).

Seuring und Müller (2008, S. 1700) define SSCM as "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, that is, economic, environmental and social, into account which are derived from customer and stakeholder requirements." This definition takes up the established view of a supply chain as linking several parties through upstream and downstream material, financial, and information flows. Moreover, the three dimensions of sustainability are included as well as both the market perspective, through customer requirements, and stakeholder theory. These additions have several consequences. First of all, adding the sustainability requirements of various stakeholders leads to much higher uncertainties. Additionally, stakeholders interested in sustainability are more likely to penalize a company whose sustainability claims are not fulfilled than the stakeholder base of more conventional companies where sustainability initiatives are of lower priority. Furthermore, the requirements of stakeholders are time-sensitive and can shift dynamically in unpredictable directions, potentially leading to highly dynamic markets for which dynamic capabilities have been proposed (Eisenhardt und Martin 2000). Finally, both SCM and SSCM are prone to the dynamics of business environments in a globalized world with complex logistics networks and global competition (Carter und Rogers 2008; Seuring und Müller 2008), which can lead to in-transparent business environments where change may come suddenly and unpredictably. This forms a clear link firstly between the dynamic business environments of sustainable supply chains and dynamic capabilities to maintain or achieve competitiveness in such environments and dynamic markets, and secondly to supply chain resilience, as discussed earlier in this chapter, as SSCM is has also been discussed as a strategy for managing supply chain risk (Gouda und Saranga 2018).

Another linkage between both perspectives, dynamic capabilities and SSCM, lies in the perception of performance. The assessment of "performance" in dynamic capabilities theory has been linked to the perceived value a good or service offers to customers and, therefore, goes beyond a one-dimensional financial performance assessment (Easterby-Smith et al. 2009; Helfat et al. 2007; Kumar et al. 2018). Similarly, as can be deduced from the SSCM definition, performance in SSCM is assessed against the three dimensions of sustainability, also going beyond the economic perspective and stakeholder requirements. Finally, dynamic capabilities and SSCM practices alike are employed by companies to purposefully influence and change their business environments to match their own business models and strategies (for example, Defee und Fugate 2010; Eisenhardt und Martin 2000; Winter 2003). Dynamic capabilities are

used to change the resource combinations, while SSCM is used to develop sustainable suppliers, products, or create awareness for sustainability.

2.6.1 Key dynamic capabilities for sustainable supply chain management

While dynamic capabilities may be based on widespread routines, the specific design and implementation of these routines can be very different in various companies or supply chain settings based on, for instance, employee behavior, management styles, or corporate culture. In the following, we will describe core dynamic capabilities which can be observed in the SSCM domain.

Knowledge and information play a pivotal role in today's business environments (Handoko et al. 2018). This can be in the form of specific patents, knowledge about specific materials with sustainable qualities or production processes, or even specific local circumstances.

Knowledge Management in the form of a dynamic capability allows companies to access, understand, integrate, or even acquire relevant knowledge and information. Accordingly in the supply chain domain, Defee und Fugate (2010, S. 188) define it as "a capability held by two or more parties that fosters an understanding of the current knowledge resources possessed by each party." By evaluating the current knowledge base and potentially reconfiguring it, such a capability is also of great importance to shape future resource configurations or to help in transforming the current ones.

Supply Chain Partner Development, in turn, is of high value to be able to steer current routines towards new patterns and thus a more competitive resource configuration, that is, transforming the resource base (Teece 2018). This is critical as many now argue that competition is no longer between companies but rather between supply networks. Hence, developing the partners in a supply chain can have a high impact, especially in a sustainability setting where more sustainable practices need to be continuously developed and implemented throughout the supply network to reach a higher overall sustainability performance (Liu et al. 2018a). This capability is also employed to reach higher supply chain resilience. Such a capability involves sensing and seizing opportunities and threats in the form of understanding and evaluation of current abilities of supply chain partners and means to potentially develop them further for improved sustainability performance (Pagell und Wu 2009) and resilience. Hence, such a dynamic capability is closely linked to the knowledge management capability.

Co-evolving allows developing and implementing new capabilities and business practices (Defee und Fugate 2010). Eisenhardt und Martin (2000, S. 1107) describe co-evolving as "the routines by which managers reconnect webs of collaborations among various parts of the firm

to generate new and synergistic resource combinations among businesses." The same holds true in the SSCM domain when transforming the current resource base or even shaping it by adding new patterns.

A ***Reflexive Supply Chain Control*** capability encompasses information gathering, evaluation, and sharing and is, therefore, again related to knowledge management. However, this capability continuously evaluates the system's functionality in relation to the supply chain's requirements in the form of a management accounting system which goes beyond purely financial data (Beske 2012). Such a capability can thus be understood to help sense threats and to a limited account also sense opportunities.

Supply Chain Reconceptualization is used to shape the supply chain by, for example, including new actors who have become valuable for the SC due to dynamically changing circumstances. These new actors can be partners from related industries, or even completely new partners previously outside of the scope of the supply network such as NGOs or other stakeholders (Busse et al. 2017; Liu et al. 2018a). When realizing new business models, such a capability is also of high importance, as this will potentially require the inclusion of new and different partners in the SC than before (Beske et al. 2014).

Implementing such capabilities can, of course, also lead to the development of new capabilities. Specifically, one purpose of the co-evolving dynamic capability is the design and implementation of new capabilities. This particular topic will be further discussed in the following section.

2.7 Relationships and predictions

In order to provide an overview of the relationships between the key variables and domains of dynamic capabilities, Table 2.3 is presented below. One notable commonality among all domains is the emphasis on the knowledge management capability, whose development has inherent impacts on other routines and capabilities, such as training and retaining experienced employees, developing long-term relationships and cooperation with partners, and co-evolving to build and develop further capabilities. The outcomes linked to firms' abilities to reconfigure and adapt their resource base as the business environment changes has direct effects on their competitive advantage, both in the traditional sense of financial performance but also in terms of social and environmental performance.

Table 2.3: Relationships between key variables and domains

Domains / Key variables	**Resilience**	**Business models**	**SSCM**
Nature	Dynamic capabilities enable the continual readiness to be prepared for unanticipated events and having the resources to respond to and recuperate from those (Chowdhury und Quaddus 2017; Porter und Heppelmann).	Business model innovation is achieved through value creation, delivery and capture to stay competitive over time (Bocken und Geradts 2020) while dynamic capabilities refine and transform business models leading to new customer offerings and revenue streams (Teece 2009; Teece 2007).	Dynamic capabilities have been discussed as internal, firm-focussed capabilities for managing the supply chain, as well as supply chain wide dynamic capabilities to gain competitive advantage through and for the supply chain as a whole (Defee und Fugate 2010).
Role	Some capabilities, such as flexibility or redundancy, are seen as more reactive and allow recovering from a threat/disruption (Hendry et al. 2019). For example, building visibility or developing supply chain partners are considered as more proactive capabilities and enable avoiding disruptions beforehand (Dabhilkar et al. 2016; Souza et al. 2017).	Lower-level dynamic capabilities as repeatable actions allow to operate the current business model (Winter, 2003) while higher level capabilities enable companies to adjust, recombine and create ordinary capabilities and related resources leading to business model innovation (Teece 2018).	Dynamic capabilities in SSCM are used to embed sustainability into the supply chain; for higher sustainability performance and also for risk management purposes (Reuter et al. 2010). They are employed to strategically select and develop suppliers, that is, (re-)configure the supply base (Beske et al. 2014).
Context	The higher the expected impact caused by disruption, the higher is the need for adaptive capabilities to be ready for responding and recovering from those disruptions (Mwangola 2018; Ponomarov und Holcomb 2009).	Dynamic capabilities not just react on a volatile environment but may also induce market transformation and the evolution of business models (Teece 2018).	Dynamic capabilities are employed in dynamic markets but also on a more general scope to be able to develop timely responses to changes in the business environment and embedded in the overall context of the supply chain (Kırcı und Seifert 2015).

Building	Supply-side resilience can be clustered into a combination of four different dynamic capabilities specifications; namely proactive-internal, proactive-external, reactive-internal, and reactive-external (Dabhilkar et al. 2016; Hendry et al. 2019; Souza et al. 2017).	Organizational design is found to be an antecedent for dynamic capabilities building (for example, business model innovation facilitated through learning incentives) (Teece 2018; Bocken und Geradts 2020). Business model innovation requirements not only encompass managerial capabilities but also individual and collective (learning) capabilities (Zahra et al. 2006; Zollo und Winter 2002).	Firms that adopt SSCM practices reap the benefits as this helps them build sustainability in their supply chains; "SSCM practices are the platform for developing dynamic capabilities which directly influence the firm's performance" (Mathivathanan et al. 2017, S. 638). As proposed by Reuter et al. (2010, S. 54), "the content of sustainable global supplier management processes is dependent on previous paths of sustainable capability building within the organizations."
Outcome	There is a significantly positive correlation between resilience capabilities and performance recovery after disruption (Birkie et al. 2017; Dabhilkar et al. 2016).	Competitive advantage is linked with internal and external innovation processes while dynamic capabilities can have a significant effect on the innovation performance (Teece et al. 1997). Open innovation capabilities enhance the evolutionary fitness to the environment utilizing existing resources as new resources (Pavlou und El Sawy 2011; Lee und Yoo 2019).	The extent of risk, uncertainty, and dynamism of the business environment is more intense with SSCM than the conventional SCM. Hence, building dynamic capabilities is critical in order to achieve sustainable performance across the triple bottom line (Kumar et al., 2018). Dynamic capabilities are a prime source for sustained competitive advantage and serve as antecedents gained by implementing SSCM practices (Mathivathanan et al. 2017; Beske 2012).
Hetero-geneity	Holling (1973, S. 21) concludes his seminal work by stating that a management approach based on resilience "would emphasize the need to keep options open, the need to view events in a regional rather than a local context, and the need to emphasize heterogeneity." Random events over time causing supply chain disruptions will be unexpected, the impact to each firm and supply chain will vary, and the resilience resources and capabilities will be	As argued by Jacobides und Winter (2012, S. 1376), "business models, in principle, are imitable; once established, they can be emulated, with no such setup costs, by others." However, heterogeneity and distinction may come in the form of a "superior skill or knowledge or simply an ability to implement the business model."	Even though dynamic capabilities might be observable to an extent and only idiosyncratic in specific details, they are often relationship specific and socially complex. As such they are deeply embedded in the individual organizational and supply chain context and can be heterogeneous (Reuter et al. 2010; Beske et al. 2014).

	heterogeneous among firms and supply chains.		

Based on the relationships shown in Table 2.3, some predictions can be established for dynamic capabilities theory in the wider supply chain context. Future threats due to pandemics, economic crises, or natural disasters for supply chains seem inevitable. For example, global supply disruptions caused by the COVID-19 have raised awareness of supply chain vulnerabilities. As a result, the debate around achieving more resilient supply chains has received increasing attention not only by academics (for example, evident by the number of calls for papers on the topic) but also by politicians, practitioners, and the media. Because studies have indicated that certain dynamic capabilities are the prerequisite for supply chain resilience as an outcome, it can be assumed that scholars and managers are both interested in more research on how those can be created or further developed to build a more resilient supply chain. Instead of developing more conceptual frameworks, a longitudinal research design with empirical data should be favored to shed light on the underlying development as well as transformation processes and the (business) context (Mandal et al. 2017).

Furthermore, future research should analyze how dynamic capabilities, which build resilience, can be strengthened in the long term. The identification of specific capabilities to facilitate and accelerate organizational learning for either avoiding disruptions or being able to respond faster can be targeted by future studies (Brusset und Teller 2017). While some studies indicate that supply chain resilience might have a positive impact on a firm's competitive advantage (Ponomarov und Holcomb 2009; Hendry et al. 2019), further research should explore the relationship between resilience and the (sustainable) performance of a company by taking into account the mitigating effect of dynamic capabilities (Mwangola 2018).

In the sustainable supply chain context, future dynamic capabilities research should foster the more profound implementation of sustainability in supply chains. As the world is currently experiencing a climate catastrophe with greater impact and higher frequency of natural disasters, such a development should be a high priority. To date, a truly sustainable supply chain hardly exists (Montabon et al. 2016; Pagell und Shevchenko 2014). Research should identify dynamic capabilities which can help to spread sustainability into the wider supply network, those that proactively shape the business environment, identify non-compliant suppliers or such dynamic capabilities which enhance resilience in such arguable more fragile supply chains with a sustainability focus.

Another path for future sustainable development lies in the circular economy, where the linear production system of current supply chains is transformed to a circular one. The whole concept of circularity, while not new, has only recently received attention by a greater number of researchers and practitioners. Accordingly, few established routines and standards exist and developments in the market are very dynamic. Additionally, very little research in dynamic capabilities for circular economy has been published to date (for example, Khan et al. 2020). Building circular supply networks from the ground up requires dynamic engagement with suppliers, competitors or even new partners. Especially in the beginning, circular supply chains will need to be able to dynamically adapt to possibly unforeseen changes, for example due to lack of experience. Inevitably, this will also influence the business models of companies.

With regard to business model research, only a minority of sustainable business models reaches international benchmarks of multinational enterprises, since most of them still operate in a niche and often lack integrated business designs combined with dynamic capabilities' building approaches. For instance, necessary logistics capabilities can help local food networks to achieve a higher sustainability performance by leveraging the companies' embedded sustainability potentials in their core business (Gruchmann et al. 2019). While the food sector shows a high potential for especially regional patterns of production and consumption, resilience can be further built by co-evolution and partner development capabilities to allow for integrated and consolidated services on the operational levels of the supply chain. How such potentials can be transferred into other branches (material and chemical industry, fashion, electronic sector, and so on) is a matter for further research. However, it can be predicted that co-evolution and partner development capabilities for sustainability might also enable a higher resilience in other industry sectors.

Moreover, digital technologies offer the possibility to move from conventional asset-ownership to product-as-a-service models (Porter und Heppelmann). This development can already be seen in logistics business models, in which the ownership of physical assets, such as warehouses or trucks, is less important for offering transportation services to the customer (Gruchmann et al. 2020). Configuring advanced services based on digital platforms can provide significant opportunities for value creation capability development accordingly (Parida et al. 2019). Having developed related organizational learning and knowledge management capabilities to use such technologies, digital business models drive collaborative value creation, where value is created beyond company boundaries and across networks/supply chains (Gruchmann et al. 2020). Here, it can be predicted that dynamic capabilities towards digital

technologies might enable cross-company supply chain optimization in various industry sectors.

2.8 Conclusion

In this chapter we provide a brief introduction to dynamic capabilities theory. We focus on three distinctive domains in the realm of SCM, namely (1) supply chain resilience, (2) business models, and (3) sustainability in supply chains. For each of the domains we highlight their relationships with key structural variables according to Teece et al. (1997).

Each of these domains have very strong linkages to the theory of dynamic capabilities. The main connection lies naturally in the dynamic changes that the domains all encompass, and its strategic importance for a competitive advantage. In terms of supply chain resilience, it is the sudden and possibly entirely unforeseen supply chain disruption which needs to be mitigated and eventually rectified. Implementing dynamic capabilities to sense especially threats is of high importance in this regard and can be considered a higher order capability (Eltantawy 2016). For business models, dynamic capabilities are implemented to create, refine, and even transform the business models (Bocken und Geradts 2020) or to even transform the market (Schaltegger et al. 2016). For the third domain, SSCM, related dynamic capabilities can, for example, come in the form of adding new resources, that is, reconfiguring the supply chain by changing or developing the supply chain partners (Kırcı und Seifert 2015). But it can also be based on capabilities which leverage and reconfigure the current resource base, for example, by developing partners into better fitting ones.

An important common factor for all three domains lies in the management of knowledge. Using knowledge management capabilities, for example, to create transparency throughout the supply chain is an invaluable way to help sensing threads and to coordinate across firm boundaries, which is of high importance for supply chain resilience. Knowledge management has also been discussed as an important capability, especially for mature organizations dynamically adopting their business models. According to Bocken und Geradts (2020), the development of individual capabilities through training and development are important for developing new business models, especially with a sustainability focus. Generally, knowledge management and learning can be viewed as having high importance for sensing and seizing opportunities by developing new or adapting existing business models (Teece 2018), for example, when implementing new technologies (Gruchmann et al. 2020). The same holds true for SSCM, where the sharing of knowledge and information is of great importance when

developing partners, finding new partners, and sensing and seizing opportunities for new practices or technologies. Additionally, such knowledge management capabilities also help to develop new business models for the overall supply chain to help cater to the needs of the supply chain partners and their stakeholders.

Generally, the SSCM domain can also be seen as a tie for all three domains discussed here. Sustainable supply chains are even more prone to sudden supply chain disruptions due to high demands related to sustainability and due to the smaller supplier and customer base compared with conventional supply chains. Therefore, supply chain resilience and its related dynamic capabilities are of high importance in this domain as well. Additionally, involving supply chain partners globally when developing business models also helps in sensing global threats and opportunities as well as seizing opportunities.

This chapter can only show a very brief glimpse of what dynamic capabilities theory has to offer. Clearly, with the rapidly accelerating change and dynamics of global markets, largely driven by technological advances, and with the climate catastrophe leading to higher frequency of natural disasters with potential high impacts on supply chains, dynamic capability theory will be of high relevance in the future. Much has been achieved since Winter wrote in 2003 about the “the mystery and confusion surrounding the concept of dynamic capabilities” (Winter 2003, S. 994). Nevertheless, as we have shown in detail above, future research is still very much required, gradually shifting from the conceptual work to empirical studies investigating the validity of the theory, for example, through longitudinal research.

3 Dynamic capabilities in sustainable supply chain management: An inter-temporal comparison of the food and automotive industries

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3.1 Abstract

This paper seeks to enrich the theoretical debate on dynamic capabilities (DCs) in sustainable supply chain management (SSCM). By extending Beske et al.'s (2014) study, a systematic literature review was conducted, and articles matching our inclusion criteria were analyzed from 2002 to 2018. Yet, two major additions are made. For the first time, two distinctive sectors, i.e., the food and automotive industry, are compared. Furthermore, a temporal perspective is provided by comparing two time periods (2002–2013 and 2014–2018) based on content as well as quantitative contingency analyses.

The results for the food sector indicate a shift from "standards and certifications," a central construct within the 2002–2013 sample, to proactive strategies aiming for the integration of stakeholders in the 2014–2018 sample. Similarly, the findings of the automotive industry indicate a shift from monitoring to joint development and knowledge management. Based on our comparison, the SSCM debate in the food industry appears more diverse in terms of practices and capabilities employed. In contrast, the analysis for the automotive industry indicates a focus on SCM elements instead of a comprehensive SSCM view.

To the best of our knowledge, this is the first attempt to apply an intra- and inter-sectoral analysis combined with a temporal analysis within the SSCM domain. This provides evidence that the methodological approach taken allows distinguishing among both time periods and industries.

Keywords: Sustainable Supply Chain Management, Dynamic Capabilities, Automotive industry; Food industry

3.2 Introduction

The domain of sustainable supply chain management (SSCM), a combination of sustainability and supply chain management, offers fruitful approaches of how sustainability can be integrated along supply chains (SCs). As a result, companies can benefit from win-win situations and competitive advantage (Katiyar et al. 2018). Since SSCM can be a major source of competitive advantage, it is inevitable for companies to have certain dynamic capabilities that enable responses to changing SC environments (Kumar et al. 2018; Hendry et al. 2019). Thus, SCs are engaged in a continuous and dynamic process of responding to these changing sustainability requirements. Some researchers have recognized the intersection of the dynamic capabilities (DCs) view and SSCM because of comparable (environmental and organizational) conditions and thereby attempt to explain the attainment of competitive advantage in a non-static environment (Beske et al. 2014; Hong et al. 2018). Hence, analyzing the SSCM domain with a DCs lens constitutes a logical choice.

Even though "the field of SSCM has seen a steady and steep growth in importance throughout the last few years" (Beske 2012, S. 373), it is remarkable that only a few efforts have been made to discuss DCs within SSCM (Hong et al. 2018). For example, Beske (2012) and Beske et al. (2014) have made significant contributions towards linking these two concepts into a concise framework where SSCM practices serve as a condition for the management of sustainable SCs. Focusing on the food industry-related literature, they have illustrated that the SSCM practices are a prerequisite to form DCs and thereby can contribute to a sustained competitive advantage. Consequently, DCs can enhance the exploitation of implemented SSCM practices and enable firms to be better equipped for adaptation to change as they aim to sustain or improve their performance.

By building on Beske et al.'s (2014) study, Kırcı und Seifert (2015) have created a framework for internal and external capabilities in the SSCM environment. To test their framework, they conducted a single case study and regarded information as well as integration capabilities as essential. Kumar et al. (2018) developed a model to study the relationship between misaligned collaboration, DCs, and sustainability performance.

While the aforementioned study rather focused on collaboration in SCs, Hong et al. (2018) analyzed how SSCM practices impact the company's performance in China by scrutinizing the mediating effect of DCs. As it can be seen from these examples, most recent studies on DCs within the SSCM field have embedded their research on pooled data or one industry only, without seeking for an inter-sectoral comparison. This view is supported by Amui et al. (2017), who have identified a lack of studies comparing different sectors. Because the current literature

on DCs in the SSCM context is scarce, one of the most comprehensive frameworks proposed by Beske et al. (2014) will serve as a starting point for this research.

This paper aims to enrich the theoretical debate by scrutinizing the interlinkage and distribution of DCs in the SSCM literature of two distinctive sectors, i.e., the food and automotive industry, as well as providing a temporal perspective by comparing two periods. There are at least two key reasons that justify scholarly work at the intersection of SSCM and DCs. To start with, the time scope of the study by Beske et al. (2014) needs an update, as there is little question that the food industry is a dynamically changing and complex industry to which the DCs view can be applied (Beske et al. 2014); however, recent research suggests an increase in coverage of DCs since 2011. Moreover, contrasting those results to a second industry might yield further insights. The automotive industry is a good choice because both industries have a dynamic character which is shaped through tough competition, fluctuating customer demands, high environmental impact and, therefore, the growing pressure of governments to create more sustainable processes and products (Katiyar et al. 2018; Kamble et al. 2020). In contrast to the food industry with local and global SCs (Hendry et al. 2019), the automotive sector is dominated mostly by globalized and highly complex SCs (Liu et al. 2018b; Liu et al. 2017). Furthermore, the temporal development of the theoretical debate within the automotive-related literature might yield contrasting and interesting results. An earlier publication by Zhu et al. (2007) found that the automotive industry was lagging behind other industrial sectors in the implementation of environmental practices, whereas more recent studies have found this to be the opposite (Damert und Baumgartner 2018; Liu et al. 2018b). Also, Ansari und Kant (2017a) have emphasized the need for more SSCM research in the automotive sector. Therefore, the results from the food industry will be compared to the automotive industry to learn more about the similarities and differences of the sectors (Beske et al. 2014; Amui et al. 2017).

An additional reason to base our research on Beske et al.'s (2014) framework is that their results can be further compared with our findings, hence allowing us to analyze the development of a particular SSCM academic debate. Analyzing samples from different industries split into different time periods enables a deeper and necessary study of dynamic capability evolution, relationships, and trends. To the best of our knowledge, no study has sought to compare two different periods of SSCM research with each other to outline their development for a specific sector. Therefore, our study is rather an extension of Beske et al.'s (2014) study than a pure/mere replication.

In the section that follows, the theoretical background and basic terminology will be provided. Next, the research method will be elaborated to carry out a literature review.

Thereafter, the results will be described in more detail, structured as content and contingency analyses by following an intra-sectoral and temporal perspective. The limitations, a comprehensive discussion of the findings, and a conclusion complement this paper.

3.3 Theoretical background

3.3.1 SSCM practices

Since all stages along the SC have an impact on the overall (sustainability) performance, a more holistic perspective is required when seeking for more sustainable business (Busse et al. 2017). We follow Seuring und Müller (2008, S. 1700), who define SSCM as *"*the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements."

However, practices can be seen as the operationalization of SSCM, embracing different internal and external routines at the strategic, structural, as well as process level to achieve a more sustainable SC. For example, the integration of sustainability thinking into SCM activities presumes to modify the companies' culture and the organizational behaviors of all SC members (Beske und Seuring 2014). Top-management support and an orientation towards sustainability have been found to be essential for this integration (Roy et al. 2020; e.g., Beske 2012).

This also raises the question of reconsidering the SC structure, or as framed by Pagell und Wu (2009), "who-is-who" in the SC. Non-traditional SC members such as NGOs, competitors, or research institutions contain valuable resources, and cooperating with them provides the opportunity to solve complex issues (Liu et al. 2018a; Busse et al. 2017). To fulfill those requirements, Beske und Seuring (2014) point out that companies tend to prefer more stable, but reduced number of suppliers with long-term relationships. Furthermore, the development of key suppliers is a well-established strategy and can lead to competitive advantages (Liu et al. 2018a).

Orientation towards sustainability within the management of SCs presupposes an increased collaboration between their members. Kumar et al. (2018) state that collaboration is an integral part of SSCM because the overall sustainability performance depends on each members contribution. Multiple authors have outlined that trust and transparency between SC members are essential. This can be achieved by enhancing the communication between SC members

through technological and logistical integration (Beske und Seuring 2014; Vachon und Klassen 2006). As a result, the creation of win-win situations is possible (Jia et al. 2019).

Stakeholders with a legitimate claim or stake in the organization play a key role in sustainable SCs (Meixell und Luoma 2015). On the one hand, they can put pressure (boycotts, strikes, etc.) on companies if they have a legitimate and urgent stake as well as enough power (Busse et al. 2017; Meixell und Luoma 2015; Wan Ahmad et al. 2017). This can ultimately result in loss of legitimacy for the affected companies. To counter this, companies can consider those requirements by proactive communication and coordination, whereas auditing and monitoring measures are rather for avoiding trade-offs (Roy et al. 2020; Seuring et al. 2019). On the other hand, SCs can benefit from collaboration with stakeholders because they can provide valuable knowledge and resources (Busse et al. 2017). Moreover, Liu et al. (2018a) have shown in an empirical study that stakeholders could have a valuable impact on the process of supplier development.

Although SSCM involves a holistic perspective and implies the consideration of all three dimensions of sustainability (environmental, economic, and social), most studies tend to emphasize the environmental dimension, especially studies that analyze the relationship between specific strategies and their performance impact (e.g., Esfahbodi et al. 2016; Maas et al. 2018; Zhu et al. 2018). For example, Maas et al. (2018) analyzed the relationship between stakeholder pressures and the adoption of environmental practices. As a response to the surplus of ecological considerations, Mani et al. (2020) studied social sustainability in SCs. Despite possessing SSCM practices, it is inevitable for companies to have certain dynamic capabilities to be able to reconfigure or extend those practices (Kumar et al. 2018; Hendry et al. 2019).

3.3.2 Dynamic Capabilities in SSCM

Grounded in the resource-based view (RBV), the dynamic capabilities theory assumes that companies require certain capabilities to be successful and responsive to the (dynamic) changes in their environment by creating, integrating, and modifying their resource base (Teece 2007; Beske 2012; Helfat et al. 2007). Hence only a unique resource configuration enables an organization to achieve or maintain a competitive advantage, especially in the long term (Teece 2007; Vanpoucke et al. 2014). Thus, DCs reflect an organization's ability to (purposefully) integrate, create, or reassemble internal and external competencies/resources (Helfat et al. 2007). Although numerous studies highlight sustainability in supply chains as a source of competitive advantage (e.g., Seuring und Müller 2008), these practices and orientation coupled with DCs permit further agility in volatile markets and can likely lead to the development of new capabilities as needed.

As one of the first attempts, Beske (2012) scrutinized the interlinkages between SSCM and the dynamic capabilities view and proposed a conceptual framework that combined those two research streams. Further studies have adopted his stated ideas (e.g., Beske et al. 2014; Kırcı und Seifert 2015). For example, Yook et al. (2018) confirmed an impact of DCs on performance, namely the economic and environmental performance, and Mathivathanan et al. (2018) investigated which DCs might influence different measures of performance. Their results indicated that, for example, the DC transparency positively influenced performance in terms of employee satisfaction. SSCM practices were found to enhance DCs, and it was suggested that DCs have a significant impact on environmental performance (Hong et al. 2018). Furthermore, Rauer und Kaufmann (2015), investigated which DCs are needed to mitigate the barriers to a green SCM.

Most researchers investigating DCs in the context of SSCM have utilized or somewhat referred to the three (micro-) foundations of Teece (2007; 1997), namely sensing, seizing, and transformation (e.g., Kırcı und Seifert 2015; Vanpoucke et al. 2014; Rauer und Kaufmann 2015). Those also can be found in the framework of Beske et al. (2014) albeit not by name.

Sensing embraces capabilities that allow for the identification of opportunities and threats. We argue that in the framework of Beske et al. (2014), two capability categories imply the gathering and interpretation of data. On the one hand, reflexive control is concerned with the gathering and the evaluation of the functionality of the supply chain against its current needs. Knowledge sharing, due to transparency and monitoring routines, allows the SC to detect threats or opportunities for improvement within the SC (Beske 2012). Knowledge management, on the other hand, entails processes to gather, share, and evaluate knowledge from all partners in the SC as well as external sources to detect further opportunities (Defee und Fugate 2010).

Sensing capabilities are the prerequisite to apply seizing or transformation capabilities. Seizing capabilities are about the provision of structures and procedures to address sensed opportunities, e.g., by collaboration (Kırcı und Seifert 2015). Thus, for SSCM, seizing can be subclassified into an SC internal perspective with partner development and co-evolving and an external perspective with the inclusion of the SC's environment through the DCs category SC re-conceptualization. The latter takes input from stakeholders into consideration to seize opportunities and create structures to seize future opportunities (Pagell und Wu 2009).

Merely selecting the right SC partners is insufficient; the way their business is conducted needs to be aligned with the entire SC and hence is deemed as an important capability (e.g., Handfield et al. 2015; Rauer und Kaufmann 2015). Rauer und Kaufmann's (2015) interpretation of SC-alignment is uni-directional, as a focal company works to align each

partner with their concept of sustainability, whereas the previously described seizing DCs can be understood as bi-directional. Providing structures and procedures can also mean that the focal firms' structures are modified according to the suppliers' structures to achieve a competitive advantage or that both focal firm and suppliers reshape to others' requirements (Handfield et al. 2015).

However, transformation capabilities enable the "[…] continuous alignment and realignment of operational practices" (Vanpoucke et al. 2014, S. 448). Hence, they can be viewed as the abilities to implement what was previously planned for the realization of a sensed opportunity, its constant re-evaluation, and adaptation to changes (Beske et al. 2014). This capability is mirrored in the reflexive control category of Beske et al.'s (2014) framework and partially in *partner development, co-evolving,* or the *SC re-conceptualization* DCs categories.

Instead of transformation capabilities, researchers suggest SC resilience as a further dynamic capability to continue on the path towards the sustained competitive advantage (Rauer und Kaufmann 2015; Hendry et al. 2019). These capabilities assist with building up the resistance of the SC to be less prone to disruptions. Resilience DCs, again, are entailed in several categories of the framework by Beske et al. (2014). Ensuring solid *partner development processes* will lessen the probability of any surprising scandals concerning sustainable business conduct of suppliers and will thus increase the SC resilience. Furthermore, reflexive control capabilities, as well as the ones of the SC re-conceptualization category, might increase resilience.

Table 3.1: Overview of SSCM practices (adopted from Beske et al., 2014)

Categories and construct	Description	Example in the analyzed literature
Orientation Dedication to SCM Dedication to TBL	The orientation to a Triple-Bottom-Line (TBL) approach means to take a more holistic SCM view by the top management and is of strategic relevance.	(Govindan 2018; Gary et al. 2018)
Supply chain continuity Long-term relationships Partner development Partner selection	Due to SC partner development or selection, long-term relationships are favored and result in a more stable SC member continuity.	(Das 2018; Grimm et al. 2014)
Collaboration Joint development Technical integration Logistical integration Enhanced communication	Implementing sustainability leads to an increase of collaboration between the SC actors, for instance, by enhancing the communication and striving for the technological and logistical integration.	(Siddh et al. 2018; Grekova et al. 2014)
Risk Management		

Individual monitoring Pressure group management Standards and certificates	Selective monitoring or certification are commonly employed by companies to avoid stakeholder pressure and to mitigate (environmental and social) risks.	(Sarkis et al. 2011; Sayed et al. 2017)
Pro-activity Learning Stakeholder management Innovation Life cycle assessment	Acting more proactive by, for example, the involvement of stakeholders, the willingness to understand and manage their issues, and to learn from them can trigger innovations.	(Petljak et al. 2018; Graham et al. 2018)

*"Partner development" and "joint development" as SSCM practices were treated as constructs by Gold et al. (2010) and Seuring und Müller (2008), whereas Beske et al. (2014) and Vanpoucke et al. (2014) considered "partner development" and "joint development" as dynamic capabilities with several sub-constructs. Taking these considerations into account, we opted for consistent adoption.

Admittedly, Beske et al.'s (2014) framework has some limitations because it is grounded on a descriptive analysis and conceptual interpretation. However, it contains a set of constructs both on the SSCM as well as the DCs side. Such a selection of constructs into a framework is necessarily limited to certain aspects, aiming to offer a sufficiently holistic comprehension (see Beske 2012; Beske und Seuring 2014; Beske et al. 2014). This summed up the field in a sound manner and has since been widely adopted in subsequent literature, evident, e.g., by the number of citations the paper has achieved. The references for the constructs and their operationalization listed in Table 3.1 and Table 3.2 provide evidence that each one has been previously adopted and is still argued for in related literature. Therefore, the framework will serve as a good starting point, further supported by other recent studies building on it (e.g., Kırcı und Seifert 2015; Yook et al. 2018).

Table 3.2: Overview of DCs (adopted from Beske et al., 2014)

Categories and construct	**Description**	**Example in the analyzed literature**
Knowledge management Knowledge sharing Common IT system Licensing Knowledge acquisition and evaluation	Knowledge management occurs via capabilities to manage common IT systems, licensing, knowledge acquisition and evaluation, and knowledge sharing. It also should be facilitated among SC partners to increase the sensing for opportunities.	(Darkow et al. 2015; Martelo-Landroguez et al. 2018; Grekova et al. 2014)
Partner development* Knowledge sharing Partner development programs	Long-term partner development programs, individual partner training or sharing valuable knowledge are fruitful approaches to develop SC partners and to improve the overall performance.	(Foerstl et al. 2015; Pakdeechoho und Sukhotu 2018)

Improving overall performance Partner training		
SC Re-conceptualization Inclusion of NGOs Inclusion of neigh., communities	Transforming towards identified opportunities also means to re-conceptualize the SC by including non-traditional SC actors such as NGOs, neighbors, communities, or policymakers.	(Govindan 2018; Stone und Rahimifard 2018)
Co-evolving Joint development of products Joint development of processes Regular meeting Partner based synergies	Joint development of products and processes as well as regular meetings, can be established to benefit from partner-based synergies and to exploit opportunities.	(Bourlakis et al. 2014; Liu et al. 2018b)
Reflexive control Transparency Information sharing for monitoring Qualitative partner control/auditing	For maintaining and adjusting goals, SC members are willing to share information for monitoring ongoing activities and applying measures for qualitative partner control/auditing to improve the entire transparency.	(Akhtar et al. 2016; Gary et al. 2018)

*"Partner development" and "joint development" as SSCM practices were treated as constructs by Gold et al. (2010) and Seuring und Müller (2008), whereas Beske et al. (2014) and Vanpoucke et al. (2014) considered "partner development" and "joint development" as dynamic capabilities with several sub-constructs. Taking these considerations into account, we opted for consistent adoption.

3.4 Methodology

In general, a systematic literature review is characterized by following a process that does the research as replicable and transparent as possible. It can be described as "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work" (Fink 2019, S. 6). We followed Seuring und Gold's (2012) and Durach et al.'s (2017) process to ensure a reliable and well-structured search.

Analyzing scientific literature in SSCM of the food and automotive industry from a time-segregated perspective concerning the occurrence of DCs allows an aggregated view on both sectors, which would not be possible when conducting, for example, a case study (Beske et al. 2014). Since our research might serve somewhat as an extension to Beske et al.'s (2014) paper, following the same structures enables the comparability of the results of both studies.

As this research seeks to set the results concerning SSCM practices and DCs into a broader perspective, the automotive and food industries are chosen because of their similar but also different characteristics. In doing so, we want to understand if certain practices and capabilities are common for both food and automotive industries or for only one of them. On the one hand, the food supply can be restricted due to long production cycles, seasonality, and fluctuating in-

and output, whereas the raw material as well as the end-products, on the other hand, are perishable, which has to be taken into account for processing, transportation, and storage (Gold et al. 2017; Kamble et al. 2020). Also, the food sector yields promising potential for sustainability improvements (Kamble et al. 2020). Moreover, the food industry is shaped by changing consumer trends and demands as well as mass-customization and pressure on companies to conduct their business sustainably (Govindan 2018). While some food products exhibit a local SC, others are characterized by globalized supply chains with many different stages and companies involved which creates opacity (Hendry et al. 2019; Graham et al. 2018). Therefore, the food industry is a suitable field of application because of the industry's complexity and dynamic environment.

Similarly the automotive industry has a dynamic character which is shaped through tough competition, fluctuating customer demands, and the growing pressure of governments to create more sustainable processes and products (Katiyar et al. 2018). As González et al. (2008, S. 1034) states, "[t]his sector underwent an important expansion process in the 1990s motivated by the trend towards globalization and the decentralization of activities, all of which led to the outsourcing of a large part of the manufacturing of automotive components." As a result, automotive SCs are globally dispersed, partially long and complex, and therefore difficult to be managed (Hashemi et al. 2015). Original Equipment Manufacturers (OEMs) and customers are looking for more sustainable vehicles in terms of fuel efficiency and less environmental impacts, and the automotive industry is considered to be one of the most influential industries in the world (Mayyas et al. 2012). Although automotive companies have started to implement greening concepts in their SCM (Liu et al. 2018b), it was found that the automotive industry was lagging behind other industrial sectors in the implementation of at least environmental concepts (Zhu et al. 2007). However, various stakeholders have recently started to put pressure on OEMs to transform their businesses into one that is more (socially and ecologically) sustainable (Maas et al. 2018). Due to these characteristics, the automotive industry has witnessed a dynamically changing environment. Thus, a DCs lens can be applied to this industry as it was to the food industry before.

Together, the food and automotive industries promise interesting insights for SSCM practices and DCs. In the food industry, a higher prevalence of local and short SCs can be seen due to movements, such as Slow Food, that support local farmers. Historically, the food industry has also been slower to innovate and adopt process improvement practices related to Total Quality Management. On the other hand, the automotive sector offers products with significantly different characteristics with purely globalized SCs. Nevertheless, this industry

faces transitions towards alternative energy sources and top-notch quality with safety at the forefront. Thus, both sectors have similarities, such as an internal dynamic character, but also different product and process features and properties.

Table 3.3: Search and reduction steps during the material collection

Search and limiting steps	Identified / remaining articles
Initial search (string)	
Food industry: ("supply chain") AND ("sustainable" OR “sustainability” OR "green") AND ("food")	981
Automotive industry: ("supply chain") AND ("sustainable" OR “sustainability” OR "green") AND ("automotive" or "automobile")	302
Manual screening of abstracts by considering the following inclusion criteria: only peer-reviewed article, clear focus on the industry; clear SC-focus; clear sustainability focus.	
Food industry	187
Automotive industry	110
Manual screening of the full paper vis-à-vis the research objective	
Food industry	175
Automotive industry	104

The first step was to gather the underlying literature by using the Web of Science (WoS) search engine. The scope of WoS provides a promising base for our research design and questions, as it is one of the largest databases for peer-reviewed journals with more than 22,000 high-impact journals across all major disciplines. Furthermore, it offers a broad set of functions that allow for organizing the search process (e.g., through Boolean operators), determining the time range of publications, and selecting specific citation indexes (e.g., Sauer und Seuring 2017). To be considered for the literature review at hand, a piece of literature had to be a full article published in a peer-reviewed journal and had to be written in the English language during the time 2001–2018. As shown in Table 3.3, the initial search string (“supply chain” AND “sustainable” OR “green” OR “sustainability" combined with either “food” OR “automotive” OR “automobile”) yielded 981 food-related and 302 automotive-related results by following the same search string as Beske et al. (2014). Next, we designed inclusion criteria for analyzing the retrieved studies with different researchers. To test the extent of agreement among researchers, the inclusion criteria were applied to a portion of the initial data sample for the year 2018. Afterwards, by manually screening the abstracts under consideration of the research scope, the sample was narrowed down to 187 (food) and 110 (automotive) articles. This sample was further reduced after reading the full papers against the aim of this research.

In order to have a similar amount of literature for the temporal analysis, we extended the initial data set of the Beske et al. (2014) study from 52 to 89 papers by splitting the entire data sample after the year 2013. Therefore, we created two somewhat balanced data samples for the food industry. We followed the same logic to split the sample for the automotive industry (see Table 3.4). Thus, instead of aiming for two equal periods, we have focused on similar sample size for the intra-temporal analysis, contributing to a contingency analysis allowing better comparison among the subsamples.

Table 3.4: Research design for extending the initial study of Beske et al. (2014)

Industry / **Period**	Food	Auto
2002 – 2013	N= 89 (1)	N=45 (3)
2014 – 2018	N=86 (2)	N=59 (4)

(1) Initial sample by Beske et al. (2014) and extended to include 2012 and 2013
(2) Extension of the time scope
(3) Extension to the automotive industry for the initial period
(4) Extension of the time scope for the automotive industry

The second step was to analyze the data by coding the total sample against the DCs and SSCM constructs proposed by Beske et al. (2014); extended by the construct "supply chain alignment" in order to show that a re-conceptualization of the SC requires a willingness towards an aligned SC of all SC members including the focal firm as explained before (Handfield et al. 2015). Furthermore, using an existing theoretical framework contributed to external validity. However, two researchers coded a sub-set of the sample to ensure further validity and reliability. Through an iterative discussion and clarification at this stage, a suitable coding routine could be established. Subsequently, the remaining literature was coded by one researcher while having frequent exchanges with other researchers. Thus, construct validity was ensured through discussing the coding results with the original researchers of this study.

In addition to the content analysis, we conducted a contingency analysis to reveal further connections between the items because this analysis "[…] identifies pairs of categories which occur relatively more frequently together in one paper than the product of their single probabilities would suggest" (Gold et al. 2010, p. 235). For a temporal analysis between the industry-specific datasets, we calculated the contingencies for each antecedent data set as well.

Based on the identified frequency of the constructs, a Chi-Squared-Test was calculated to determine whether relationships existed between single constructs. Subsequently, a pair of relationships was considered valid and relevant when meeting the following two criteria. First, to not get distracted by correlations that were caused by an occurrence in a marginal number of papers, a category pair had to occur in at least 10% of the related base sample. Second, the phi

value had to be greater (or equivalent) to 0.3. In general, a phi value below |0.299| indicates insignificant values, whereas values greater (or equivalent to) 0.3 show a significant strength of the relationship; the stronger, the higher the value is (Gold et al. 2010).

Because a contingency analysis only indicates a relationship between two constructs without any causality, a theoretical interpretation is therefore required to make sense of those correlations. We refrained from presenting again the results from the content-analysis based literature review for 2002–2013 because those results were already disclosed, for example, in the study from Beske et al. (2014). In this regard, we focused our temporal analysis for each industry on those constructs where significant contingencies were revealed.

3.5 Results

The number of SSCM publications, around six per year from 2001-2013 and 10 per year from 2014-2017, is somewhat constant for the automotive industry with a rise in 2018. At the same time, the number of publications in the food sector increased, with a drop in 2015. The high number of publications in 2014 was influenced by a special issue published in the International Journal of Production Economics (IJPE) with the title "Sustainable Food Supply Chain Management." As this title represents all the search terms used to generate the research sample for the research at hand, it is not surprising that nine of the analyzed articles were published in the special issue of IJPE. Apart from that, *Journal of Cleaner Production* (JCLP) and IJPE have published most of the analyzed articles for both sectors (i.e., N= 61 food articles; N= 25 automotive articles). A list of the most cited journals and the distribution over time per sample are provided in the appendix.

The next section presents the results of the content-analysis based literature review.

3.5.1 Content analysis

The literature sample was analyzed against the core constructs from Beske et al. (2014). In the following, the results and frequencies of the different constructs and sub-dimensions of SSCM and DCs will be further explained and compared for both industries. Note that the value in parentheses shows the distribution among the related sample in percentage for the particular construct.

Content analysis for SSCM practices

"Long-term relationships," characterized by higher reliability and trust, can contribute to transparency and the willingness to share information (Bourlakis et al. 2014; Katiyar et al. 2018). Those relationships can be enhanced by developing suppliers due to training sessions or instructions on how to use right key technology and infrastructure, which "has a positive impact on the accuracy of planning deliveries, stir the adoption of complex quality standards, and stimulate the use of best practices" (Arias Bustos und Moors 2018, S. 1024). Even though it is interesting that partner development in the literature of the food industry is mentioned twice as much as in the automotive industry, the results also indicate that continuity practices, in general, are somewhat overlooked in the analyzed literature.

Table 3.5: SSCM constructs and their distribution

Construct	**Frequency**			
	Food_2002-2013	**Food_2014-2018**	**Auto_2002-2013**	**Auto_2014-2018**
Orientation				
SCM	89 (100.0 %)	79 (91.9 %)	45 (100 %)	58 (98.3 %)
TBL	56 (62.9 %)	44 (51.2 %)	24 (53.3 %)	24 (40.7 %)
Supply chain continuity				
Long-term relationships	16 (18.0 %)	15 (17.4 %)	28 (62.2 %)	7 (11.9 %)
Partner development	14 (15.7 %)	12 (14.0 %)	12 (26.7 %)	4 (6.8 %)
Partner selection	14 (15.7 %)	19 (22.1 %)	16 (35.6 %)	9 (15.3 %)
Collaboration				
Joint development	10 (11.2 %)	24 (27.9 %)	19 (42.2 %)	24 (40.7 %)
Technical integration	9 (10.1 %)	9 (10.5 %)	9 (20 %)	5 (8.5 %)
Logistical integration	12 (13.5 %)	9 (10.5 %)	7 (15.6 %)	4 (6.8 %)
Enhanced communication	39 (43.8 %)	24 (27.9 %)	19 (42.2 %)	8 (13.6 %)
Risk Management				
Individual monitoring	16 (18.0 %)	14 (16.3 %)	19 (42.2 %)	2 (3.4 %)
Pressure group management	36 (40.4 %)	32 (37.2 %)	32 (71.1 %)	13 (22.0 %)
Standards and certificates	40 (44.9 %)	35 (40.7 %)	39 (86.7 %)	26 (44.1 %)
Pro-activity				
Learning	9 (10.1 %)	22 (25.6 %)	16 (35.6 %)	11 (18.6 %)
Stakeholder management	29 (32.6 %)	40 (46.5 %)	28 (62.2 %)	20 (33.9 %)
Innovation	26 (29.2 %)	39 (45.3 %)	30 (66.7 %)	23 (39.0 %)
Life cycle assessment	34 (38.2 %)	32 (37.2 %)	21 (46.7 %)	15 (25.4 %)

*As explained in the methodology, "SC alignment" was added by us and, therefore, the Beske et al. (2014) study has not considered this construct.

Within the collaboration category, the two constructs "technical integration" and "logistical integration" are referred to in less than 10% of the articles. While "enhanced communication" is mentioned in almost a third of all food articles, only 14% of the automotive articles have

discussed it. Due to the perishability of food, several researchers claim that the industry often requires intensive information exchange (Mangla et al. 2018; Sellitto et al. 2018). Another difference between the two industries is "joint development." A closer inspection of Table 3.5 shows that more than 40% of the automotive articles refer to this practice, in contrast to 28% of the food articles. Hence, collaborative efforts with suppliers are essential to ensure a successful product development, as studied in China's automotive industry (Liu et al. 2018b).

Risk management-related constructs are as a group the second-most mentioned category. Several authors stressed that the investments a firm is willing to make towards sustainability depend on the stakeholders' requirements and especially customers as they can harm a firm's reputation (Pakdeechoho und Sukhotu 2018; Seles et al. 2016; Govindan 2018). As shown by Table 5, "individual monitoring" is largely overlooked (11%) by the research, especially within the automotive research (3%). Petljak et al. (2018) reported that retailers of the food industry apply "individual monitoring" to measure the environmental impact of their processes due to their stakeholder requirements, which is in line with the stronger "pressure group management."

Content analysis for dynamic capabilities within the SSCM context

Comparing the results from the two industries displayed in Table 3.6, constructs from knowledge management seemed to be more critical in food industry studies than in the automotive sector. While in both industries "knowledge acquisition and evaluation" is somewhat equally distributed, sharing knowledge along the SC through standardized or centralized technology to coordinate and communicate, e.g., "common IT," was more frequently mentioned in the food studies (Grimm et al. 2014; Graham et al. 2018).

Table 3.6: DCs constructs and their distribution

Construct	**Frequency**			
	Food_2002-2013	**Food_2014-2018**	**Auto_2002-2013**	**Auto_2014-2018**
Knowledge management				
Knowledge sharing	20 (22.5 %)	43 (50.0 %)	16 (35.6 %)	12 (20.3 %)
Common IT system	11 (12.4 %)	13 (15.1 %)	5 (11.1 %)	4 (6.8 %)
Licensing	5 (5.6 %)	2 (2.3 %)	0 (0 %)	0 (0.0 %)
Knowledge acquisition and evaluation	7 (7.9 %)	22 (25.6 %)	9 (20 %)	12 (20.3 %)
Partner development				
Knowledge sharing	11 (12.4 %)	12 (14.0 %)	5 (11.1 %)	7 (11.9 %)
Partner development programs	5 (5.6 %)	11 (12.8 %)	11 (24.4 %)	7 (11.9 %)
Improving overall performance	19 (21.3 %)	12 (14.0 %)	20 (44.4 %)	4 (6.8 %)
Partner training	13 (14.6 %)	12 (14.0 %)	12 (26.7 %)	3 (5.1 %)
SC Re-conceptualization				

Inclusion of NGOs	25 (28.1 %)	12 (14.0 %)	6 (13.3 %)	5 (8.5 %)
SC Alignment	----------*	24 (27.9 %)	----------*	12 (20.3 %)
Inclusion of neigh., communities	29 (32.6 %)	37 (43.0 %)	21 (46.7 %)	16 (27.1 %)
Co-evolving				
Joint development of products	5 (5.6 %)	12 (14.0 %)	13 (28.9 %)	20 (33.9 %)
Joint development of processes	6 (6.7 %)	28 (32.6 %)	9 (20 %)	22 (37.3 %)
Regular meeting	4 (4.5 %)	4 (4.7 %)	4 (8.9 %)	4 (6.8 %)
Partner based synergies	6 (6.7 %)	13 (15.1 %)	3 (6.7 %)	1 (1.7 %)
Reflexive control				
Transparency	42 (47.2 %)	28 (32.6 %)	6 (13.3 %)	8 (13.6 %)
Information sharing for monitoring	13 (14.6 %)	15 (17.4 %)	2 (4.4 %)	2 (3.4 %)
Qualitative partner control/auditing	18 (20.2 %)	21 (24.4 %)	15 (33.3 %)	22 (37.3 %)

*As explained in the methodology, "SC alignment" was added by us and, therefore, the Beske et al. (2014) study has not considered this construct.

Partner development dynamic capabilities, although being essential to seize opportunities, are the less frequently mentioned capabilities and largely overlooked because only one-quarter of all articles considered those. By considering the industry-specific studies, around one-third of food articles have referred to at least one of those capabilities and only 12% of the automotive industry. This embraces the potential for further research. One example of a study addressing multiple partner development capabilities is that of Rueda et al. (2017), where the global food manufacturer, Mars, implemented its "Vision for Change" program, concerned with improving the productivity of farmers and promoting proven agricultural practices for better soil fertility (Rueda et al. 2017).

The design of sustainable SCs differs from ordinary SCs. Therefore, we could observe one of the highest frequencies for constructs concerned with re-conceptualizing the SC. Interestingly, twice as many counts occurred in food-related studies compared to automotive. Nevertheless, studies from both industries report that sourcing from the local community with creative procurement practices or the inclusion of the community in decision-making processes support the establishment of a good relationship (Goggins 2018; Bourlakis et al. 2014; Chkanikova und Lehner 2015).

For example, in Liu et al. (2018b), Chinese managers were striving for a close network with their suppliers, customers, and the government for seeking opportunities together and achieving competitive advantage.

Studies from both sectors report that the SC alignment from all actors towards mutual values is essential to gain a competitive advantage (e.g., Agyemang et al. 2018; Govindan 2018). For

responding to a fast-changing environment, co-evolving capabilities are important in terms of the product and process levels to gain or sustain competitive advantage. For example, Mangla et al. (2018) found out that the "joint development of processes" and capacity building was a requirement to gain competitive advantage. Thereby, traceability allows SC members to detect potential process improvements together, e.g., minimizing waste and resource consumption (Bourlakis et al. 2014) and finding adequate solutions (Arias Bustos und Moors 2018).

In contrast, studies from the automotive industry report more frequently on the "joint development of products" than from the food industry. For example, ABB, a Fortune Global 500 company in automation and power, and BYD, an automotive company, have strengthened their strategic collaboration to jointly develop new possibilities for energy storage. Liu et al. (2018b, S. 434) stated that "strong partnerships and integration with supply chain members may facilitate knowledge sharing and cooperative activities, wherein suppliers' technology and innovation capabilities can be brought into the design process to enhance green design performance." So, the selection, as well as the integration of the proper partner along with sharing knowledge can foster development capabilities based on partner synergies (Sellitto et al. 2018; Akhtar et al. 2016).

Reflexive control, embracing capabilities to enable a continuous assessment of ongoing (sustainability) routines, appears to be a relatively important category for both industries. However, Table 6 shows that the two sectors have a different focus within the category. For papers reporting on reflexive control capabilities from the food industry, "transparency" is the most mentioned capability (33%). A transparent SC enables the members to detect critical stages with inefficiencies or risks and to make progress in sustainability improvements (Grimm et al. 2014; Akhtar et al. 2016). Within those studies, traceability of products is a frequent topic to assure product quality and food safety, e.g., by sharing information about applied (used) proceeding methods and materials (Sellitto et al. 2018). Labels were then used to signal details about the production process and product ingredients to the customers. Being transparent to the customer was another frequently mentioned reason (Aschemann-Witzel et al. 2017; Pakdeechoho und Sukhotu 2018). For the automotive industry, the research focus is more on control and auditing mechanisms, and those studies reported them as requirements for a sustainable advantage (Mathivathanan et al. 2018). However, many companies only conduct supplier audits at first-tier suppliers, a critical issue, especially with the topic of rare earth metals (Rauer und Kaufmann 2015) and, in some cases, only a downturn could trigger an action (Krause und Ellram 2014).

Nevertheless, most of the reviewed articles have focused rather on the outcome of reflexive control capabilities than on the underlying information sharing routines. Studies from both industries have reported that reflexive control capabilities facilitate, for example, assessing suppliers' performance, higher visibility, or ensuring/guaranteeing product quality (Martelo-Landroguez et al. 2018; Mathivathanan et al. 2018; Sellitto et al. 2018). These studies did not attempt to analyze the requisite information sharing routines, even though only effective communication enables the ongoing assessment of sustainability issues (Malviya et al. 2018).

3.5.2 Contingency analysis

For a better understanding of the research development and to shed light on which constructs share significant relationships, a quantitative contingency analysis using SPSS was applied to the results of the literature review. This examination of possible correlations between the single SSCM practices and DCs enabled the detection of pairs that occur relatively more frequently together in a sample than the product of their single probabilities would suggest. We have calculated those contingencies for both industry-specific data samples for 2014–2018. Additionally, we applied a contingency analysis to the data samples for the automotive and food industry for 2002–2013. After reporting the results for both industries separately, we present the results of a cross analysis between both industries.

Contingency analysis for the food industry

For the 2002–2013 food sample, the contingency analysis resulted in 12 significant contingencies of pairs that were observed in eight or more articles (showing a Phi-value above 0.3; see Figure 3.1). The core construct with the most contingencies (7) is "standards and certificates." The four linked constructs TBL-orientation, stakeholder management, individual monitoring, and transparency show no further contingencies.

In contrast, pressure group management is linked to qualitative partner control and auditing. Partner development and the capability to integrate NGOs also share a significant relationship. The latter is further connected to "involving neighbors, communities, and policymakers," which shows a link to long-term relationships. Overall, constructs from risk-management, external stakeholders, and reflexive control frequently appear together within the data sample.

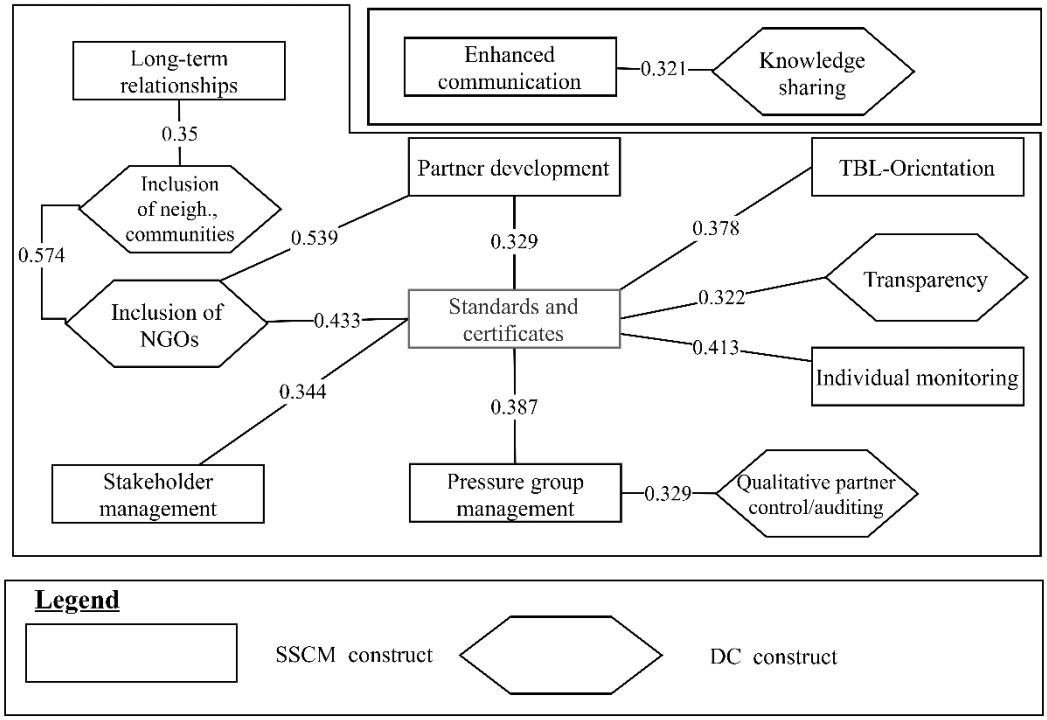

Figure 3.1: (Sustainable) supply chain model for the food industry (2002-2013)

For the 2014–2018 food sample, the contingency analysis resulted in 26 significant contingencies. Table 3.7 displays their observed occurrence together as well as the expected joint occurrence. Moreover, the one-sided significance values are provided for the single correlated pairs, and in the first column, the phi-values show the strength of the correlations. Table 3.7 is organized based on the strength of phi-values, i.e. showing highest to lowest significant relationships. Tables with the contingencies for the other samples can be found in the appendix and maintain the same structure.

Table 3.7: Example for contingency results (2014–2018 food sample)

Pair	X^2 - significance	φ – coefficient	Observed frequen	Expected frequency
PressureGroupManag. * StandardsandCertification	0.000	0.538	24	13
PartnerDevelop.Programs * Qualitativepartnercontrolaudi.	0.000	0.512	9	3
LongtermRelationships * Qualitativepartnercontrolaudi.	0.000	0.452	10	4
KnowledgeSharing * KnowledgeAcquisitionandEvaluation	0.000	0.426	19	11
Joint Develop. * EnhancedCommunication	0.000	0.422	14	7
Transparency * Informationsharingformonitoring	0.000	0.400	11	5
LongtermRelationships * EnhancedCommunication	0.000	0.397	10	4
Improvingoverallperfor. * Qualitativepartnercontrolaudi.	0.000	0.396	8	3
PartnerSelection * IndividualMonitoring	0.001	0.373	8	3
PartnerTraining * Transparency	0.001	0.365	9	4
JointDevelop.ofproducts * JointDevelop.ofprocesses	0.001	0.365	9	4

PressureGroupManag. * Informationsharingformonitoring	0.001	0.344	11	6
EnhancedCommunication * JointDevelop.ofprocesses	0.002	0.342	14	8
LongtermRelationships * KnowledgeSharing	0.002	0.337	13	8
LongtermRelationships * Transparency	0.002	0.335	10	5
TBL * Inclusionofneigh.Communitiespolicy.	0.002	0.332	26	19
JointDevelop.fprocesses * Partnerbasedsynergies	0.002	0.330	9	4
JointDevelop.* Informationsharingformonitoring	0.002	0.329	9	4
InclusionofNGOs * Inclusionofneigh.Communitiespolicy.	0.002	0.328	10	5
StandardsandCertification * PartnerDevelop.Programs	0.003	0.321	9	4
Learning * KnowledgeSharing	0.003	0.320	17	11
StandardsandCertification * StakeholderManagement	0.003	0.319	23	16
EnhancedCommunication * KnowledgeSharing	0.004	0.311	18	12
TBL * SCAlignment	0.004	0.310	20	14
Innovation * InclusionofNGOs	0.004	0.307	10	5
InclusionofNGOs * SCAlignment	0.005	0.306	8	4

Three lines of arguments can be made from the recent results (see Figure 3.2). The first two are that the contingencies for SSCM constructs are structured around two nexuses, which are cross-linked. The first nexus is centered around “enhanced communication,” “long-term relationships,” and “knowledge sharing”; all three are contingent to each other and have four links. In addition to the two other practices, “knowledge sharing” is further linked to “learning” and “knowledge acquisition and evaluation.”

“Enhanced communication” is linked to the collaboration practice “joint development” as well as the co-evolving dynamic capability “joint development of processes.” The latter is also connected to two other co-evolving dynamic capabilities, namely “joint development of products” and “partner-based synergies” which strengthens the value of collaboration within the development process. “Long-term relationship” is the last part of the triangle and connected to the two reflexive control capabilities “transparency” as well as “qualitative partner control and auditing.” Both form the second nexus – together with “information sharing for monitoring.” Due to the low frequency of “long-term relationships” (only mentioned in 15 papers), this finding is somewhat unexpected and underlines the importance when seeking for higher transparency and the willingness to share information (Grimm et al. 2014; Darkow et al. 2015).

“Qualitative partner control and auditing” is contingent to two partner development capabilities. The first one is “improving the overall performance,” and the second one is “partner development programs.” The latter is a strong link and is further connected to standards and certificates. This compound is via “long-term relationships” indirectly linked to the second brick of this nexus, namely “transparency,” which might provide further evidence of the importance of “long-term relationships.” However, “transparency” is also connected to “partner

training," a more individual and short-term capability, and "information sharing for monitoring" to reduce risks (Pakdeechoho und Sukhotu 2018). The latter represents the last part of this nexus and shows a connection to "joint development" and "pressure group management"; it is further strongly linked to "standards and certificates," which is then connected (back) to "partner development programs" as said before. However, "standards and certificates" is contingent to (the proactive practice) stakeholder management. This emphasizes the argument for using "standards and certificates" as a legitimate instrument to overcome pressure groups and to seek for transparent SCs for decreasing risks (Arias Bustos und Moors 2018; Govindan 2018; Sayed et al. 2017).

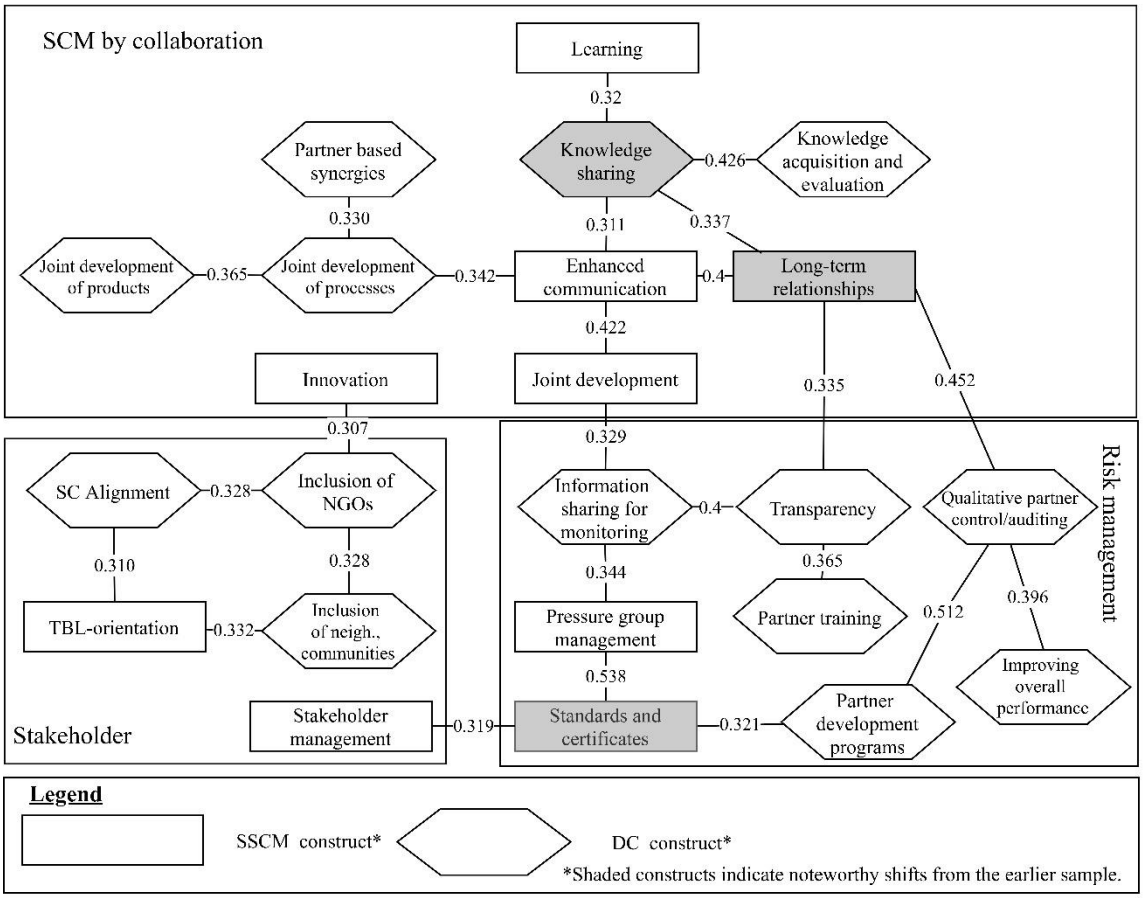

Figure 3.2: (Sustainable) supply chain model for the food industry (2014–2018)

The third argument is around TBL orientation and stakeholder integration. TBL orientation is contingent to two of the three SC re-conceptualization constructs, namely "SC-alignment" and "inclusion of neighbors, communities, and policymakers." Both are then linked to "inclusion of NGOs," which is further connected to "innovation," and can be understood as an innovation driver. This composition is aligned with arguments from the food literature that a TBL orientation means to re-conceptualize the SC design and to integrate actors such as NGOs

or further stakeholders for transforming the SC towards sustainability and innovative behavior (Pagell und Wu 2009; Roy et al. 2020). This transformed SC structure can further lead to innovations. Furthermore, this interplay of TBL orientation and SC re-conceptualization is in line with the DCs argumentation of the need for a continuous transformation (Kırcı und Seifert 2015).

We now turn our focus to the temporal comparison of food-related literature. The analysis reveals that stakeholder constructs (e.g., "stakeholder management" or "pressure group management") are integrated within other lines of arguments. While "transparency" is only linked to "standards and certificates" in the old data set, the analysis of the newer data shows a different picture, as can be seen in Figure 3.1 and Figure 3.2.

However, the results from the "new" food sample are different from the "older" in a number of aspects. The first observation is that the connections of "TBL orientation" and capabilities to involve stakeholders have changed. While those constructs were centered around "standards and certificates" in the older sample (see Figure 3.1), which can be interpreted as a risk aversion, one can see in Figure 3.2 a shift towards interconnectivity between those constructs. This is a more comprehensive understanding of a TBL orientation where integrating stakeholders and considering their requirements are essential (e.g., Sellitto et al. 2018) and in line with established SSCM literature (Pagell und Wu 2009; Busse et al. 2017; Beske und Seuring 2014).

The next observation is the development towards a collaboration perspective. Previously, the contingencies among the constructs were centered around "standards and certificates." Constructs linked to accessing, evaluating, and sharing knowledge such as "long-term relationships" or "enhanced communication" are now central in the composition of contingencies. By contrast, "enhanced communication" or "knowledge sharing" were not even connected to other constructs in the analysis of the previous data sample (see Figure 3.1). Furthermore, the joint development of products and processes due to pooling knowledge and capabilities have become more critical and appeared as relevant. Moreover, the development and training of partners are shifting towards a more central and nuanced aspect within the academic discourse.

When comparing the data sets, it can be seen that the theoretical debates are happening in a more differentiated way. For example, the analysis revealed that the discussion around joint development has been broken down into more specific co-evolving capabilities, namely joint development of products and processes as well as "partner-based synergies." Furthermore, the discourse related to partner development is more sophisticated in the current data set. Long-term partner development programs appear more often together in the studies with standards

and certificates than expected. Also, the analysis reveals a contingency between "transparency" and specific short-term "partner training," which fits in the current debate that the weakest link limits the overall SC performance (Liu et al. 2018a). A transparent SC enables the detection and transformation of those links by, for example, a tailored training to improve the performance.

Contingency analysis for the automotive industry

In total, the data set from 2002-2013 contains 15 pairs with significant relationships, as shown in Figure 3.3. The construct "individual monitoring" shows the highest number of contingencies (5). Despite this, both "enhanced communication" and "knowledge sharing for partner development" do not have a further link, while "knowledge sharing" is connected to "TBL orientation."

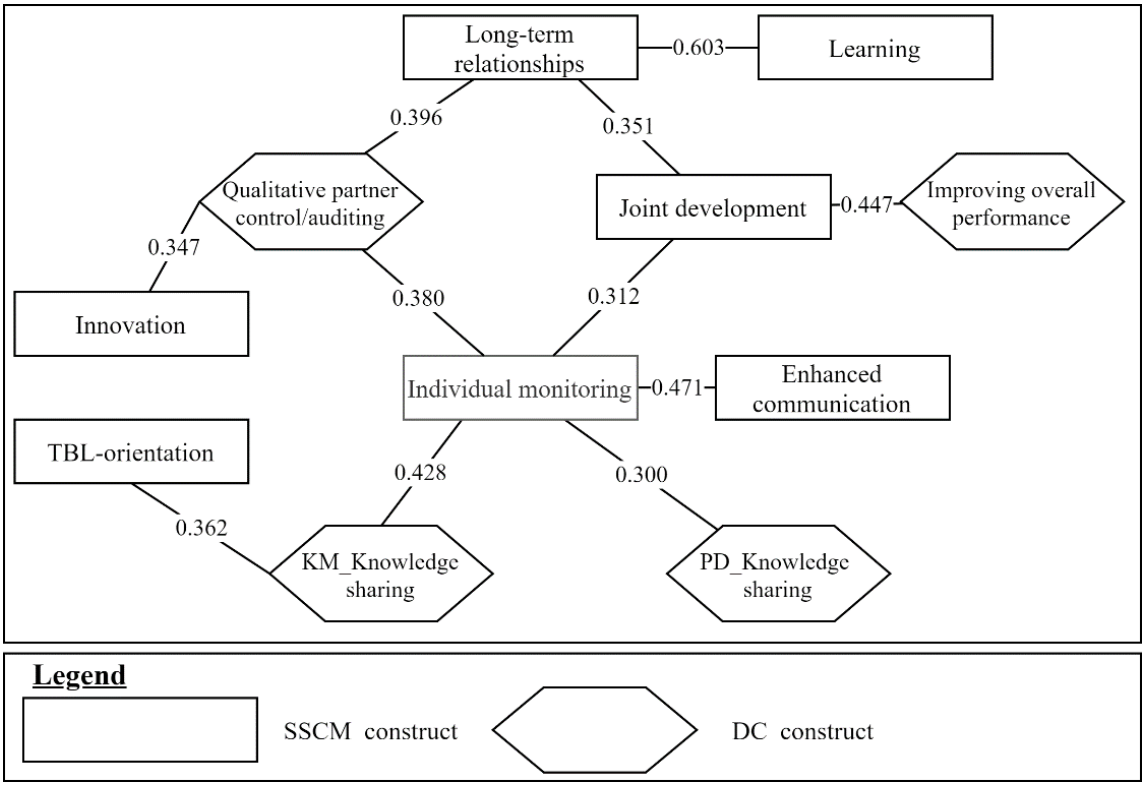

Figure 3.3: (Sustainable) supply chain model for the automotive industry (2002–2013)

By contrast, the two remaining contingencies to "qualitative partner control and auditing" and "joint development" have one unique link each, and both are also contingent to "long-term relationship," which shows an additional strong link to learning.

For the 2014–2018 automotive sample, the contingency analysis resulted in 14 significant contingencies of pairs that are observed in six or more articles. The first observation is the

marginal coverage and linkage of the stakeholder debate. Also, there is a link between "pressure group" and "stakeholder management" or "integration of neighbors, communities, and policymakers" and "partner selection"; both pairs show no further connection to other constructs, an indication that stakeholder issues are only mildly covered and detached from other lines of arguments (Mathivathanan et al. 2018; Foerstl et al. 2015).

The second observation concerned the rather limited consideration of environmental management aspects. Environmental issues are only addressed by the unique link between "TBL orientation" and "life-cycle assessment," which shows no further connection to other practices or constructs. Additional evidence shows that automotive companies only partially address environmental demands, typically only those raised by their direct stakeholders (e.g., governmental regulations) (Seles et al. 2016; Martelo-Landroguez et al. 2018). This debate is also disconnected from the other lines of arguments.

A further notable conclusion from Figure 3.4 is that the capabilities "knowledge acquisition and evaluation" and "joint development of products" are both central nexuses of contingencies, which are indirectly connected by the two pro-active practices "learning" and "innovation" for the SCM domain. The first nexus around "knowledge acquisition and evaluation" shows four contingencies. One direct link is to "qualitative partner control and auditing," which is further connected to "standards and certificates," a risk management practice. The latter indicates the ensuring of minimum requirements by using accepted standards (Opazo-Basáez et al. 2018; Liu et al. 2017). The next two connections, "supply chain alignment" and "knowledge sharing," are both contingent to each other. The strongest link (Phi 0.6) is to the practice "learning," which acts as a tie to the second nexus. This second central point is around "joint development of products" and has three links. Aside from the link to "innovation," the two others are to the practice "joint development" and to "joint development of processes," both with a phi-value of above 0.6 and interconnected.

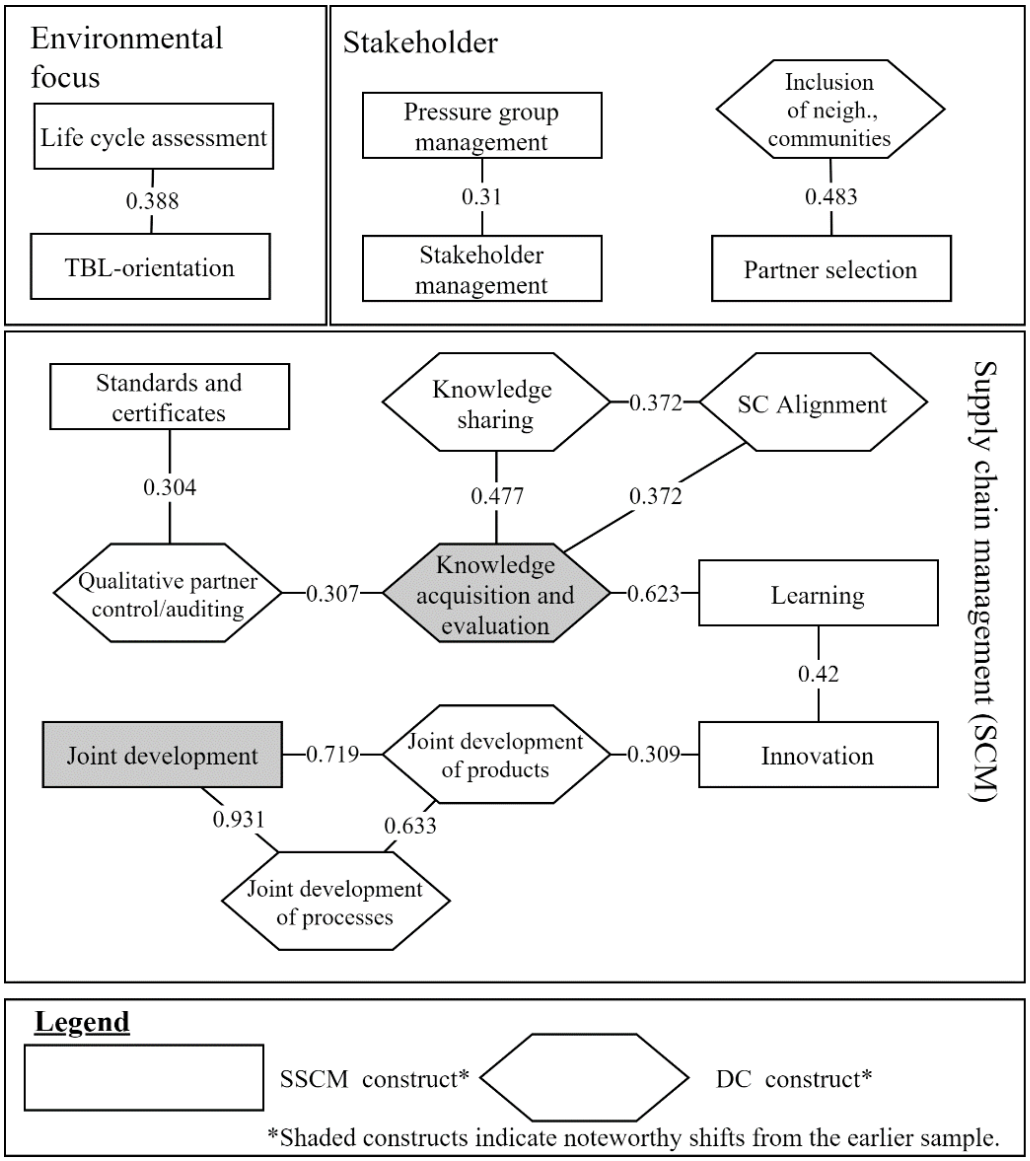

Figure 3.4: (Sustainable) supply chain model for the automotive industry (2014-2018)

"Joint development" (SSCM practice) and joint "development of processes" (dynamic capability) shows the strongest Phi-value of 0.93 among all contingencies. Although joint development efforts are considered as important in automotive literature, such a strong interconnection indicates, again, a high share of upstream value-add in the SC (Damert und Baumgartner 2018). Taking a look at the contingencies as a whole, the results indicate that automotive SCs are focused rather on SCM than on SSCM constructs, which seem to be a viable research gap within the automotive industry.

We now turn our attention to the main differences between the two data sets. The first observation is that the stakeholder domain does not show any contingencies to other constructs within the old data set. In contrast, those are appearing only with interlinkages within the category and without any further connection in the 2014–2018 sample.

Surprisingly, the most interlinked construct, “individual monitoring” (as a risk management practice), in the older sample no longer shows significant connections (see Figure 3.3 and Figure 3.4). Instead, knowledge management capabilities are more connected and represent somewhat the core constructs. Furthermore, collaboration and continuity constructs, with the exception of “joint development,” no longer have contingencies to other constructs. So, it provides further evidence that the core arguments from the SSCM debate around collaboration and continuity are still rarely addressed in the automotive industry. However, the domain of joint development is significantly interlinked in both samples. Again, this debate seems to be more differentiated now compared to the older data sample.

Table 3.8: Central notes of the academic debate

Industry / Period	Food	Auto
2002 – 2013	Standards and Certificates	Monitoring
2014 – 2018	Stakeholder Integration, Collaboration & Knowledge Management	Joint Development & Knowledge Management

Having analyzed the findings within both literature streams, we now move to the sectoral comparison of the contingencies. The embeddedness of constructs from knowledge management in the automotive data sample is quite similar to the results from the food industry (see Table 8). The distribution of information for environmental measures between SC partners was identified as essential (Mangla et al. 2018) because “knowledge is a key resource for achieving a competitive advantage” (Martelo-Landroguez et al. 2018, S. 3). Nonetheless, a careful evaluation of the benefits is required because acquiring licenses of or adopting new technologies to enhance knowledge acquisition and sharing might be too costly for more marginal producers (Rueda et al. 2017).

Although constructs such as “technical integration” or “licensing” have low frequencies, building and maintaining a consistent IT-infrastructure throughout the SC was identified as relevant and necessary for improving performance. This is achieved by fostering a more efficient sharing and evaluation of data (e.g., Arias Bustos und Moors 2018; Darkow et al. 2015; Grimm et al. 2014), also referred to as “digital capability” (Opazo-Basáez et al. 2018).

Nevertheless, the emphasis is different among the two sectors. Both automotive and food literature show a set of contingencies around co-evolving constructs and joint development. Those are further embedded into a more diverse net of constructs around “enhanced communication” and “long-term relationships" for the food sample. While the “joint

development of processes" is more emphasized in the food industry (e.g., Mangla et al. 2018; Pakdeechoho und Sukhotu 2018), strategic collaborations to jointly develop products are dominating in the automotive sector. A highly differentiated allocation of specific resources needed for the development in the automotive industry might give particular importance to joint development (Liu et al. 2017). For example, suppliers contribute to approximately 70% of value-added activities and are responsible for a significant share of innovations in the German automotive sector (Damert und Baumgartner 2018).

Also, the stakeholder domain is more strongly interlinked within the food sample and allows the consideration of different perspectives. Close interaction with stakeholders, who are a valuable source of knowledge and resources, can trigger "innovation" and "learning" capacity from companies. Foremost, learning of customers' or other stakeholders' requirements enables a company to act accordingly (Sayed et al. 2017; Mangla et al. 2018).

Overall, the SSCM debate in the food industry appears more diverse in terms of practices and capabilities employed. In contrast, the analysis for the automotive industry indicates a focus on SCM elements instead of a comprehensive SSCM view.

3.6 Discussion

Since little research focuses on the intersection between DCs and SSCM, the paper contributes to the understanding of SSCM practices in DCs within the scope of the food and automotive literature. To the best of our knowledge, this is the first attempt to apply an intra- and inter-sectoral analysis combined with a temporal analysis within the SSCM domain. In this respect, the paper offers a methodological contribution in the execution of literature reviews. This design allows the evaluation of industry-specific differences and similarities among the constructs by a continuous comparison between those perspectives. One purpose of the current study was to compare results from two different temporal perspectives in a similar setting, which is why the application of a similar theoretical perspective used in previous studies was required. To address the limiting descriptive analysis and interpretation of Beske et al.'s (2014) framework, we went one step further. Instead of causal reasoning, we have now applied a more quantitative and in-depth contingency analysis. Thus, this literature review conducted in two sectoral SSCM literature streams has revealed research gaps and different developments within these two streams.

On the content side of the contribution, by returning to Table 3.5 and Table 3.6, it is apparent that specific DCs and SSCM constructs are largely overlooked within the analyzed literature. Contrary to expectations, practices concerned with SC continuity or partner development DCs

had a rather moderate or even low concurrency across the food and automotive literature sample. First, SC continuity is considered in established SSCM literature to bring sustainable benefits for all SC members (Beske und Seuring 2014; Kumar et al. 2018). Second, supplier development capabilities are considered as essential for improving the overall performance and seizing identified opportunities by developing own and SC partners' capabilities (Jia et al. 2019; Liu et al. 2018a). Therefore, this result is somewhat unexpected and might call for further research.

Despite the relatively low occurrence rate of these aforementioned constructs, the results of the contingency analysis of the food sample showed that practices and DCs of these categories correlate with other practices and DCs which signifies the relevance of continuity practices and partner development capabilities. For example, the results indicate that "long-term relationships" are essential when aiming for transparency and the willingness to share and evaluate key knowledge (see Figure 3.2), in line with recent papers in the field (Grimm et al. 2014; Mangla et al. 2018; Chkanikova und Lehner 2015). Further studies taking those contrasting results into account might yield interesting insights and could broaden our understanding.

The enhanced involvement of research in the food industry with practices and capabilities from the stakeholder domain indicates a strong interest of stakeholder groups into the food products produced and a high dependency of food producers on the approval of the stakeholders (Darkow et al. 2015; Graham et al. 2018). While the interest can be used through collaboration and "enhanced communication" (Mangla et al. 2018; Govindan 2018; Sellitto et al. 2018), the approval of the stakeholders might be gained through "pressure group management," SC "transparency" and the integration of the social dimension in sustainability efforts to satisfy demands for ethical conduct (Sayed et al. 2017). In contrast, certain stakeholder constructs have been identified in the automotive literature (see Table 3.5), although the contingency analysis revealed that those arguments (e.g., stakeholder as a pressure group) are appearing as an outlier without any further connection to other lines of arguments. Stakeholders are considered rather as pressure groups than valuable partners for exchanging knowledge and resources (Seles et al. 2016), in line with, e.g., Wan Ahmad et al. (2017) or Mathivathanan et al. (2018).

Another contribution of this study is the inter-temporal analysis within sector-related literature, allowing further insights into the development of the academic debate. For example, the findings for the food sector indicate a shift from "standards and certifications," a central construct within the 2002–2013 sample, to proactive strategies aiming for the integration of stakeholders (Graham et al. 2018; Sellitto et al. 2018). This development is in line with

established SSCM literature where "standards and certificates" are a starting point for establishing minimum criteria (Seuring et al. 2019).

In accordance with the present results for the 2014–2018 food literature (see Figure 3.2), previous studies have demonstrated that the joint development of products and processes through the pooling of knowledge and capabilities appear as more relevant (e.g., Hong et al. 2018). Related constructs such as "enhanced communication" or "knowledge sharing" were not even displayed in the contingency analysis of the previous data sample (see Figure 3.1).

When comparing the sectoral findings, it can be seen that scholars have reported different findings concerning sustainability. This can be illustrated briefly by the debate around the "TBL orientation." Recent studies already criticize that more academic research papers have focused on environmental aspects instead of a holistic perspective (e.g., Mani et al. 2020). The results for the automotive industry indicate that most OEMs address only the environmental dimension of sustainability, and their efforts have focused on their own company instead of involving the entire SC (Damert und Baumgartner 2018). Hence, more research is needed for the integration of automotive suppliers in the process of improving sustainability performance, e.g., reducing emissions and waste. Food companies, however, tend to proactively engage with suppliers and stakeholders to consider their requirements and to comply with them accordingly (Mangla et al. 2018). Collaboration with stakeholders can trigger the learning capacity of a company and thereby yield joint innovations (e.g., Goggins 2018; Sayed et al. 2017). The automotive industry might follow a "window-dressing" strategy instead of attaining truly sustainable efforts. Developing more comprehensive approaches may be achieved by taking into account best practices from other industries.

The study contains three main limitations. First, we have analyzed the literature using construct adoptions from one main framework. Even though we have carefully discussed the underlying constructs against current studies, this selection might limit the insights to the chosen constructs and does not give insights beyond our results. Hence, this yields potential for further research by extending or choosing different constructs. However, the extensive and valuable results from the study as well as high number of citations to date might be additional ex-post justification.

Second, the study is further limited by considering only SSCM literature related to the automotive and food sectors, which ultimately decreases the ability to generalize results. Studies focused on other industries might yield additional insights and, therefore, be the scope of future research. Third, despite the first joint coding at the beginning of the content analysis, the coding process was mostly conducted by one researcher, which might result in a within-

study bias (Durach et al. 2017). Even though we aimed to outline the research process as transparent as possible (e.g., inclusion and exclusion criteria, coding scheme), other scholars following the research process might end up with slightly differing results.

3.7 Conclusion

The findings reveal the development of DCs in the SSCM context for two different industries. For example, the results for the food sector indicate a shift from "standards and certifications," a central construct within the 2002–2013 sample, to proactive strategies aiming for the integration of stakeholders in the 2014–2018 sample. Similarly, the findings of the automotive industry indicate a shift from monitoring to joint development and knowledge management. By comparing both sectors, we see that the SSCM debate in the food industry appears more diverse in terms of practices and capabilities employed. In contrast, the analysis for the automotive industry indicates a focus on SCM elements instead of a comprehensive SSCM view.

Furthermore, the applicability of the framework was validated with secondary data regarding its elements and advanced by enhancing the time horizon and including a second industry. Even though the occurrences of the individual SSCM practices and DCs are not equally pronounced, each practice category and DCs category of the Beske et al.'s (2014) framework was somewhat a topic in the automotive and food samples and justify its use. Certain practices and DCs occurred especially often across industries and periods. Such practices were "SCM orientation," "joint development," and "stakeholder management." The identified DCs often belonged to the category reflexive control and knowledge management. Compared with other periods and the automotive industry, the practices "triple bottom line orientation," "enhanced communication," and "pressure group management" had a dominant occurrence in the context of the 2014-2018 food sample.

Moreover, various correlations between the single practices and DCs have been identified, which confirmed the interrelatedness of the SSCM practices and DCs as proposed in the Beske et al. (2014) framework. To the best of our knowledge, this is the first attempt to apply an intra- and inter-sectoral analysis combined with a temporal analysis within the SSCM domain. Future research should include the case study method with the application of the framework in a dynamic SSCM environment like the food industry. The collection of primary data across multiple sectors would permit further theory testing and predictions.

4 Stakeholder roles in sustainable supply chain management: A literature review

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4.1 Abstract

Since ecological deterioration and social discrepancy are intensifying, multiple stakeholders are driving companies to incorporate sustainability in their supply chains. Thus, integrating non-traditional supply chain stakeholders, such as non-governmental organizations and competitors, in supply chain practices is essential for achieving a more sustainable supply chain. Hence, this research aims to show how stakeholders and their roles are related to sustainable supply chain management practices. A systematic literature review including 78 peer-reviewed English journal articles published between 2000 and 2020 was conducted. The results suggest that multiple supply chain external and internal stakeholders drive, facilitate, or inspect the implementation of sustainable supply chain management practices. While governmental and non-governmental organizations are key drivers for implementing sustainable supply chain management practices, they can also support their implementation. Moreover, proactive engagement with external supply chain stakeholders facilitates the organizational learning process through capability development, increasing understanding and awareness of sustainability, and creating knowledge. This study strengthens the value of proactive and collaborative measurements to deal with stakeholder issues before putting pressure on a company, which can result in reputation and legitimacy loss. These insights enrich the theoretical debate while explaining stakeholders' relevance and roles in the sustainable supply chain management context. However, the study has some limitations regarding the chosen sustainable supply chain management and stakeholder constructs and potential within-study bias, offering possibilities for further research.

Keywords: Sustainable Supply Chain Management, Stakeholder Roles, Collaboration, Engagement, Systematic Literature Review

4.2 Introduction

Although sustainable supply chain management (SSCM) can be a significant source of competitive advantage, implementing the underlying SSCM practices typically requires more resources and knowledge than a single focal firm possesses (Beske und Seuring 2014; Oelze et al. 2016). SSCM means that organizations and their supply chain (SC) partners aim to meet economic, environmental, and social requirements stemming from stakeholders by managing SC flows accordingly (Seuring und Müller 2008). Thus, Pagell und Wu (2009) proposed that working with non-traditional SC members, such as non-governmental organizations (NGOs), competitors, or other stakeholders, is essential for SSCM. So far, multiple studies have perceived stakeholders as drivers rather than taking an integrative approach with a more differentiated view toward stakeholders in the SSCM debate (e.g., Hörisch et al. 2014; Meixell und Luoma 2015; Rebs et al. 2019). For example, Meixell und Luoma (2015) conducted a literature review and analyzed stakeholder pressure in the context of awareness, adoption, and integration of SSCM practices to show how stakeholder pressure affects SC sustainability. According to Maas et al.'s (2018) quantitative analysis, stakeholder pressure leads to the integration of environmental practices and enhancement of the company's financial performance. While Maas et al. (2018) only considered the environmental dimension, Rebs et al.'s (2019) study indicated that stakeholders' pressure impacts SSCM performance cross-dimensionally. Furthermore, Fritz et al. (2018) suggested an iterative process to reveal SC stakeholders and how they identify and manage their concerns. Stakeholder engagement, thus, facilitates the detection of further stakeholders along the SC. Hence, although these studies consider stakeholders as drivers or recipients of initiatives taken by companies, additional stakeholder roles remain indistinct.

According to Liu et al. (2018a), stakeholders can take the valuable role of driver, facilitator, or inspector within the process of supplier development, a sub-component of SSCM, to close knowledge or resource gaps. We argue that the same is likely to hold for SSCM practices in general (e.g., Busse et al. 2017; Oelze et al. 2016; Meixell und Luoma 2015). For instance, Busse et al. (2017) proposed that stakeholders can support companies in detecting SC sustainability risks, particularly when they face low SC visibility. However, to the best of our knowledge, no study has analyzed different stakeholders and their roles within SSCM practices so far.

By taking this into account, the following research question was derived:

- How are stakeholders and their roles related to SSCM practices?

Several SSCM concepts deal with the question of how a sustainable SC might be achieved (Seuring und Müller 2008; Pagell und Wu 2009) and even what a truly sustainable SC means (Gold und Schleper 2017). Beske und Seuring's (2014) conceptual framework offers a starting point because it incorporates pivotal SSCM studies, such as Pagell und Wu (2009), and operationalizes SSCM through a generic list of SSCM practices. Furthermore, it is well accepted in the current debate and has been used in multiple studies (e.g., Khalid et al. 2015; Sauer und Seuring 2017).

As this paper seeks to enrich the theoretical debate on stakeholder roles in SSCM, the literature is analyzed with the help of Beske und Seuring's (2014) and Liu et al.'s (2018a) frameworks. These frameworks serve as the theoretical starting point for assessing the roles of stakeholders as drivers of SSCM practices with the help of a literature review (e.g., Meixell und Luoma 2015). This research is relevant for at least two reasons. First, it extends the stakeholder perspective in SSCM and explores the current state of research concerning stakeholders and their roles in an SSCM context. Second, the aggregated view ensured by reviewing the literature will guide both academics and business practitioners, as shown by other literature reviews in SSCM (e.g., Meixell und Luoma 2015; Siems et al. 2021; Rebs et al. 2019). Thus, exploring the current state of research concerning stakeholder roles in SSCM could identify research gaps and future research directions in the academic debate. Academics can learn about so far unexplored stakeholder roles to foster the implementation of SSCM practices. For practitioners, this study is important to identify stakeholders and the roles they take in the implementation of SSCM practices.

For this purpose, the next section of this paper builds the underlying terminological foundation. The methodology section outlines the literature review grounded in qualitative content analysis and contingency analysis. This is followed by the presentation of the results and discussion of the identified issues. Lastly, we outline our research limitations and propose possible future research opportunities.

4.3 Conceptualization

4.3.1 Stakeholder theory

In general, stakeholder theory describes how organizations deal and interact with individuals or groups (i.e., stakeholders) that exert an influence or are influenced by their business operations (Freeman 2010). As SSCM aims to meet sustainability requirements stemming from stakeholders, it is crucial to identify them. Yet multiple definitions of stakeholders exist—either

broad and inclusive ones or narrow and pragmatic ones (Donaldson und Preston 1995). For example, Donaldson und Preston (1995) defined stakeholders as "persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity" (p. 85). This definition emphasizes that an actor needs at least a legitimate claim or stake in the organization to be considered a stakeholder. Scholars have identified various stakeholders for a firm (Meixell und Luoma 2015; Parmar et al. 2010). While some studies have clustered stakeholders against generic classes, such as NGOs, citizens, or employees (e.g., Busse et al. 2017; Freeman 2010), other researchers have classified stakeholders even more broadly, resulting in fuzzy and unclear subdivisions (e.g., Rebs et al. 2019). According to Park-Poaps und Rees (2010), firms' stakeholders vary depending on different factors, such as their perceived importance, the time, or the context. However, Svensson et al. (2016) proposed the five dimensions of the focal company, downstream stakeholders, societal stakeholders, market stakeholders, and upstream stakeholders to frame the different stakeholders for the sustainable SC context (see Table 4.1). For example, the focal company contains top management, middle management, or employees as subordinated stakeholders. Norris et al.'s (2021) conceptual study emphasized that employees can provide knowledge capital and creativity to create value for all involved stakeholders at a more comprehensive level.

Table 4.1: Stakeholder dimensions adapted from Svensson et al. (2016)

Dimension	**Stakeholder construct example**	**Example in the analyzed literature**
Upstream stakeholders	This group contains upstream internal SC stakeholders such as raw material producers, suppliers, and suppliers' suppliers.	(Busse et al. 2017; Camargo et al. 2019)
Focal company	This group contains internal stakeholders of the focal company, such as top leadership, middle management, and employees.	(Meqdadi et al. 2020; Roy et al. 2020)
Downstream stakeholders	This group contains downstream internal SC stakeholders such as retailers, wholesalers, and logistical intermediaries.	(Chkanikova 2016; Nayak et al. 2019)
Market stakeholders	This group contains stakeholders such as unions, competitors, and financial intermediaries.	(Sajjad et al. 2019; Camargo et al. 2019)
Societal stakeholders	This group contains social stakeholders such as NGOs, governmental actors, and research institutes/universities.	(Stekelorum et al. 2020; Aboelmaged 2012)
Stakeholder without specification*	This item covers the general mentioning of the term stakeholder.	(Roscoe et al. 2020; Silva und Schaltegger 2019)
*During the coding process, we identified the need to add "Stakeholder without specification" since multiple studies proposed SSCM practices but only linked to stakeholder as a broad term.		

Although we consider the five dimensions to be a good starting point to frame stakeholders in the SC context, according to our SC understanding, the subordinated stakeholders differ from the original suggestion. For example, customers are separated from end-users—when the underlying study allows such a precise separation—to enable a more precise analysis. Both stakeholders are shifted to downstream stakeholders instead of market stakeholders since they are frequently considered essential SC actors (e.g., Fritz et al. 2018; Rebs et al. 2019; Seuring und Müller 2008).

Different stakeholder approaches have emerged over the years (Hörisch et al. 2014). According to Donaldson and Preston (1995), these can be traditionally distinguished into descriptive/empirical, instrumental, and normative approaches. A descriptive/empirical approach seeks to describe the extent to which organizations and stakeholders' interests are managed and to link theoretical assumptions in reality and practice (Richter und Dow 2017; Donaldson und Preston 1995). An instrumental approach strives to analyze how the management of stakeholder interests can be linked to achieving conventional business

objectives, such as economic growth or profitability. This has been criticized because of the indication that more ethical actions should contribute to better financial performance (Richter und Dow 2017; Hörisch et al. 2014). A normative approach defines moral and philosophical values and advice according to the management's behavior and the company (Donaldson und Preston 1995). However, Hörisch et al. (2014) and Parmar et al. (2010) proposed integrating the three different approaches (integrative stakeholder theory), as they are directly linked to each other and cannot be considered in isolation.

Stakeholder theory was generally criticized for having a weak normative basis; thus, Richter und Dow (2017) proposed a deliberative approach emphasizing the relevance of dialogue and participation to reach corporate legitimacy. This allows "to (…) understand the role of legitimacy for a stakeholder claim, (…) provide insights into the operationalization of stakeholder dialogues, and (…) enhance the understanding of the responsibilities of corporations toward stakeholders in times of globalization" (p. 440).

Based on these five different approaches, different understandings of SSCM emerge. The derivation of the stakeholders' SSCM requirements and resulting objective can be accomplished through a more descriptive, instrumental, normative, integrative, or deliberative approach. Thus, these approaches are taken up in the analysis of the coding material (see Table 4.6).

4.3.2 Stakeholder roles and sustainable supply chain management

Interest in sustainable SCs has been growing for over a decade and has become mainstream in academic discourse (Ansari und Kant 2017a; Ahi und Searcy 2013). According to Touboulic und Walker (2015), SSCM definitions include more aspects and perspectives and have become more precise and multifaceted since 2000, but most contain similarities. We follow the well-cited definition put forward by Seuring und Müller (2008) of SSCM as "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements" (p. 1700). In addition to emphasizing stakeholders' crucial role through the definition, stakeholder theory is one of the most applied theories in the SSCM field (Touboulic und Walker 2015). For example, Maas et al. (2018) used stakeholder theory to argue why stakeholders' pressure triggers companies to adopt environmental practices.

Most recent research has examined how several sustainability practices can address different stakeholder claims and how different strategies might impact an organization's economic,

environmental, or social performance (e.g., Busse et al. 2017; Maas et al. 2018; Rebs et al. 2019). For example, Rebs et al. (2019) used a system dynamics model to analyze stakeholder influence (governmental and other external stakeholders' pressure) on sustainable SC performance.

Thus, the intersection of stakeholders and the SC itself and how stakeholders may contribute to a more sustainable SC are rarely analyzed or defined. Scholars have recently identified the link between stakeholders and sustainable risk management in SCs as a major research opportunity for the future (Reefke und Sundaram 2017).

Carmagnac (2021) proposed four roles of non-traditional SC stakeholders: instigating a change, supporting training or the development of standards, facilitating the organization of actors, and leading the SC transformation. Unlike traditional stakeholders such as buyers and suppliers, non-traditional stakeholders comprise NGOs, social enterprises, local communities, or multi-stakeholder initiatives (Carmagnac, 2021). Liu et al.'s (2018a) study also covered the aforementioned roles. Hence, the instigating and leading role is framed as the driver while the facilitator embraces the supporter and facilitator role. Furthermore, Liu et al. (2018a) suggested the additional role of an inspector for stakeholders in the context of supplier development (see Table 4.2). Nevertheless, other studies indicated stakeholders' possible contributions to SSCM practices (e.g., Busse et al. 2017; Meixell und Luoma 2015; Siems und Seuring 2021).

By taking different roles, stakeholders can act as a driver, facilitator, or inspector to ensure the implementation of SSCM practices. The aforementioned framework of Beske und Seuring (2014) comprehensively operationalized SSCM and has been used multiple times already and been extended to different contexts, such as the mineral (Sauer und Seuring 2017) or Base of the Pyramid (Khalid et al. 2015). The framework contains five categories and several subordinated practices. While a category is defined as "an umbrella term to group and sort the different practices and link them to relevant issues, "a practice is understood as "the customary, habitual or expected procedure or way of doing something" (Beske and Seuring, p. 323). The five main categories are (1) orientation, (2) continuity, (3) collaboration, (4) risk management, and (5) proactivity (see Table 4.3). We refrain from offering a pure repetition of the framework and present it later in the order of the findings. Nevertheless, to underline the suitability of these constructs and their line of argumentation, the following section elaborates on how stakeholders can be linked to these categories.

(1) The orientation to a triple-bottom-line (TBL) approach means the top management taking a more holistic supply chain management (SCM) view and is of strategic relevance (Sauer und Seuring 2017). SC external stakeholders, such as NGOs, can drive awareness for the adoption

of SSCM practices due to pressure, incentives, or detection of sustainability blind spots/vulnerabilities, such as in the case of low SC visibility (Meixell und Luoma 2015).

(2) Due to supplier development or selection, long-term relationships are favored and result in more stable supplier continuity (Beske und Seuring 2014). Seuring und Müller (2008) suggested that companies should engage in supplier development to enhance overall performance and capabilities (e.g., via training or technical investment). Supplier selection is equally important to ensure high SC performance owing to suppliers organizational values or capabilities (Pagell und Wu 2009; Siems et al. 2021). Different stakeholders can support the focal firm in evaluating and assessing suppliers' sustainability performance, especially when facing the challenge of having no direct access to a supplier (Beske und Seuring 2014; Siems und Seuring 2021). According to Busse et al. (2017), stakeholders can support companies to detect SC sustainability risks, while "gatekeeper instruments" (e.g., codes of conduct or third-party standards) can help to select suitable suppliers, monitor risks, and impact suppliers' behavior (Rebs et al. 2019). Moreover, cooperation with NGOs can lead to the sharing of knowledge, skills, and other resources (Wankmüller und Reiner 2020).

(3) Furthermore, implementing sustainability leads to increased collaboration between the SC actors, for instance, by enhancing communication and striving for technical and logistical integration (Beske und Seuring 2014; Gold et al. 2010; Wankmüller und Reiner 2020). Due to SC complexity, transparency issues, and limited resources, focal firms sometimes have limited access to their suppliers. Therefore, they might be unable to implement the demanded SSCM practice despite their willingness to tackle it. Thus, Pagell und Wu (2009) proposed that working with non-traditional SC members is essential for achieving a more sustainable SC. For example, Siems und Seuring (2021) suggested that a focal firm could integrate SC external and internal stakeholders into SSCM practices in its internal and external dimensions to gain a more sustainable SC. Therefore, stakeholders also help facilitate SSCM practices by orchestrating resources, such as knowledge or capital (Busse et al. 2017; Liu et al. 2018a).

(4) To address stakeholder pressure, selective monitoring or certification and standards are common for managing risks. While standards and certification are commonly used as minimum requirements (Seuring und Müller 2008; Khalid et al. 2015), companies install monitoring systems to control the desired performance outcomes.

Pressure groups, such as NGOs, or the media might launch campaigns and boycotts against targeted companies, but they are also a valuable source of knowledge (Busse et al. 2017; Siems und Seuring 2021). According to Fritz et al. (2018), SC internal and external stakeholders can support the process of identifying further stakeholders and their concerns. Collaborating with

those stakeholder groups might facilitate identifying and avoiding potential sustainability risks (Pagell und Wu 2009; Beske und Seuring 2014).

(5) Additionally, acting more proactively by, for example, involving stakeholder(s) (management) and being willing to understand their issues and learn(ing) from them can also lead to innovation (Pagell und Wu 2009; Seuring und Müller 2008; Siems und Seuring 2021). Consequently, a set of possible practices is helpful to identify opportunities for stakeholders to occupy different roles to contribute to a more sustainable SC.

Therefore, the different roles of stakeholders proposed by Liu et al. (2018a), their specific issues, and SSCM practices proposed by Beske und Seuring (2014) frame the further research process. Tables 4.2 and 4.3 merge those deductively derived categories and constructs. The references in the third column in both tables provide evidence that the presented constructs are still relevant in the current SSCM debate. These constructs are used to evaluate the body of literature.

Table 4.2: Overview of stakeholder roles adapted from Liu et al. (2018))

Categories and constructs	Description	Example in the analyzed literature
Stakeholder roles		
Drivers	Stakeholders who drive awareness for sustainability (e.g., pressure or incentives)	(Camargo et al. 2019; Foerstl et al. 2015)
Facilitators	Facilitators provide knowledge and resources in order to support a company when implementing SSCM practices	(Dahlmann und Roehrich 2019; León-Bravo et al. 2019)
Inspectors	Inspectors might evaluate or assess the implemented SSCM practices along with the SC subsequently	(Silvestre et al. 2018; Chen und Kitsis 2017)

Table 4.3: Overview of SSCM practices (adapted from Beske and Seuring [2014])

Categories and constructs	Description	Example in the analyzed literature
SSCM practices		
Orientation		
SCM TBL	The orientation to a TBL approach means taking a more holistic SCM view by the top management and is of strategic relevance.	(Sajjad et al. 2019; Gualandris et al. 2015)
SC continuity		
Long-term relationships Partner development Partner selection	Due to supplier development or selection by incorporating non-traditional SC actors, long-term relationships are favored and result in a more stable SC member continuity.	(Dahlmann und Roehrich 2019; Silvestre et al. 2018; Busse 2016)
Collaboration		
Joint development Technical integration Logistical integration Enhanced communication	Implementing sustainability leads to increased collaboration between internal (e.g., supplier, focal firm) and external (e.g., communities, NGOs) SC actors, for instance, by enhancing communication and striving for technical and logistical integration.	(Köksal et al. 2017; Oelze et al. 2016; Camargo et al. 2019)
Risk management		
Individual monitoring Pressure group management Standards and certificates	For addressing pressure by groups such as media or customers, selective monitoring or certification and standards provided, for example, by NGOs, are common ways to manage risks.	(Paulraj et al. 2017; Wilhelm et al. 2016)
Proactivity		
Learning Stakeholder management Innovation Environmental proactivity* Social proactivity*	Acting more proactive by, e.g., the involvement of stakeholders (management) and the willingness to understand their environmental and social issues and learn(ing) from them can also lead to innovation.	(León-Bravo et al. 2019; Padhi et al. 2018; Rodríguez et al. 2016)

*During the coding process, we identified the need to split the original item "life-cycle assessment" into environmental and social proactivity, which we have added.

4.4 Methodology

Analyzing scientific literature in SSCM provides an aggregated view and is a valuable way to contribute to theory development (Seuring et al. 2021). The role of literature reviews can be

seen in multiple studies in the SSCM context (e.g., Khalid et al. 2015; Sauer und Seuring 2017; Siems et al. 2021). To reduce the researchers' bias, strengthen rigorousness, and meet practitioners' and policymakers' operational needs, it is essential that the literature is synthesized "in a systematic, transparent, and reproducible manner" (Tranfield et al. 2003, p. 207). Thus, this research follows a replicable and transparent process, as recommended for literature reviews (e.g., Meixell und Luoma 2015). The purpose is to gain an extensive overview of the SSCM practices and stakeholder roles inherent in in the SSCM research context.

First, we conducted a literature review grounded in qualitative content analysis (Seuring und Gold 2012). This expedient approach encompasses a systematic, rule-governed, and reproducible design while being guided by theory to identify, evaluate, and interpret the existing body of literature (Mayring 2015). A qualitative content analysis-based literature review is a recommended way to anchor a research idea in the body of existing knowledge (Seuring und Gold 2012; Seuring et al. 2021). It is also a valid tool for consolidating and developing an existing theory by, for instance, outlining current research gaps. The applied structured literature review approach suggested by Seuring und Gold (2012) also includes the more generic qualitative content analysis by Mayring (2015) and encompasses a four-stage process comprising material gathering, descriptive analysis, category definition, and material analysis and evaluation. This approach is well in line with the five-phase cycle according to Yin (2016), who suggested compiling, dis- and reassembling, and iteratively interpreting qualitative data before conclusions can be derived.

The first step was to gather literature using the Web of Science and Scopus search engines, two of the largest databases for peer-reviewed journals. As several studies concluded that the SSCM discourse started around 2000 (e.g., Seuring und Müller 2008; Touboulic und Walker 2015), the search targeted the time scope of 2000–2020. 2020 was set as the end date because the research started in 2021, and only entire years were considered. While this bears the risk of missing some recent studies, it ensures that the most important debates are analyzed in a consistent and complete set of 20 years of data.

After limiting the number of articles by keywords, the identified articles from both databases were merged and duplicates were removed. The abstracts of the remaining articles were screened manually by following the exclusion criteria, resulting in 78 articles (see Table 4.4). Excluded were articles restricted to only one dimension of sustainability because we recognized the concept of SSCM as a holistic view within all three dimensions that needed to be considered. For instance, few authors used the term "sustainability" while being restricted in their investigations to economic issues. Since we were exploring the intersection of stakeholder roles

and SSCM, we ruled out articles that did not make stakeholders of a company the core purpose of the analysis, articles where stakeholders were only mentioned as receivers of the results, or articles that applied the term "stakeholder" as a synonym for selected groups, for example, by referring exclusively to internal SC actors.

Table 4.4: Search and reduction steps during the material collection

Search and limiting steps	**Identified/remaining articles**	
Initial search (string)	Web of Science	Scopus
("SSCM" OR "sustainable supply chain*" OR "sustainable supply chain management" OR "supply chain sustainability") AND TOPIC: ("stakeholder*" OR "pressure*" OR "third-party" OR "third party" OR "non-traditional")	442	490
	Identified/remaining articles after merging	
Manual screening of abstracts by considering the following inclusion criteria: only peer-reviewed English articles; clear focus on stakeholders; clear SC-focus; clear sustainability focus.	156	
Manual screening of the full paper vis-à-vis the research objective.	78	

The descriptive analysis presents formal characteristics to explain the analyzed materials' background. For instance, the kinds of journals in which the articles were published, the geographic and SC foci, and the applied stakeholder approaches were further categories for the descriptive analysis. Using existing theoretical frameworks (see Tables 4.1, 4.2, and 4.3) contributes to external validity within a qualitative content analysis. Two researchers worked through a portion of the sample and discussed their results to achieve additional validity and reliability. Subsequently, one researcher coded the remaining articles and exchanged them with other researchers to resolve potential ambiguities.

Second, we conducted a contingency analysis to add further insights to these more qualitative results to reveal additional connections between the items. Gold et al. (2010) claimed that a contingency analysis seeks to extract "association patterns between categories, i.e. […] pairs of categories which occur relatively more [or less] frequently together in one paper than the product of their single probabilities would suggest" (p. 235). The actual occurrence of category pairs can be referred to as the observed frequency and the product of their single probabilities as the expected frequency.

A chi-squared test was undertaken by using the calculated constructs' frequencies to identify possible relationships between constructs. To be valid and relevant, a set of two relationships

must meet two criteria. First, the pair of relationships must appear in no less than 10% of the entire literature sample. Thus, a distraction due to construct correlations only occurring in a minor number of articles could be avoided. Second, the phi value must exceed |0.299|, because a lower value indicates little strength of the pair's relationship (Gold et al. 2010). To understand a correlation of a pair, their theoretical interpretation is essential because a contingency analysis only points out a connection between them. A transparent and documented research process obtains further validity. For example, repeatability is possible, as databases and keywords are given. However, this study also has its limitations. For example, a literature review involves several biases that we aimed to minimize but might not have entirely avoided. Furthermore, different methods exist to conduct a contingency analysis that might lead to varying results.

4.5 Results

The results are structured into the descriptive analysis, qualitative content analysis, and quantitative contingency analysis. We acknowledge that our analysis represents a one-shot picture, since the analyzed studies show particular stakeholders at one moment rather than presenting an analysis that provides evidence of changing stakeholders and their roles over time.

4.5.1 Descriptive analysis

To provide further information on the data context to understand the reviewed material better, the first part of the analysis is a descriptive analysis. Figure 4.1 shows a steady increase in the number of scientific publications over the years until the peak in 2016. Interestingly, this chart shows the decrease in published articles at the intersection of stakeholder and SSCM starting in 2019. Yet different authors acknowledged the potential for more research on using stakeholder theory in the context of SSCM (Rebs et al. 2019; Silva und Schaltegger 2019).

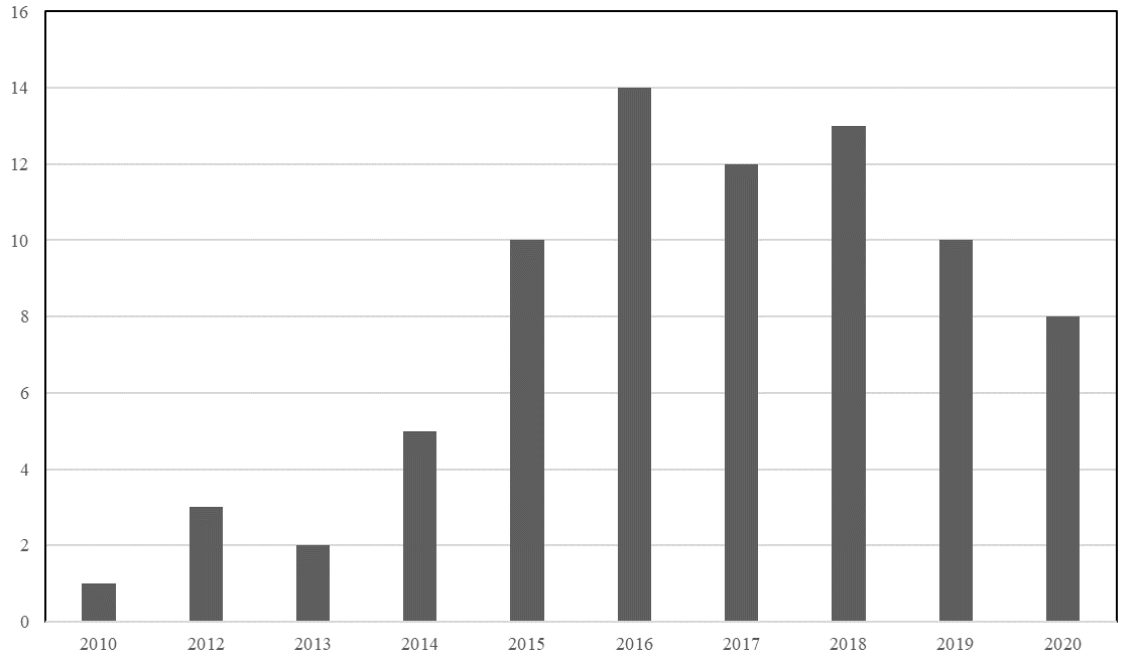

Figure 4.1: Distribution of reviewed articles over time (n = 78)

Table 4.5 provides an overview of the distribution of reviewed publications across the journals. *Journal of Cleaner Production* (JCLP) has the most published articles, followed by *Business Strategy and the Environment* (BSE), and with four publications each, *Sustainability*, *International Journal of Physical Distribution and Logistics Management* (IJPDLM), *International Journal of Production Economics* (IJPE), and *Journal of Business Ethics* (JBE).

Table 4.5: Distribution of reviewed articles over journals (n = 78)

Name	Number
JCLPRO	12
BSE	7
SUSTAINABILITY	4
IJPDLM	4
IJPE	4
JBE	4
JSCM	2
RCR	2
IMM	2
IJOPM	2
PPC	2

Rest appeared less than two times

Table 4.6: Distribution of reviewed articles over stakeholder approaches (n = 78)

Approach	Number
No approach	59
Instrumental approach	8
Descriptive approach	5
Integrative approach	5
Normative approach	1
Deliberative approach	0

The majority of the analyzed publications did not apply or discuss a specific stakeholder approach as proposed by Donaldson und Preston (1995). This can be attributed to the fact that stakeholders' appearance often per se is considered, and no precise approaches are chosen to reconcile interests. Nonetheless, eight articles used an instrumental approach, and five articles adopted a descriptive and integrative approach as discussed by Hörisch et al. (2014) (see Table 4.6). While the studies with an instrumental stakeholder view focused on why companies should consider stakeholders to achieve a competitive advantage (e.g., Awan et al. 2017; Roscoe et al. 2020; Maas et al. 2018), those with a descriptive view sought to distinguish different stakeholders from each other (e.g., Gualandris et al. 2015).

The studies with an integrative approach analyze the relationships between companies and their stakeholders where the involved actors work collaboratively to increase mutual benefit for all parties instead of purely seeking to augment the company's economic return (e.g., Matos und Silvestre 2013; Sajjad et al. 2019).

Furthermore, the only study with a normative approach argues that organizations must continuously realign their capabilities and sustainability practices to align with their stakeholders' expectations since they build their foundation.

Although most articles did not explicitly mention an approach, some indicated somewhat descriptive ideas to explain specific constructs from the SSCM (stakeholder) debate (Kumar und Rahman 2017; Silvestre et al. 2018). However, instead of a differentiated discussion, as put forward by, for example, Busse (2016) or Sajjad et al. (2019), those studies with no stakeholder

approach referred to stakeholder pressure as the reason for incorporating sustainability into SCs. In contrast to the already listed approaches, normative and deliberative approaches are (almost) not considered. This is owing to the fact that approaches based on moral behavior and the principles of deliberative democracy are not considered valid approaches to address stakeholder interests.

The following section presents the results of the content analysis-based literature review.

4.5.2 Qualitative content analysis of stakeholder roles in the sustainable supply chain management context

Only those codings with a clear overlap between one construct from each debate—that is, stakeholders, their role, and SSCM practices—were considered in the qualitative content analysis.

Table 4.7 shows the distribution of identified stakeholders in their roles coded against the dimensions proposed by Svensson et al. (2016). Although Svensson et al. (2016) suggested different stakeholders for their dimensions, Table 4.7 considers only the identified stakeholders, inductively extended on the basis of the findings (e.g., financial intermediaries). Stakeholders were only considered in the case of a clear link between a role and an SSCM construct.

The analysis reveals that "societal stakeholders" show the highest occurrence in the entire sample. As expected, many articles presented NGOs as one of the biggest contributors to a more sustainable SC. For example, NGOs, owing to their on-the-ground understanding, can bridge the expectations of upstream SC stakeholders, such as consumers, with the downstream SC stage (Gurzawska 2020). Hence, they can facilitate the process of translating consumer expectations into an appropriate SC measurement. Furthermore, they pressure focal firms by making public unsustainable business practices, such as environmental pollution or child labor (Roy et al. 2020; Sajjad et al. 2019). In her case study, Wolf (2011) showed that NGOs' pressure focuses on upstream SC practices rather than all stages.

Governmental entities are also well distributed across the roles (see Table 4.7). Both governmental organizations and NGOs are key drivers and facilitators for implementing SSCM practices (Wolf 2011; Roy et al. 2020; Sajjad et al. 2019). While NGOs rather support single SCs (Stekelorum et al. 2020; e.g., Busse et al. 2017), governmental actors can establish a coherent policy framework to stimulate the industry-wide development of SSCM (Govindan 2018; Brix-Asala et al. 2018). Noteworthy, once NGOs are well-organized and powerful, they might also be able to shape an entire industry by, e.g., industry standards or benchmark reports.

However, Table 4.7 demonstrates that customers are most frequently identified in the role of driver of SSCM. While the high occurrence of customers and end-users was expected, the analysis reveals only retailers in the role of further downstream stakeholder in a few articles. Even though some studies reported retailers as the driver, facilitator, or inspector of SSCM practices (e.g., Chkanikova 2016; Roy et al. 2020), other scholars suggested that retailers are the recipient of external stakeholder pressure (León-Bravo et al. 2019; Köksal et al. 2017). Both groups of scholars assign a core role to retailer in achieving a more sustainable SC (Chkanikova 2016; León-Bravo et al. 2019; Roy et al. 2020). Surprisingly, other stakeholders, such as wholesalers or logistic intermediaries, could not be observed in a particular role for driving, facilitating, or inspecting SSCM practices.

Table 4.7: Distribution of stakeholders to their roles

	Drivers	**Facilitators**	**Inspectors**
Upstream stakeholders			
Suppliers	14	15	9
The focal company			
Shareholder	12	0	1
Top leadership/management	22	14	3
Employees	20	9	2
Downstream stakeholder			
Customers	45	5	3
End users	19	1	1
Retailer	2	2	2
Market stakeholders			
Financial intermediaries	5	3	0
Unions	7	1	1
Competitor	19	5	1
Industry association	5	8	4
Societal stakeholders			
NGO	35	31	16
Research institute / universities	2	7	0
(local) Communities	14	4	4
Media	20	5	2
Governmental entities	44	17	11
Stakeholder without specification	**23**	**7**	**1**

***** Appearance of a combination of a particular stakeholder and a role is only counted one time per paper for avoiding a distraction by a high number of occurrences of a specific combination in one single paper.

Regarding the role-specific distribution of stakeholders, the inspector role appears underrepresented compared to the other two roles. Thus, it can be questioned why inspector-

related SSCM practices remain underrepresented to date and whether stakeholders could play this role in the SSCM context.

Table 4.8 shows the distribution of stakeholder roles in the different SSCM practices. Their occurrence is calculated at the category and individual levels. Since an article can be assigned to more than one item per category, a category's frequency can be lower than the sum of its subordinated frequencies (see Table 4.8).

For example, the constructs in the category "continuity" are linked to stakeholders in the role of "driver" in 22 articles, to "facilitator" in 23 articles, and to "inspector" in nine articles. While 16 articles contain one corresponding combination, nine articles have two combinations, four articles have three combinations, one article has four combinations, and one article has five combinations. Therefore, the resulting sum is 31 instead of 55.

A holistic orientation toward SCM and TBL is the first category derived from Beske und Seuring's (2014) framework. The analysis reveals a link between this category and one of the three stakeholder roles in the literature sample, as shown in Table 4.8. The most commonly identified role of a stakeholder is as a driver of a TBL orientation.

Table 4.8: Results from the qualitative content analysis for stakeholder roles linked to SSCM

SSCM Categories and construct	Stakeholder role	Driver	Facilitator	Inspector
Orientation	**26**	25	4	0
TBL		18	4	0
SCM		7	0	0
Continuity	**31**	22	24	9
Long-Term Relationships		3	4	0
SC Partner Selection		15	9	4
SC Partner Development		4	11	5
Collaboration	**35**	16	21	10
Technological Integration		2	0	0
Logistical Integration		0	1	0
Enhanced Communication		11	10	8
Joint Development		3	10	2
Risk Management	**55**	40	23	16
Standards and Certificates		15	9	6
Selective Monitoring		12	9	9
Pressure Groups		13	5	1
Proactivity	**78**	49	49	21
Learning		4	13	3
Stakeholder Management		13	11	7
Innovation		9	9	4
Environmental Pro-Activity		13	10	4
Social Proactivity		10	6	3

***** Appearance of a combination of a particular stakeholder role and SSCM construct is only counted one time per paper for avoiding a distraction by a high number of occurrences of a specific combination in one single paper.

However, according to the analyzed material, stakeholders drive companies toward a TBL orientation in various ways. While governmental actors use regulations or tax incentives (e.g., Roscoe et al. 2020), internal stakeholders, such as employees, pressure their employers for a more holistic consideration of sustainability (Chen und Kitsis 2017). The analysis also indicates that companies, driven by external stakeholders (e.g., media and NGOs), were described as more reactive and as having already faced reputation loss before incorporating a TBL orientation into their SC (Busse 2016). On the contrary, focal firms, driven by customer demands and an awareness of future trends due to changing needs, were described as more proactive than reactive (Govindan 2018). Overall, the research has neglected how stakeholders

could be integrated into the process of defining/determining a coherent corporate sustainability policy. However, the analysis reveals that a TBL orientation is a holistic view that hampers the assignment to specific stakeholder roles. This finding strengthens our decision to distinguish between environmental proactivity and social proactivity, as Sauer and Seuring (2017) suggested.

Table 4.8 shows that 31 out of 78 articles mentioned stakeholder roles in the debate on SC continuity. The results indicate that multiple studies revealed that SC partner selection is regularly linked to customer pressure; companies tend to drop suppliers instead of cooperating or developing them (e.g., Busse 2016; Chen und Kitsis 2017). As Padhi et al. (2018) stated, "it may be because the firms prefer to select a supplier with a better TBL performance than to collaborate and develop sustainability practices with existing suppliers" (p. 11). Conversely, the analysis discloses several possibilities for stakeholders to assist focal firms with supplier development. For example, NGOs can support focal firms to identify best practices or provide resources, such as knowledge and assistance with training programs (Govindan 2018; Rodríguez et al. 2016). In addition, governmental bodies can drive and facilitate SSCM practices in the SC with the help of regional development funds for the certification process or suppliers' training (Wilhelm et al. 2016). Thus, more participatory/action research approaches with multi-stakeholder networks might support companies in achieving more sustainable SCs.

Collaborating with non-traditional SC members (e.g., universities), as suggested by Pagell und Wu (2009), allows the spread of superior SSCM practices across the industry to interchange knowledge or education and identify risks (Silvestre 2015; Oelze et al. 2016). In fact, nearly half the sample discussed stakeholder roles in the context of collaboration constructs. Enhanced communication shows the highest number of assigned roles (driver, facilitator, and inspector) within the collaboration category. On the one hand, consumers drive enhanced communication between SC partners due to changing (product) expectations (León-Bravo et al. 2019). On the other hand, enhanced communication with SC internal stakeholders is required to fulfill transparency expectations and inform them about applied sustainability practices (Chen und Kitsis 2017; Paulraj et al. 2017). Once enhanced communication with internal SC stakeholders is established, these stakeholders can facilitate identifying and addressing proactive sustainability risks or compliance violations (Sodhi und Tang 2017). Thus, this is closely linked to risk management constructs (Oelze et al. 2016).

However, stakeholders can join the development of projects and facilitate, for example, the improvement of products' environmental impact (Wilhelm et al. 2016). Even though Beske und Seuring (2014) outlined the importance of technological and logistical integration in the SSCM

context, Table 4.8 shows a low frequency of both constructs when considering stakeholders' contributions. This contrasting result is somewhat unexpected and might call for further research. However, Oelze et al. (2016) stated "that there are different approaches to supplier knowledge platforms" (p. 248) to improve organizational understanding. Besides, the analysis provides some indications of collaboration with stakeholders. For example, Stekelorum et al. (2020) proposed that SMEs should collaborate with international NGOs because they have the expertise and experience regarding other stakeholders and their expectations in different geographical settings and can assist in bridging existing knowledge and resource gaps.

At the same time, the total number of findings is still relatively low compared to other SSCM domains (i.e., risk management and proactivity). However, according to Busse et al. (2017), focal firms need to balance and evaluate the contributions of their stakeholders carefully. Otherwise, they might be distracted and consider only issues that are relevant to them.

Risk management shows the second-highest frequency (see Table 4.8). It incorporates the detection of risks and requires knowledge and transparency of the SC (Beske und Seuring 2014), which SC internal and external stakeholders can provide once companies collaborate with them (e.g., Rodríguez et al. 2016). According to Table 4.8, the most significant (risk management) practice is standards and certifications; several studies identified stakeholders as the main driver of standards and certifications (e.g., Seuring et al. 2019). For example, customers or end-users demand standards and certifications especially for the upstream SC (Sodhi und Tang 2017). Furthermore, multiple studies indicated that companies start to apply SSCM practices once they face pressure from stakeholders, such as media and NGOs (Wilhelm et al. 2016). Wolf (2014) described responding to pressure as a reactive (SSCM) strategy. Yet Roy et al. (2020, S. 11) showed that "by being simply reactive to stakeholder pressures, apparel manufacturing firms can obtain only fragmented leads when implementing sustainability practices" (p. 11).

However, "engagement with some stakeholders can provide an early warning system for emerging sustainability risks, anticipating unexpected negative outcomes before they occur" (Gualandris et al. 2015, p. 8). Thus, engagement facilitates the selective monitoring of critical SC stages due to third-party involvement in executing audits and assessing SC performance (Seuring et al. 2019; Sodhi und Tang 2017), strengthening the value of proactive and collaborative measurements to deal with pressure (Oelze et al. 2016).

The analysis uncovers at least one result for the proactivity category regarding underlying practices and stakeholder roles for each article of the sample (see Table 4.8). Within this category, stakeholder management, a core instrument for building a reputation (Sauer und

Seuring 2017), dominates the other practices, which can be explained by the study's research purpose in focusing on stakeholder-related SSCM literature. However, the analyzed studies suggest that proactive engagement with SC external stakeholders, such as research institutes or NGOs, facilitates the learning process due to capability development, increased understanding, and knowledge creation (Govindan 2018; Oelze et al. 2016). This engagement can trigger joint innovations (Padhi et al. 2018). Furthermore, León-Bravo et al. (2019) found that collaborating with NGOs can foster environmental awareness, cut costs, and contribute to higher natural resource efficiency. According to Wolf (2011), focal firms need a stakeholder integration capability to achieve a more sustainable SC. Additionally, Chen und Kitsis (2017) proposed that social or environmental proactivity can create a competitive advantage and, thus, drive competitors toward sustainability. Therefore, the results mentioned above, particularly the aforementioned calls for more research on social aspects in SSCM, might be a promising pathway for further studies (Meqdadi et al. 2020; Roy et al. 2020). To promote proactive engagements, particular attention should be paid to its interaction with collaboration and integration capabilities which is crucial to overcome reactive stances (León-Bravo et al., 2019; Wolf, 2011).

4.5.3 Contingency analysis

To better understand the stakeholder-related SSCM literature and examine which constructs have significant relationships, we conducted a quantitative contingency analysis via SPSS. This exploration of potential correlations between particular SSCM practices, stakeholders, and their roles allows us to distinguish pairs that appear disproportionately together in a portion of the sample. Table 4.8 contains for each pair the one-sided significance value, phi value (showing the soundness of the correlations), observed occurrence, and expected occurrence. Table 4.9 is structured from the highest to lowest phi values. In total, the sample contains 21 pairs with significant relationships, as shown in Figure 4.2.

Table 4.9: Results from the contingency analysis

Pair	X^2 - significance	φ – coefficient	Observed Frequency	Expected frequency
Societal stakeholders * Drivers (role)	0.000	0.698	74	72
Long-Term Relationships * Logistical Integration	0.000	0.466	11	4
Upstream stakeholders * Enhanced Communication	0.000	0.465	37	28
Joint Development * Stakeholder Management	0.000	0.460	28	19
Technological Integration * Logistical Integration	0.000	0.424	8	3
Upstream stakeholders * Technological Integration	0.000	0.413	16	10
Technological Integration * Enhanced Communication	0.000	0.413	16	10
Upstream stakeholders * Market stakeholders	0.000	0.410	45	39
Joint Development * Learning	0.000	0.399	22	14
Logistical Integration * Joint Development	0.000	0.397	12	6
Enhanced Communication * Joint Development	0.000	0.397	28	20
Upstream stakeholders * Stakeholder Management	0.000	0.396	34	27
Upstream stakeholders * Long-Term Relationships	0.001	0.389	22	15
Upstream stakeholders * The focal company	0.001	0.388	35	28
Stakeholder Management * Innovation	0.001	0.386	26	19
Upstream stakeholders * Logistical Integration	0.001	0.380	14	8
Upstream stakeholders * Social Proactivity	0.002	0.352	29	22
Drivers * Logistical Integration	0.002	0.347	12	14
Joint Development * Innovation	0.002	0.346	21	14
Upstream stakeholders * Joint Development	0.002	0.344	27	20
Enhanced Communication * Stakeholder Management	0.002	0.343	33	27

Looking at Figure 4.2, the first observation is the nexus around “upstream stakeholder,” which shows the highest number of contingencies (9). Despite this, “market stakeholder,” “focal firm,” and “social proactivity” show no further connections to other constructs, while the remaining six constructs are further linked. For example, “focal firm” and “market stakeholders” are connected to “upstream stakeholders” (i.e., supplier and supplier’s supplier), which are further linked to all collaboration practices. This nexus emphasizes the line of argumentation that powerful stakeholders, such as customers or end-users, demand and drive the integration of SSCM practices, particularly for the upstream SC (Meixell und Luoma 2015).

“Technological integration” is contingent on “enhanced communication,” the core construct of the second cluster, which is connected to “upstream stakeholder.”

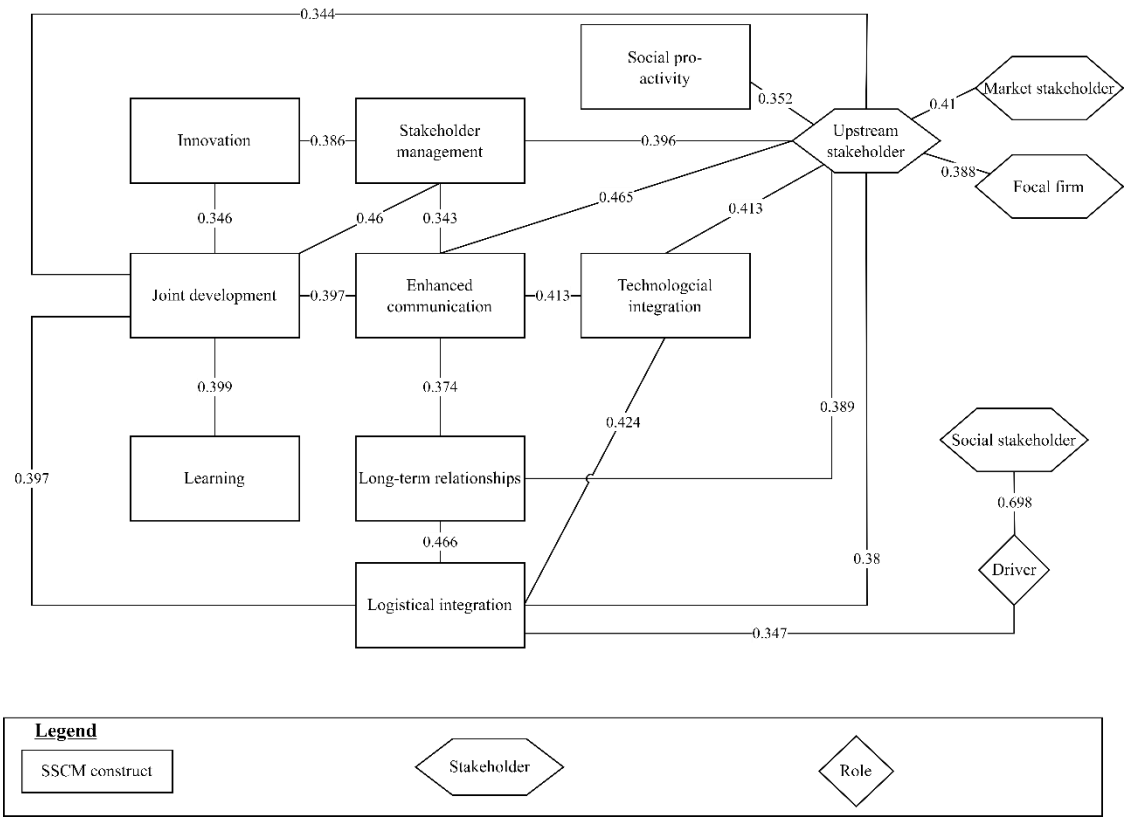

Figure 4.2: (Sustainable) SC model with stakeholder consideration

The second observation is that the other constructs, clustered around "enhanced communication," have different relationships. Figure 4.2 shows that "enhanced communication" directly connects to all other collaboration constructs (i.e., "joint development" and "technical integration") except for logistical integration, which is indirectly threefold linked. This finding underlines that collaboration with stakeholders is essential to achieve a more sustainable SC, in line with the established SSCM literature (Pagell und Wu 2009). "Joint development" is also contingent on three proactivity practices ("learning," "innovation," and "stakeholder management") and "logistical integration." The latter is connected to "upstream stakeholder," "technical integration," and "long-term relationships." This composition aligns with arguments in the SSCM literature that striving toward sustainability means building long-term relationships with suppliers and firmly integrating them (Beske und Seuring 2014).

Third, the line of argument around "stakeholder management" has four significant contingencies. Two contingencies are collaboration practices ("joint development" and "enhanced communication"), and one is the link mentioned above to "upstream stakeholder." The remaining connection is another proactivity practice, "innovation," which strengthens the value of proactive and collaborative measurements to integrate stakeholders into SC activities

(Oelze et al. 2016). Thus, integrating and learning from stakeholders facilitate the process of innovation and can result in joint development of products, as stated by Dahlmann und Roehrich (2019).

Surprisingly, the analysis shows no contingencies for constructs from the orientation and risk management category, and these constructs only appear together with other constructs as often as was statistically expected. This result might occur because the underlying and coded constructs are equally distributed within and over the analyzed literature and, thus, appear with no statistical peculiarity with other constructs (see Table 4.9). However, this is for the orientation category somewhat in line with the results from the qualitative analysis, where we identified a lack of examples where stakeholders were integrated into the process of defining/determining a coherent corporate sustainability policy (i.e., SCM and TBL orientation). This also holds for "downstream stakeholders, " the only stakeholder group showing no contingencies. This indicates that they are not noticeable frequently discussed with any other group of stakeholders, roles, or SSCM practices. This might be caused by the fact that this stakeholder group is less intensively embedded in the SSCM debate.

The last observation concerns the relationship between "societal stakeholders" and the "driver" role, which shows the strongest phi value of 0.698. Although social stakeholder as a driver of sustainability is an established argument in the SSCM literature (e.g., Meixell und Luoma 2015), only the construct "driver" shows one further contingency to the collaboration practice "logistical integration." Thus, societal stakeholders appear only as drivers more often than statistically expected even within the SSCM literature, which emphasizes a need to consider stakeholders in future studies. This result might call for further research with a more differentiated stakeholder view by considering stakeholders not only as a homogeneous phenomenon but individually according to their associated dimension and role.

4.6 Discussion and Contribution

4.6.1 Theoretical contribution

Since there is a lack of research on the intersection between stakeholder roles and SSCM (e.g., Rebs et al. 2019), this study contributes to the debate around the role stakeholders may play regarding SSCM practices. For example, Liu et al.'s (2018a) study focused on supplier development, representing only one component of SSCM (Beske und Seuring 2014). Our study extends the debate around stakeholder roles from supplier development to SSCM. It is in line with current studies that the SSCM discourse shows shortcomings regarding stakeholder roles

(e.g., Carmagnac 2021). Hence, our findings explain stakeholders' relevance and roles in the SSCM context, but possible research gaps could also be identified. Thus, to the best of our knowledge, this is one of the first comprehensive studies on stakeholders and their roles in the SSCM debate.

Although most of the reviewed publications showed no specific approach (see Table 4.6), the instrumental stakeholder approach—focusing on why companies should consider stakeholders—was found the most frequently in those articles with an approach (e.g., Awan et al. 2017; Maas et al. 2018; Roscoe et al. 2020). This is in line with Gold und Schleper (2017), who indicated that an instrumental perspective might dominate the discourse around SSCM because current business systems are shaped by a North American philosophy of profit maximization. According to Gold und Schleper (2017), shifting from a reification to a recognition perspective in the current debate might help to overcome the dominant instrumental sustainability interpretation. Thus, using recognition theory yields promising research opportunities in the context of SSCM and stakeholders.

Furthermore, this literature review indicates that some core constructs have been largely overlooked in the SSCM debate. Against our expectations, SC continuity or collaboration constructs had a rather moderate or even low occurrence (see Table 4.8), even though SC continuity brings sustainable benefits for all SC members (Beske und Seuring 2014). While enhanced communication (a collaboration practice) appeared in both the content and contingency analyses, the two other collaboration constructs (i.e., technological and logistical integration) showed low frequencies, even though Beske und Seuring (2014) outlined the importance of technical and logistical integration in the SSCM context.

In line with the results from the contingency analysis (see Figure 4.2), previous studies argued that striving toward sustainability means building long-term relationships with suppliers and firmly integrating them into the SC (e.g., Beske und Seuring 2014; Rebs et al. 2019).

While the results suggest that companies tend to drop suppliers instead of cooperating with or developing them (Chen und Kitsis 2017; Busse 2016), the analysis also identified possibilities for stakeholders to support focal firms in developing their suppliers (e.g., training provided by NGOs) (Govindan 2018; Padhi et al. 2018). Thus, more participatory research approaches (e.g., action research) with multi-stakeholder networks might be a valuable research avenue to support companies in achieving more sustainable SCs. Wickert et al. (2021) also called for more research with managerial implications and impact.

By returning to Table 4.8 and Figure 4.2, both analyses provided evidence that stakeholder management and integration are essential for SSCM. Proactive engagement with SC external

stakeholders facilitates the organizational learning process due to capability development, increased understanding and awareness of sustainability, and knowledge creation (Oelze et al. 2016; Seuring et al. 2019). For example, León-Bravo et al. (2019) found that collaborating with NGOs can raise environmental awareness, cut costs, and increase natural resource efficiency. This engagement can ultimately lead to competitive advantage (Chen und Kitsis 2017). According to Wolf (2011), integrating stakeholders to collaborate and exchange expectations requires specific capabilities and is essential for SSCM.

However, this study complements the findings of earlier research concerning the relevance of proactive behavior within SSCM (e.g., Pagell und Wu 2009). Several studies have indicated that companies start to apply SSCM practices once they face pressure from stakeholders, which has been described as reactive behavior and linked to reputation and legitimacy loss (Wilhelm et al. 2016; Busse 2016; Wolf 2014). This strengthens the value of proactive and collaborative measurements to deal with stakeholder issues before putting pressure on a company, in line with Pagell und Wu (2009) and Siems und Seuring (2021).

Although this study provides insights on how and where stakeholders can participate in SSCM practices, another contribution is its identification of under-researched areas, which point to future research possibilities. For example, societal stakeholders appear only as drivers more often than statistically expected, even within the SSCM literature, which emphasizes the need to consider stakeholders. This result might call for further research with a more differentiated stakeholder view.

In addition, León-Bravo et al. (2019) studied SSCM practices at different stages and the performance impact through a case study in the Italian food industry. The authors suggested using institutional theory to explain the motivation for implementing SSCM practices through case studies in other geographical contexts or industries than Italian food SCs and considering additional actors, like small farmers. Furthermore, Multaharju's (2016) conceptual work defined a framework that shows how companies' performance might trigger stakeholder reactions. According to Multaharju (2016), using an empirical research approach might be valuable for investigating how focal firms' sustainability performance and their entire SC might trigger stakeholder reactions.

Although various SSCM scholars outlined the lack of research on the social dimension in the debate in the past (e.g., Rebs et al. 2017), authors such as Meqdadi et al. (2020) and Roy et al. (2020) identified that there is still a need for research on social aspects in SSCM. Thus, Roy et al. (2020) proposed analyzing how social companies manage their stakeholder relationships under their social (business) purpose via a case study approach with a multi-tier perspective.

Similarly, it might be worth investigating how focal firms' SC sustainability performance might trigger stakeholder reactions using an empirical research approach, as Multaharju (2016) suggested.

According to Touboulic und Walker (2015) stakeholder theory is one of the most commonly applied theories in the SSCM field. Yet the debate has been somewhat limited to using stakeholders as reasoning for SSCM, with some exceptions, such as Rodríguez et al. (2016). Thus, a more differentiated debate involving more comprehensive approaches, such as the integrative framework put forward by Hörisch et al. (2014), might give us more insights into incorporating stakeholders in SC as proposed by Pagell und Wu (2009).

In line with this, future research could differentiate stakeholders regarding their sector of operation and associated tier-level. This promises important insights because the visibility and influence of stakeholders differ among sectors and tier-levels which might affect the roles they take in the context of SSCM.

4.6.2 Practical contribution

In addition to the theoretical contribution, our study has some practical implications. For example, engaging with stakeholders and their integration into business processes can increase learning capabilities by gaining new knowledge and other resources.

According to Stekelorum et al. (2020), collaborating with international NGOs gives SMEs and their SC members access to the NGOs' expertise and experience regarding other stakeholders and their expectations. Thus, they can assist companies in bridging existing knowledge and resource gaps which allows for improving their SSCM practices (e.g., Siems und Seuring 2021; Wankmüller und Reiner 2020). In addition, this accumulation of external and internal expertise can lead to innovative ideas for meeting SSCM challenges and, thereby, gaining a competitive advantage (Chen and Kitsis, 2017; Oelze et al., 2016). Hence, this kind of insight can help in deciding whether to integrate stakeholders into SSCM practices.

Moreover, integrating stakeholders into SSCM processes, such as assessing the company's own or its suppliers' performance, provides the opportunity to gain more legitimacy to do business and create additional value (Norris et al. 2021). Additionally, more proactive and integrative corporations with stakeholders can provide an external view for integrating, assessing, or evaluating SSCM practices.

Besides gaining more legitimacy or a competitive advantage, engaging with SC stakeholders can help managers fill existing knowledge and resource gaps. On the one hand, stakeholder claims can be fulfilled internally because of extended resource bases. On the other hand, working with stakeholders offers the chance to reach suppliers beyond boundaries arising from

a physical or institutional distance (Sauer and Seuring, 2018). In this context, stakeholders can facilitate communication, assessment, and evaluation of suppliers and provide support to develop training programs.

4.6.3 Limitations

The results contain opportunities for both practitioners and scholars, but our study faced three major limitations. First, while we grounded our research in selected constructs from the SSCM literature, a more reflective approach with other stakeholder and SSCM constructs might yield additional or different insights. For example, the results show that the inspector role appears underrepresented compared to the other two roles. Furthermore, analyzing the negative impact of SC internal and external stakeholders (i.e., hindering or undermining SSCM) might provide additional insights, since our study focused instead on positive roles. Thus, it can be questioned why inspector-related SSCM practices remain underrepresented to date and whether the role of stakeholders could be stronger in the SSCM context.

Second, although we based our research on established theoretical constructs and the data analysis followed strict rules (e.g., Mayring 2015), within-study bias could not be entirely avoided because most of the coding was done by one researcher. Third, the data, restricted to keywords, might cause the limited generalizability of our results. The extensive and valuable results might be an additional ex-post justification for our selected theoretical constructs and keywords.

However, our study's limitations create future research opportunities, and by taking those partly contrasting results into account, future studies might yield interesting insights and could extend our understanding. The next step could be an explorative case study approach applying the proposed SSCM and stakeholder constructs. Focusing in particular on both positive and negative roles would extend our understanding of SC internal and external stakeholders' role in achieving a more sustainable SC.

4.7 Conclusion

Since integrating non-traditional SC stakeholders, such as NGOs and competitors, in SC practices is essential for achieving a more sustainable SC, this study contributes to the debate around the role stakeholders may have in SSCM practices. Our study extends the debate around stakeholder roles from supplier development to SSCM and provides evidence of their relevance in the SSCM context.

Based on the qualitative content analysis, the findings reveal different stakeholder roles in the context of SSCM practices and explain their relevance. For example, stakeholders, such as

NGOs and universities, can facilitate the implementation of SSCM practices owing to their access to valuable knowledge, skills, and other resources. Similarly, proactive engagement with SC external stakeholders appears to lead to a competitive advantage and drive competitors toward sustainability by creating the need to mimic these practices. Conversely, the results indicate that companies' reactive behavior results in the risk of reputation loss and strengthens the line of argumentation for proactive and collaboration measurements. Thus, SC internal and external stakeholders facilitate the development of learning and innovation capabilities and support the detection of risks or improvement potential. Nevertheless, the inspector role of stakeholders related to SSCM practices has been underrepresented, according to the content and contingency analyses. Thus, further studies could take into account these insights.

While recent studies (e.g., Maas et al. 2018; Rebs et al. 2019) considered only stakeholder pressure and its impact on performance, our study applied a more differentiated view regarding stakeholders.

Therefore, our study is one of the first efforts to apply a more differentiated view to stakeholders and their roles in the SSCM debate. By considering our results, future research could apply a case study design to gain a deeper understanding of stakeholders and their roles in achieving a more sustainable SC.

5 Stakeholder management in sustainable supply chains: A case study of the bioenergy industry

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5.1 Abstract

Engaging with stakeholders and managing their issues when striving for a sustainable supply chain (SC) is a significant challenge. Although most studies on sustainable supply chain management (SSCM) consider stakeholder management necessary, little is known about related stakeholder management practices in SSCM. Thus, this paper seeks to enrich the theoretical debate on stakeholder management practices in SSCM through a case study approach to bioenergy SCs in Chile. Based on 28 interviews with SC actors and representatives from the surrounding stakeholder environment, the deductive–inductive analysis reveals that stakeholder management combines different practices to discuss stakeholder concerns, address them, and evaluate the process at the SC's external and internal levels. We propose structuring these practices based on two dimensions: "practices to address stakeholder requirements" and "practices whereby stakeholders are integrated." The analysis' results indicate that although two-way communication with stakeholders can be seen as the core of stakeholder management, a certain willingness to learn and transform SC design is a prerequisite for true orientation toward stakeholder management in SSCM. Additionally, linkage development and local anchoring are practices used to obtain further legitimacy at the external level. Building on these findings, this study can guide practitioners in engaging with stakeholders and managing their issues across the SC.

Keywords: Stakeholder management, Sustainable supply chain management, Stakeholder engagement, collaboration, bioenergy supply chains

5.2 Introduction

Companies around the globe are continually requested to meet the increasing challenges posed by a highly complex economy. Sustainability is among the most important goals to accomplish, as social inequality and ecological degradation continue to rise (Jakhar et al. 2020). Hence, the operationalization of sustainability requires a paradigm shift from focusing solely on maximizing profit to addressing companies' social and ecological performance goals (Meixell und Luoma 2015). Companies specifically recognize sustainability and its high importance through their supply chains (SC). Considering that SCs contemplate the product from the initial processing of natural resources to the end customer, drawing attention to SCs is a step toward broader sustainability adoption (Hofmann et al. 2014; Ansari und Kant 2017b). Thus, sustainable supply chain management (SSCM) entails adopting more sustainable practices and facilitating more sustainable behavior in SCs (Ahi und Searcy 2013).

In this regard, stakeholders, such as regulatory authorities, citizens, and non-governmental organizations (NGOs), are crucial for SCs that are facing the challenge of becoming more sustainable, as they need to obtain their legitimacy to do business (Jakhar et al. 2020; Xu et al. 2019). Therefore, the literature proposes that activities to consider stakeholders can be labeled stakeholder management, and these are positive for the SC or any organization (Park-Poaps und Rees 2010; Silvestre et al. 2018). Hofmann et al. (2014) suggested that stakeholder management as a function of SCs embraces reporting to and interacting with stakeholders. Ahl et al. (2018) mentioned that stakeholder management is critical for SC innovations in regard to understanding stakeholders' interests through knowledge exchange and communication. However, the authors provided no guidance on how stakeholder management can be conducted. According to Silvestre et al. (2018), stakeholder management refers to collaboration between firms and stakeholders in the form of multi-stakeholder initiatives. In most studies on SSCM, stakeholder management is considered necessary; therefore, the lack of research on certain stakeholder management practices in SSCM is perceived as a gap. Thus, the following research question is posed: How do focal firms use SSCM practices as part of their stakeholder management?

This study uses a qualitative case study approach to investigate bioenergy SCs in Chile to address this research question. A case study allows us to disclose a theoretical item and identify underlying causal relationships in a real-world setting. To achieve this, Ansari und Kant (2017b) have called for more case studies in the SSCM field. At least two key reasons justify scholarly work on bioenergy SCs in Chile.

Although well-designed bioenergy systems promise several benefits and solutions (Dale et al. 2018; Hong et al. 2016), stakeholders have identified different social, environmental, and economic issues (e.g., competing land use between biomass production for food, material, and energy or loss of biodiversity) along with the SC in Chile and have demanded changes (Almonacid 2018; Gold 2011; Carranza et al. 2020). Thus, it is especially significant that the entire SC of bioenergy operations is carefully designed and managed while considering the companies' stakeholders and related "socio-environmental conflicts" (Buchholz et al. 2009; Carranza et al. 2020). Therefore, it can be expected that as focal firms, bioenergy producers need to establish practices to interact with stakeholders as part of their stakeholder management.

Furthermore, the research is also relevant, as stakeholder issues and SSCM are typically discussed within the context of Europe and North America. Data from emerging economies, including South America, are still scarce (Jia et al. 2018; Kumar et al. 2020). Hence, more research from the perspective of emerging economies is required and relevant (Morais und Silvestre 2018).

The remainder of the paper is organized as follows. The next section provides the theoretical background and basic terminology. Next, the research method used to carry out the case study is elaborated. Thereafter, the results are described in more detail. This is followed by the limitations; a comprehensive discussion of the findings; and the conclusion, which complements the paper.

5.3 Literature Background and Conceptual Framework

5.3.1 SSCM and stakeholder (management) terminology

One way in which companies recognize the importance of sustainability-conscious behavior is through their SCs. Mentzer et al. (2001, S. 4) defined SCs as "a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer." Adopting more sustainable practices and facilitating more sustainable behavior in SCs is considered SSCM (Ahi und Searcy 2013; Seuring und Müller 2008). Although several definitions have been provided for SSCM, most contain similarities (Ahi und Searcy 2013). We follow the well-cited definition of SSCM provided by Seuring und Müller (2008, S. 1700) "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and

stakeholder requirements." This definition emphasizes that stakeholders play a crucial role when seeking a more sustainable SC because, inter alia, their legitimacy is required for successful business operations (Meixell und Luoma 2015; Xu et al. 2019). We view legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman 1995, S. 574).

However, multiple definitions of stakeholders exist. For example, Freeman (1984, S. 25) defined stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives." In the context of sustainable SCs, governmental bodies, NGOs, associations, residents, consumers, or citizens are merely a few examples of possible stakeholders (Meixell und Luoma 2015; Busse et al. 2017). Stakeholders vary in many respects—for example, in regard to their interests and roles (Gualandris et al. 2015; Jakhar et al. 2020). Some stakeholders may hope for the firm's success (e.g., employees and customers), while others may not mind failure (e.g., competitors) (Hofmann et al. 2014; Shubham et al. 2018). The literature has proposed that activities to consider stakeholders can be labeled as stakeholder management, and these have a positive effect on SCs or any organization (Park-Poaps und Rees 2010; Silvestre et al. 2018). Although effective stakeholder management is considered to lead to reputation gains, higher financial performance, and competitive advantage (Xu et al. 2019; Ruf et al. 2001), the understanding of stakeholder management and related management practices remains vague (e.g., Ahl et al. 2018; Chowdhury et al. 2019; Silvestre et al. 2018). The following section elaborates on practices related to stakeholder management in SSCM with regard to vagueness.

5.3.2 Stakeholder (management) practices

Several SSCM studies address the question of how a sustainable SC might be achieved (Seuring und Müller 2008; Pagell und Wu 2009) and even what a genuinely sustainable SC means (Gold und Schleper 2017). Integrating sustainability thinking into SCM activities requires modifying company culture, the organizational behavior of all SC members, and cooperation with new actors (Svensson et al. 2018; Pagell und Wu 2009).

However, there is a gap in the research on the relative importance of integrating various stakeholders into SC decisions. These stakeholders are typically marginalized or are ignored by traditional SCs (Shubham et al. 2018; Busse et al. 2017). Hence, SC actors should consider their relationships with the broader social and natural environments, as sustainability also reflects the attainment of society's green concerns and welfare (Gold und Schleper 2017; Jakhar

et al. 2019). For Pagell and Wu (2009), sustainable SCs should be reconceptualized to include NGOs, community members, and even competitors.

Beske and Seuring (2014) followed Pagell and Wu's (2009) recommendations and developed a conceptual framework that integrates various stakeholders into SSCM. In this vein, external stakeholders, such as NGOs, are regarded as pressure groups. Thus, companies should adopt risk management practices in the form of standards and certifications to monitor environmental and social issues and avoid sanctions and stakeholders' disapproval (Seuring und Müller 2008). Sustainability-engaged companies should also be proactive by adopting innovative products and services based on internal and external stakeholders' requirements.

Further studies have put forward Beske und Seuring's (2014) research on SSCM (e.g., Mathivathanan et al. 2018; Sauer und Seuring 2017). For example, Sauer und Seuring (2017) identified shortcomings regarding the institutional context of SCs and extended it to a deeper consideration of governmental and local actors. Although these prior studies acknowledge the relative importance of stakeholders to SSCM, there is limited knowledge of how stakeholders can be considered in SC decisions to enhance sustainability performance.

By taking into account the reviewed literature, we argue that stakeholder management refers to a set of management practices (e.g., Beske und Seuring 2014; Liu et al. 2018a; Silvestre et al. 2018), and we categorize these as internal and external practices. These twofold dimensions integrate stakeholders' requirements in terms of sustainability and SC decisions. While internal practices addressing stakeholders' requirements come from the focal firm, external practices are outside the focal firm's direct areas of control. In this frame, stakeholders include both traditional and nontraditional SC actors. Thus, the literature proposes management practices whereby stakeholders' requirements are addressed to mitigate related risks and maintain or increase legitimacy (e.g., Beske und Seuring 2014; Hofmann et al. 2014).

Stakeholder management embraces processes that are used to learn and acquire from and share knowledge with stakeholders to achieve sustainability-related improvements and solutions and minimize risks from pressure groups (Beske und Seuring 2014; Pagell und Wu 2009). Companies can adopt trust-building transparency, two-way communication, or knowledge transfer to increase their legitimacy, but such practices are restricted to communication instruments to address stakeholders' requirements (e.g., Gold 2011). Reporting systems are a one-way communication instrument that is utilized to broaden, integrate, and improve traditional economic approaches to corporate performance measurement, and they take stakeholder needs and requirements into account (Perrini und Tencati 2006; Meckenstock et al. 2015).

Sauer und Seuring (2017) identified linkage development in the SC for minerals as a direct (e.g., fiscal incentives to mining companies) and indirect (e.g., domestic demand driven by miners' income) contribution to the economic development and social well-being of the SC underlying the local region and stakeholders. These practices are particularly valuable in emerging or developing countries (Kumar et al. 2020).

Furthermore, companies can proactively integrate stakeholders into decision-making and business activities in an internal dimension—for example, selecting new SC partners—thereby building more sustainable SCs (e.g., Liu et al. 2018a; Manzhynski und Figge 2020) and achieving legitimacy (Hofmann et al. 2014; Xu et al. 2019). Similarly, Shubham et al. (2018) stated that engaging with stakeholders facilitates the joint development of innovations by enabling an enhanced understanding of the external environment through knowledge exchange and communication. Pagell und Wu (2009) showed that some sustainable SC managers re-conceptualize the SC by collaborating with nontraditional SC actors, but they missed the opportunity to identify and characterize collaboration practices in detail.

Table 5.1: Inductive and deductive derived structural dimension and analytical stakeholder management practices

Categories and assigned practices	Description
Practices to address stakeholder requirements	
Internal	
Transparency by one-way communication Two-way communication Evaluating stakeholder relationships* Technical or organizational transformation*	Addressing stakeholders requirements at the internal dimensions centers on transparency through **one-way** or **two-way communication** but also immediate **technical or organizational transformation** of internal processes (e.g., changed sourcing/production strategy) to maintain or gain legitimacy (Beske und Seuring 2014; Shubham et al. 2018; Perrini und Tencati 2006; Hofmann et al. 2014). Further improvements can be subsequently detected by **evaluating stakeholder relationships**.
External	
Linkage development Educating stakeholders*	External practices target directly or indirectly the development, resilience, and well-being of the local region and its stakeholders, e.g., through **linkage development** or the support of local organizations (Sauer und Seuring 2017; Ahl et al. 2018).
Practices whereby stakeholders are integrated	
Internal	
Standards and certification** Selecting SC partner Joint development Re-conceptualization	Integrating stakeholders in internal activities tap knowledge and further resources when, e.g., **selecting SC partners** or **assessing** existing **suppliers** and striving for **standards and certification**. Also, SC **re-conceptualization** by cooperating with competitors, local communities, or other new SC-partners facilitate **joint development** or (innovative) **learning** (Gualandris et al. 2015;

Learning*	Pagell und Wu 2009; Shubham et al. 2018; Svensson et al. 2018; Oelze et al. 2016; Manzhynski und Figge 2020).
Local anchoring*	
Assessment of supplier *	
External	
Standards and certification**	Stakeholders can turn into valuable partners that support external processes for the **development**, the **selective monitoring** of suppliers, or **certifying** them and detecting further risks along with the SC (Busse et al. 2017; Liu et al. 2018a; Gualandris et al. 2015; Jakhar et al. 2019).
Selective monitoring	
Supplier development	

Note: Inductive derived practices are marked with an asterisk (*)
** The item "standards and certification" appears twice because it is considered as relevant for the internal and external levels.

Nevertheless, studies have shown that companies can collaborate with stakeholders in regard to the external dimension of the SC because of their capacity for valuable knowledge and resources (e.g., Oelze et al. 2016). On the one hand, stakeholders can be assets by identifying, mitigating, and solving risks along with the SC; enhancing internal SC transparency; and monitoring suppliers (Busse et al. 2017). On the other hand, in their empirical study, Liu et al. (2018a) pointed out that stakeholders can play valuable roles in the process of supplier development.

Together, these studies indicate a need to understand the various perceptions of stakeholder integration in research on SSCM practices. In Table 5.1, we show the identified deductive practices of stakeholder management mentioned in the reviewed literature on SSCM. These were inductively complemented based on the analyzed empirical material.

5.3.3 Bioenergy as a field of application

Biomass has significant potential to overcome the shortcomings of fossil fuels and works as a substitute for heat, power, and chemical production (Dale et al. 2018; Ahl et al. 2018). While well-designed bioenergy systems have several benefits and provide solutions to fossil fuels shortcomings (Hong et al. 2016; Dale et al. 2018), different social, environmental, and economic issues communicated by stakeholders along the SC can be identified (Carranza et al. 2020; Almonacid 2018). Despite the land use competition between biomass production for food, material, and energy, multiple studies point to the crucial role of the (sufficient) supply of biomass (e.g., Flores-Fernández 2020; Hong et al. 2016). Moreover, carbon emissions and noise pollution due to transportation are problems to be considered in regard to bioenergy SCs (Buchholz et al. 2009; Almonacid 2018). Because these issues affect stakeholders, they put pressure on companies. Gold (2011, S. 455) claimed that stakeholder management "[…] plays

an outstanding role for bioenergy chains […] thus ensuring their license to operate in the middle and long term."

Chile provides an ideal setting for this research because it imports most of its energy in the form of fossil fuels, while its local biomass potential is poorly used. Based on its own limited fossil fuel resources, such as natural gas, hard coal, and oil, Chile needs to import these primary energy carriers (Román-Figueroa und Paneque 2015; Flores-Fernández 2020). The permanent shutoff of the natural gas supply provided by pipelines from Argentina exacerbates Chile's dependence on natural gas and is one reason for its critical and fragile energy situation (Flores-Fernández 2020). Consequently, the pulp, paper, and wood industry has started to tap bioenergy since exploring biomass as a possible energy source. Owing to the expected side effects such as odor, increasing lorry traffic, and water scarcity, local governments and communities have demonstrated against new energy projects in the Chilean province of BioBío. For instance, the mayor of Cabrero (BioBío) protested against the construction of a bioenergy plant and rejected its planning application (Parraguez 2014). The entire SCs of additional bioenergy operations have to be carefully designed and managed while taking into account the claims of company's stakeholders (Buchholz et al. 2009; Carranza et al. 2020). Using an SSCM perspective to address these challenges might be fruitful because it takes into account stakeholder sustainability concerns.

5.4 Method

With the aim of theory elaboration, this research followed the design of a single case study with multiple embedded units of analysis (Ketokivi und Choi 2014). The units of analysis were focal firms in the Chilean pulp, paper, and wood industry and their SCs, which produced energy as a by-product. Compared to large-sample theory-testing methods, case studies have the advantage of enabling closeness to a theoretical item and explaining underlying causal relationships (Siggelkow 2007; Hong et al. 2016). Furthermore, evidence of the case study's value regarding the analysis of the bioenergy SCs can be seen in other research projects, such as those of Ahl et al. (2018) or Dale et al. (2018), wherein the authors interviewed stakeholders and experts. A comparative analysis between the empirical results and the theory allowed us to provide theoretical propositions, which was the aim of this study. According to Eisenhardt und Graebner (2007), a case study requires a transparent research process. We followed Stuart et al.'s (2002) suggestion to define the research question; determine the research instruments and field; gather and analyze the data; and, finally, validate the research quality of the entire process (see Figure 5.1).

5.4.1 Description of the research instrument: A case study

Because it enables an in-depth understanding of a specific and real phenomenon by using different data sources to gain knowledge for further interpretations and applications (Yin 2018), the case study approach might be appropriate for analyzing stakeholder management practices in SSCM, especially in an emerging country setting (Stuart et al. 2002). It is especially reasonable for an analysis in which the boundaries between the phenomenon and its context are indistinct (Yin 2018; Bryman und Bell 2015).

This research was based on extensive fieldwork carried out on SCs in the pulp, paper, and wood industry in Chile from November 2016 to July 2017. While Chile has arguably only two big companies in the pulp, paper, and wood sector (when comparing turnover and owned forest area), we mainly focused the data generation on their SCs (PE1, PE6) and the related stakeholder environment (see Table 5.2 and Table 5.3). To enable the possibility of contrasting the findings, we included one small-sized company (PE8). As suggested by Pagell und Wu (2009), we collected primary and secondary data from more than one company in each SC to enable a full understanding of the implemented SSCM practices (see Table 5.3). Regarding the primary data sources, it is worth noting that we first elaborated on and discussed the interview instrument with experienced SC researchers to ensure accurate data gathering in the empirical field. We also validated the interview instrument with biomass experts. Next, we asked some Chilean bioenergy experts to review the interview instrument, and together, we adapt it to the local culture and language. We also pretested the questionnaire with a sawmill CEO in Chile; this company produces energy from production waste (biomass). The resulting interview was not part of the final data sample. After the pilot phase, we conducted 28 semi-structured interviews with biomass SC actors and related stakeholders in Chile in Spanish (see Table 5.2) because the first author is fluent in Spanish.

Table 5.2: Overview of the data sample by interviewee position

Organization	N° interviews	Position of interviewee
Producer of energy (PE1)*	4	(PE1A) Public relations manager, (PE1B) Head of environmental development and risk management, (PE1C) Head of raw material sourcing, (PE1D) Manager of supply strategy, (PE1E) Secondary material
Producer of energy (PE6)*	2	(PE6B) Plant manager, (PE6C) Head of sourcing, (PE6A) Secondary material
Producer of energy (PE8)*	2	(PE8A) Supply chain manager, (PE8B) Head of R&D for products and processes, (PE8C) Secondary material
Supplier (S1)	1	Plant manager
Supplier (S2)	1	Sub-manager for raw material supply
Supplier (S3)	1	Head of logistics and SC management
Supplier (S4)	1	Head of production controlling

Supplier (S5)	1	Head of sale
Supplier (S6)	1	Sub-manager of sales and development
Universities and research institute (U)	7	(UA) Head of the chemical engineering department, (UB) Professor of the wood engineering department, (UC) Research professor at the faculty of forest sciences and natural resources, (UD) Director of the chemical engineering department, (UE) Research assistant, (UF) Head of the environment area, (UG) Executive director
Government (G)	1	(G1) Regional ministerial secretary
Association (A)	3	(AA) Vice president, (AB) Project technical secretary, (AC) Executive manager
Business Consulting (CS)	3	(CSA) Independent Consultant, (CSB) Project engineer, (CSC) project engineer
	28	

*For additional insights, these interviews were complemented with integrated reports.

Table 5.3: SC design of the interviewed companies

PE1	PE6	PE8
S2	S1	S3
S4	S3	
S5	S5	
	S6*	

*S6 is also a supplier of S2

The semi-structured interviews with various actors provided direct access to practical experiences and different views in the target field, leading to new ideas and useful insights by identifying what, how, and why certain events were taking place (King 2004; Yin 2018). As proposed by Wolf (2011), we checked newspapers and business magazines to identify possible interview partners in the context of bioenergy SCs. Additionally, we selected contacts in cooperation with local project partners. Our primary purpose was to interview representatives in management positions and other influential decision-makers in the bioenergy field. One researcher audiotaped all face-to-face interviews with prior consent. While the interviews were conducted, the questionnaire was slightly modified to accommodate the interviewees' context.

As far as the secondary data are concerned, we took notes based on a series of site visits and considered additional documents provided by the companies whose employees were interviewed. Moreover, relevant information was collected based on three stakeholder workshops that we organized with the involved actors. The data were triangulated using different sources of information.

5.4.2 Data analysis

After conducting the interviews, the audio recordings were transcribed according to specific rules that embrace the recommendations of Mayring (2015) and Bryman und Bell (2015) to guarantee the transparency and consistency of interview transcripts. The company names, brand names, locations, and particular practices mentioned during the interviews were anonymized. The total duration of the interviews was 30 hours 40 minutes, which is equivalent to 564 pages

of transcripts. Internal validity was ensured by returning summaries of the interviews to the interviewees and asking for their consent. Qualitative content analysis was used to evaluate the interview material. Kassarjian (1977) stated that content analysis should follow a clear and reasonable operational structure. Therefore, a five-step content analysis based on Mayring's (2015) suggestions was applied (see Figure 5.1). Following this abductive research logic (Kovács und Spens 2005; Locke et al. 2008), the starting point was to derive deductive categories from the analyzed literature. To complete the resulting composition of categories, further items were added inductively when new issues were discovered while reviewing the material (see Table 5.1).

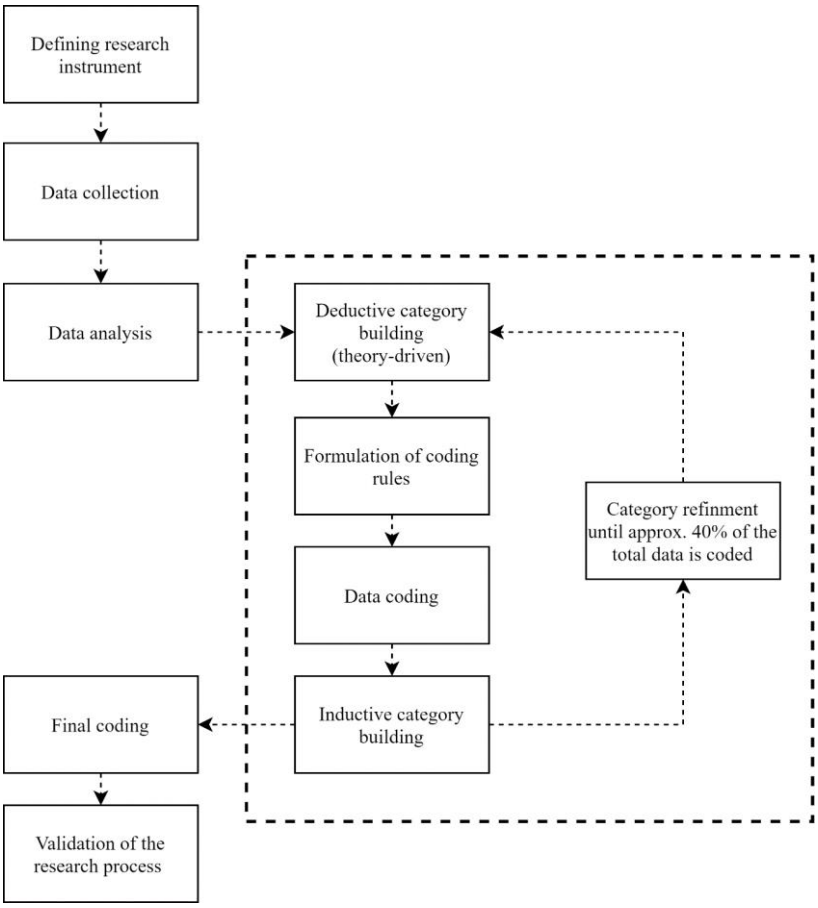

Figure 5.1: Process of data gathering and analysis process

After the pilot phase was completed and the final coding scheme was determined, all primary and secondary material was coded, followed by a final reliability and accuracy check. We analyzed and coded the collected data using the qualitative analysis software MAXQDA. This software was helpful into organizing the content in a coherent category/construct system. Two researchers independently coded all the material and then triangulated the findings to ensure validity.

5.4.3 Reliability and validity

The research quality criteria of a case study are particularly important because its theoretical propositions might be questioned with regard to their generalizability, robustness, and testability (Eisenhardt und Graebner 2007; Stuart et al. 2002). To ensure the quality of the whole research process, critical dissemination of the research findings—including the anticipation of valid and invalid criticism, the assurance of credibility, and the appropriateness of the research questions for the research method—is essential. Therefore, Table 5.4 summarizes the measurements and criteria that were applied during the research project.

Table 5.4: Research quality criteria

	Objective	**Application**
Construct validity	The degree of legitimacy to which the operational measures for the studied constructs are established	-Interview guideline and deductive categories were based on sound theoretical frameworks. -The interviews' summaries were returned to the interviewees. -Data triangulation (primary and secondary data)
Internal validity	The extent to which a particular claim regarding a causal relationship within a study can be proofed	-Both the coding scheme and questionnaire were based on relevant scientific frameworks - Multiple researchers were integrated within the design of the questionnaire, which was based on theoretical constructs. -The interviews' summaries were returned to the interviewees. -The results were discussed with practitioners and other researchers within Chilean stakeholder workshops
External validity	The extent to which a study's findings and its presumed causal relationships can be generalized	-Cases consist of several internal and external actors from different SC stages. -Due to abductive reasoning (Locke et al. 2008), analytical generalizability was striven for.
Reliability	The assurance of transparency and the guarantee that the study is replicable under consistent conditions.	- Structured research process (Stuart et al. 2002) -Definition of rules for the transcription and data analysis process followed the recommendations of Mayring (2015) -Sound coding scheme was based on established theoretical constructs. -For the data analysis, different researchers, who did not gather data, were involved. -Database and coding were completely done in MAXQDA.

5.5 Results

This section presents our case study results to illustrate how focal firms and their suppliers manage stakeholders and their issues while aiming for a more sustainable SC. The data were analyzed using abductive reasoning. Thus, constructs were taken from the literature and inductively enhanced. First, we show how focal firms and their suppliers address stakeholder issues at the internal and external SC levels. This is followed by an examination of the practices

into which stakeholders are integrated to maintain or gain legitimacy. Table 5.5, Table 5.6, Table 5.7, and Table 5.8 illustrate the condensed results of the conducted interviews. The columns on the left-hand side how (a) the number of coded items observed in the analyzed interviews, (b) the number of interviews in which the constructs could be detected, and (c) the number of companies that referred to the construct.

5.5.1 Practices addressing stakeholders' requirements

Focal firms and their suppliers do business in a complex environment in which they need to consider several stakeholders' claims to gain or maintain their legitimacy. To achieve this, both focal firms and suppliers apply different practices at the internal and external SC levels.

Internal practices addressing stakeholders' requirements

The data revealed that being transparent and communicating with stakeholders are the most dominant practices when it comes to directly addressing stakeholder requirements stipulated by focal firms and their suppliers.

Table 5.5: Practices to address stakeholders (requirements) reported by companies

Category	Number of			Answer by company								
	References	**Interviews**	**Companies**	**PE1 A,B,C,D,E**	**PE6 A,B,C**	**PE8 A,B,C**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
Internal												
Transparency by one-way communication	13	6	7	7 A,B,E	3 A	3 B,C	0	0	0	0	0	0
Two-way communication	37	12	7	17 A,B,D,E	7 A,C	4 B,C	3	1	0	0	3	2
Evaluating stakeholder relationships	5	4	3	1 A	2 A,C	1 C	0	0	0	0	0	0
Technical or organizational transformation	5	5	4	1 B	1 B	2 B,C	0	0	1	0	0	0
External												
Educating stakeholders	7	3	3	2 E	2 A	3 C	0	0	0	0	0	0
Linkage development	36	12	6	20 A,B,C,D,E	9 A,B	4 B,C	0	1	1	0	1	0

Table 5.6: Practices to address stakeholders (requirements) reported by stakeholders

Category	Counted / observed number of			Answer by stakeholder			
	References	**Interviews**	**Organization**	**Association A,B,C**	**CS A,B,C**	**U A,B,C,D,E,F,G**	**G1**
Internal							0
Transparency by one-way communication	0	0	0	0	0	0	0
Two-way communication	6	5	4	3 B,C	1 C	1 G	1
Evaluating stakeholder relationships	0	0	0	0	0	0	0
Technical or organizational transformation	0	0	0	0	0	0	0
External	0	0	0	0	0	0	0
Educating stakeholders	2	2	2	0	1 A	1 C	0
Linkage development	4	3	2	0	3 B,C	1 F	0

As Shubham et al. (2018) suggested, an ongoing discourse with stakeholders through *two-way communication* ensures that they are informed about their requirements and can facilitate efforts to meet them. All but one focal firm indicated that they failed to involve their stakeholders, such as communities, and that in the last decades, they have therefore come under increasing pressure from them (PE1D, PE8B, UG). Hence, the results show that all focal firms and four out of six suppliers apply *two-way communication* via different platforms or channels to maintain ongoing dialogue with their stakeholders (see Table 5.5). Thus, they can also be informed of the stakeholders' concerns and ideas for improvement through, for example, stakeholder workshops, personal dialogue with representatives, field visits, and open doors (e.g., PE1A, PE6A, PE8B, S5). As one interviewee stated, "The primary objective is to engage with stakeholders through consultation and dialogue processes, open meetings and visits to company operations, thus fostering interaction, creating opportunities to learn about community needs, and receiving and taking in their concerns" (PE1E). Table 5.6 shows that multiple stakeholder groups have reported that they have been involved in the process of *two-way communication* between the operating companies and other stakeholders. Thus, we argue that *two-way communication* is essential for stakeholder management to discuss stakeholder concerns and might be a way to overcome the loss of legitimacy even beforehand.

Owing to *two-way communication* with stakeholders, the discussion of concerns sometimes needs to be addressed via *technical or organizational transformation* at the internal SC level. All focal firms and one supplier reported cases of *technical or organizational transformation* at the internal SC level to address stakeholder concerns. For example, stakeholders were negatively impacted by odor or noise (the technological improvement of production processes could solve this hazardous risk to health), while others were forced to exclude suppliers or include new ones (P1B, P6A, P8B, S3). Thus, *technical or organizational transformation* can be a way to abolish the issues directly and avoid further reputation loss.

To keep stakeholders informed about business activities, *transparency through one-way communication* is considered necessary (Meckenstock et al. 2015; e.g., Gold 2011). All focal firms have enhanced their *transparency through one-way communication* instruments (see Table 5.5). Some interviewees suggested sustainability or a carbon footprint report as two possible ways to inform interested stakeholders about business-related issues such as emissions (e.g., PE1A, PE6A, PE8B). However, several interviewees indicated that capital-driven companies are legally obligated to publish these reports, which can be seen as the minimum for aligning with the legal requirements (e.g., PE1B, PE8B). Additionally, only the three focal firms used *transparency through one-way communication* instruments, while no supplier

reported on this (see Table 5.5). Therefore, we argue that being transparent through *one-way communication* is only a "must-have" if particular stakeholders are interested in these business reports; it should be more of an add-on rather than the embodiment of a company's stakeholder management (Meckenstock et al. 2015; Beske und Seuring 2014).

In addition to addressing stakeholder concerns at the internal SC level, *evaluating stakeholder relationships* can entail an assessment of the efforts made and can reveal further improvements. All focal firms reported measurements such as an internal reputation index or external studies used by other stakeholders to evaluate, for example, the reputation of the focal firm from the community's point of view (PE1E, PE6B, P8C).

However, the results suggested that focal firms and suppliers interact and address stakeholders and their issues at the SC's internal and external levels.

External practices to address stakeholders (requirements)

To gain further legitimacy, *linkage development* extends the remaining share of the value chain in the target region (e.g., Sauer und Seuring 2017), which is especially relevant to developing and emerging countries (Kumar et al. 2020).

As the head of a research institute stated, "Chile is generally characterized as a country that produces raw material but not so much processed goods" (UF). Additionally, Chile's communities do not profit directly from, for example, business taxes (CSC). All focal firms and three one-tier suppliers applied *linkage development* instruments to achieve legitimacy for their business operations. Specifically, they fostered microenterprise initiatives and implemented social projects, such as building schools, hospitals, and other infrastructural installations (see Table 5.5).

One focal firm manager stated, "One of our values as a company is to be a good neighbor … to act as a good neighbor" (PE1B). While most SC actors pinpointed the social outcomes of adopting *linkage development*, some offered a note of caution (PE8B, CSC, UF). For example, a focal firm manager stated that "permission to operate is bought with money in the end" (PE8B). Thus, the results indicate that *linkage development* seems necessary for involving local stakeholders and improving the community's well-being and might positively contribute to social SC performance. Nonetheless, it needs to be carefully deployed because it can be seen as a bribery intent that might jeopardize the SC's legitimacy.

Moreover, *educating stakeholders* is another strategy to make stakeholders aware of sustainability issues. The coding revealed that all focal firms have developed education programs or workshops for external stakeholders in an effort to raise their awareness about

sustainability-related issues (see Table 5.5). One researcher who was interviewed stated, "The idea is to teach or socialize the knowledge of the use of biomass at the level of the new generations and to educate young people and children on the importance of using biomass in the right way because there we will produce the change" (UC). Several participants agreed that universities or governmental actors were frequently included in these education workshops (see Table 5.6).

Thus, the findings indicate the importance of providing *education* to stakeholders to enable them to build skills and abilities and forging long-term alliances to reduce negative perception. Therefore, we propose the first set of propositions:

P1: Stakeholder management requires proactive two-way communication.

P2: Addressing stakeholder requirements with SC internal and external practices ensures a minimum level of legitimacy.

P2A: Orientation toward stakeholder management entails willingness regarding technical and organizational transformation, which can lead to legitimacy.

P2B: In developing and emerging countries in particular, the careful application of SC external practices such as linkage development and education for stakeholders, increases business legitimacy.

The results in this section indicate that, on the one hand, stakeholder management consists of different practices used to exchange and target stakeholder requirements. On the other hand, involving stakeholders in the SC operations can be another way to cooperate with them directly. The next subsection, therefore, discusses practices whereby stakeholders are directly integrated in SC activities.

5.5.2 Practices whereby stakeholders are integrated

Within SSCM, stakeholders can be integrated at the internal and external levels, with other SC actors, to strive for a more sustainable SC. Integrating stakeholders within SC activities facilitate the closing of resource gaps and extends the legitimacy to do business.

Internal practices where stakeholders are integrated

Sometimes, stakeholders' integration is obligatory for achieving certain *standards and certification* (e.g., Seuring und Müller 2008), such as the Forest Stewardship Council, ISO 14064 (carbon footprint), ISO 31.000, ISO 22.301, and the Program for the Endorsement of Forest Certification. However, the results of the analysis indicate that companies cooperate with external actors to develop their own standards because this can add further legitimacy to the focal firm. Many interviewees (from all the focal firms and three suppliers) highlighted the

value of external stakeholders' involvement in establish *standards and certification*. As one interviewee employed to a focal firm declared, "All these processes are certified, approved by different people who validate what we are doing in the right way" (PE1A). But others considered the national standards and requirements too low (PE8B, S1, S5, AB). Hence, one company has created its own standards, together with the community and other stakeholders, to close this gap (P8B).

Table 5.7: Practices to integrate stakeholders reported by companies

Category	Counted / observed number of			Answer by company								
	References	**Interviews**	**Companies**	**PE1 A,B,C,D,E**	**PE6 A,B,C**	**PE8 A,B,C**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
Internal												
Standards and certification	22	8	6	7 A,E	8 A,B	1 B	0	0	3	0	2	1
Learning	6	3	3	3 E	2 B	0	0	0	1	0	0	0
Re-conceptualization	12	8	4	2 B,E	3 A,C	6 A,B,C	0	1	0	0	0	0
Selecting SC partner	3	3	3	1 A	1 A	0	0	0	0	1	0	0
Assessment of supplier	2	1	1	0	0	2 C	0	0	0	0	0	0
Joint development	14	7	5	4 C,E	1 A	6 A,B,C	1	0	2	0	0	0
Local anchoring	13	10	7	7 A,C,D,E	1 C	1 C	0	1	1	1	1	0
External												
Standards and certification	33	13	6	13 A,B,D,E	9 A,B,C	2 B	0	0	3	0	2	3
Selective monitoring	14	8	4	7 A,B,E	5 A,B,C	0	0	0	1	0	0	1
Supplier development	10	6	3	3 A,E	5 A,B,C	2 C	0	0	0	0	0	0

Table 5.8: Practices to integrate stakeholders reported by stakeholders

Category	**Counted / observed number of**			**Answer by stakeholder**			
	References	**Interviews**	**Organization**	**A A,B,C**	**CS 1,2,3**	**U A,B,C,D,E,F,G**	**G1**
Internal							
Standards and certification	7	5	4	3 B,C	3 A,C	1 B	0
Learning	13	8	4	5 B,C	4 A,B	3 A,B,C	1
Re-conceptualization	5	4	3	3 B,C	1 A	1 D	0
Selecting SC partner	1	1	1	1 B	0	0	0
Assessment of supplier	0	0		0	0	0	0
Joint development	7	6	4	1 C	1 A	3 B,C,F	2
Local anchoring	0	0	0	0	0	0	0
External							
Standards and certification	3	3	2	2 A,C	1 C	0	0
Selective monitoring	0	0	0	0	0	0	0
Supplier development	0	0	0	0	0	0	0

However, the results indicate that *learning* from and with stakeholders is an essential component of stakeholder management in SSCM (see Table 5.7); this is in line with, for example, Roscoe et al. (2020). The focal firm can exchange knowledge and information with stakeholders to close knowledge gaps or extend the knowledge base (PE1E, PE6B, S3). As one interviewee, a researcher, stated, "They [focal firms] are groups that receive education and training in new technologies through the university" (UC).

Moreover, stakeholders can provide new business ideas or transfer new knowledge from other countries to local companies (S3, AC, UB). One interviewee stated that they, as a company, search for new business ideas in foreign countries and showcase detected innovations or business ideas to local suppliers (S3, AC).

The *re-conceptualization* of the current SC structure by integrating nontraditional SC members is essential when striving for a more sustainable SC (Pagell und Wu 2009). Several interviewees highlighted that they work collaboratively with other nonstandard companies, universities, and governmental actors to achieve a more sustainable business (design) and, therefore, higher sustainability performance (PE1A, PE1B, PE1C, PE6A, PE6C, PE8B, S1, AC, CSA). Furthermore, two of the three focal firms have started to cooperate with one of their competitors to reduce environmental emissions. Instead of joining an SC as a new SC member, the data indicate that stakeholders can also support firms by *selecting SC partners* (AB, CSA, G1). One of the interviewed researchers stated, "[The research institute] brings together people who are from the university with people who are in the industry" (UD) and thus supports the focal company's efforts to find the right partner to develop a new product because of the stakeholders' know-how (S3). Additionally, one interviewee employed by a focal firm added that involving stakeholders in the direct *assessment of suppliers* yields the potential of an external evaluation of possible new business partners (PE8C).

Moreover, the analysis revealed that *joint development* with stakeholders has been a fruitful way to launch innovative projects and tackle their limited internal resources. All focal firms and even two of their suppliers reported that they collaborate with stakeholders to develop joint projects or drive research programs to meet the challenge of achieving sustainable innovations (PE1C, PE1E, PE6A, PE8A, PE8B, PE8C, S1, S3). For example, one supplier stated, "We intended to look for new options and in conversations with the Unidad de Desarrollo Tecnológico, […] we showed them what we were doing, and from that came a joint idea […]" (S3).

Despite *linkage development, local anchoring* is more about (new business) behaviors to integrate local stakeholders by favoring local employment or involving nearby smallholders

and families in delivering raw material (PE1C, PE1D, S5). Representatives from all but two companies stated that they strived for local anchoring (see Table 5.7). As one interviewee stated, "The company also makes an effort to favor local employment during the recruitment of new staff" (PE1E). A common view that was shared was that once stakeholders were involved in the business activities and were somewhat a part of the value chain, the mutual recognition/acceptance off both sides could be extended (e.g., PE1A, PE1C, PE1D, PE1E, PE6C, PE8C, S5).

Together, these results provide important insights into the practice of engaging with stakeholders to achieve a more sustainable SC and legitimacy at the internal company level. The following section discusses the practices at the external company level.

External practices whereby stakeholders are integrated

Regarding *standards and certification*, the empirical findings showed stakeholders' involvement in certifying suppliers, as indicated in the literature (e.g., Oelze et al. 2016). All the focal firms and three suppliers reported that they have worked with stakeholders to certify their suppliers to ensure minimum requirements regarding, for instance, working conditions, community relationships, and environmental practices (see Table 5.7). As one manager of a focal firm put in, "There is a certain level of external controls [...] not only audits but also talks with the communities and talks with other stakeholders because they are more demanding in terms of commitments" (PE1B).

Standards and certifications are closely connected to *selective monitoring* because regular audits and monitoring programs to measure environmental or social criteria are frequently a component of standards and certifications (Meckenstock et al. 2015; Perrini und Tencati 2006). While all focal firms worked with third-party certifiers to monitor their suppliers, two of them also integrated communities or other stakeholders into the monitoring program to ensure acceptable behavior by their suppliers (see Table 5.8). These firms provide contact centers, online complaint platforms, and roundtables to facilitate immediate communication and to report suppliers' misbehavior (PE1A, PE1B, PE1E, PE6B).

Supplier development is closely linked to internal-practice SC *partner selection* and external-practice *standards and certification*. All focal firms reported that they cooperate with stakeholders to provide suppliers with training programs to improve their overall sustainability SC performance (PE1A, PE1E, PE6A, PE6B, PE6C, PE8C). For example, a representative of one focal firm stated, "A pilot project was developed to reduce emissions and foster energy

efficiency with contracting transport companies, which involves training for participants provided by the Chilean Energy Efficiency Agency" (PE1E).

Thus, we propose the second set of propositions regarding stakeholder management:

P3: Reconceptualization of the SC by integrating nontraditional SC members can lead to higher sustainability performance.

P3A: Involving stakeholders can close resource and knowledge gaps and deficits at the company level.

P3B: Involving stakeholders allows a focal firm to tackle SC issues beyond its own boundaries.

P4: Involving stakeholders within the SC requires but can also contribute to further legitimacy.

5.5.3 Conceptualization of the findings

Together, these results provide essential insights into the operationalization of stakeholder management, as shown in Figure 5.2. The study findings suggest that two-way communication with stakeholders can be seen as the core of stakeholder management (P1). Moreover, addressing stakeholder requirements with SC internal and external practices ensures a (minimum) level of legitimacy (P2). Therefore, the transformation of the technical and organizational SC design may be required (P2A). Additionally, especially in developing and emerging countries, the careful application of SC external practices such as linkage development and education for stakeholders can lead to further legitimacy (P2B).

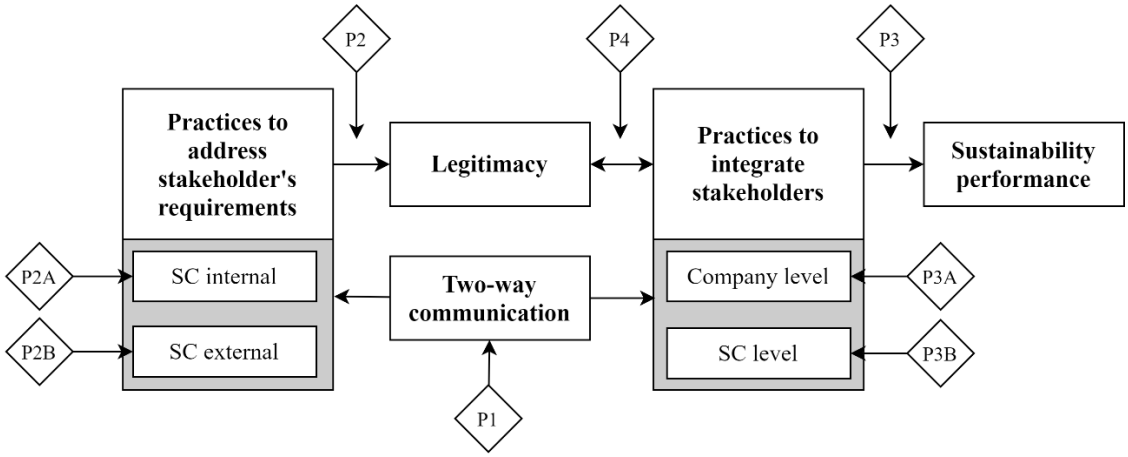

Figure 5.2: Stakeholder management practices in SSCM

Thus, stakeholder management combines different practices to discuss stakeholder concerns, address them, and evaluate processes at the SC's external and internal levels to gain legitimacy.

However, legitimacy is somewhat a prerequisite for involving stakeholders within the SC, which can, in turn, contribute to further legitimacy (P4).

Furthermore, all practices work toward a more sustainable SC by addressing or integrating stakeholders at different levels (P3). For example, the SC's reconceptualization by integrating nontraditional SC members (i.e., stakeholders) can lead to higher sustainability performance (P3). Involving stakeholders can close resource and knowledge gaps at the company level (P3A) and tackle SC issues beyond its boundaries (P3A, P3B).

The results indicate that certain practices—for example, the reconceptualization of the SC—can improve performance; most interviewees were aware of this but struggled to expound on the interlinkages between certain practices and a particular dimension of sustainability. Thus, the results reveal somewhat limited insights into the relationship between specific practices and one of the three sustainability dimensions. However, they provide evidence of the prerequisite of stakeholder management practices for improving overall SC sustainability performance.

5.6 Discussion

Although the management of stakeholder issues is a core element in arguing why companies strive toward a more sustainable SC (Chowdhury et al. 2019; Beske und Seuring 2014), little research focuses on the operationalization of stakeholder management in SSCM. The current study is an attempt to scrutinize stakeholder management practices in SSCM by applying a case study design. Because SSCM contains myriad aspects, picking suitable practices is a crucial phase. Thus, we followed the considerations of well-accepted studies as a starting point for stakeholder management practices. These deductively derived constructs were complemented inductively based on the empirical data. Hence, we elaborated on theory through construct splitting and restructuring in the SSCM domain (Fisher und Aguinis 2017). Further, the results provide empirical evidence of how companies interact with stakeholders to establish stakeholder management in SSCM within the scope of the bioenergy field, answering the call from Ansari und Kant (2017b) to conduct more case studies to advance the SSCM debate.

The study suggests analyzing stakeholder management practices vis-à-vis the dimensions of "practices to address stakeholder requirements" and "practices where stakeholders are integrated."

In the current SSCM literature, stakeholder management is more a term that lacks specification (e.g., Chowdhury et al. 2019; Perrini und Tencati 2006) or somewhat an instrument for communicating with the stakeholder (Hofmann et al. 2014). The literature paints an incomplete picture when it comes to an understanding how stakeholder management can be

operationalized in SSCM. Thus, the study findings suggest that stakeholder management combines different practices to exchange stakeholder concerns, address them, and evaluate the process at the SC's external and internal levels to gain legitimacy.

In line with the literature (e.g., Beske und Seuring 2014; Oelze et al. 2016), the results indicate that an ongoing discourse with stakeholders through two-way communication ensures that companies are informed about the stakeholders' requirements and facilitates the process of meeting these requirements. Although two-way communication with stakeholders can be seen as the core of stakeholder management (Beske und Seuring 2014; Hofmann et al. 2014), the analysis also indicates that a certain willingness to learn and transform the SC design is a prerequisite for a true orientation toward stakeholder management in SSCM, which is in line, for example, with Svensson et al. (2018) and Shubham et al. (2018).

SSCM scholars suggest that linkage development is a relevant strategy for involving stakeholders in businesses, particularly in emerging countries, but it has received minimal attention to date (Sauer und Seuring 2017). The study findings indicate that further legitimacy can be achieved through linkage development (e.g., job creation and extending the community's well-being) and by educating stakeholders at the external SC level. Further, the results suggest that local anchoring by adopting (new business) behaviors to integrate local stakeholders due to favoring local employment or involving nearby smallholders and families in delivering raw material can foster direct stakeholders' positive perception; this is in line with, for example, Ahl et al. (2018).

To ensure the stakeholders' legitimacy (Xu et al. 2019; Ruf et al. 2001), "trust-building transparency," "two-way communication" and "knowledge transfer" are proposed practices for stakeholder management (e.g., Beske und Seuring 2014; Meckenstock et al. 2015). Our findings broaden this view by emphasizing that integrating stakeholders at different SC stages might be an additional stakeholder management component. Both measures can contribute to gaining legitimacy from local actors.

In addition to legitimacy, the findings suggest that stakeholder integration can lead to higher sustainability performance. As indicated by Pagell und Wu (2009) and Shubham et al. (2018), the study shows that SC's re-conceptualization, thus stakeholder integration, contributes to expanding the resource base or closing gaps, such as limited knowledge. Further, collaborating with stakeholders can trigger a company's learning capacity and thereby yield the potential of joint product developments (Manzhynski und Figge 2020). In accordance with the present results, previous studies have demonstrated that knowledge exchange and frequent

communication with stakeholders are essential for innovation (Ahl et al. 2018; Oelze et al. 2016).

A further contribution lies in the selected empirical field. While the current SSCM discourse is clearly dominated by a Western perspective (Jia et al. 2018; Morais und Silvestre 2018), this piece of research is one further step toward filling the gap by being based on an emerging country setting.

Nevertheless, the empirical qualitative study has its limitations theoretical and empirical limitations (Eisenhardt und Graebner 2007). Three major limitations can be identified. (a) While we grounded our research on established SSCM constructs, a more reflective approach and the selection of other constructs on stakeholder management and SSCM might yield additional insights. (b) Although we based our research on established SSCM constructs, and the data analysis process followed strict rules (e.g., Mayring 2015), the researcher's subjectivity in the analyzing process could not be completely avoided. While attempts were made to prevent bias during data gathering and analysis, it might have been impossible to exclude every researcher's influence (Bryman und Bell 2015; Stuart et al. 2002). (c) The fact that the data were restricted to one industry in one country might have caused limited generalizability of these results.

However, the limitations of our case study point to future research opportunities. Our empirical propositions should be anchored more comprehensively in the existing body of literature. Here, a literature review applied to the field of stakeholder management in SSCM might validate or reject our propositions and reveal what has been studied to date. While the generalizability is currently restricted, further empirical studies in a diverse setting setting—for instance, another industry in an industrialized country—can extend it (Eisenhardt und Graebner 2007). This would also provide further empirical evidence, as requested by Meixell und Luoma (2015).

5.7 Conclusion

This study explores SSCM practices applied by focal firms to engage with stakeholders and manage their issues as part of their stakeholder management due to extensive empirical work.

The findings show that stakeholder management combines different practices to exchange stakeholder concerns, address them, and evaluate the process at the SC's external and internal levels to gain legitimacy. We structure these practices based on two dimensions: "practices to address stakeholder requirements" and "practices where stakeholders are integrated."

The results indicate that although two-way communication with stakeholders can be seen as the core of stakeholder management, a certain willingness to learn and transform the SC design is a prerequisite for true orientation toward stakeholder management in SSCM. Additionally, linkage development and local anchoring are practices used to obtain further legitimacy at the external level. These and other insights can help managers develop and implement practices to engage with stakeholders and manage their issues. For example, a company facing resource and knowledge gaps and deficits at the internal level or beyond its boundaries can involve stakeholders in closing these gaps. Furthermore, involving stakeholders within the SC can contribute to legitimacy and lead to higher sustainability performance.

Although this study is the first attempt to analyze stakeholder management practices in SSCM, it has both theoretical and empirical limitations. Thus, digging deeper would contribute to a more comprehensive understanding of stakeholder management in SSCM.

6 Stakeholder influence on sustainable supply chain management: A case study of a German apparel frontrunner

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6.1 Abstract

Although interest in green and sustainable supply chains has been growing for over a decade in the academic discourse, the textile industry still embraces numerous examples of non-sustainable behaviour (i.e., environmental damage, poor working conditions, or modern slavery. While there is a general agreement that stakeholder pressure can lead to more sustainable SCs, a lot remains for a more differentiated stakeholder perspective in sustainable supply chain management (SSCM). Thus, this study aims for theory elaboration by structuring relationships between SSCM and stakeholder constructs through an exploratory single case study design on the Otto Group, a German apparel frontrunner. It enables an in-depth investigation of the complexity of both stakeholder engagement/relationships and SSCM. As key results, sustainability managers and employees are important facilitators to realize win-win situations. Further, most progress is nowadays made in participating in multi-stakeholder-initiatives (MSI) and with standards to tackle sustainability issues in SCs. Furthermore, this study shows the importance of a shift from the perspective of sustainable products towards sustainable values, and it outlines best practices regarding the integration of stakeholders' expectations in SSCM.

Keywords:
Sustainable supply chain management, stakeholder roles, collaboration, apparel industry, case study

6.2 Introduction

Although interest in green and sustainable supply chains has been growing for over a decade in the academic discourse (Ansari und Kant 2017a), the apparel industry embraces numerous examples of non-sustainable behaviour. For example, clothing production is associated with myriad environmental damages, such as the contamination of rivers by chemicals used to dye

the textiles. Moreover, working conditions, especially in manufacturing countries like China, Bangladesh, or Cambodia, are anything but sustainable – some even speak of modern slavery (Hasan 2019). Most companies strive to achieve classical business targets rather than a genuine orientation towards sustainability (Gold und Schleper 2017). Many companies have their own (in contrast to industry-wide) instruments and standards, which are not always applied comprehensively. Although anchoring sustainable and responsible supply chain management (SCM) on a strategic level and in corporate values is considered as essential (Beske und Seuring 2014), the impact of stakeholders on sustainable supply chains (SCs) should not be underestimated (Wolf 2014). One example is the Clean Clothes Campaign which advocates for workers' rights and improved working conditions in the international apparel industry and successfully calls for transparency in global SCs (Robledo und Triebich 2020). Given that stakeholders come from different contexts, they have diverse expectations of a company. In addition to profit-oriented stakeholders, others are also concerned with social or environmental issues and therefore aim for sustainability in SCs. This stakeholder approach can lead to a shift in focus from the single economic view towards a holistic view of the value chain and potentially lead to a more ambitious and sustainable SCM approach (e.g., Gold und Schleper 2017).

As most companies' SCs are very complex and not always clearly transparent, it is challenging to determine which stakeholder has a relevant role and can actively influence the company’s approach towards more sustainability (Fritz et al. 2018). While there is a general agreement that stakeholder pressure can lead to more sustainable SCs (e.g., Meixell und Luoma 2015; Wolf 2014), a lot remains for a more differentiated stakeholder perspective in SSCM (Parmigiani et al. 2011; Siems und Seuring 2021).

In many cases, stakeholder groups are described as pressure groups of companies and are thus seen as drivers towards sustainability (Meixell und Luoma 2015). For example, Meixell und Luoma (2015) investigated stakeholder pressure towards the awareness, adoption, and integration of SSCM owing to a literature review. Fritz et al. (2018) developed a SC oriented iterative process to identify stakeholders in order to understand and address their concerns. This process includes, inter alia, stakeholder’s engagement to spot other stakeholders. While apart from stakeholders as drivers or receivers of measures, other roles remain vague, Liu et al. (2018a) attempted to explore additional possible stakeholder roles in the SSCM context. According to them, stakeholder groups can also act as facilitators or inspectors and thereby contribute to a more sustainable SC (Liu et al. 2018a). Nevertheless, their study results are limited to supplier development which is just one part of SSCM (Beske und Seuring 2014). In

this context, the consideration of further SSCM constructs can be a valuable contribution. However, to the best of our knowledge, no empirical study has analysed stakeholders in different roles in the context of SSCM. Thus, the following research question can be established: How are stakeholders and their roles related to SSCM in the apparel industry?

To address this research question, an explorative case study on the textile division of Otto Group was conducted. As a large family-owned company with over 70 years of history they have experienced and initiated a transition towards a more sustainable SC. This transition was triggered by external pressure and stakeholders, but also actively driven by the company itself – not least because of the person at the top of the company. For example, the Otto Group was one of the first companies which introduced a Code of Conduct in Germany and can therefore be classified as a frontrunner (Otto Group 2019). Further, environmental protection has been anchored as a corporate goal since the 1980‘s which is why the incorporation of stakeholders along the SC is an essential issue. The Otto Group is also member and co-founder of several alliances and MSIs to implement environmental and social standards for the apparel industry (Otto Group 2020).

Thus, this research is relevant for the following reasons at least. First, several researchers called for more best practice case studies to learn from commendable companies in order to share SSCM practices (e.g., Köksal et al. 2017, Silvestre 2015). Second, according to Khurana und Ricchetti (2016) further research is needed to evaluate current developments in SSCM for the apparel industry. In this respect, following similar case study designs, e.g., Brix-Asala et al. (2018)’s study (2018) which analysed practices in relation to sustainability tensions of the frontrunner Fairphone, this paper aims to contribute by identifying stakeholders in different roles of SSCM.

The following chapter lays the theoretical background using literature on both SSCM in general and on the influence that stakeholders have in this respect in particular in order to create a link between SSCM and stakeholders’ contributions to sustainability. Subsequently, the methodology is outlined. Here it should be noted that the results of a case study of a single company cannot, of course, be applied to an entire industry, but it can be advantageous to approach a phenomenon on a small scale in order to then examine it at the next larger level. Therefore, the case study uses mainly publicly available data, which was enriched with primary data, and thus strives for a higher method variety in qualitative research, as demanded by Bansal et al. (2018) and Eisenhardt et al. (2016). The following chapter shows the results of the analysis from the Otto Group’s material and the interview by bringing together the previously theorised concepts of SSCM and stakeholder roles. In the discussion, the significance of the results is

highlighted and the extent to which the case study brings value is elaborated. Finally, it will be shown how the results can be integrated into existing (scientific) discourses and where there is a need for further research.

6.3 Theoretical background

6.3.1 Stakeholder and SSCM Terminology

The ongoing globalization led to more globalized SCs, which results in sustainability issues beyond national and company boundaries. Manufacturing processes have been relocated to countries with lower labour and environmental standards, and suppliers fulfil these processes in a multi-tier SC (Khurana und Ricchetti 2016). Thus, the triple bottom line approach (TBL) (Elkington 1998)– aiming to achieve simultaneously social, ecological, and economic business objectives – has become increasing attention. In the same line of argument -i.e., shifting attention towards a more differentiated business perspective – the stakeholder theory emphasizes that despite classical shareholders, other stakeholders, e.g., supplier, employees, or communities along with the SC, also require to be integrated into business decisions. Otherwise, a company may lose the legitimacy to do business. Parmar et al. (2010, S. 429) define stakeholders as „any group or individual that can affect or be affected by the realization of an organization's purpose."

Following to Mitchell et al. (1997), stakeholders can be differentiated by three attributes: power, legitimacy, and urgency. Other studies distinguish stakeholders according to their relationship to a specific company. Therefore, Clarkson (1995) differs between primary and secondary stakeholders. For primary stakeholders, companies themselves "can be defined as a system of primary stakeholder groups, a complex set of relationships between and among interest groups with different rights, objectives, expectations and responsibilities" (Clarkson 1995, S. 107). Secondary stakeholder groups can be defined as those who influence or affect a company or are influenced or affected by a company but are not engaged in transactions with the company and are not essential for its survival (Clarkson 1995).

Seuring und Müller (2008) incorporated those considerations in the SCM context. They defined SSCM as "the management of material, information and capital flows as well as cooperation among companies along the SC while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements" (Seuring und Müller 2008, S. 1700).

In fact, not all sustainability dimensions can be considered equally, as there are different stakeholders (e.g., primary and secondary) with both different sustainability expectations and influence degrees (Meixell und Luoma 2015).

6.3.2 SSCM and stakeholder roles

Research on sustainability in the SSCM context highlights, among other foci, which economic or social goals are triggered by pressures and incentives from external demands such as governments, customers, and other stakeholders (Köksal et al. 2017; Seuring und Müller 2008). In this concern Meixell und Luoma (2015) state to what extent stakeholders can influence sustainability in SCs. They identify a positive correlation between stakeholder pressure in SCM and sustainability awareness, adoption of sustainability goals and/or implementation of sustainability practices.

According to Seuring und Müller (2008), two different fields require attention to achieve a more sustainable SC: (a) supplier management for risks and performance and (b) SCM for sustainable products. To improve sustainability in SCs and of products, focal firms have to find ways to manage quality and sustainability criteria through the whole SC in order to guarantee a certain sustainability level. Thus, enhancing the SCs overall sustainability performance incorporates the selection of a reduced but reliable supplier base and thus the assessment and (self-) evaluation of their performance (Siems et al. 2021). Implementing environmental and social standards, e.g., SA 8000 or ISO 14001, is a popular way to ensure a minimum performance and to manage risks along with the SC where the suppliers' involvement can facilitate the required exchange of information and coordination (Hofmann et al. 2014; Köksal et al. 2017; Yawar und Seuring 2017). In addition to enhanced coordination and communication with suppliers, supplier development and life-cycle assessment of products contribute to further sustainability improvements and facilitate joint (product) developments (Beske und Seuring 2014; Siems et al. 2021). This can ultimately lead to more efficient business operations while realizing win-win scenarios (Rodríguez et al. 2016; Seuring und Müller 2008). Due to complexity, transparency issues, and limited resources, the focal firm has limited access to its suppliers (Busse et al. 2017). Thus, it sometimes faces trade-off decisions because goals of all three sustainability dimensions cannot be achieved simultaneously (Brix-Asala et al. 2018; Seuring und Müller 2008). These trade-off decisions affect the SC performance and require agreeing to the lowest common thread to minimize risks and improve the SCs conditions as much as possible (Beske und Seuring 2014; Seuring et al. 2019). Therefore, they can sometimes not solve an issue despite their willingness to tackle it (Carter et al. 2015).

However, the cooperation with non-traditional SC members such as NGOs, competitors or research institutes, and universities with a broad knowledge about different topics might be a suitable strategy to solve these complex issues (Rodríguez et al. 2016; Siems und Seuring 2021; Roscoe et al. 2020). Liu et al. (2018a) state that stakeholders can contribute to sustainable SCs as drivers, facilitators or inspectors within the process of supplier development at least. According to their study, drivers could be defined as actors „that provide pressure and/or incentives to initiate SDS [supplier development for sustainability] practices“ (Liu et al. 2018a, S. 105). Facilitators provide knowledge and/or resources for practices; and inspectors provide a neutral and scientific ground for SDS practices (Liu et al. 2018a). The fact that the role of drivers is mentioned more often in different studies than other roles is an interesting starting point for subsequent research. Other studies e.g., such as Köksal et al. (2017), mention stakeholders' role as drivers and characterize them as initiating and motivating factors in implementing SSCM practices. According to Siems und Seuring (2021), stakeholders can be integrated into SSCM practices at the internal and external dimensions of a focal firm to achieve true stakeholder orientation. Furthermore, Busse et al. (2017) illustrate how companies could identify SC sustainability risks with stakeholders' help. To monitor these risks, “gatekeeper instruments” such as Code of Conducts and processes (e.g., supplier selection) are in place, which can influence suppliers’ behaviour (Busse et al. 2017). Busse et al., (2017) assume that many industries (above all the apparel industry) only have low SC visibility – e.g., not enough information about suppliers – is therefore an interesting field to conduct further research. Consequently, it is crucial to take a look at the apparel industry and identify its nature. Together, these studies indicate the requirement to unravel the various contribution of stakeholders within SSCM.

Table 6.1 shows the identified deductive constructs of stakeholder roles mentioned in the reviewed literature on SSCM (e.g., Liu et al. 2018a; Seuring und Müller 2008; Seuring et al. 2019) and illustrates the underlying coding scheme. The table is derived from the SSCM construct of Seuring und Müller (2008) and the stakeholder constructs of Liu et al. (2018a) and is furthermore enriched by the aforementioned current debate in SSCM literature.

Table 6.1: Overview of the analysed SSCM and stakeholder constructs

Category	**Item**	**Description**	**Excerpts from coded material**
Triggers for SSCM			
Sustainability expectations	Primary stakeholders, e.g.: CEO Employees	The corporation itself can be defined as a system of primary stakeholder groups, a complex set of relationships between and among interest	

	Sustainability managers	groups with different rights, objectives, expectations, and responsibilities (Clarkson, 1995).	
	Secondary stakeholders, e.g.: Government NGOs Alliances	Secondary stakeholders are those who influence or affect, or are influenced or affected by the corporation, but they are not engaged in transactions with the corporation and therefore not essential for its survival (Clarkson, 1995).	
Influence in SSCM			
Stakeholder roles	Drivers	Stakeholders who drive awareness for sustainability (e.g., pressure or incentives) (Meixell und Luoma 2015; Busse et al. 2017)	"In the new topic area 'Empowered Employees' we want to pay great attention to our colleagues in the Otto Group. […] the topic of corporate responsibility is of great importance to many – together with the Group companies, we want to create opportunities for participation and show how to shape everyday working life" (Otto Group, 2020, p. 22). "Climate protection occupies a prominent place in public perception – noticeable consequences of climate change and the "Fridays for Future" movement gave new resonance to the appeals of the scientists and the decisions of the Paris Climate Agreement of 2015" (Otto Group, 2020, p. 15).
	Facilitators	Facilitators provide knowledge and/or resources so that a company can act more sustainable and implement SSCM practices (Busse et al. 2017; Köksal et al. 2017; Liu et al. 2018a; Siems und Seuring 2021).	"The Corporate Responsibility holding division manages the group-wide sustainability activities of the Otto Group. This division develops goals and concepts and advises the Group companies. Due to the Otto Group's decentralized organisational structure, the managing directors of the individual Group companies hold responsibility for implementing the five sub-strategies of CR strategy 2020. They receive support from CR coordinators who are in constant contact with the Corporate Responsibility division" (Otto Group, 2019, p. 74).
	Inspectors	Inspectors evaluate or assess subsequently the implementation of	"Political regulations have a direct impact on the Otto Group's business activities.

		sustainability practices along the SC (Liu et al. 2018a; Busse et al. 2017).	Responsibility aspects of business activities are becoming increasingly regulated in the European Union and in Germany. If the objectives of the National Action Plan (see Annual Report 2017/18, page 58), which are based on the principle of voluntary action, are not met, the coalition agreement stipulates that legal regulations are to be reviewed. To this end, Development Minister Gerd Müller has already submitted an initial proposal for a Supply Chain Law. According to these regulations, German companies would also be liable for violations of the law by business partners in supplier countries." (Otto Group, 2019, p. 73).
Supplier management for risk and performance			
Supplier management	Supplier selection	For achieving a more sustainable SC, selecting a reduced but reliable supplier base is essential and thus the assessment and (self-) evaluation of their performance (Seuring und Müller 2008). Implementing environmental and social standards are a common way to ensure a minimum performance where the suppliers' involvement can facilitate the required exchange of information and coordination (Beske und Seuring 2014; Siems et al. 2021).	"[…] Supply chain management has always played a relevant role and will continue to do so. In the new strategy, it is an important piece of the puzzle, and still has the most manpower behind it in the organization, to ensure that environmental and social standards are brought forward […]. The strategy is not about minimum standards that are mandatory, but rather about encouraging all suppliers at all levels of the supply chain to improve, knowing […] that someone at Tier 2, 3, 4, 5 level no longer even knows it as a name. In other words, it is a challenge to carry any requirements through the supply chain without losing suppliers and upsetting them. That's why it's a lot about partnership and cooperation" (Interview, p. 7).
	Supplier (self-) evaluation		
	Supplier assessment		
	Implementation of environmental standards		
	Implementation of social standards		
	Supplier involvement		
Sustainable performance relationships	Win-win	In striving for a financially viable and sustainable business, a company often faces trade-off decisions where targets from all three dimensions are hard to achieve simultaneously(Brix-Asala et al. 2018). To avoid risks and improve conditions in the SC, the lowest	"As far as suppliers are concerned, to answer the question in this regard, they already have their specifications on the one hand: they are no longer allowed to supply conventional cotton to the Otto Group, but only sustainable cotton. For the other materials, we follow suit.
	Trade-off		
	Minimum criteria		

		common thread, i.e., minimum criteria, is agreed, and might serve as a starting point to aim for win-win situations/scenarios (Seuring et al. 2019; Rodríguez et al. 2016).	[…] That means it's a push-pull effect. On the one hand, they realize that I have to, and on the other hand, of course, you also have many people who say stop, this is a business. I'll prepare for it and adjust to it and make explicit offers, […] which they would not have thought of in the past. A side sentence to it still, one must pay attention then evenly very much to it: Does he do that just to do business […], where he just writes on it and in the end it was not. Or has he really changed the philosophy of working in the direction of sustainability, so to speak, and it's good to work with him" (Interview, p. 9).
Sustainability risk dimensions	Economic risk management	This category embraces a company's activities and efforts to manage environmental, social, and economic risks along the SC due to, e.g., compliance with standards such as SA 8000 or ISO 14001 (Beske und Seuring 2014; Hofmann et al. 2014; Yawar und Seuring 2017)	"[…] sustainability management is important if you want to be a responsible entrepreneur, and this then became increasingly concretized, in fact, if you will, in retrospect, the classical topics that began in the nineties with child labor, no more furs, when it came to textiles, at some point energy efficiency classes. Then came the chemicals issue. Now we are somehow moving deeper into the supply chain, there a lot about alliances, how do I actually manage a platform?" (Interview, p. 6).
	Social risk management		
	Environmental risk management		
SCM for sustainable products			
SCM	Coordination and communication	To manage a SC for sustainable products requires enhanced coordination and communication with suppliers, their development, and the life-cycle assessment of the product but can also lead to joint (product) developments (Liu et al. 2018a; Siems und Seuring 2021; Pagell und Wu 2009)	"In addition, secondly, relationship management with the partners of the value network is necessary. […] Values do not emerge in sequential chains, but in complex constellations. Values are thus co-produced in a system of different economic actors - suppliers, business partners, customers. To achieve this, roles and relationships must be reconfigured within the framework of a stakeholder approach - with upstream and downstream partners. Instead of a narrow operational focus on short-term profit maximization, the commonality of interests and

			the constant commitment of all stakeholders must be ensured"(Riekhof 2013, S. 119)
	Supplier development		
	Joint innovation		
	Life-cycle-assessment		

6.4 Methodology

As there is insufficient evidence in previous publications on which stakeholders can influence corporate sustainability efforts and in which way, the Otto Group's SC is examined more closely in order to find out what impact stakeholders have on the implementation of sustainability in this area. However, we do not look at the individual steps of the Otto Group's SC because it is not fundamentally different in comparison to other companies, but rather at the complexity and structure of the SC in general to elaborate existing theory. Thus, the study aimed for theory elaboration by structuring relationships between SSCM and stakeholder constructs through a single exploratory case study design. It enables an in-depth investigation of the complexity of both stakeholder engagement/relationships and SSCM.

According to Stuart et al. (2002) a case study is helpful when the research question asks why or how things happen. Besides, it looks at a real-world phenomenon, which means that the case's context is crucial and cannot be controlled (Yin 2018; Saunders et al. 2016). In this respect, case-based research cures a "weak and limited understanding of the body of knowledge as a whole" (Stuart et al. 2002, S. 421–422). Case studies not only serve to capture a phenomenon and develop from their richness of observation, but they also allow to refute or extend existing theories. Since exploratory research seeks to define an identified problem (Sreejesh et al. 2014), this case study aimed to explore stakeholders' influence by bringing together theoretical assumptions of both stakeholder theory and SSCM. As a case study should contain a transparent research process, the suggestions from Stuart et al. (2002) were followed with minor modifications: (1) Development of research instrument, (2) Data gathering, (3) Data analysis, and (4) Dissemination (see Figure 6.1).

6.4.1 Development of research instrument: A case study

The apparel industry is an interesting field to research as it is one of the biggest industries with approximately € 1.5 trillion annual revenue (Shahbandeh 2021). As mentioned before, the industry is characterized by the complexity of their SCs and the existence of multiple stakeholders, some of which are loud, others are in the background. Further, it is very

susceptible to disruption and often subject to criticism, especially regarding sustainability-related aspects.

The industry's development towards fast response to consumer demands and permanently changing trends (Christopher et al. 2004) has led to lower producing costs resulting in bad environmental and poor labour conditions in SCs in producing countries (Masson et al. 2007). Although some apparel companies have addressed sustainability for many years (Khurana and Ricchetti 2016), the industry is still known for incidents like Rana Plaza and environmental problems in their factories (Köksal et al. 2017). Therefore, it seems necessary to conduct further research on the factors that could counteract these adverse events and consequences. In this context, it is crucial to consider the social conditions in SCs – especially in upstream tiers – as they have not been sufficiently appreciated in previous research compared to environmental and economic aspects.

SSCM in the apparel industry takes into account both internal company measurements and industry-wide practices for a sustainable value chain. This includes stakeholders who can act as primary and secondary drivers, enablers or barriers; but also technological improvements and cost-driven decisions can influence a company's business decisions (Köksal et al. 2017). Khurana und Ricchetti (2016) describe the integration of SC sustainability into core business practices and the implementation of transparency in SCs as important instruments for more sustainability along the value chain of the apparel industry. The theoretical approaches cited above regarding a higher SC sustainability performance underline that a case study in the apparel industry is an appropriate approach to question theoretical hypotheses and identify challenges and methods for sustainability in SCM.

Regarding responsibility towards suppliers, Awaysheh und Klassen (2010) summarize four dimensions of socially responsible practices: supplier human rights, supplier labour practices, supplier codes of conduct and supplier social audits. In addition, Code of Conducts and Code of Ethics, and third party-audits that monitor compliance with the codes of the firms, can contribute to the implementation of sustainability in SCs (Köksal et al. 2017). By taking into account these lines of argumentation, a case study on the apparel industry might be a suitable approach to question theoretical hypotheses and identify challenges and methods for sustainability in SCM.

With almost 50,000 employees, more than € 15.5 billion in revenue, and more than 120 group companies (Otto Group 2021), the Otto Group is an outstanding example of a company in the apparel sector, primarily because of its long-standing focus on sustainability. The various group companies are linked to a highly complex SC. Against the background of this complexity,

it is particularly interesting to identify and analyse the influences of different stakeholders and the mechanisms to manage them better.

As already outlined, the Otto Group's SC with the involved stakeholders as a frontrunner in the apparel industry offers an intriguing framework for this research due to the special conditions in a family-owned business and the company's long-standing sustainability orientation. This setting represents a different case compared to most apparel companies and could lead to a benchmark for the entire industry.

As already mentioned, the Otto Group can be seen as a role model/frontrunner in the apparel industry in terms of sustainability. Since the 1980's, environmental protection was implemented as a company goal. The Otto Group has been involved in the development of worldwide guidelines for social and environmental improvement. In order to increase their sustainable impact and to achieve sustainability goals, the Otto Group enters cooperation with different stakeholders along with the SC (Otto Group 2019). As a further instrument, the Otto Group uses financial incentives for its chair members with regard to variable remuneration that depends on the extent to which sustainability targets and goals are fulfilled (CSR in Deutschland 2014).

Beyond its long-term internal engagement on sustainability, the Otto Group is a member or co-founder of several alliances and MSIs to implement environmental and social standards for the apparel industry and in SCs (Otto Group 2020). The combination of the different alliances and methods to tackle sustainability issues leads to a variety of stakeholder involvement and thus an interesting angle for this case study.

In this respect, this paper does not conduct a multi-case study with the integration of several generic companies, but focuses only on the Otto Group to show what they do as a frontrunner and can thus be understood as a best practice example – as requested e.g., by Köksal et al. (2017) and Silvestre (2015).

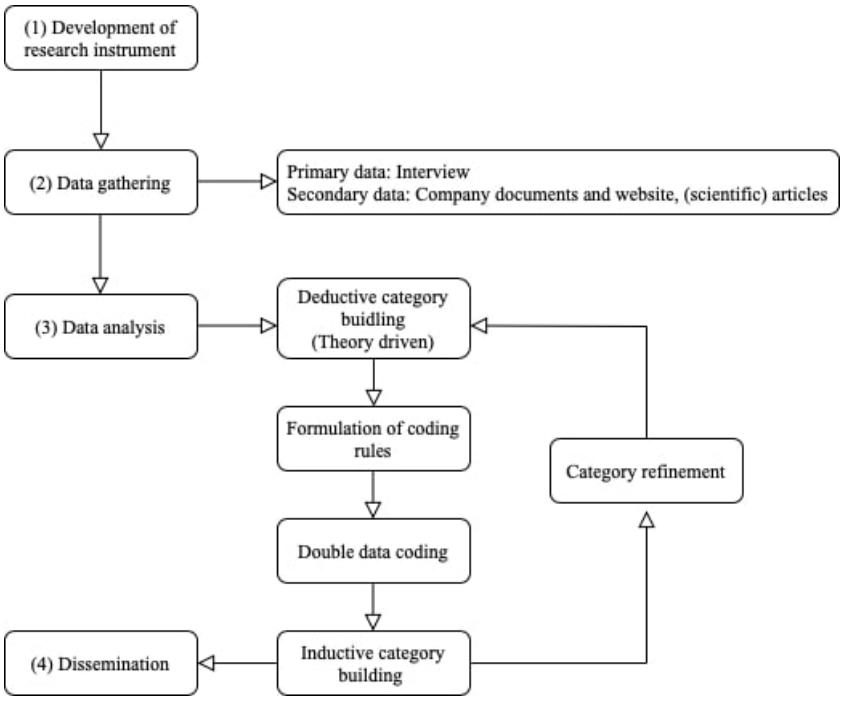

Figure 6.1: Applied research process (based on Stuart et al. 2002)

6.4.2 Data Gathering

According to material analysis, the case study was based on primary and secondary data (see Figure 6.1). As a starting point, the website of the Otto Group was scanned to get a first overview regarding the research scope. Two Otto Group annual reports (2018/2019 and 2019/2020) were used as secondary data in order to get an impression on the company's approach to sustainability. Furthermore, two articles about the Otto Group's sustainability strategy with a special focus on marketing opportunities but also the orientation and positioning of the company towards sustainable sourcing were used (Riekhof 2013; Brock und Streubig 2014). As a final secondary source that should not be forgotten, existing research on SSCM and stakeholder management was included in the analysis.

To validate and complete the first analysis's insights, a semi-structured interview with an SSCM expert from the Otto Group was conducted. A guideline developed by the research team served as the basis for the interview questions. On the one hand, the interview allowed to elaborate on some of the issues that have been identified as of particular interest and, on the other hand, tried to generate information about the existence and importance of stakeholders. The advantage of semi-structured interviews compared to open discussions is that the respondent can answer in their own words and has sufficient time and space. Still, the interviewer ensures that the answers are focused on the relevant topic (Sreejesh et al. 2014).

Further, it allows going more into details on questions that appear during the interview and allows to ask further questions (Saunders et al. 2016).

The questions for the interview were chosen based on the underlying theoretical constructs and supplemented during the discussion with further researchers. The interview was conducted in a video conference and by both researchers in order to be able to analyse it as neutral as possible. In addition, the transcription was carried out on the basis of already proven scientific rules by the research team. Internal validity was achieved by offering to return the interview summary to the interviewee and offering his consent.

The combination of both data from the company and external information gained in a direct dialogue results in a more complete picture of the phenomena (Stuart et al. 2002).

6.4.3 Data Analysis

The case study aimed at theory elaboration, which define Fisher and Aguinis (2017, p. 441) as "the process of conceptualizing and executing empirical research using pre-existing conceptual ideas or a preliminary model as a basis for developing new theoretical insights by contrasting, specifying, or structuring theoretical constructs and relations to account for and explain empirical observations." The research started with an existing conceptual model; then, data was collected to refine theory and gain new insights (see Figure 6.1). As there is also potential to collect additional data, this method seemed appropriate (Fisher und Aguinis 2017). Both the interview and the secondary material were analysed using the qualitative content analysis as it allows to analyse texts and draw conclusions (Kassarjian 1977). In this analysis, the procedure of structuring was used. The aim is to assess the material based on defined criteria in order to filter out certain aspects (Mayring 2015, S. 65). According to Fisher und Aguinis (2017), the structuring approach is appropriate if the study's primary focus is to improve an existing theory's explanatory and predictive adequacy (Fisher und Aguinis 2017). Which contents are to be extracted from the material will be developed by theory-guided categories (Mayring 2015). Therefore, an abductive approach was chosen which allows both the application of an established interpretative rule – which in this case is existing in theory – and the observation of an empirical phenomenon. This results in a re-interpretation of existing theory (Alvesson und Kärreman 2007). The advantage is that researchers can critically assess alternative ways of framing empirical material.

Therefore, the material to be analysed was first condensed. As most of the material was published by the company, it is not neutral or scientific and consciously addresses certain aspects, while others are not mentioned. After an initial screening of the material, a first categorisation was created based on the screened literature. The first draft of the category

system was renewed in a next step by merging and omitting some of the categories according to Seuring und Müller (2008). According to Gioia et al. (2013), the reduction of categories helps to make the categories more manageable, so that in a second-order analysis it is easier to assess whether the categories are helpful to answer the research question. This was followed by a coding with the help of the software MAXQDA. In order to achieve as much neutrality as possible, the authors used a double coding by ensuring that two researchers analysed the material and that only those factors were considered that coincided. Further, the authors see that the existing explanation is incomplete and therefore must be widened to unite stakeholder theory with literature on sustainable SCs.

6.4.4 Dissemination

According to Stuart et al. (2002) a case study must reflect the phenomena they are intended to, and must be repeatable and conclude with the same results. Thus, Table 6.2 condenses different validity and reliability measurements to disseminate the conducted qualitative research.

Table 6.2: Research quality measures

	Objective	**Application**
Construct validity	The degree of legitimacy to which the operational measures are set for the areas studied.	- Interview guideline and categories were based on profound theoretical frameworks. - The interviewee was offered to receive the summary of the interview for release. - Data triangulation (primary and secondary data).
Internal validity	The extent to which claims can be casually linked within a study.	- Both the coding scheme and questionnaire were based on relevant and well cited scientific frameworks. - Multiple researchers were integrated within the design of the questionnaire. - The interviewee was offered to receive the summary of the interview for release.
External validity	The extent to which the results of a study and its presumed causal relationships can be generalized.	- According to Locke et al. (2008), the applied abductive reasoning logic enables analytical generalizability. - Inclusion of literature in order to analyse not only internal company documents and to recognise cross-company problems.
Reliability	The assurance of transparency and the guarantee that the study can be replicated under consistent conditions.	- Structured and transparent research process (Stuart et al., 2002). - Definition of rules for transcription and data analysis process followed the recommendations of Mayring (2015) and the already established scientific rules of the research team. - Sound coding scheme was based on established theoretical constructs. - Database and coding were completely done in

		MAXQDA. - Multiple researchers were involved in analysing the data, deriving their results as well as interpreting them.

6.5 Findings

Within the analysed material, different stakeholders were identified. These stakeholder groups have one or several stakes in the Otto Group's activities and can influence or were influenced by the Otto Group's actions (see Table 6.3). This fact often results in mutual relationships. Therefore, according to the definition of Parmar et al. (2010), these stakeholders are relevant for the Otto Group and are listed below in different functions. The distinction of stakeholder groups into primary and secondary stakeholders (Table 6.3) is based on Busse et al. (2017).

Table 6.3: Inductively identified stakeholders with definitions based on Busse et al. (2017)

Stakeholders	**Abbreviation**	**Definition**
Primary stakeholder		
Dr Michael Otto	(MO)	Former CEO of the family company, now chairman of the supervisory board
Employees	(EM)	Regular employees within a company except for sustainability managers
Sustainability managers	(SM)	Employees within a company that are directly addressed to manage sustainability
Customers	(CUS)	All people that affect directly or indirectly the purchasing strategy of a company by buying or not buying its goods
Suppliers	(S)	All companies and people along the value chain that affect the goods of another company
Secondary stakeholder		
Competitors	(COM)	All companies and people that compete directly or indirectly in the same market than the origin company
NGOs	(N)	Non-governmental organizations that affect a company's business operations
Public opinion/Civil society	(P)	All topics that are discussed by the society and have to be taken into account by a company, e.g., working conditions in producing countries or "Fridays-for-future"
Governments	(G)	All legislators who can influence a company's business operations through statutory provisions or regulations
Media	(M)	All media players who directly or indirectly influence the sustainability efforts of a company through reporting
Alliances	(A)	Multi-company cooperation or cooperation with NGOs or governments
Finance market	(FM)	All actors and actions of the financial market that can have an impact on sustainability efforts of a company

In the next step, the respective actors are assigned to the three roles (drivers, facilitators, and inspectors) according to Liu et al. (2018a) that have been extracted through the material analysis. Within the categories, a further distinction is made between primary and secondary

stakeholders to illustrate their influence. According to Table 6.1, the stakeholders and their roles were then linked to the SSCM categories in terms of their influence on SSCM of the Otto Group. The coding allows categorising and analysing stakeholders' influence more precisely by revealing recurring patterns in individual stakeholder roles that relate to and influence sustainability in the Otto Group's SC. The extent to which these groups can affect the Otto Group's operations is outlined in the following chapters using the Otto Group's SSCM in combination with several stakeholder groups or response to pressure from stakeholder groups. Overall, it is a combination of different stakeholder groups that can influence the Otto Group's actions about sustainability in SCs in different ways.

6.5.1 Drivers

In order to assign the various stakeholder groups to their most frequent roles, MO and customers as primary stakeholders and secondary stakeholders such as NGOs, civil society, and media are identified as drivers (see Table 6.3 and Table 6.4). According to Busse et al. (2017), drivers are stakeholders that push awareness for sustainability. In line with the arguments of Table 6.1, the drivers were analysed in combination with supplier management for risk and performance. In this regard, the implementation of standards is the most common way of the Otto Group to ensure a minimum SC performance also driven by stakeholder groups (Beske und Seuring 2014).

Supplier management

All analysed sources describe MO, the chairman of the supervisory board, as a primary driver. As the CEO of the Otto Group, his engagement can be linked to supplier management. Since the 1980s, he has promoted the Otto Group's commitment to sustainability through his position as CEO from 1981 to 2007 by defining environmental protection as a corporate goal in 1986 (Otto Group 2019). During this time, the Otto Group already implemented and pushed suppliers to incorporate environmental and social standards, e.g., child work restrictions or energy efficiency classes (Interview, 2020). While the implementation of standards is more a minimum requirement nowadays, it was a benchmark and not widely applied in the apparel sector or for large companies in general when the standards were implemented in the Otto Group. Therefore, MO's engagement has to be divided into two different stakeholder roles. The CEO's engagement can be classified as a driver and differs from his actual role, as he can be seen more as an inspector (see Chapter 6.5.3).

As a second stakeholder group identified as drivers concerning supplier management, customers play an essential role. In this context, the interviewee and several secondary sources

mentioned the great relevance of customers. They do not directly reward positive, sustainable behaviour and increasingly buy from such companies, but rather punish non-sustainable activities and then purchase from other companies. This means that any company must constantly be aware of and ensure compliance with specific standards. This expectation, combined with negative differentiation, makes positioning sustainability more difficult since positive differentiation does not have the expected effects on customers. Therefore, the Otto Group would welcome even greater commitment from customers so that a positive dedication to sustainability is also reflected in their purchasing behaviour.

Nevertheless, customers in their role as drivers are granted a great deal of power, which, in conjunction with other secondary drivers, can often cause urgency. Urgency is, according to Mitchell et al. (1997), one of three crucial attributes (power and legitimacy) in order to identify stakeholder's salience. Especially the interaction with NGOs, the media, and the resulting public opinion can ensure that specific trends in sustainability arise, and that unsustainable behaviour of companies is avoided and even punished.

Sustainable performance relationships

As an essential point for the engagement of MO, the foundations of MO, which cooperate closely with the Otto Group, target, in particular, the upstream stages of the SC and – through cooperation with producers and farmers – attempt to produce more sustainable materials right at the beginning of the value chain. Pagell und Wu (2009) suggested that working with non-traditional SC actors yields the potential to achieve (sustainable) win-win situations by combining efforts and resources. Even though foundations like the "Aid by Trade Foundation" or the "Stiftung 2°" serve as facilitators, the engagement of MO within the company and in combination with his position as founder of the initiatives mentioned above can be linked to his role as a driver. Thus, this example outlines how one stakeholder can trigger other stakeholders to work together to advance a particular goal that cannot be achieved alone.

Sustainable risk management

Furthermore, several secondary drivers influence the commitment to sustainability in the Otto Group on different levels (see Table 6.4). As far as social risks are concerned, the issue is being promoted by NGOs in particular. In the interview, they are described as a kind of "watchdog" who pays close attention to how the Otto Group behaves in this area and communicates misconduct accordingly. Since NGOs often address corporate violations, they also ensure that social risks, especially in production, must always be considered, and the social

situation in SCs needs to be communicated to the public – especially as this issue is of public interest (Interview, 2020). When media, public opinion/civil society, and customers come together, a unique dynamic develops, which can pose economic risks for companies by causing much sensible attention. In particular, negative publicity, e.g., the accusation of greenwashing, can lead to a generally negative image and lower sales figures (Riekhof 2013). This fact results in the Otto Group's strategy of not primarily targeting individual sales measures through sustainability, but rather to avoid customers perceiving the Otto Group as a non-sustainable company. The narrative has changed due to the possibility of differentiation through sustainability. While this used to be mainly positive, it now often happens that (some) customers ignore companies that are negatively associated with sustainability issues in their SC and do not buy products from them (Interview, 2020). Companies, including the Otto Group, must pay attention to this and recognize these trends through risk management and stakeholder dialogues in order to be able to react at an early stage so that the company is not negatively penalized by customers and potential customers (Riekhof 2013; Interview, 2020).

SCM for sustainable products

At this point, a link can be drawn to SCM for sustainable products. According to Pagell und Wu (2009) and Seuring und Müller (2008), managing SCs for sustainable products requires enhanced coordination and communication and supplier development and joint innovation. According to Riekhof (2013) the Otto Group shifts the perspective from the narrative of sustainable products to values, where several stakeholders are co-producers of these values, and therefore, their roles and relationships must be reconfigured. This process can be seen as an outcome derived from customers as drivers regarding risk management. In this respect it is particularly striking that MO, in his role as a driver, is identified in all three risk dimensions. This can be explained by the early recognition of the social and ecological impact of companies which has led to a strong corporate focus on sustainability through MO since the 1980s. In addition, the company's name is automatically linked to his name, which is why unsustainable behaviour is not only negatively linked to the company, but also to his person and family (Interview, 2020). As explained earlier, this stakeholder role is linked to his previous engagement with the company, and his current position may be more related to that of an inspector – also concerning risk management.

When it comes to SCM for sustainable products, the foundations are essential drivers to develop better solutions in SSCM. This can be seen, e.g., on the example of two foundations that were founded with the cooperation or under the initiative of MO – especially against the

background that actors have not sufficiently addresses these issues. Despite sustainability measures focusing on the upstream SC stage, MO established the "Stiftung 2°", a cross-market initiative for German companies to join forces for climate protection (Otto Group 2019). Through the "Aid by Trade Foundation", the initiative "Cotton made in Africa" (CmiA) was founded, which promotes sustainable and organic cotton in cooperation with small farmers. CmiA supports farmers in the sub-Saharan region to establish sustainable and ecological businesses that provide better income for families in the region and further improve the environmental footprint of the buying companies (Cotton made in Africa 2021). With 86 million cotton articles, the Otto Group is a significant buyer from these farmers. For this reason, the Otto Group cooperates with foundations that tackle sustainability issues at different stages of the SC, e.g., through supplier development and joint innovations (CmiA) or improved coordination and communication, which is what the "Stiftung 2°" does.

6.5.2 Facilitators

When stakeholders act as facilitators, these stakeholder groups may provide the required know-how and resources to establish valuable measures for improving sustainable practices in companies (Busse et al. 2017). Among the primary stakeholder groups, sustainability managers and employees were most frequently mentioned in the role as facilitators, while among secondary stakeholder groups, alliances and suppliers were attributed this role. In addition, acceptance by suppliers and employees is necessary to establish effective methods and standards. Sustainability managers as primary stakeholders and alliances on the secondary side help communicate this approach more effectively and provide appropriate expertise. The interview clarified that – especially in cooperation with the alliances – a certain amount of power must be ensured to drive forward sustainability efforts.

Supplier management for risk and performance

Supplier management for risk and performance is the first category, obtained from the Seuring und Müller (2008) framework. The analysis revealed that the Otto Group frequently uses both supplier involvement and implementation of standards. According to Beske und Seuring (2014), implementing standards can ensure a minimum performance; the participation in alliances with competitors, NGOs or governments, facilitates the implementation of standards in the SC for the Otto Group.

Sustainable performance relationships

Sustainability managers and employees are key facilitators for win-win situations in sustainable performance relationships. To strengthen the role of employees, the Otto Group implemented a Code of Ethics, providing employees with guidelines on how to act and work within the company. The idea is similar to a Code of Conduct for suppliers. Like the Code of Conduct, this instrument can be considered as a minimum requirement. According to Rodríguez et al. (2016), minimum criteria can be seen as the lowest common thread for risk-avoiding and improving conditions in the SC. Still, they can also be a starting point to aim for win-win situations. It is worth mentioning that this Code of Ethics is not introduced top-down but has been developed in a participatory manner. A more value-oriented company can strengthen the identification of employees with the company and improve the good external image. Above that, suggestions can be presented more easily by employees -site and implemented to improve the sustainability performance. In the past, more than 4,500 personal commitments of employees have been implemented, enhancing profitability, innovation, diversity, and sustainability (Brock and Streubig 2014).

According to the SSCM expert interviews, this can be linked to suppliers in their role as facilitators with a win-win outcome in the sustainable performance relationship. The relationship to raw material suppliers is described with a push-pull effect. On the one hand, the Otto Group demands sustainable materials and can therefore be seen as a driver from the suppliers' perspective. On the other hand, suppliers rely on sustainability regarding the materials to receive better and stable contracts and establish a benchmark in the market so that the Otto Group must follow these trends accordingly to be perceived as sustainable. Besides, the interviewee also emphasized that it is a challenge not to fall into greenwashing attempts of suppliers but to build on long-term partnerships. With the possibility of achieving better orders, better acceptance, more extended collaboration, suppliers are incentivized to behave more sustainably. Despite the benefits for suppliers, this situation can be seen as a win-win situation

because this also creates benefits for the Otto Group, as they can promote independent improvements and achieve higher SC sustainability performance (Interview, 2020).

The data revealed two different strategies to involve suppliers in progress towards a more sustainably SC. The first option is more direct and can lead to more holistic and more advanced sustainable solutions with a win-win outcome. Most outcomes in combination with competitors or alliances as drivers or facilitators led to minimum requirements as the environmental and social standards were implemented top-down in the SC. About the data, this led to joint innovation in the alliance and less supplier development and is used more for supplier assessment and supplier (self-) evaluation when it comes to supplier management (Otto Group 2019; Weber et al. 2020). The second option addresses SCM for sustainable products and is later outlined.

Sustainable risk management

Concerning the avoidance and addressing of sustainability risks, sustainability managers act as facilitators since they provide know-how and resources to identify potential opportunities and risks in the impact process. These identification processes play an essential role both for the Otto Group's commitment to sustainability and for conducting materiality analyses in stakeholder dialogues (Interview, 2020; Otto Group 2020), especially when it comes to internal management instruments. As a last instrument for sustainable performance relationships, the "140mpact process" is an essential key tool to analyse and avoid sustainability risks with measures and training to improve sustainability in the SC. Therefore, it can be seen as the most critical gatekeeper instrument for supplier selection within the Otto Group. Furthermore, sustainability managers facilitate coordination and communication towards primary and secondary stakeholders to improve the necessity of SCM for more sustainable products (Otto Group 2020). This can be linked to Pagell und Wu (2009), who suggested that enhanced coordination and communication with suppliers and other stakeholders can be used to manage SC for more sustainable products.

SCM for sustainable products

As already explained in the case of the win-win outcome with suppliers, this can, in turn, be linked to supplier involvement for supplier management and supplier development concerning SCM for sustainable products. Thus, Pagell und Wu (2009) suggest using supplier development to manage the SC for sustainable products. In combination with this stakeholder role, Beske und Seuring (2014) mention that supplier involvement can facilitate the necessary information

exchange and coordination for minimum requirements. With the "EMPact Social" program, the Otto Group offers training in suppliers' factories for eight months to develop concrete improvement measures for several challenges. These workshops are held with factory representatives also to improve factory-specific topics (Otto Group 2020).

6.5.3 Inspectors

As a third stakeholder role, inspectors can be named. In this role, stakeholder groups provide a neutral or scientific ground for sustainable supplier development and evaluate or assess the implementation of sustainability practices along with the SC (Liu et al. 2018a). The results suggested governments as the key stakeholder for this role. Besides governments, MO as the primary inspector and NGOs as secondary inspectors were identified.

Supplier management for risk and performance

Beske und Seuring (2014) suggested that implementing environmental and social standards is common to ensure minimum performance. The interviewee defined the role of governments to ensure a level playing field in which all companies can and must operate (Interview, 2020). Thus, governments defined social and environmental standards, which, in turn, served as a core component for supplier management for companies (Interview, 2020; Otto Group 2019). Furthermore, in large MSIs where companies such as the Otto Group are involved, governments are in charge of coordination and communication to navigate the different companies and stakeholders and moderate the different opinions to reach a common perspective (Weber et al. 2020). This combination can also be extended to other categories from the framework, like sustainable performance relationships, so the focus on this combination will be deepened in the following paragraphs. The data indicated that, as governments, NGOs nowadays could also be defined as inspectors regarding implementing Codes of Conduct and environmental and social standards for supplier management (Riekhof 2013).

Sustainable performance relationships

The implementation of standards and Codes of Conduct results in most cases in implementing minimum requirements that triggered two changes: on the one hand, to avoid the identified risks. On the other hand, the requirements lead to a general improvement of the SC's conditions, which is in line, for example, with Seuring und Müller (2008). Moreover, the interviewee suggested that standards must be developed for all market participants to ensure a neutral level playing field (Interview 2020). Furthermore, the analysis revealed that another possibility for governments is to set up initiatives and alliances in which, under political

pressure, companies agree to implement (more) sustainability practices within the SC (Otto Group 2020).

The data indicate that legal frameworks as minimum requirements come into place when voluntary solutions do not work. According to the analysed data, there is, for example, new legislation for the delivery sector since 2019 (Otto Group 2020). This law is intended to improve working conditions in the distribution sector, as they have been massively criticised in recent years, especially in subcontractors. Furthermore, the German government plans a supply chain law that the European Union strives as a common regulation for the entire Union, aiming to make companies more responsible for their SCs (Interview, 2020). Thus, companies can also be held liable for infringements in the deeper SC. Initiatives like these often result in gatekeeper instruments such as Codes of Conduct or a suitable process for selecting suppliers to influence the suppliers' behaviour (Busse et al. 2017).

In the Otto Group, this is manifested in the "amfori Business Social Compliance Initiative" (BSCI), which is used throughout the industry (Otto Group 2019). According to the interviewee, the Otto Group wants to maintain long-term partnerships with suppliers and qualifies them through audits and training, which leads to a lack of consistency in non-compliance because so much has been invested in these partnerships (Interview 2020). Nevertheless, it is still challenging to find suitable suppliers with very high sustainability standards because of the low margins, which already fulfil the supplier selection process and ambitious Codes of Conduct. In addition, the contracts with suppliers will be terminated if they do not comply with the Code of Conduct. For this reason, especially in earlier tiers of SCs, industry solutions or common standards are often developed as minimum requirements through alliances, as the selection of suppliers and training and education would require significantly higher resource input. Besides, these industry solutions offer more attractive margins for the suppliers to seriously and, on a large scale, align themselves with the customers' ideas (Interview, 2020).

Sustainable risk management

As mentioned in the chapter about the role of drivers, MO can also be seen as an inspector when it comes to economic risks because the name of the company is automatically linked to his name, which is why unsustainable behaviour is not only negatively linked to the company, but also his person and family and can affect the financial situation of the company and the shareholders (Interview, 2020).

SCM for sustainable products

Within SCM for sustainable products, joint innovations and supplier development can be tackled with NGOs in regulatory functions. They participate in the construction of Codes of Conduct or standards and the development of certificate systems and support monitoring, and reporting activities of companies (Riekhof 2013).

6.5.4 Synthesis of detected stakeholder roles within SSCM

Table 6.4 provides an overview which stakeholders could be assigned to which SSCM construct and what particular role they play. The identified stakeholders of the Otto Group are divided into primary and secondary stakeholders to allow further distinction. Together, the results yield meaningful insights into stakeholders' roles within the SSCM debate.

Table 6.4: Cross-arrangement of SSCM categories and assigned stakeholder roles

Categories	Drivers	Facilitators	Inspectors
Supplier management			
Supplier selection	Primary: / Secondary: /	Primary: / Secondary: /	Primary: / Secondary: (N)
Supplier (self-)evaluation	Primary: / Secondary: /	Primary: (S) (SM) Secondary: (N)	Primary: / Secondary: (A) (N)
Supplier assessment	Primary: / Secondary: (G) (A)	Primary: (S) (SM) Secondary: /	Primary: / Secondary: /
Implementation of environmental standards	Primary: (MO) Secondary: (G) (A)	Primary: (SM) Secondary: (N)	Primary: / Secondary: (N) (G) (CUS) (P)
Implementation of social standards	Primary: (MO) Secondary: (G) (A)	Primary: (SM) Secondary: (N)	Primary: / Secondary: (N) (G) (CUS) (P)
Supplier involvement	Primary: (S) Secondary: /	Primary: (S) (SM) Secondary: (A)	Primary: (SM) (CUS) Secondary: (G)
Sustainability performance relationships			
Minimum requirements	Primary: / Secondary: (S)	Primary: / Secondary: /	Primary: / Secondary: (G) (A)
Trade-off	Primary: / Secondary: (N) (P) (M)	Primary: / Secondary: /	Primary: / Secondary: /
Win-win situations	Primary: (MO) (CUS) Secondary: (COM) (A)	Primary: (EM) (SM) (S) Secondary: (COM) (A)	Primary: (SM) Secondary: (M) (A)
Sustainability risk dimensions			
Environmental risks	Primary: (MO) Secondary: (P), (J)	Primary: (SM) Secondary: (A)	Primary: / Secondary: (A)
Social risks	Primary: (MO) Secondary: (N)	Primary: (SM) Secondary: /	Primary: / Secondary: /
Economic risks and disruption	Primary: (MO) Secondary: (M) (COM)	Primary: / Secondary: /	Primary: / Secondary: /
SCM for sustainable products			

Coordination and communication	Primary: / Secondary: (A)	Primary: (SM) Secondary: (A)	Primary: (CUS) Secondary: (P) (M) (G)
Supplier development	Primary: / Secondary: /	Primary: (SM) (S) Secondary: (N) (A) (P)	Primary: / Secondary: (G)
Joint innovation	Primary: / Secondary: (A)	Primary: (S) (SM) Secondary: (A) (N) (COM)	Primary: (SM) Secondary: (N) (P)
Life cycle-assessment	Primary: / Secondary: /	Primary: / Secondary: /	Primary: / Secondary: /

6.6 Discussion

Since little research focused on a more differentiated view regarding stakeholder roles in the context of SSCM, the aim of this case study was to have a broader look. In many SSCM studies (e.g., Meixell und Luoma 2015; Wolf 2014), stakeholders are described as drivers that force companies to establish or distance themselves from certain practices or products. By challenging this stigma, this research extends the debate on stakeholders' roles concerning SSCM and how a company responds to them by applying a single case study design.

In general, it is noticeable that various stakeholders exert their influence on different parts of the SC. In contrast to Meixell und Luoma (2015), which describes sustainability action mostly as top-down decisions, our findings show that sustainability is more present in the analysed company’s DNA, so various departments consequently implement different sustainability issues. In many cases, these actions are also relevant tasks for secondary groups of stakeholders like alliances, NGOs, or governments. The consequent and fast implementation of sustainability issues may be since sustainability has been part of the Otto Group’s core business for a long time and is profoundly established in operational and strategic processes, which is why important issues regarding SSCM can quickly be identified and addressed.

Turning to Table 6.4, it is noticeable that inspectors were identified most for providing primary and minimum requirements. At the same time, drivers and facilitators were found in the context of more developed and in-depth sustainability issues. This finding might serve as a starting point for further research to scrutinize different stakeholders' allocation and their particular contributions. Other companies could adopt this approach when stakeholder groups are allocated to the various stakeholder roles and how often they occur.

Implementing industry-wide used standards can be seen rather as a complement to the already integrated sustainability practices/standards than an external stakeholder-driven requirement. This could be attributed to the fact that sector-wide standards may achieve greater comparability but do not improve further the processes in terms of content. On the one hand, this facilitates the process for suppliers to identify the criteria they have to meet to be accepted

as a possible long-term partner, and shared knowledge within alliances or MSIs can be used to improve sustainability issues, which is in line with the current literature (e.g., Liu et al. 2018a; Siems und Seuring 2021). On the other hand, companies that use a uniform Code of Conduct are better positioned than companies applying individual standards to penetrate deeper SCs by putting pressure on suppliers through industry-wide uniformity.

Furthermore, the present study results could be compared to similar companies to identify similarities and differences and, thus, could serve as an interesting approach for further research. In the analysed case, the Otto Group already achieved transparency for first-tier suppliers. Currently, the main effort lies in the extension beyond this directly visible horizon, as outlined by Busse et al. (2017). However, it must also be made clear which limitations exist regarding the possibilities for advanced transparency in the SC. First, there are limited resources possessed by a company and the direct suppliers to track the relationships to the suppliers in the next tiers; fostered by a high fluctuation of suppliers in the upstream SC due to prize-driven competition (e.g., Beske und Seuring 2014). For this purpose, incentive systems could be developed to be able to develop long-term relationships in deeper SCs with the push-pull effect without reducing potential innovation through competition. Secondly, the inherent motivation of the company to reduce uncertainties within the SC could be discussed in further studies.

In line with established literature (e.g., Meixell und Luoma 2015; Oelze et al. 2016), the analysis revealed that another possibility for governments to trigger more commitment regarding sustainability in the SC in specific sectors, is to set up initiatives and alliances in which, under political pressure, companies agree to implement (more) sustainability practices within the SC.

As a solution for low transparency in SCs and identifying possible risks in the apparel industry (e.g., Hasan 2019), the results indicate that cooperating with different stakeholders at different stages of the SC provide more insights in several steps and improve the transparency of their own SC. For example, the analyzed company use knowledge and resources gained from cooperation with foundations and NGOs, in line with current papers in the field (Siems und Seuring 2021; Pagell und Wu 2009; Roscoe et al. 2020). In deeper SCs, they even cooperate with competitors in the form of alliances and with governments and further NGOs to implement standards like Codes of Conducts and training as well as possibilities to control implemented standards with audits. Further, the focal company faces/targets low levels of SC visibility and identifies sustainability risks with the help of its stakeholder network as described in Busse et al.'s (2017) framework.

The fact that sustainability is firmly anchored in the core business processes can also be traced back to MO. Since the former CEO is present throughout the analysis and assumes various roles, it is worth taking a closer look at his unique role. When MO was still CEO of the focal company, the focal company had not yet experienced any adverse effects from name-and-shame campaigns and has always presented itself as a driving force for the further development of sustainable practices. While the findings contained most of the SCM for sustainable products constructs, the life-cycle assessment was not identified as a relevant issue even outlined in the SSCM discussion (e.g., Beske und Seuring 2014; Siems et al. 2021). As mentioned before, the focal company shifted the focus from sustainable products towards sustainable values to overcome challenges in the SC from a general perspective and not to deal with problems for single products periodically. For further research, it would be interesting to find out how this focus shifts towards a value orientation than on single products and the special role of MO differs from other companies and how the development of CSR is related to the upper echelons theory (Petrenko et al. 2016). Among other things, this theory attaches great importance to the personal values of management board members regarding the orientation of the company. However, the differences between family-owned companies and corporate groups must also be highlighted, as the loyalty and thus the motivation of top management are different.

In this respect, the philosophy of the Otto Group regarding SSCM can also be well illustrated by the quote, "alone you can go fast, together we can go far" (Interview, 2020, l. 379). This makes it clear that the Otto Group wants to achieve possible successes through joint efforts and that the resources for this are being bundled. From this, it can be concluded that stakeholders can best influence the Otto Group through support in the form of cooperation, the provision of know-how and resources with regard to a more sustainable SC. Nevertheless, empirical qualitative research contains limitations on both the empirical and theoretical sides (Eisenhardt und Graebner 2007).

On the one hand, there are limitations regarding the quantitative selection of the material. In particular, the fact that only one interview could be conducted could lead to an abbreviated view and result in limited generalization. Additional interviews with different managers, business partners and external stakeholders could have extended the studies insights. For example, the suppliers' point of view is particularly interesting to find out what the Otto Group’s requirements mean to them. However, the study’s research team conducted further interviews, but the company stated that more interviews were impossible due to limited personal resources.

Moreover, to address the issue of change over time, a comparison of several annual reports might have delivered interesting outcomes. Also, a direct comparison of different companies

would have given more insights for further studies. It would also be helpful to conduct more interviews than just one. For that purpose, it would be particularly revealing to interview suppliers to find out how they understand their role. On the other hand, criticism can be made of the qualitative selection of the material, as many internal company materials were examined, which could lead to bias as these sources are not objective. Although we included other external sources (e.g., Brock und Streubig 2014; Riekhof 2013), the critic remains that mainly internal sources and perspectives were used, which does not reflect reality in a completely neutral way. In this respect, it would be interesting for a critical classification to include other external sources.

Furthermore, there are limitations to the comparability of stakeholder influence between companies. For example, the Otto Group has a special form of corporate philosophy with longstanding work in sustainability, which also includes the SC. Further, cooperation with stakeholders seems to play an important role. However, this situation cannot be fully transferred to companies with a different structure. Validating how beneficial the Otto Group's approach is for both stakeholders and companies, their way of stakeholder management could be compared to other, differently operating companies. Lastly, although the research was rooted in profound SSCM constructs (e.g., Seuring and Müller, 2008), applying different SSCM or stakeholder constructs might yield additional insights. The outlined papers' limitations provide a basis for further research, both to get a broader picture of possible stakeholder roles and to be able to make more precise predictions about how these can be more efficiently integrated.

6.7 Conclusion

The academic contribution of our paper lies in its relevance to the management field. In particular, our research project has highlighted the need for research about the influence of a company's management on sustainable practices and how SSCM practices can differ by implementing a (more differentiated) stakeholder perspective. This field has not gained much attention so far but contains further research potential. Thus, this study answers the research question of understanding which stakeholders and their roles are related to SSCM in the apparel industry. The case study has shown how the Otto Group interacts with its primary and secondary stakeholders at different SC stages to enhance the overall sustainability performance. Thus, this research provides best practices for integrating stakeholders that practitioners can learn from as called for (e.g., Köksal et al. 2017, Silvestre 2015). For example, the Otto Group intensively communicates with their stakeholders in the whole SC, meets partners at eye level, and seeks to collaborate with non-traditional SC members. Additionally, the Otto Group takes different

approaches to have an impact, particularly the upstream tiers, and, thus, takes a multi-tier approach, as suggested by Khurana und Ricchetti (2016). This approach can be a contribution to the debate on the multi-tier SCM field.

Since the case of the Otto Group represents a particular case, the generalizability of the results might be questionable. Thus, the particular results could serve as a starting point for further research on stakeholders and their roles towards a more sustainable SC and, therefore, putting forward the current SSCM debate. However, the described issues and applied practices might help managers achieving a more sustainable SC and follow the call by Wickert et al. (2021) to conduct more research with managerial implications.

Furthermore, the findings indicate that family-owned companies and corporate groups might operate differently, which is in line with Maloni et al.'s (2017) call for research on family businesses SCs. As already mentioned within the limitations, different perspectives from other stakeholders could give further insights. For example, the supplier perspective could be taken into account to validate or oppose the current state. Thus, both the study's limitations and results can serve as the basis for further research. Therefore, we suggest applying a more differentiated view regarding stakeholder roles in the SSCM context and encouraging companies to enhance their degree of stakeholder interaction.

7 Discussion

One of the primary purposes of the present dissertation is to contribute to theorizing in SSCM. Although each chapter (2-6) contains an individual discussion section regarding its research scope, the following part of this dissertation moves beyond this particular consideration. Thus, the overall contributions, limitations, and implications are discussed from a synthesized perspective by considering the dissertation's scope. While the two overall research questions highlighted in Chapter 1.2 are considered separately, the managerial implications, limitations, and research opportunities are presented in a cumulated section.

7.1 SSCM practices in a dynamic environment with changing stakeholder and sustainability issues

The existing body of SSCM research suggests that stakeholder expectations form the basis for SSCM (Seuring und Müller 2008; Ahi und Searcy 2013); thus, they need to be considered to some extent, e.g., through stakeholder management. Chapter 1.2 outlined a lack of a precise theoretical understanding and operationalization of stakeholder management in SSCM.

Furthermore, since there is a broad agreement that sustainability and stakeholder expectations constantly change (Chowdhury et al. 2019; Fritz et al. 2018), companies must adapt their SSCM practices and resources accordingly. Although the DC view is proposed as a suitable theoretical lens to analyze this (Beske 2012; Hong et al. 2018), the intersection between DCs and SSCM showed an incomplete picture. Considering this, the findings from this dissertation make three main contributions to the current literature, at least.

First, a dynamic environment and changing stakeholders require deviating from renowned routines and existing behavior patterns owing to a bundle of particular DCs.

While DCs emerge from SSCM practices, these capabilities also yield the possibility to accelerate established SSCM practices (Beske et al. 2014). Thus, firms receive due to DCs the ability for a superior adoption of SSCM practices to meet the requirements of the changing environment. Although this interconnectedness between DCs and SSCM practices promises valuable insights, research targeting these phenomena is limited (Hong et al. 2018). Therefore, one contribution of the dissertation is the extension of both Beske et al.'s (2014) framework and the methodological approach of conducting a structured literature review in Chapter 3. The breakdown of samples from distinctive industries into disparate periods permits a profound and more comprehensive study of the DC phenomenon in the SSCM literature from a time-isolated view. The dissertation's findings clearly show the evolution of different constructs for two industries over time (see Chapter 3). For example, the results for the food industry indicated a

transition from formalized minimum requirements (i.e., standards and certificates) toward proactive strategies seeking for integrating stakeholders along with the SC because of their valuable contribution.

Based on these insights, the dissertation elaborated deeper on integrating stakeholders and their contribution in different components of SSCM; Chapter 4 made additional suggestions accordingly. Thus, the dissertation supports a stakeholder-integrative approach instead of a perspective where mainly the focal firm's efforts matter to achieve a more sustainable SC.

Second, this dissertation complements the findings of earlier studies for the relevance of a proactive behavior within SSCM. The results suggest that a reactive behavior by companies, i.e., acting after facing too much pressure by stakeholders, can result in reputation and legitimacy loss, emphasizing the line of argumentation for more pro-activity and collaboration by focal companies. For example, engaging external stakeholders into SC processes facilitates the building of profound sustainability knowledge and additional capabilities and triggers innovation and joint product development (Oelze et al. 2016; Seuring et al. 2019). Furthermore, integrating stakeholders can enhance the sustainability performance and, thus, build a competitive advantage and create the need for competitors to transform towards a more sustainable SCM.

However, exchanging knowledge with external stakeholders and sharing gathered knowledge and information with SCs partners is essential towards a more sustainable SC. Thus, the results outlined the crucial function of comprehensive information exchange, and it can be seen as a DC (Handoko et al. 2018).

The third significant contribution emerging from this dissertation is the elaboration of stakeholder management in SSCM, which has been assigned a pivotal role (see Chapter 1.2).

The ongoing SSCM debate treats stakeholder management more as an unprecise and broad term (e.g., Chowdhury et al. 2019; Perrini und Tencati 2006) or downgrades it as somewhat a communication instrument with stakeholders (Hofmann et al. 2014) and, thus, paints an incomplete picture. Hence, this dissertation proposes that stakeholder management merges particular practices for learning, evaluating, and dealing with stakeholders' concerns to gain or maintain legitimacy on both levels, internal and external. These can be structured on two dimensions: "practices to address stakeholder requirements" and "practices where stakeholders are integrated."

For addressing stakeholder requirements at the internal level, two-way communication with stakeholders is crucial to exchange proactive stakeholders' concerns and avoid legitimacy loss in advance (Beske und Seuring 2014; Hofmann et al. 2014). Furthermore, internal processes

need to be technical or organizational transformed to maintain legitimacy, while additional improvements can be identified through evaluating stakeholder relationships (Beske und Seuring 2014; Shubham et al. 2018).

However, external practices to address stakeholders' requirements appeared as relevant, too. For example, linkage development embraced measurements to extend the value share for local stakeholders, complemented by new business behaviors owing to local anchoring, which is particularly pertinent to developing and emerging countries (Kumar et al. 2020).

The second dimension entails "practices whereby stakeholders are integrated" to achieve a more sustainable SC. While stakeholders can provide access to knowledge and other resources for joint development at the internal company level, they can act as partners to improve companies' external processes owing to, e.g., partner development. For example, interviews conducted in the case study of Chapter 5 claimed that focal companies and their suppliers get education and training in new technologies by universities and, thus, facilitate learning processes, in line with current studies (Roscoe et al. 2020)

Together these results suggest that organizations require stakeholder management to understand better what to do and why. Thus, it is a precondition as well as part of integrating SSCM practices.

7.2 Stakeholders' contribution to realizing a more sustainable supply chain

Recently, researchers have shown that a stakeholder approach in SSCM paints an incomplete picture so far. Therefore, several scholars have called for incorporating more substantial stakeholders in SSCM research. This dissertation puts forward the debate around stakeholders' contribution towards a more sustainable SC.

Pagell und Wu (2009) concluded that the re-conceptualization of the entire SC structure by involving stakeholders is vital to achieving a more sustainable SC. This dissertation suggests that stakeholders can operate at the company's internal and external level and might contribute to the SC re-conceptualization twofold.

First, they can be integrated into the SC as part of the (re-conceptualized) SC and thereby facilitate learning processes due to offering training. Moreover, stakeholders close resource gaps and provide further knowledge. Thus, they extend the possible business scope as well as the legitimacy of doing business.

Second, stakeholders can also support the processes of detecting and selecting new partners. According to Busse et al. (2017), focal firms with multi-tiered SCs often face the challenge of a limited visible horizon. Herein, stakeholders can help focal companies to reach suppliers

beyond boundaries by providing expertise and knowledge. Additionally, stakeholders can provide support to integrate those suppliers into the SC or to train them accordingly.

Furthermore, stakeholders play a crucial role in supplier development and, in particular, the debate around standards and certificates. On the one hand, the case study of Chapter 6 stated that stakeholders could actively design standards to target specific issues and convince companies and their suppliers to implement them, as suggested by Oelze et al. (2016). However, the dissertation's results demonstrate that commonly used standards might somewhat complement the already established SSCM practices. This proposition aligns with Beske und Seuring (2014), who suggested that standards and certification could be seen as minimum requirements. On the other hand, working with stakeholders is sometimes the prerequisite to accomplishing a standard's requirements (see Chapters 5 and 6). Nevertheless, standards and certification are closely linked to supplier development. Cooperation with stakeholders can serve as a base for providing suppliers with training and enhancing the whole sustainability SC performance, as indicated by the interviews conducted in Chapter 5.

Finally, a further contribution lies in linking stakeholders in their different roles to SSCM; this has been done twofold. A more "holistic perspective" was achieved due to the literature review in chapter 4, while the case study in Chapter 6 aimed toward an in-depth analysis of specific stakeholder roles in SSCM. From a general perspective, the literature review suggests that collaboration with stakeholders can ultimately result in a competitive advantage and create a mimetic effect by competitors and, thus, shift an entire industry towards more sustainable practices. Further, the inspector role appeared notably less than the other two roles. However, stakeholders assigned to the pressure role dominated the analyzed paper even within the SSCM literature with a stakeholder focus. Although the majority of the researched publications showed no specific approach in Chapter 4, the instrumental stakeholder approach – focusing somewhat on why companies should consider stakeholders – was found the most in those papers with an approach (e.g., Awan et al. 2017; Maas et al. 2018; Roscoe et al. 2020). This is in line with Gold und Schleper (2017), who indicated that an instrumental perspective might dominate the discourse around SSCM because current business systems are shaped by a North American philosophy of profit maximization. According to Gold und Schleper (2017), shifting from a reification towards a recognition perspective in the current debate might help to overcome a predominated instrumental sustainability interpretation. Thus, using recognition theory yields promising research opportunities in the context of SSCM and stakeholders.

The literature synthesis was complemented by an in-depth investigation owing to a case study on a German sustainability frontrunner (see Chapter 6). While the literature review results

indicated a lack of the inspector role, the analysis of the case study could provide linkages between supplier development and SCM for sustainable products and secondary stakeholders. For example, secondary stakeholders (i.e., NGOs, competitors, etc.) played a pivotal role in monitoring instruments to ensure a minimum performance behind tier one or two of the SC. Thus, the dissertation validated the results by Liu et al. (2018) and extended it to a broader SSCM context and, therefore, contributed to theorizing in SSCM by using a theory elaboration approach.

Moreover, the case studies and literature reviews contained multiple managerial implications to guide practitioners, in line with the call by Wickert et al. (2021) to conduct more research that impacts the academic discourse and further fields of society.

7.3 Managerial implications

Although each chapter contained individual managerial implications, the following section takes a more general perspective by merging all chapters.

First, the dissertation's results strongly underline the inevitability for companies to aim for comprehensive stakeholder management. For example, engaging with stakeholders and their integration into business processes can increase the learning capability by achieving access to "fresh" knowledge and other resources. This accumulation of external and internal expertise can lead to innovative ideas for meeting sustainability challenges and, thereby, gaining a competitive advantage (Oelze et al. 2016; Chen und Kitsis 2017).

Furthermore, integrating stakeholders into processes – such as assessing the company's own or its suppliers' performance – yields the opportunity of getting more legitimacy to do business. Additionally, these corporations with stakeholders can provide an unbiased and scientific view for integrating, assessing, or evaluating SSCM practices.

Despite gaining more legitimacy or a competitive advantage, engaging with stakeholders can help managers to bridge existing knowledge and resource gaps. On the one hand, stakeholder claims can be fulfilled internally because of the extended resource base. On the other hand, working together with stakeholders offers the chance to reach suppliers beyond their own boundaries arising from a physical or institutional distance (Sauer und Seuring 2018). Herein, stakeholders can facilitate the communication, assessment, and evaluation of suppliers and provide support to develop training programs.

Further, external stakeholders can help to design corporate standards beyond local or state requirements and, thus, get more legitimacy, as indicated in Chapter 5. In addition, they can complement these practices by acting as a "watchdog" regarding frauds or misbehavior up the

SC tiers. For example, the case study of chapter 6 presented stakeholder integration strategies to evaluate and adjust SSCM practices by suppliers. Since companies worldwide operate in a highly complex and dynamic environment (see Chapter 1.1.), this continuous set of practices where stakeholders are integrated might offer additional value.

From an institutional perspective, the thesis results underline the assumption that governmental actors should establish multi-stakeholder initiatives and alliances to convince companies to set up more SSCM practices and create a platform for exchanging best practices and further issues. Further, the joint development of standards by multi-stakeholders initiatives under a governmental lead might cover a more comprehensive set of stakeholder issues along with a higher legitimacy by affected stakeholders. Once standards are developed, the results strongly suggest that these must be enrolled to ensure the same primary market conditions for all market actors.

Finally, the intra-sectoral analysis of this dissertation enables a more differentiated perspective and provides the opportunity to mimic best practices from other sectors. For example, the results of Chapter 3 suggested that automotive companies tend to focus on the implementation of sustainability practices in their organization instead of considering their different SC tiers (Damert und Baumgartner 2018). This proposition is in line with Wolf (2011), who stated that the SC stage around the raw material extraction causes high environmental impacts. Therefore, focal firms need to consider their entire SC to achieve truly sustainable improvements. Thus, these companies can follow recommended practices from other industries to achieve a higher overall sustainability performance.

7.4 Limitations

Although the dissertation contributes to the academic discourse in SSCM and provides managerial implications, it contains methodological and theoretical limitations. Qualitative research is frequently criticized for holding restrictions regarding validity, reliability, and generalizability (Bell et al. 2019). Thus, certain attempts were made to accomplish research quality criteria to a certain degree.

Internal validity was tried to achieve by grounding each study on carefully selected theoretical constructs. For example, theory played a pivotal role in creating interview guidelines, designing the coding framework for the analysis, and the subsequent interpretation.

However, the thesis is based on carefully chosen constructs, although different constructs could have yielded different results and explanations. For example, Chapter 3 used specific DC and SSCM constructs based on Beske's (2012) framework. Yet, Chapter 2 showed that other

DC constructs would have been conceivable. Still, one justification for the selected framework might be that it is well-accepted and frequently-used (e.g., Kırcı und Seifert 2015; Yook et al. 2018), allowing for extending and comparing Beske et al.'s (2014) study. Another post-justification of the used constructs could be the study's good and rich results (see Chapter 3).

Nevertheless, the critic remains that selecting different theoretical constructs could have led to other results. Although this critic applies to each chapter, this yields promising research avenues for the future.

Overall, to avoid too limited results owing to using only one methodological approach, the dissertation applied a mixture of literature reviews and case studies. However, both research designs still have their natural limitations.

For example, other research designs such as a labor experiment could yield the possibility of testing validity through an exact replication (Bell et al. 2019). Thus, the degree of replicability by case studies might be challenging through the uniqueness of a case's social and environmental setting. Therefore, both case studies sought to enhance transparency by providing detailed information regarding the case and interviewee selection, the interview procedure, and the analysis process (see Table 5.4 and Table 6.2).

By being aware of the potential researcher's subjectivity, sound theoretical frameworks guided the data gathering and analysis processes, and methodological recommendations by Yin (2018) and Stuart et al. (2002) underpinned the research process to address this limitation. In addition, further validity could be gained due to data triangulation, discussion rounds with experts, and returning the interviews' summaries to interviewees.

Generalizability – a core part of external validity – for an entire population or all organizations can hardly be achieved in qualitative research. One single case study can typically not represent all other existing cases (Eisenhardt und Graebner 2007; Yin 2018). However, this was never aimed for by this dissertation; the purpose was instead to use the strength of qualitative results "to make theoretical generalizations" (Bell et al. 2019, S. 375) for a specific context; that can be tested in other settings in further studies. According to Eisenhardt und Graebner (2007), case studies are a valuable instrument for extending or building theory, and, therefore, this thesis contributed to theorizing in SSCM. Furthermore, this dissertation also answered the call by Ansari und Kant (2017a) for more case studies to move forward the SSCM discourse. However, literature reviews use an aggregated view to study a phenomenon and, thus, can complement case studies (Beske et al. 2014; Fink 2019).

For addressing general critic regarding literature reviews such as replicability, transparency, and soundness (Fink 2019), both literature reviews followed the recommendations by Seuring

und Gold (2012). They defined a set of steps to carry out a structured literature review. Further transparency was attained owing to detailed tables that provide information regarding each data gathering and analyzing stage. Additionally, both literature reviews used qualitative content analysis as a structured instrument to make sense of the selected data in a structured and transparent way, as suggested by Seuring et al. (2021) and Durach et al. (2017).

However, the limitations of the dissertation pave the way for future research, which are outlined in the next section.

7.5 Future research

Taking together the limitations of the dissertation, these suggest different research possibilities for further theorizing in SSCM. Several limitations targeted the dominating qualitative approach, which pointed to complement it with other research designs.

Focus groups or quantitative approaches like surveys could help gain more robust data and verify the proposed theoretical suggestions to complement explorative insights. Furthermore, a longitudinal research study could shed light on the evolvement, adoption, and reconfiguration process of DCs into the SSCM context.

As stated above, the theoretical propositions of a single case study can be questioned for their generalizability, robustness, or testability (Eisenhardt und Graebner 2007). Nevertheless, exploratory theory development through case studies is still required to substantiate the constructs and propositions (Eisenhardt 1989), particularly in SSCM research (Meqdadi et al. 2020; Roy et al. 2020; León-Bravo et al. 2019). Yin (2018) supposes that multiple cases serve to replicate, contrast, or extend emerged theoretical constructs (in a more comprehensive way). Thus, a cross-case design could help clarify and verify the dissertation's theoretical implications or if they are simply idiosyncratic to the first case (Eisenhardt und Graebner 2007). Following this logic makes the theoretical propositions more deeply rooted in diverse empirical evidence (Bell et al. 2019). For example, the case of electronic cars might yield valuable insights regarding stakeholder roles in SSCM and further research opportunities. Although the extraction of rare earth, such as cobalt or lithium, as an integral part of them are already linked to environmental and social issues (mostly in developing countries) and discussed in public (Giurco et al. 2014), the German government established financial incentives for buying electric cars. Therefore, these contrasting points might result in potential tensions along SC stages – amplified by different institutional contexts – and would be a fruitful area for further work. Instead of a win-win perspective for the analysis, a paradox or tension view might be a good completion, as multiple researchers call for it (Brix-Asala et al. 2021; Zhang et al. 2021).

Furthermore, a Delphi study might be a further approach to round off the latter one. A respective study could validate, rank, and echo the dissertation's propositions by consulting the expertise of scholars and identifying future research objectives. Considering the most relevant authors identified in Chapter 4 and practitioners in the field of stakeholders in SSCM, it could focus on stakeholder roles towards a more sustainable SC.

This leads to theoretical research proposals, e.g., applying a more differentiated stakeholder perspective in SSCM. Even though stakeholder theory is one of the most adopted theoretical lenses in SSCM (Touboulic und Walker 2015), one surprising result of the dissertation is that only a few attempts were made to apply a more differentiated stakeholder perspective or a precise stakeholder approach, at least. Thus, it is vital to discuss stakeholders from different perspectives as outlined by Rodríguez et al. (2016) or Liu et al. (2018a). Besides, other roles for stakeholders might be considered to complement the three roles by Liu et al. (2018a).

Furthermore, routine dynamics (RD) might be an insightful complement to a DCs view in the SSCM context. Both views consider routines; the DCs view targets routines as the micro-level of analysis and the RD view as the macro-level of analysis (Feldman et al. 2016; Teece 2007; Salvato und Rerup 2011). Moreover, the DCs view focuses more on the senior management level and seeks to understand how higher-order capabilities transform and build practices. By contrast, the RDs view emphasizes the role of particular actants and aims to understand the mutual interference between singular actions and action patterns (Salvato und Rerup 2011). Combining both theoretical perspectives might yield the chance to complement each other's points of view and understand more precisely underlying patterns and phenomena.

Since the current SSCM discourse is clearly dominated by a Western perspective (Jia et al. 2018; Morais und Silvestre 2018), this dissertation contributed toward filling the gap by being partly based on an emerging country setting (see Chapter 5). Nevertheless, this study's scope was limited to the theoretical view and the researcher's background; both were rooted in the Western world. Thus, further studies need to be carried out to address the dominating Western perspective.

Another more general suggestion is to use a more comprehensive sustainability approach in SSCM. Various SSCM scholars pointed to the lack of an unequal consideration of the three sustainability perspectives in the past (e.g., Rebs et al. 2017). According to Rebs et al. (2017), the social dimension was underrepresented in the past debate. Since Chapter 4 showed that current studies still call for more research on the social side (Meqdadi et al. 2020; Roy et al. 2020), adopting a more holistic sustainability view in future SSCM studies might yield promising research possibilities.

7.6 Concluding remarks

This dissertation explores stakeholder management in SSCM. Sustainability is considered one of the biggest current challenges as environmental degradation and social discrepancy are continuously increasing. Due to the growing awareness of these sustainability issues, numerous stakeholders are pushing executives to implement sustainability across the SC and hold focal companies accountable. Thus, stakeholder management takes an essential role in the incorporation of sustainability into SCM. Since these stakeholder interests are continuously changing, particular DCs are required to realign their practices and the associated resource composition. The research between stakeholders, DCs, and SSCM is relatively undifferentiated.

Thus, this dissertation starts at this intersection using structured literature studies and empirical case studies to synthesize and comprehensively analyze the academic discourse to date. Based on the previous research discourse findings, the case studies provide an opportunity to deeply consider and understand the real-world phenomena in an empirical context.

For addressing the complexity of DCs phenomena in the SSCM context, this dissertation analyzes for the first time the evolution of DCs in the SSCM literature for two different industries from a temporally isolated perspective. This modified methodological approach further develops the previously used structured literature analyses in the SSCM discourse, not only for the DC domain.

Furthermore, the previous discourse treated “stakeholder management” as an undifferentiated and very broad term. This thesis elaborated and specified this theoretical construct in more depth and proposes that corresponding practices exist at the internal and external levels of the company. These practices can be structured according to the two dimensions “practices to address stakeholder requirements” and “practices in which stakeholders are integrated.” For example, stakeholders can provide access to knowledge and other resources to develop suppliers according to sustainability requirements. Thus, focal companies should not only build structures and develop capabilities to communicate with stakeholders, but they should also be proactively integrated into business processes.

Furthermore, this thesis addresses the roles stakeholders can play to contribute to a more sustainable SC. This work suggests that they can actively participate in sustainable transformation at their internal and external corporate levels. For example, stakeholders can help focal companies reach suppliers outside their visible horizons along with their SC.

Nevertheless, this elaboration also shows that stakeholders and their roles have been considered relatively undifferentiated in the SSCM discourse. This research gap could be taken

up in future research and thereby address current environmental and social sustainability problems.

In summary, this thesis elaborates on different stakeholder roles in the SSCM context and offers empirical insights into a possible realization of stakeholder integration.

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9 Appendices

9.1 Appendix of Chapter 3

01_Food 2002-2013 data sample

02_Food 2014-2018 data sample

03_Auto 2002-2013 data sample

04_Auto 2014-2018 data sample

05_Tables most cited journals

06_Contingency results

9.2 Appendix of Chapter 4

01_2021_Literature data sample

11.1 Appendix of chapter 3

A.1 Food 2002-2013 data sample

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B.1 Food sample 2002-2013 most cited journals

Name of journal	Frequency
Journal of Cleaner Production	8
British Food Journal	6
Business Strategy and the Environment	6
International Journal of Production Economics	6
Food Policy	4
Journal of Supply Chain Management	4
Supply Chain Management: An International Journal	4
Rest appeared less than three times	

B.2 Food sample 2014-2018 most cited journals

Name of journal	Frequency
Journal of Cleaner Production	32
International Journal of Production Economics	15
Food Policy	5
British Food Journal	4
Supply Chain Management: An International Journal	4
Business Strategy and the Environment	3
International Journal of Life Cycle Assessment	3
Resources, Conservation and Recycling	3
Sustainability	3
Rest appeared less than three times	

B.3 Auto sample 2002-2013 most cited journals

Journal	Frequency
Journal of Cleaner Production	8
Benchmarking: An International Journal	4
Resources, Conservation and Recycling	3
Supply Chain Management: An International Journal	3
International Journal of Operations & Production Management	2
Rest appeared less than two times	

B.4 Auto sample 2014-2018 most cited journals

Journal	Frequency
International Journal of Production Economics	8
Journal of Cleaner Production	8
Journal of Manufacturing Technology Management	5
Journal of Supply Chain Management	5
Benchmarking: An International Journal	3
Resources, Conservation and Recycling	3
Rest appeared less than three times	

C.1 Contingency results for the 2002–2013 food sample

Pair	Chi-square significance	Phi-coefficient	Observed frequency	Expected frequency
SCRe_IoNGO * SCRe_IoNC	0,0000	0,574	24	9,1
Con_PD * SCRe_IoNGO	0,0000	0,539	14	3,8
RM_SaC * SCRe_IoNGO	0,0000	0,433	24	12,1
RM_IM * RM_SaC	0,0000	0,413	20	9,6
RM_PGM * RM_SaC	0,0000	0,387	31	18,7
Ori_TBL * RM_SaC	0,0000	0,378	47	34,5
Con_LTR * SCRe_IoNC	0,0000	0,35	16	7,5
RM_SaC * ProA_SM	0,0000	0,344	32	20,8
Con_PD * RM_SaC	0,0000	0,329	15	7,5
RM_PGM * RC_QPCA	0,0000	0,329	15	7,2
RM_SaC * RC_Tra	0,0000	0,322	34	23,3
Col_EC * KM_KS	0,0000	0,321	19	10,4

C.2 Contingency results for the 2014–2018 automotive sample

Pair	Chi-square significance	Phi-coefficient	Observed frequency	Expected frequency
Col_JD * CoEv_JDoProc	0	0,931	22	9
Col_JD * CoEv_JDoProd	0	0,719	18	8
CoEv_JDoProd * CoEv_JDoProc	0	0,633	16	7
ProA_Lea * KM_KAaE	0	0,623	8	2
Con_PS * SCRe_IoNC	0	0,483	7	2
KM_KS * KM_KAaE	0	0,477	7	2
ProA_Lea * ProA_Ino	0,001	0,42	9	4
Ori_TBL * ProA_LCA	0,003	0,388	11	6
KM_KS * SCRe_SA	0,004	0,372	6	2
KM_KAaE * SCRe_SA	0,004	0,372	6	2
RM_PGM * ProA_SM	0,017	0,31	8	4
ProA_Ino * CoEv_JDoProd	0,018	0,309	12	8
KM_KAaE * RC_QPCA	0,018	0,307	8	4
RM_SaC * RC_QPCA	0,02	0,304	14	10

11.2 Appendix of Chapter 4

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