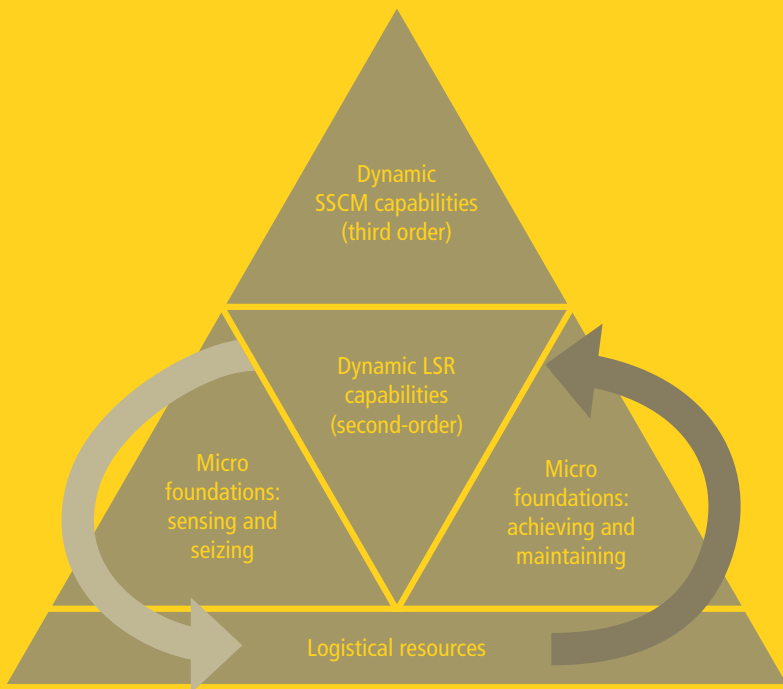


Logistics Social Responsibility and Dynamic Capabilities: Conceptualization and Empirical Analysis



Supply Chain Management | Band 11

Herausgegeben von / Edited by
Prof. Dr. Stefan Seuring, Universität Kassel

Tim Gruchmann

Logistics Social Responsibility and Dynamic Capabilities: Conceptualization and Empirical Analysis

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1st Supervisor: Prof. Dr. Stefan Seuring
2nd Supervisor: Prof. Dr. Marcus Brandenburg
3rd Supervisor: Prof. Dr. Alexander Hübner

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III. Table of content

- I. Acknowledgementsi
- II. List of contributions from the dissertation ii
- III. Table of content..... iii
- IV. List of figuresvii
- V. List of abbreviations viii
- VI. English summary.....ix
- VII. German summary – deutsche Zusammenfassung.....xii

- 1. Introduction to the research 1
 - 1.1. Background..... 1
 - 1.2. Positioning in the literature 3
 - 1.3. Research aim and questions..... 4
 - 1.4. Theoretical lens..... 5
 - 1.5. Scope of the research 6
 - 1.6. Research design 7
 - 1.7. Structure of the dissertation..... 10

- 2. Explaining Logistics Social Responsibility from a dynamic capabilities perspective..... 12
 - 2.1. Abstract 12
 - 2.2. Introduction 13
 - 2.3. Positioning of LSR in the literature 15
 - 2.4. Theoretical lens on LSR..... 17
 - 2.5. Dynamic capabilities’ structural dimensions..... 20
 - 2.6. Conceptualizing LSR practices from a dynamic capabilities perspective 22
 - 2.7. Relationships between logistical capabilities and SSCM-related dynamic capabilities 30
 - 2.8. Discussion, conclusion and directions for future research 33

2.9. Acknowledgements	35
3. Mapping logistics services in sustainable production and consumption systems: what are the necessary dynamic capabilities?.....	36
3.1. Abstract	36
3.2. Introduction	36
3.3. Theory building in SSCM	38
3.4. Participatory systems mapping.....	41
3.5. System dynamics modelling.....	42
3.6. Workshop results	43
3.7. Theoretical lens.....	46
3.8. Conclusion and outlook.....	49
3.9. Acknowledgements	51
4. Assessing the intersections of Logistics and Consumer Social Responsibility in sustainable supply chains.....	53
4.1. Abstract	53
4.2. Introduction	54
4.3. Literature background	55
4.3.1. Consumer Social Responsibility	55
4.3.2. Logistics Social Responsibility.....	56
4.4. Research design	58
4.5. Findings: challenges and driving factors.....	61
4.5.1. Logistics service providers' challenges in enhancing LSR activities	61
4.5.2. Factors and trends driving further LSR activities	62
4.5.3. Consumer's awareness of sustainability impacts of logistics services	64
4.6. Findings: consumer-choice-centered LSR categories.....	65
4.6.1. Raising awareness and communication of sustainability impacts	65
4.6.2. Target-group-oriented supply chain configurations.....	67

4.6.3. Financial incentives for sustainable consumption choices.....	70
4.7. Synthesized empirical results	71
4.8. Discussion.....	73
4.9. Managerial implications, limitations, and outlook	75
4.10. Acknowledgements	77
5. Assessing the role of sustainable collaborative strategies in local food businesses: a dynamic capabilities perspective.....	78
5.1. Abstract	78
5.2. Introduction	79
5.3. Literature background.....	81
5.3.1. Related SSCM practices in food supply chains.....	81
5.3.2. Dynamic capabilities to achieve supply chain sustainability	82
5.4. Research design	85
5.5. Within-case analysis	88
5.6. Cross-case analysis	90
5.7. Extended theoretical framework.....	95
5.8. Discussion.....	97
5.9. Conclusion and outlook.....	99
5.10. Acknowledgements.....	100
6. Local and sustainable food businesses: assessing the role of supply chain coordination ..	101
6.1. Abstract	101
6.2. Introduction	101
6.3. Literature background.....	103
6.4. Research design	106
6.5. Case analysis.....	108
6.5.1. NETs.werk Hörsching.....	108

6.5.2. Regionalwert AG Freiburg	111
6.5.3. Analyzing driving factors for sustainability	114
6.6. Discussion.....	117
6.7. Conclusion and outlook.....	120
6.8. Acknowledgements	121
7. Contribution of the dissertation thesis	122
7.1. Theory building at the intersections between different literature streams	122
7.2. How can dynamic capabilities theory add to the understanding of LSR practices in sustainable supply chains?	123
7.3. How can logistics service providers contribute to creating sustainable production and consumption systems and, at the same time, support more sustainable consumption patterns?	124
7.4. How and under which circumstances can LSR be accomplished if sustainable production and consumption consumer choices are taken into account?	125
7.5. How does a dynamic comprehension of the food supply and distribution chain enable local businesses in improving their sustainability impact?.....	127
7.6 How can supply chain coordination contribute to transferability and scaling of local food businesses and their sustainability efforts? How is this reflected in their business model?.....	128
7.7. Overarching limitations and future research directions	131
7.8. Managerial implications	133
References.....	134
Appendices	160
Appendix A	160
Appendix B	161
Appendix C	162
Appendix D	163

IV. List of figures

Figure 1-1: Positioning in the literature.....4

Figure 1-2: Research model according to Mitroff et al. (1974).....8

Figure 1-3: Structure of the dissertation..... 11

Figure 2-1: LSR in the literature..... 16

Figure 2-2: Main components of the conceptual framework.....23

Figure 2-3: Conceptual framework29

Figure 3-1: Applied methodology of causal diagrams and participatory system mapping.42

Figure 3-2: Causal Loop Diagram (Melkonyan et al., 2017).47

Figure 4-1: Theoretical framework.72

Figure 5-1: Extended theoretical framework of SSCM dynamic capabilities in the food industry.97

Figure 6-1: Key parameters in sustainable business models. 106

Figure 6-2: Conceptual sustainable business model framework for local food networks..... 117

Figure 7-1: Theory building at the intersection between different literature streams. 122

Figure 7-2: Mapping logistics businesses in the supply chain..... 131

V. List of abbreviations

B2B.....	Business to Business
B2C.....	Business to Customer
CLD.....	Causal Loop Diagram
C&C.....	Click & Collect
ConSR.....	Consumer Social Responsibility
CSR.....	Corporate Social Responsibility
DPD.....	DPD Group (logistics service provider)
EDI.....	Electronic Data Interchange
ERP.....	Enterprise Resource Planning
ICT.....	Information and Communication Technology
LSR.....	Logistics Social Responsibility
NGO.....	Non-Governmental Organizations
NRBV.....	Natural Resource Based View
OM.....	Operations Management
OR.....	Operations Research
PSM.....	Participatory Systems Mapping
PSR.....	Purchasing Social Responsibility
RBV.....	Resource Based View
RP.....	Research Proposition
RWAG.....	Regionalwert AG
SCC.....	Supply Chain Coordination
SCM.....	Supply Chain Management
SCRM.....	Supply Chain Risk Management
SSCM.....	Sustainable Supply Chain Management
SD.....	System Dynamics
SFSC.....	Short Food Supply Chains
TBL.....	Triple Bottom Line
3PL.....	3rd Party Logistics

VI. English summary

Sustainable logistics is no longer just a temporary fashion but is a topic that has been discussed by experts for many years. What is new is, on the one hand, the increased social and political awareness and, on the other hand, the transfer of environmental and social core statements to entrepreneurial problems. Consequently, the role of logistics service providers is today understood as a decisive determinant for a Sustainable Supply Chain Management (SSCM). As concerns for the environment and social issues rise, logistics service providers' capabilities to facilitate sustainable practices in supply chains are coming to the fore. Accordingly, these requirements to further enhance Logistics Social Responsibility (LSR) activities demands the link to another field in management research, namely the dynamic capabilities approach (originally proposed by Teece et al., 1997). Using dynamic capabilities routines in a strategic manner, logistics service providers' managers can purposefully change their business environment (Helfat et al., 2007) by forming new partnerships or changing the relationships between partners in the supply chain. In this line, the following main research questions guided the dissertation:

- 1) How can dynamic capabilities theory add to the understanding of LSR practices in sustainable supply chains?
- 2) How can logistics service providers contribute to creating sustainable production and consumption systems and, at the same time, support more sustainable consumption patterns?
- 3) How and under which circumstances can LSR be accomplished if sustainable production and consumption consumer choices are taken into account?

By analyzing dynamic capabilities in a specific industry context, in particular in the food industry, it was possible to broaden the scope of the dissertation thesis and, at the same time, validate the findings in the light of existing business cases. Therefore, the following additional research questions could be answered by the present thesis:

- 4) How does a dynamic comprehension of the food supply and distribution chain enable local businesses in improving their sustainability impact?
- 5) How can supply chain coordination contribute to transferability and scaling of local food businesses and their sustainability efforts? How is this reflected in their business model?

To address these research questions, the dissertation is structured into seven chapters, where chapter 1 introduces and motivates the study, gives a positioning in the relevant research literature, and provides an overview of the research design and structure of the dissertation. Chapters 2-6 comprise five separate articles, in particular a conceptual study, a participatory study, an explorative study and two case study articles. Chapter 7 revisits the single research questions, showing the necessary sequence of the articles and the development of the contribution. Further limitations and suggestions for future research conclude this dissertation.

Chapter 2 is conceptual and grounded on dynamic capabilities theory. The purpose of this study is to contribute to theory by an assessment of LSR and its linkages to dynamic capabilities theory to gain insights into how logistics service providers can foster an enhanced application of LSR practices. Relevant literature from logistics management, (S)SCM as well as dynamic capabilities was examined to build upon existing theory by conceptualizing LSR from a dynamic capabilities perspective. In addition, propositions for future research are presented based on the conceptual model.

Chapter 3 investigates advanced capabilities to fertilize sustainable corporate development on the level of operations management. Thus, this chapter describes the approach of Participatory Systems Mapping (PSM) to fill knowledge gaps for required dynamic capabilities in the field of SSCM. The results derived from several workshops were mapped into a Causal Loop Diagram (CLD) describing relevant variables and their causal relations. In this line, relevant relations could be discussed in a broader SSCM context to promote further theory building on dynamic capabilities.

Chapter 4 aims at an empirical analysis of the interplay between logistics services and sustainable consumer choices. Based on expert and in-depth consumer interviews, an exploratory study with regard to sustainable logistics practices was conducted, explicitly taking a consumer-choice-centered perspective. In this line, this study investigated promising sustainable logistics practices to promote corporate and consumer social responsibility in supply chains. The findings illustrate challenges and driving factors for logistics service providers in facilitating more sustainable consumer choices. Moreover, consumer-choice-centered LSR categories were identified and validated through consumer interviews.

Chapter 5 analyzes sustainability-related practices in six local food production and distribution networks in Germany and Austria. By applying a within- and cross-case study approach the study intends to shed light on necessary dynamic capabilities to tap further

increases in SSCM oriented business practices in the food industry through the professionalization and expansion of local food networks. In this respect, the study builds on dynamic capabilities theory by identifying and describing core SSCM practices and capabilities and, at the same time, is among the first to extend the use of the dynamic capabilities perspective in a specific industry setting.

Chapter 6 analyzes sustainability related practices in two local food production and distribution networks in Germany and Austria applying a multiple-case study approach in order to understand how business models can facilitate sustainable practices within the food industry. By comparing the selected cases, insights were derived with regard to sustainable business model elements in local food networks, in particular promoting logistics and financial coordination in the supply chain. By doing so, the article builds on academic literature by identifying and describing key elements of sustainable business models in local food networks.

VII. German summary – deutsche Zusammenfassung

Nachhaltigkeit in der Logistikbranche wird von Experten bereits seit einigen Jahren diskutiert. Neu ist, auf der einen Seite, das verstärkte gesellschaftliche und politische Bewusstsein für Nachhaltigkeitsfragestellungen in der Logistik und, auf der anderen Seite, die Verankerung von Nachhaltigkeitsaspekten in unternehmerischen Kernaktivitäten. Entsprechend wird die Rolle von Logistikdienstleistern als wichtige Einflussgröße für nachhaltige Wertschöpfungsketten verstanden. Vor diesem Hintergrund eines gestiegenen Bewusstseins für ökologische und gesellschaftliche Herausforderungen gewinnen entsprechend auch die Kompetenzen von Logistikdienstleistern an Bedeutung. Um den Anforderungen der „Logistics Social Responsibility“ (LSR) gerecht zu werden, sind Fähigkeiten des strategischen Managements notwendig, unter anderen die Routinen der „Dynamic Capabilities“ Theorie (Teece et al., 1997). Durch die Implementierung von dynamischen Routinen innerhalb der Unternehmensstrategie ist es Logistikdienstleistern nämlich möglich, ihr Geschäftsumfeld durch neue oder angepasste Geschäftsbeziehungen positiv zu verändern (Helfat et al., 2007). Entsprechend leiteten die folgenden Forschungsfragen die vorliegende Dissertation, um notwendige „Dynamic Capabilities“ Routinen von Logistikdienstleistern zu analysieren:

- 1) Wie kann die „Dynamic Capabilities“ Theorie zu einem besseren Verständnis von LSR Aktivitäten in nachhaltigen Wertschöpfungsketten beitragen?
- 2) Wie können Logistikdienstleister die Transformation hin zu nachhaltigen Produktions- und Konsumsystemen unterstützen und gleichzeitig nachhaltige Konsummuster fördern?
- 3) Wie und unter welchen Gegebenheiten kann LSR realisiert werden, wenn nachhaltige Produktions- und Konsumentenentscheidungen explizit Berücksichtigung finden?

Um den Fokus der Dissertation zu konkretisieren und gleichzeitig die bisherigen Ergebnisse im Licht eines spezifischen Industriekontexts zu validieren, wurden weiterhin dynamische Routinen innerhalb der Lebensmittelindustrie untersucht. Dadurch konnten die weiteren Forschungsfragen beantwortet werden:

- 4) Wie kann ein dynamisches Verständnis von Lebensmittelwertschöpfungsketten und Vertriebswegen unterstützen, regionale Geschäftsmodelle und deren Nachhaltigkeitspotentiale zu stärken?

- 5) Wie kann die Koordination von Lebensmittelwertschöpfungsketten dazu beitragen, regionale Geschäftsmodelle und deren Nachhaltigkeitsvorteile zu skalieren und auf die gesamte Lebensmittelindustrie zu übertragen? Welche Geschäftsmodell-Elemente sind hier von Bedeutung?

Um diese Forschungsfragestellungen zu beantworten, gliedert sich die vorliegende Dissertation in sieben Kapitel, wobei das erste Kapitel den Forschungsbedarf aufzeigt, die Forschungsfragen innerhalb der Literatur positioniert und das Forschungsdesign der Arbeit darstellt. Die Kapitel 2 bis 6 beinhalten fünf separate Studien, wovon eine Studie konzeptionell, eine partizipativ, eine explorativ und zwei als Fallstudien angelegt sind. Das siebte Kapitel diskutiert abschließend die Ergebnisse anhand der einzelnen Forschungsfragen und nimmt Bezug auf den Aufbau und die Sequenz der einzelnen Kapitel. Zudem werden die Erkenntnisgrenzen der Arbeit diskutiert und ein Ausblick für weitere Forschungsarbeiten gegeben.

Das Kapitel 2 beinhaltet eine konzeptionelle Studie beruhend auf der „Dynamic Capabilities“ Theorie. Ziel dieses Kapitels ist einen Beitrag zur Theorieentwicklung durch die Analyse des LSR-Konzepts und dessen Anknüpfungspunkten zur „Dynamic Capabilities“ Theorie zu leisten, um Einblicke zu erlangen, wie Logistikdienstleister nachhaltige Routinen verstärkt zur Anwendung bringen können. Hierbei wurde relevante Literatur im Bereich des Logistik-Managements, des nachhaltigen Supply Chain Managements (SCM) sowie im Bereich der „Dynamic Capabilities“ Theorie inhaltlich analysiert, um LSR von einer „Dynamic Capabilities“ Perspektive aus zu konzeptualisieren. In diesem Zusammenhang wurden weitere mögliche Forschungsansätze auf Basis der Konzeptualisierung identifiziert.

Kapitel 3 untersucht weiterhin, welche Routinen eine nachhaltige Unternehmensentwicklung auf operativer Ebene fördern können. Das Kapitel nutzt hierbei den „Participatory Systems Mapping“ (PSM) Ansatz, um notwendige „Dynamic Capabilities“ im Umfeld eines nachhaltigen SCM zu finden. Die Ergebnisse aus mehreren partizipativen Workshops konnten in einen „Causal Loop“ Diagramm“ (CLD) synthetisiert werden, um kausale Zusammenhänge zwischen relevanten Systemvariablen zu dokumentieren. Entsprechend konnten notwendige „Dynamic Capabilities“ zur Realisierung positiver, dynamischer Effekte in einem breiteren SCM Kontext diskutiert werden.

Kapitel 4 beinhaltet eine empirische Analyse der Zusammenhänge zwischen logistischen Dienstleistungen und nachhaltigeren Konsumentenentscheidungen. Auf der Basis von

Experten- und Konsumenteninterviews wurde eine explorative Studie durchgeführt, die nachhaltige Logistikdienstleistungen von einer Konsumentenperspektive aus betrachtet. Hierdurch konnten vielversprechende Logistikdienstleistungen identifiziert und validiert werden, um „Corporate Social Responsibility“ (CSR) und „Consumer Social Responsibility“ (ConSR) in Wertschöpfungsketten zu fördern. Die Ergebnisse illustrieren hierbei unter anderem Hürden und Treiber für Logistikdienstleister bei der Umsetzung konsumentenorientierter LSR.

Kapitel 5 analysiert nachhaltige Aktivitäten in sechs regionalen Lebensmittel-Wertschöpfungsketten in Deutschland und Österreich. Durch die Anwendung eines Fallstudienansatzes war es das Ziel der Studie, Erkenntnisse über notwendige „Dynamic Capabilities“ Routinen zur Förderung eines nachhaltigen Wirtschaftens in regionalen Lebensmittel-Wertschöpfungsketten durch Professionalisierung und Expansion zu erlangen. Hierbei leisten die Fallstudien einen Beitrag zur Weiterentwicklung der „Dynamic Capabilities“ Theorie und stellen dabei eine der ersten empirischen Studien über „Dynamic Capabilities“ in einem spezifischen Branchenkontext dar.

Kapitel 6 analysiert nachhaltigkeitsbezogene Aktivitäten in zwei regionalen Lebensmittel-Wertschöpfungsketten in Deutschland und Österreich mithilfe eines Fallstudienansatzes, um ein besseres Verständnis für zur Förderung eines nachhaltigeren Wirtschaftens in der Lebensmittelindustrie zu bekommen. Durch den Vergleich der Fallstudien konnten insbesondere die Geschäftsmodellelemente einer logistischen und finanziellen Koordination der Wertschöpfungskette identifiziert werden, die für die Nachhaltigkeit in Lebensmittelindustrie förderlich sind. In diesem Zusammenhang leistet die Studie insbesondere einen Literatur-Beitrag, indem nachhaltige Geschäftsmodellelemente in regionalen Wertschöpfungsketten identifiziert und beschrieben werden.

1. Introduction to the research

Sustainable logistics is no longer just a temporary fashion but is a topic that has been discussed by experts for many years. What is new is, on the one hand, the increased social and political awareness and, on the other hand, the transfer of environmental and social core statements to entrepreneurial problems. Not least the economic crisis that began at the end of 2008 reinforced the change in attitude towards a more sustainable economy. As a result of the crisis, the cost situation but also the competitive environment has intensified for companies, which are now also concentrating on areas such as reverse logistics, which had previously not been taken into account. Concrete climate protection strategies designed to prevent CO₂ emissions, are therefore being actively pursued by industrial companies, particularly by companies with high transport volumes. For the logistics industry as such, which is strongly affected by a dynamic, competitive market environment, more sustainable business strategies mean not only a reduction of CO₂ emissions and cost savings in economic terms, but also opportunities to highlight the value creation logic and to allow for new governance forms such as social businesses (Schaltegger et al., 2016). In particular social issues, such as working conditions and wages, are questioning the producer and distributor business relations with the logistic industry significantly after scandals and public debates increased the logistical awareness of consumers. Consequently, the role of logistics service providers is today understood as a decisive determinant also for the (social) sustainability in supply chains. As concerns for the environment and social issues rise, logistics service providers' capabilities to facilitate sustainable practices in the supply chains are coming to the fore. Accordingly, the alignment of logistical actions between actors in the supply chain defines more sustainable and innovative logistics business models (Boschian and Paganelli, 2016).

1.1. Background

Corporate Social Responsibility (CSR) has gained importance in recent years and has begun to merge with the long-lasting debate on sustainable development, which have been recently agreed upon the "Sustainable Development Goals" (Hák et al., 2016). These goals aim to enable sustainable lifestyles to secure a healthy and safe living environment for current and future generations (<http://www.undp.org>). Against this background, CSR refers to the *"responsibility of an organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behavior that:*

- *contributes to sustainable development, including health and the welfare of society;*

- *takes into account the expectations of stakeholders;*
- *is in compliance with applicable law and consistent with international norms of behavior;*
- *and is integrated throughout the organization and practiced in its relationships” (ISO 26000, 2010).*

Like any other company, logistics service providers must respond to the demand for sustainability of their stakeholders (in particular consumers and the government) (Bowersox, 1998; Carter and Jennings, 2002; Gold et al., 2010). In this context, sustainable logistics management can be interpreted as the realization of the companies’ Logistics Social Responsibility (LSR) (Carter and Jennings, 2002; Ciliberti et al., 2008; Miao et al., 2012). In this line, LSR emerged as a way to integrate sustainability throughout logistics-oriented processes in the supply chain (Mejías et al., 2016). Hence, different logistics services, such as sourcing and procurement, transportation management, warehousing, and inventory management are linked to sustainability requirements. These requirements have to address environmental, economic and social topics that include diversity, working conditions, human rights, safety, philanthropy, and community involvement (Carter and Jennings, 2002). Accordingly, LSR can be defined as socially responsible logistics management (Carter and Jennings, 2002).

To meet these sustainability requirements, logistics service providers can, on the one hand, respond to their responsibility by reducing the ecological and social impact of the supply chain: e.g., by technological innovations or the improvement of working conditions (Chapman et al., 2003; Lieb and Lieb, 2010). On the other hand, it has been recognized that consumers also need to adapt to sustainability requirements: e.g., by supporting sustainable logistics strategies with their monetary “votes” (Shaw et al., 2006) or by changing their own logistics behavior (such as using an environmentally friendly alternative to get to the supermarket). In the literature on sustainable consumption research, the interdependence between CSR and Consumer Social Responsibility (ConSR) is referred to as “shared responsibility” which requires mutual support and cooperation (Brinkmann, 2004; Schmidt, 2016). Therefore, the core assumption of this dissertation is that logistics service providers can further support sustainable development by facilitating more sustainable consumer logistics choices (e.g., choices referring to the distribution channels, the bundling of deliveries, and other logistics actions).

The logistics service providers' necessity to further enhance their LSR activities demands the link to another field in management research, namely the dynamic capabilities approach (originally proposed by Teece et al., 1997). With regard to the literature on dynamic capabilities, several routines have been identified through which managers can pool their knowledge and skills to generate new knowledge, solutions or resource configurations (Eisenhardt and Martin, 2000). Using these routines in a strategic manner, logistics service providers' managers can purposefully change their business environment (Helfat et al., 2007) by forming new partnerships or changing the relationships between partners in the supply chain. Particularly, logistics service providers would gain from developing new business practices stressing anti-competitive and performance enhancement purposes. (see section 1.4)

1.2. Positioning in the literature

The general problem of coordinating interdependent supply chain members in order to maximize supply chain profitability has been subject of supply chain research for a number of decades (Simatupang and Sridharan, 2002). Skjøtt-Larsen (2000) sees a coordinated supply chain as collaboration between several companies in a network to share opportunities and risks, using an integrated planning based on a common information system. Similarly, Simatupang and Sridharan (2002) define a coordinated supply chain as a collaboration of independent companies to operate more efficiently as if operations are planned and carried out separately. In the last decade, social and environmental issues found their way into supply chain research, emphasizing the importance of cooperation among companies in order to maximize profitability while minimizing environmental impacts and, at the same time, maximizing social well-being (Seuring and Müller, 2008). Compared with the traditional Supply Chain Management (SCM), which is usually intended to solely focus on economic performance, Sustainable Supply Chain Management (SSCM) is characterized by the explicit integration of environmental and/or social objectives which extend the economic dimension to the Triple Bottom Line (TBL) (Carter and Rogers, 2008). Following the latest developments in SCM literature, the incorporation of the people dimension into SCM can unlock further sustainability potentials (cf., Wieland et al., 2016). Accordingly, the present work also intends to be in line with Wieland et al.'s (2016) proposed future research agenda for (S)SCM by taking a consumer-choice-centered perspective.

In particular with regard to the literature on LSR, authors already have clustered main categories of sustainable logistics management practices, particularly sustainable purchasing, sustainable transportation, sustainable warehousing, sustainable packaging and sustainable

reverse logistics (Carter and Jennings, 2002; Ciliberti et al., 2008). However, the literature explicitly on LSR is still rather small (Mejías et al., 2016) such that definition and content of LSR have not reached uniformity yet (Miao et al., 2012). Nonetheless, other literature streams tackle LSR issues not explicitly talking about LSR. In the green logistics literature for instance, logistics service providers should mainly focus on the optimization of their sub-processes from an environmental perspective, e.g. by reducing CO₂ emissions in the transport sector, but also have to respond to health and safety issues. In recent years, social issues were addressed more intensively in a supply chain context emphasizing the importance of a supply chain wide implementation of CSR strategies, also including a logistics perspective (Yawar and Seuring, 2017). Accordingly, the dissertation thesis can be located at the intersections between (S)SCM, CSR and dynamic capabilities literature (see Figure 1-1).

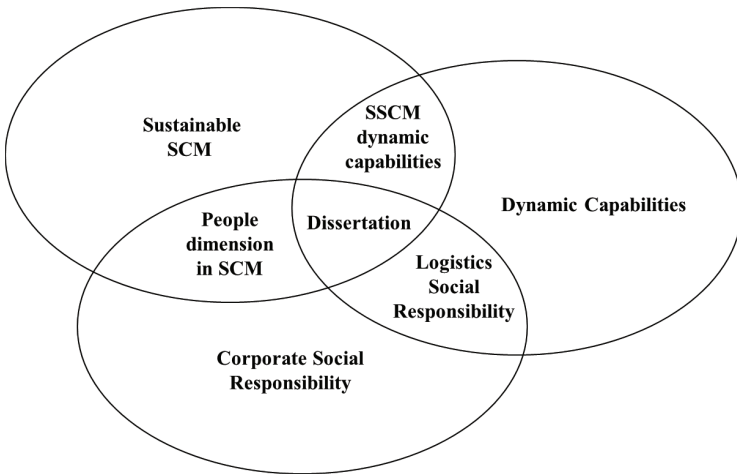


Figure 1-1: Positioning in the literature.

1.3. Research aim and questions

To develop sustainable logistics service provider’s strategies and business models, it is necessary to discuss sustainable logistics practices from multiple perspectives, hence, the SSCM perspective to coordinate and plan between several entities of a supply chain, the CSR perspective as ethical background of relevant actors in the supply chain, and the dynamic capabilities perspective as theoretical underpinning to understand necessary abilities of relevant actors in the supply chain. Accordingly, the present dissertation aims to contribute to theory and practice at the intersections of SSCM, CSR, dynamics capabilities and sustainable business model literature. Accordingly, the following research questions guided the

dissertation in order to explore those settings where logistics services facilitate more sustainable consumer consumption patterns and preferences:

- 1) How can dynamic capabilities theory add to the understanding of LSR practices in sustainable supply chains?
- 2) How can logistics service providers contribute to creating sustainable production and consumption systems and, at the same time, support more sustainable consumption patterns?
- 3) How and under which circumstances can LSR be accomplished if sustainable production and consumption consumer choices are taken into account?

By analyzing dynamic capabilities in a specific industry context, in particular in the food industry, it is possible to further broaden the scope of the dissertation thesis and, at the same time, validate the findings in the light of existing business cases. Therefore, the following additional research questions guided the present thesis:

- 4) How does a dynamic comprehension of the food supply and distribution chain enable local businesses in improving their sustainability impact?
- 5) How can supply chain coordination contribute to transferability and scaling of local food businesses and their sustainability efforts? How is this reflected in their business model?

To address the proposed research questions, the present dissertation conducts five studies which are standing for themselves presented in the chapters 2 to 6 of this dissertation. However, these separate articles take into account the findings of the previous studies and, therefore, build on each other.

1.4. Theoretical lens

With regards to the limited number of explicit LSR publications with theoretical scope, starting point of the dissertation are theory building efforts in SSCM. Despite several calls for building a more comprehensive theory in (S)SCM (e.g., Carter and Rogers, 2008), there is still a relative lack of theoretically grounded research in SSCM (Touboulic and Walker, 2015; Matthews et al., 2016). Here, the integration of the discrete concepts of sustainability and SCM is seen as the biggest challenge so far. In this line, Matthews et al. (2016) even argue that the omnipresent assumption of achieving economic, environmental and social goals at the

same time needs to be reassessed to build an alternative theory. Following Carter and Easton (2011) as well as Touboulic and Walker (2015), most theoretical studies on SSCM use popular theories from other management disciplines such as stakeholder theory, resource-based view (RBV), natural resource-based view (NRBV) and institutional theory. With regard to stakeholder theory and institutional theory, both theories stress the influence of stakeholders and other parties as drivers for SSCM (Touboulic and Walker, 2015; Quarshie et al., 2016). These theories take a rather organizational and strategic view with prevalence to a large buyer firm. Due to their scope, stakeholder theory and institutional theory seem not qualified to explain major obstacles for logistics service providers to enhance LSR activities. Moreover, Miao et al. (2012) state that pressures from customers, suppliers and competitors do not have significant effects on LSR practices, at least in a Chinese context.

With regard to RBV and NRBV, these theories focus on the competitive advantage that can be derived from managing resources as well as (sustainability-related) competencies in the supply chain (Touboulic and Walker, 2015). In this line, the dynamic capabilities theory derived from the transformation of the RBV and NRBV into a dynamic environment (Beske, 2012). Here, dynamic capabilities theory aims to explain how companies can achieve a temporary or even long-term competitive advantage in dynamic markets (Teece et al., 1997; Teece, 2007; Eisenhardt and Martin, 2000). Hence, firms require dynamic capabilities that enable them to integrate, reconfigure, gain, and release resources to match and include market change (Teece et al., 1997; Vanpoucke et al., 2014). In particular Beske et al. (2014) stress that most of the dynamic capabilities are relationship-specific with the aim to improve the relations among the different supply chain members to enable further transformation towards a more sustainable supply chain configuration. In the context of sustainable supply chains, Mathivathanan et al. (2017) see dynamic capabilities also as inherent capabilities developed through the implementation of sustainable supply chain practices. Taking into account the relationships between SSCM practices, SSCM dynamic capabilities and the resource base, only a few studies conceptualized concrete relationships and causalities. Thus, the dissertation aims to build on a more concrete dynamic capabilities theory in the context of sustainable supply chains.

1.5. Scope of the research

A significant increase in the market share of e-commerce business models could be observed in the last years (Edwards et al., 2011), where dynamic changes in consumers' behavior such as the need of permanent product availability and fast supply were facilitated by building

alternative logistics networks (Wollenburg et al., 2018) and, as a consequence, encouraged new logistics service business models. In this context, Chapman et al. (2003) state that the logistics industry is a classic example of the birth and development of a vital new service-based industry, transformed from the business concept of transportation to that of serving the entire logistical needs of customers. However, the integration of additional online distribution channels (so-called omni-channel distribution) depends strongly on the product, market and retailer specifics (Wollenburg et al., 2018). Therefore, the scope of the dissertation is, firstly, to analyze an efficient and sustainable logistics strategies for online food retailing, compared to traditional (conventional) food retailing, from a logistics service provider and consumer perspective. Here, innovative logistics networks need to build capabilities to fulfill consumer expectations in terms of delivery speed, delivery costs and product availability as well as retailer expectations with regard to flexibility and costs (Wollenburg et al., 2018). The scope of the dissertation is, secondly, narrowed to last mile logistics services and, accordingly, mostly neglecting logistics services downstream the supply chains. Here, the last mile is seen as the most expensive part of the entire supply chain and, at the same time, is accountable for a large proportion of total CO₂ emissions (Edwards et al., 2011). Furthermore, the last mile is considered to be one of the most complex units of a supply chain. This complexity is generated by tight delivery time windows and a growing number of small orders (e.g., Punakivi et al., 2001). Thirdly, the scope of the dissertation prioritizes social aspects of sustainability in comparison to the economic and environmental dimension of the TBL as social issues are still underrepresented in SSCM research (Brandenburg and Rebs, 2016; Brandenburg, 2018).

1.6. Research design

To answer the proposed research questions, a dedicated research design is required. According to Mitroff et al. (1974), a holistic view is necessary to ascertain the most essential characteristics of scientific studies. To assure the systems perspective, they provide a diagram describing the phases of Operations Research (OR) and Operations Management (OM) research processes which are illustrated in Figure 1-2. Following the research model of Mitroff et al. (1974), the research design of the dissertation consists of five chapters (articles). Each chapter presents a single step in the research cycle. By doing so, the dissertation intends to contribute to scientific literature by exploring, building and (partially) testing theory at the intersections of the relevant literature streams. As the dissertation was conducted under the umbrella of a funded research project, the author of this dissertation chose a cumulative research design.

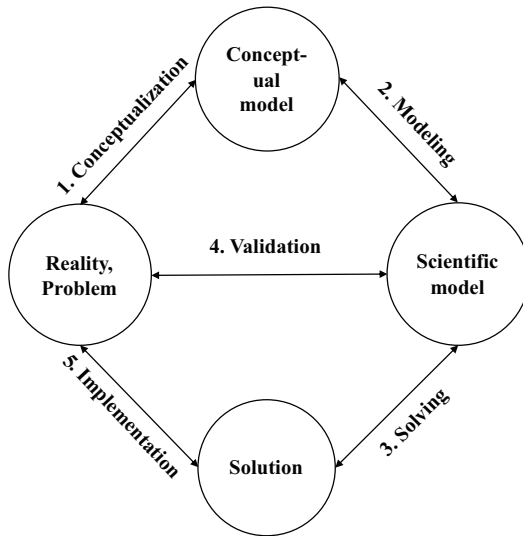


Figure 1-2: Research model according to Mitroff et al. (1974).

Conceptualization: Taking into account the underlying problem, a conceptual framework provides the description of the relevant characteristics of the problem (Weick, 1995). Hereby, the references to the existing body of knowledge within the literature have to be illustrated, as the characteristics of the problem need to be generally accepted (Karlsson, 2009). Although dynamic capabilities have been intensively studied, the interlinkages between LSR and dynamic capabilities still lacks conceptualization. Therefore, the dissertation intends to contribute firstly by assessing LSR practices and their interlinkages to dynamic capabilities in a conceptual framework to give insights into how logistics service providers can foster an enhanced application of LSR practices. To do so, relevant literature from logistics management, (S)SCM as well as dynamic capabilities is examined to build upon existing theory by conceptualizing LSR from a dynamic capabilities perspective. In addition, propositions for future research can be deduced based on the developed conceptual model.

Modeling: In the next step, the conceptual model is transformed into a scientific model. Here the relationships between the relevant variables are formulated to build the structure for the analysis. Furthermore, the underlying assumptions of the model can be specified (Karlsson, 2009). In this line, current trends in logistics and lifestyle research are discussed with representatives of logistics service providers and other academics within a series of workshops using the method of Participatory Systems Mapping (PSM) (Sedlacko et al.,

2014). The purpose of the PSM is to define the actors, success factors, challenges and strategies to implement innovative distribution strategies to promote sustainable lifestyles. Thus, the results derived from several workshops were mapped into a Causal Loop Diagram (CLD) describing relevant variables and their causal relations. This scientific model facilitates the analysis of the dynamics of main feedback loops, e.g., the change of consumer habits or logistics infrastructure while necessary dynamic capabilities are discussed in order to derive implications on (re)shaping the supply chain towards more sustainable configurations. Hence, relevant relations can be discussed in a broader SSCM context to promote further theory building on dynamic capabilities.

Solutions: Third, the aim of an exploratory, qualitative study is to provide a structured analysis of interlinkages between logistics services and consumer decisions to investigate possible solutions for logistics service providers to enhance the application of LSR activities. Therefore, qualitative, semi-structured expert interviews are conducted to derive possible settings where logistics services enable sustainable consumption patterns. Using qualitative information from interviewees, interviews are generally used as methodology for explorative knowledge production (Alvesson, 2003; Roulston, 2014). Since the research interest addresses logistics services, the qualitative interviews are held as expert interviews with interviewees who are specialists in the field of logistics services and consumer decisions. To further strengthen the validity of the results, consumer interviews are conducted in order to evaluate and triangulate the expert interview results. By doing so, this study can illustrate challenges and driving factors for logistics service providers in facilitating more sustainable consumer choices. Moreover, consumer-choice-centered LSR categories can be identified promoting corporate and consumer social responsibility in sustainable supply chains.

Empirical validation (case studies): Since the scientific model itself and its underlying assumptions present idealized constructs, the validity of the model needs to be shown comprehensively in a fourth step. For this reason, the theoretical results from the scientific model as well as the exploratory, qualitative study have to be validated through a case study approach in a specific industry setting. Based on an interview outline, qualitative interviews are conducted to analyze six cases in local food production and distribution businesses. Due to the complexity of qualitative interviews, careful interpretations of the interview results are necessary to analyze to which extent the findings serve the research purpose (Alvesson, 2003). Therefore, an expert workshop is performed to evaluate the case data from the interviews as well as collected secondary data. Accordingly, this study intends to shed light

on necessary dynamic capabilities to tap further increases in SSCM oriented business practices in the food industry through the professionalization and expansion of local food networks. In this respect, the study builds on dynamic capabilities theory by identifying and describing core SSCM practices and capabilities in a specific industry setting.

Discussion of implementation: In a fifth step, the business model perspective is used to discuss the implementation of the previous results from a logistics and financial coordination perspective. A sustainability business model can be described in different ways such as a narrative of sustainability practices; a description of features, attributes, and characteristics; as well as a list of necessary and sufficient conditions (Stubbs and Cocklin, 2008). In this line, sustainability business models are analyzed in two local food production and distribution networks in Germany and Austria applying a multiple-case study approach in order to understand how business models can facilitate sustainable practices within the food industry. By comparing the selected cases, insights are expected with regard to sustainable business model elements in local food networks. By doing so, the study intends to build on academic literature by identifying and describing key elements of sustainable business models in local food networks.

1.7. Structure of the dissertation

The dissertation is structured as follows: The literature and theoretical background with regard to the conceptual model is summarized in chapter 2. Chapter 3 offers a detailed description of the scientific model as well as its representation in a CLD. Thus, chapter 2 and 3 comprise the conceptualization and modeling of the underlying system and its structures. These articles lay the foundation for the subsequent empirical studies. Next, chapter 4 presents the findings of the exploratory, qualitative study providing possible solutions for logistics service providers to enhance the application of LSR activities. Hence, chapter 4 explores potential solutions for the system. In chapter 5, the scientific model as well as its possible solutions are validated and extended through a case study approach applied to local food businesses. Next, chapter 6 discusses the implementation of the dissertation's results by taking a sustainable business model perspective. Finally, chapter 7 discusses and concludes the dissertation's contribution by showing limitations, future research opportunities and managerial implications accordingly. Accordingly, Figure 1-3 gives a graphical representation of the dissertation's structure.

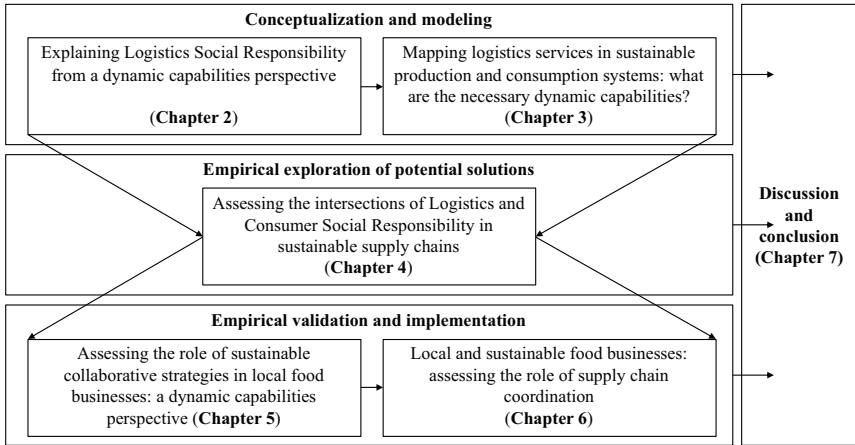


Figure 1-3: Structure of the dissertation.

2. Explaining Logistics Social Responsibility from a dynamic capabilities perspective

This chapter presents an article accepted for publication by the author of this dissertation and Stefan Seuring. Any reference to this chapter should be cited as:

Gruchmann, T., and Seuring, S. (2018), “Explaining Logistics Social Responsibility from a Dynamic Capabilities Perspective”, forthcoming in: *International Journal of Logistics Management*.

2.1. Abstract

Purpose – So far, most of the literature on LSR has prioritized the examination, classification of and adaption towards positive LSR practices instead of investigating necessary logistics service providers’ capabilities to implement LSR strategies. Therefore, the purpose of this study is to contribute to theory by an assessment of LSR and its linkages to dynamic capabilities theory to gain insights into how logistics service providers can foster an enhanced application of LSR practices.

Design/methodology/approach – The study is conceptual and grounded on dynamic capabilities theory. Relevant literature from logistics management, SCM and SSCM as well as dynamic capabilities was examined to build upon existing theory by conceptualizing LSR from a dynamic capabilities perspective. In addition, propositions for future research are presented based on the conceptual model.

Findings – With regards to the controversial discussion in the literature about the direct link between dynamic capabilities and competitive advantage as well as the necessary degree of heterogeneity of dynamic capabilities, the conceptualization of LSR from a dynamic capabilities perspective adds new elements to this discussion. Considering long-term or even sustainable competitive advantage, the current degree of homogeneity across logistics services might hinder a sustainable advantage in the long run and demands for more advanced logistical capabilities. In this line, it is important to understand and utilize the causal relationships between different logistical resources and capabilities to achieve a unique long-term advantage allowing logistics service providers to further enhance LSR practices.

Practical implications – Due to the current role of logistics service providers, they should not just foster their resources focusing on the relationship to the focal firm, but they should also develop and implement new logistical capabilities derived from SSCM related dynamic capabilities to design alternative service portfolio extensions and new business models.

Originality/Value – Although dynamic capabilities have been studied intensively in the last two decades, the causal relationships between different logistical resources and necessary dynamic capabilities to achieve advantages by enhancing LSR practices still lacks conceptualization. To build on the understanding of LSR, the study at hand presents a conceptual framework explaining LSR and SSCM practices through the lens of dynamic capabilities theory.

Keywords: Logistics services; Sustainability; Supply chain competences; Management research

2.2. Introduction

In line with the ongoing sustainability debate, logistics service providers – as any other actor in the supply chain – have to respond to the increasing demands for sustainability of their stakeholders (particularly of end customers and the government) (Bowersox, 1998; Carter and Jennings, 2002; Gold et al., 2010). In this context, a sustainable logistics management can be interpreted as the realization of their LSR (Carter and Jennings, 2002). Accordingly, the processes of logistics service providers such as sourcing and procurement, transportation management, warehousing and inventory management are linked with sustainability requirements, namely requirements of environmental concerns, ethics, diversity, working conditions and human rights, safety, philanthropy and community involvement (Carter and Jennings, 2002). In the past, the performance of logistics service providers has been defined purely in quantitative terms (e.g., Halldórsson and Skjøtt-Larsen, 2004). As concerns for environmental and social issues within the society and at consumer side rise, logistics service providers' capabilities to facilitate sustainable practices and business models are coming to the fore. Consequently, the role of logistics service providers can be interpreted as a key determinant for sustainability in supply chains. To date, the literature on LSR is still rather small and, at the same time, the definition as well as the content of LSR have not yet reached uniformity (Miao et al., 2012; Mejias et al., 2016). Despite the importance of incorporating CSR practices in the logistics industry, most of the existing studies address single LSR functions such as sustainable purchasing, sustainable transportation, sustainable warehousing, sustainable packaging and sustainable reverse logistics rather than providing cross-functional investigations (Ciliberti et al., 2008). Hence, most authors have prioritized the examination, classification of and adaption towards positive LSR practices instead of investigating missing logistics service providers' abilities to implement further LSR strategies. Recently, Heidbrink et al. (2015) stated that the dependence on other supply chain members as well as fierce

competition are major challenges for logistics service providers to implement further LSR practices which partially lead to an unsatisfactory service performance (Wong and Karia, 2010). Accordingly, logistics service providers do not yet sufficiently meet their stakeholders' demands for sustainability.

Furthermore, research on CSR practices within the supply chain carried out from the focal firm perspective dominates the literature (Spence and Bourlakis, 2009). Here, the focal firm refers to the company governing over the supply chain, providing direct contact to end customers, and having bargaining power over other actors in the supply chain, e.g., original equipment manufacturers in the automotive industry (Harrison and van Hoek, 2008). Just in recent years, the research interest in (S)SCM has gradually shifted from focusing on focal firms to tier 1 suppliers and sub-suppliers at multi-tier supply chain levels (Tachizawa and Wong, 2014). However, very few contributions focus on logistics service providers, although they have the potential to directly coordinate sustainable actions in multi-tier supply chains. In contrast, focal companies and tier 1 suppliers rather have to govern the supply chain indirectly or work with a third party in order to enforce sustainable practices (Tachizawa and Wong, 2014).

This demands a connection to be built to another field in management research, namely the dynamic capabilities approach (originally proposed by Teece et al., 1997). Regarding the literature on dynamic capabilities, several routines have been identified through which managers can pool their knowledge and skills to generate new knowledge, solutions or resource configurations (Eisenhardt and Martin, 2000). Using these routines in a strategic manner, managers of logistics service providers are able to purposefully change their business environment (Helfat et al., 2007) by forming new partnerships or by changing the relationships between partners in the supply chain. Recent findings on existing obstacles preventing logistics service providers from an enhanced application of LSR practices (cf., Heidbrink et al., 2015; Abbasi and Nilsson, 2016) indicate that logistics service providers would benefit from developing new business practices to enable less competitive and performance-oriented business environments. Accordingly, the study intends to contribute by conceptualizing LSR from a dynamic capabilities perspective to enhance the understanding of the logistics service providers' capacities to shape supply chain configurations and, therefore, to promote sustainable logistics practices in supply chains. The following research question guided our conceptual study: How can dynamic capabilities theory add to the understanding of LSR practices in sustainable supply chains?

To answer the proposed question, the study at hand is structured as follows: In section 2.3, the relevant literature on LSR is summarized, while the necessary theoretical underpinnings of dynamic capabilities theory are presented in section 2.4 and 2.4. Section 2.6 integrates the results into a theoretical framework that describes necessary logistics service providers' capabilities to enable enhanced LSR practices, while section 2.7 develops propositions for future research. The final section 2.8 discusses the framework and concludes the article accordingly.

2.3. Positioning of LSR in the literature

Generally, the literature on sustainable logistics practices encompasses all processes of transportation, warehousing and inventory management including the management of Third Party Logistics (3PL) (Ciliberti et al., 2008). This list already shows that sustainable activities are mainly triggered by the focal firm while logistics service providers rather play a passive role in adapting to green and/or socially responsible processes. In the green logistics literature, a subset of sustainable logistics management (Murphy and Poist, 2002; Miao et al., 2012), logistics service providers should mainly focus on the optimization of their sub-processes from an environmental perspective (Ciliberti et al., 2008; Perotti et al., 2012), e.g., by reducing CO₂ emissions in the transport sector (Aronsson and Huge Brodin, 2006; Tacke et al., 2014). In recent years, social issues were addressed more intensively in a supply chain context emphasizing the importance of a supply chain wide implementation of socially responsible strategies (Andersen and Skjøtt-Larsen, 2009; Yawar and Seuring, 2017). Although originally integrated in the concept of LSR (Carter and Jennings, 2002), Purchasing Social Responsibility (PSR) evolved into a rather “*pari passu*” discipline which stresses that the purchasing function can be used to transfer social and/or environmental standards to (sub)suppliers (Carter and Rogers, 2008; Reuter et al., 2010). Although CSR literature in supply chains does not take an explicit logistics perspective, a sustainable logistics can be seen as a sub-set of CSR. Accordingly, LSR can be located at the intersections between SCM, CSR and logistics management (see Figure 2-1).

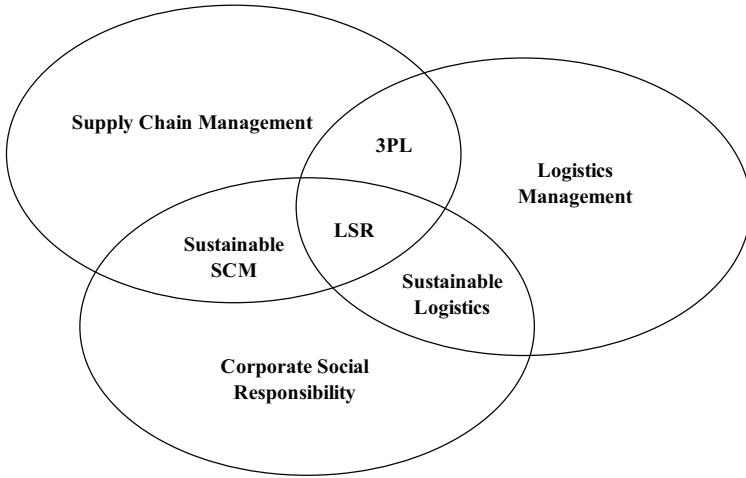


Figure 2-1: LSR in the literature.

Focusing on sustainable practices from a logistics service providers' perspective, relevant literature on LSR and logistical capabilities were content analyzed using structural dimensions deductively derived from dynamic capabilities literature (see Table 2.1 - Deductive coding scheme) and linked to the general literature streams of SSCM and dynamic capabilities (Mayring and Frenzl, 2014; Schreier, 2014). Within this focused review (Tatham et al., 2017), 55 selected papers from the last two decades were analyzed. The paper selection was guided by four recent literature reviews focusing on sustainable supply chain practices and their interlinkages to dynamic capabilities, namely the literature reviews provided by Ciliberti et al. (2008), Beske et al. (2014), Mejías et al. (2016) and Amui et al. (2017). Based on this pre-selection, relevant papers were chosen and clustered following their self-reported focus on LSR, green logistics, purchasing sustainable logistics, logistics capabilities, SSCM and dynamic capabilities (see Appendix A: Table A1 – Coded literature).

Despite the limited number of LSR frameworks, authors have already clustered main categories of LSR practices, particularly sustainable purchasing, sustainable transportation, sustainable warehousing, sustainable packaging and sustainable reverse logistics (Carter and Jennings, 2002; Ciliberti et al., 2008; Mejías et al., 2016). Analyzing these categories and frameworks, logistics service providers adapt mainly to environmental “stand-alone” practices in transportation, warehousing, packaging and assure the minimum social standards required by external stakeholders (mainly the focal firm). Up to now, only a few authors have investigated the barriers to implementing LSR practices. For instance, Carter and Jennings

(2002) found a main barrier in the coordination of activities and objectives among members of the supply chain. Moreover, Heidbrink et al. (2015) see logistics service providers still facing an increased shortage of skills due to partially poor working conditions as a major challenge for implementing further knowledge driven LSR practices. Recently, Abbasi and Nilsson (2016) explored customer priorities, managerial complexity, network imbalances as well as technological and legislative uncertainties as major logistics service providers' challenges to implement green practices. They concluded that logistics service providers' capabilities to overcome such barriers and enhance their LSR activities beyond the current level, particularly for socially responsible practices, remain rather incomplete, unstructured and are not linked to existing management theory. In this line, the study at hand intends to contribute to literature by conceptualizing LSR from a dynamic capabilities perspective to enhance the understanding of the logistics service providers' capabilities to facilitate further LSR practices.

2.4. Theoretical lens on LSR

With regard to the limited number of explicit LSR publications with a theoretical scope, the literature analysis focused on the theory building efforts in SSCM. Despite several calls for building a more comprehensive theory in (S)SCM (e.g., Carter and Rogers, 2008), however, there is still a relative lack of theoretically grounded research in SSCM (Touboulic and Walker, 2015b; Matthews et al., 2016). In this line, the integration of discrete concepts of social sustainability into supply chain and logistics management is the biggest challenge (Touboulic and Walker, 2015b; Matthews et al., 2016; Quarshie et al., 2016). Matthews et al. (2016) even argue that the omnipresent assumption of achieving economic, environmental and social goals at the same time needs to be reassessed to build an alternative theory. According to Carter and Easton (2011) as well as Touboulic and Walker (2015b), most theoretical studies on SSCM use popular theories from other disciplines such as stakeholder theory (cf., Freeman, 1984) and institutional theory (cf., DiMaggio and Powell, 1983), transaction cost theory (cf., Williamson, 1975) as well as the RBV (cf., Barney, 1991) and the NRBV (cf., Hart, 1995; Hart and Dowell, 2011).

Considering logistical capabilities, most of the existing studies are based on the RBV rating logistics as a resource to enable strategic moves (Abrahamsson et al., 2003), supply chain integration (Mellat-Parast und Spillan, 2014) or supply chain agility (Gligor and Holcomb, 2014). Due to the high impact of logistics services on the company's business performance, logistical activities such as service performance capabilities as well as information and

warehouse management capabilities have been studied intensively from a RBV perspective (Zhao et al., 2001; Mellat-Parast und Spillan, 2014). In this context, logistical capabilities are seen as an important factor to remain competitive in the marketplace (e.g., McGinnis et al., 2010). However, these studies mainly concentrate on the sourcing of logistical resources from a buying firm's perspective while the examination of logistical capabilities of logistics service providers is rather underrepresented (Wong and Karia, 2010). Regarding the NRBV, this theory focuses on the competitive advantage that can be derived from managing natural resources as well as (sustainability-related) capabilities in the supply chain (Touboulic and Walker, 2015b). Here, the NRBV perspective on the contingent nature of resources and capabilities allowed researchers to draw specific links between environmental and financial performance (Hart and Dowell, 2011). Although Hart's (1995) key strategic capabilities of pollution prevention, product stewardship and sustainable development foster green logistics practices, the logistics service providers' impact on the (socially) sustainability performance of a company or supply chain is contingent. Considering the logistics service providers' integration capabilities (Gligor and Holcomb, 2014) solely from an economic and ecological standpoint, the achievement of a competitive advantage through on-time logistics services (Mentzer et al., 2004) and customer satisfaction through inventory availability (Esper et al., 2007) fall short of reaching holistic sustainability goals. When logistics capabilities simply contribute to a focal firm's competitive advantage through decreasing costs and efficiency gains, it is unlikely that the competitive advantage taps the full sustainability-related potential of the supply chain.

As the (N)RBV considers firms to consist of a bundle of resources which are rare, valuable and hard to imitate, a firm can achieve a long-term competitive advantage assuming that the firm's environment stays relatively unchanged (D'Aveni, 1994). For companies to achieve strategic temporary or even long-term competitive advantages in dynamic markets (Teece et al., 1997; Teece, 2007; Eisenhardt and Martin, 2000), the concept of dynamic capabilities was derived from the transformation of the RBV and the NRBV into more dynamic settings and applied to more complex systems such as supply chains (Beske, 2012). Considering the flexibility and agility potentials of logistics service providers in turbulent markets to address uncertain customer demands and increased competition (Nilsson, 2006; Tatham et al., 2017), dynamic capabilities to create, extend or modify a supply chain's resource base (Helfat et al., 2007) are a promising approach to comprehend LSR practices, particularly not taking a focal firm perspective. While taking a dynamic capabilities theoretical lens, the general criticism concerning the (N)RBV, that a competitive advantage deriving from a bundle of resources

cannot be sustained in a dynamic environment (Teece, 2007), can be addressed in the context of the logistics industry and, at the same time, extended towards including the social dimension of sustainability.

So far, the research on dynamic capabilities in sustainability management and particularly in SSCM is relatively young and has accelerated in the last years because of its prevalence for purposefully changing business environments and (socially) sustainable innovations (Amui et al., 2017). An early article in this field was published by Defee and Fugate (2010) which stresses the importance of extending the dynamic capabilities' nature from a firm-centric to a supply chain view. Only a few authors have explicitly applied dynamic capabilities in SSCM to a company or industry context. Here, Beske (2012), Beske et al. (2014) and Land et al. (2015) proposed and further developed a conceptual framework embedding dynamic capabilities into SSCM practices focusing on the food and automotive industry. Recently reviewing the literature on corporate sustainability and dynamic capabilities, Amui et al. (2017) yet state that this research area still needs to be further explored by using qualitative and quantitative methods. Although the articles by Beske (2012), Beske et al. (2014) and Land et al. (2015) provide insights into the process of identifying specific dynamic capabilities in the context of SSCM, the specific logistics service providers' characteristics are not addressed in these studies. In line with Beske et al. (2014), most of the dynamic capabilities are relationship-specific with the aim to improve the relations among the different supply chain members to enable further transformation towards a more sustainable supply chain configuration. Considering the logistics service providers' fixed role within the ultimate supply chain as provider of services (Mentzer et al., 2001), the specific logistics service providers' relationships need to be addressed from a transformational perspective in more detail. Hence, the study at hand content-analyzes relevant literature on LSR and logistical capabilities deductively using the analytic categories provided by Beske (2012) and Beske et al. (2014) as well as using the linkages to general dynamic capabilities' structural dimensions described in the next section (Mayring and Fenzl, 2014; Schreier, 2014). In this line, Table 2.1 shows the corresponding coding scheme originally proposed by Beske (2012) and Beske et al. (2014) and describes these theory-driven analytic categories. Through analyzing the literature in a deductive manner, conceptual links between logistical resources and logistical capabilities as well as SSCM-related dynamic capabilities can be drawn to build a more comprehensive theoretical framework accordingly.

Table 2.1: Deductive coding scheme.

Coding category	Description
Knowledge management	Knowledge management includes the acquisition of new and the evaluation of current knowledge by supply chain members (Defee and Fugate, 2010).
Partner development	Partner development involves all activities to qualify supply chain partners to fulfill their (sustainability) responsibilities (Seuring and Müller, 2008).
Supply chain re-conceptualization	Another set of routines deals with the transformation of the supply chain in line with a strategic re-orientation of single members describing the change of supply chain wide business models (Beske et al., 2014).
Co-evolution	Co-evolution is characterized by improved relationships of single supply chain members leading to more efficient collaboration and cooperation among the partners (Eisenhardt and Martin, 2000).
Reflexive control	Reflexive control refers to the comparison and evaluation of the supply chain functionality (Beske et al., 2014).

2.5. Dynamic capabilities' structural dimensions

According to Barreto (2010), the body of literature on dynamic capabilities has grown rapidly in the last two decades leading to an intensively studied and complex management theory. The article by Teece et al. (1997) proposing dynamic capabilities as an extension of the RBV is generally seen as the starting point of this research field. Teece et al. (1997: 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 have offered alternative definitions and conceptualizations (Barreto, 2010). Based on Teece’s et al. (1997) main structural dimensions of dynamic capabilities, namely the nature, role, context, building and development, outcome and heterogeneity of dynamic capabilities, the alternative perspectives of dynamic capabilities in the literature are introduced in the following. To build on these main theoretical underpinnings of dynamic capabilities theory, in a first step, this section links the dynamic capabilities’ structural dimensions with logistical capabilities and resources conceptualized from a RBV perspective (see Table 2.2 - Dynamic capabilities’ structural dimensions).

Table 2.2: Dynamic capabilities' structural dimensions.

Nature	Several authors followed Teece et al.'s (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 (cf., Eisenhardt and Martin, 2000; Helfat et al., 2007; Winter, 2003; Zahra et al., 2006). 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, logistics service providers' resources do not by themselves lead to an improved outcome since the performance is dependent on how they leverage their resources (Lai, 2004). The literature on logistical resources generally distinguishes between physical resources (access to hubs, warehouse capacities and transport), strategic resources such as information and communication technology (ICT), human resources and intangible assets (knowledge and relationship resources) (Wong and Karia, 2010).
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 and Ahmed (2007) describe a similar hierarchical order distinguishing between zero-order, first-order, second-order and third-order capabilities. Similarly, Winter (2003) distinguishes between ordinary capabilities allowing a firm to run its business in the short term, substantive capabilities to solve problems and dynamic capabilities to change ordinary capabilities. Accordingly, such higher-level capabilities are especially necessary when changing supply chain configurations to give logistics service providers the possibility of a strategic re-orientation. In this context, higher-level capabilities to integrate technological, communication and process innovations in logistics service providers' business models might promote a more balanced power distribution in the supply chain.
Context	According to Eisenhardt and 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 (Zahra et al., 2006) while others acknowledge its relevance in both stable and dynamic market environments (Barreto, 2010). Eisenhardt and 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. Especially in in turbulent markets characterized by uncertain customer demands and increased competition (Nilsson, 2006; Tatham et al., 2017), such as the automotive industry, logistics service providers' capabilities to decrease schedule instability by installing an efficient order and inventory management come to the fore (cf., Childerhouse et al., 2008).
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 (cf., Nelson and Winter, 2002) emphasizing learning mechanisms such as structuring R&D, information technology support as well as problem-solving and knowledge-sharing processes (Easterby-Smith et al., 2009). Additionally, top management can guide building and creation of dynamic capabilities (Narayanan et al., 2009). Considering the development of dynamic capabilities, existing operational capabilities can be shaped to obtain more mature dynamic capabilities (Newey and Zahra, 2009). In the logistics literature, authors rather stress leveraging existing logistical capabilities to take advantage of certain opportunities (Sirmon et al., 2007) instead of developing new ones. Nonetheless, building additional higher-level capabilities such as knowledge management capabilities provide opportunities to extend the logistics service providers' service portfolio.

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 (e.g., Makadok, 2001; Zollo and Winter, 2002). In contrast, other researchers question such a direct relationship stressing that company performance depends on the specific resource configuration (e.g., Eisenhardt and Martin, 2000; Helfat et al., 2007). Nevertheless, the creation of a new resource base might affect intermediate outcomes on company performance such as related and unrelated diversification (Barreto, 2010). From a logistics capabilities perspective, most authors still stress the logistical contribution to a company's competitive advantage through creating cost leadership and differentiation (e.g., Halldórsson and Skjøtt-Larsen, 2004). As concerns for environmental and social issues within the society and at consumer side rise, logistics service providers' capabilities to facilitate sustainable practices and business models in the supply chain question this sole evaluation of logistics services with monetary outcome indicators.
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 (e.g., Teece et al., 1997; Makadok, 2001). On the other hand, some authors assume that dynamic capabilities have at least a few commonalities across companies (e.g., Eisenhardt and Martin, 2000). Most of the authors are skeptical about these commonalities arguing that dynamic capabilities are more than just best practices (Easterby-Smith et al., 2009). From a logistical perspective, capabilities concerning tangible logistical resources such as physical and human resources are easier to imitate and therefore have more commonalities across logistics service providers. Hence, logistics service providers should stress capabilities with regard to intangible resources to exploit these tangible resources to achieve a competitive advantage, especially in a dynamic environment (Wong and Karia, 2010).

Analyzing the dynamic capabilities' structural dimensions, in particular the discussion about outcome and heterogeneity of dynamic capabilities, company or industry specific processes are critical for the development of higher-level dynamic capabilities (Eisenhardt and Martin, 2000). In this line, conceptualizing common features of dynamic capabilities in a certain industry context may give an answer to *"how firms transform resource advantage to marketplace advantage at a general level, rather than in the firm-specific context, and hence [they] can be adopted as a framework to reveal firms' transformational mechanisms in general"* (Wang and Ahmed, 2007: 35). Consequently, the study at hand intends to contribute by conceptualizing common SSCM features of dynamic capabilities in the logistics industry in order to explain existing and possible future LSR practices and, at the same time, understand logistics service providers' current challenges to further enhance their LSR activities.

2.6. Conceptualizing LSR practices from a dynamic capabilities perspective

Building on dynamic capabilities' theoretical underpinnings (Teece, 2007), a framework is developed by conceptualizing logistical capabilities from a dynamic capabilities perspective to facilitate the understanding of LSR practices. In accordance with the theoretical studies by Teece et al. (1997), Teece (2007), Defee and Fugate (2010) as well as Beske (2012) and Beske et al. (2014), Figure 2-2 provides an overview of the scope of the framework with its

main components, namely LSR micro foundations, logistical resource base, necessary LSR-related and SSCM-related dynamic capabilities. Here, the framework’s micro foundations “*undergird enterprise-level sensing, seizing, and reconfiguring capacities [...] to develop and deploy*” (Teece, 2007: 1319) the resource base; particularly the available logistical resources distributed across the entire supply chain. To do so, the necessary capabilities, which describe “*distinct skills, processes, procedures, organizational structures, decision rules, and disciplines*” (Teece, 2007: 1319), are conceptualized in the industry-specific context of the logistics industry and are linked to higher-level SSCM-related dynamic capabilities to increase the overall comprehension of LSR practices and their interlinkages to SSCM practices. By linking the single components of the framework, it can be seen that logistics-related and SSCM-related dynamic capabilities are embedded in a continuous iterative process of reconfiguring the resource base to align the company’s and supply chain’s strategy to its dynamically changing environment. These temporary and long-term iteration cycles are highlighted in Figure 2-2. In the following, the main components of the framework are described in detail.

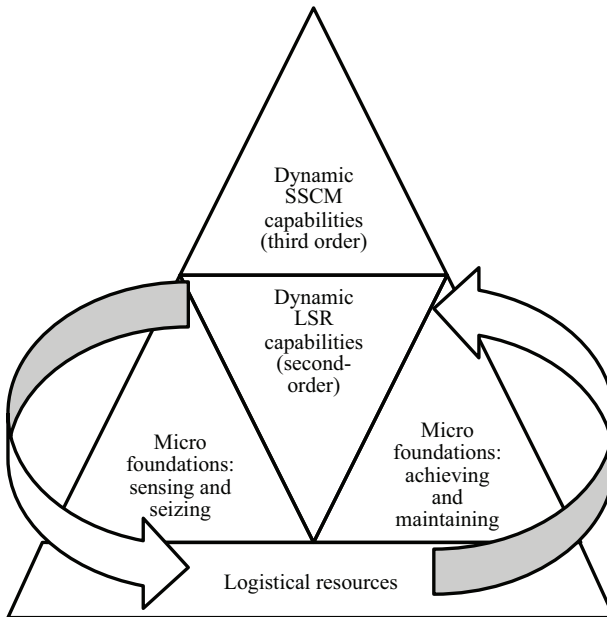


Figure 2-2: Main components of the conceptual framework.

Micro foundations: According to Beske (2012), each member of the supply chain needs to implement sustainable practices in its corporate policies to achieve sustainable advantage. Applied to logistics service providers, they should analyze their LSR practices from a dynamic capabilities perspective to sense sustainability opportunities and threats, seize sustainability opportunities as well as to achieve and maintain a sustainable advantage (Teece, 2007). Based on Teece's (2007) theoretical underpinnings, the dynamic capabilities' micro foundations have to be analyzed from a logistics service provider perspective to increase temporary competitive advantages by leveraging logistical resources as well as maintain long-term and sustainable competitive advantage by reconfiguring the logistical resource base. The logistics service providers' micro foundations refer to sensing sustainability opportunities and threats from changed consumption patterns or technological innovation and shaping opportunities through the design of new sustainable business models.

Sensing sustainability opportunities and threats: Sensing involves activities such as scanning, searching and exploring across technologies and markets (Teece, 2007). In this context, Tatham et al. (2017) explored necessary knowledge management skills. Particularly, they investigated information gathering, problem identification, analysis and solving, as well as sensing sustainability opportunities and threats. Currently, social trends such as urbanization (Crook, 2015) and the shift in consumer preferences (Zweck et al., 2015) towards an increased individualism are dynamically adapting consumption patterns and they require a different kind of logistics services accordingly. For instance, last mile logistics services have been highly affected by increased online retailing activities which lead to higher failed delivery rates and return rates and, accordingly, to higher CO₂ emissions (Edwards et al., 2011). In contrast, newer technologies such as web-based ordering, electronic data interchange, barcoding, vehicle routing and scheduling, inventory replenishments and automated storage (Chapman et al., 2003) as well as big data analytics (Akter et al., 2016; Wamba et al., 2017) and blockchain technology (Yli-Huomo et al., 2016) dynamically innovate the market environment and provide opportunities for more eco-efficient products and services. Here, suppliers and service providers can also be drivers of technological and sustainable innovations in dynamic environments, e.g., in the last mile, which stands in contrast to the traditional PSR assumption that standards are solely transferred by the buying firm (Carter and Jennings, 2004).

Sizing opportunities through designing new business models: According to Teece (2007), the traditional elements of business models such as tangible assets ownership, cost control and

inventory optimizations are not sufficient for long-term competitive performance. Instead, dynamic capabilities support shaping the business environment by developing new products (respectively logistics service portfolio extensions) or even new business models. In this line, Tatham et al. (2017) identified project, risk and strategic management skills as important capabilities to seize more sustainable alternatives. From a logistics service provider perspective, new service portfolio extensions or business models might merge technological innovations in production and consumption with logistical processes to create more sustainable logistics service offers. Here, logistics service providers have the chance to integrate widely distributed capabilities into the supply chain, both on a horizontal and a vertical level. In this context, social and technological innovations bear sustainability potentials if differently structured supply chains configurations provide products and services which support more sustainable production and consumption patterns. For instance, 3D printing can provide such an opportunity on a vertical level in terms of decentralized production at logistics service providers' sites (Zweck et al., 2015). The 3D prints can be produced in their distribution centers as a value adding service or the raw material can be supplied for printing directly at the consumers' site. This would clearly simplify the supply chain structure and reduce transportation distances, energy consumption and organizational efforts (e.g., through less traffic and emissions).

Achieving and maintaining a sustainable competitive advantage: To achieve and maintain competitiveness, Tatham et al. (2017) stress the enhancement, combination, protection and, if necessary, reconfiguration of tangible and intangible logistical resources through warehouse and inventory management, transportation and purchasing management as well as logistics information systems. From an economic and ecologic point of view, dynamic capabilities can leverage logistical resources and, hence, provide a competitive advantage (Esper et al., 2007), at least temporarily. To achieve such a temporary competitiveness, capabilities to sense innovations and seize new products such as knowledge management capabilities come to the fore (Defee and Fugate, 2010) (see short-term iteration cycle in Figure 2-3). By doing so, however, firms are not able to significantly enhance their long-term position through simply implementing logistics information systems as this action could be easily imitated by other firms (Mellat-Parast and Spillan, 2014). From a logistics service provider perspective, capabilities that concern tangible logistical resources such as physical and (partially) human resources are easier to imitate and therefore show more commonalities across the logistics industry. Considering long-term or even sustainable competitive advantage, the degree of homogeneity across logistics services might hamper a sustainable advantage in the long-run,

thus demands for more advanced logistical capabilities such as reflexive control and supply chain re-conceptualization capabilities to purposely reconfigure the logistics service providers' resource base (Beske et al., 2014) (see long-term iteration cycle in Figure 2-3). To foster LSR practices in this line, e-business models incorporating social and technological trends might help to cope with a dynamic environment and increase the overall logistics sustainability (Wang and Lalwani, 2007). For instance, the trend of the so-called sharing economy (e.g., Hamari et al., 2015) has potential for more sustainable configurations of business-to-customer relationships. Especially local delivery practices such as "bringing along" of groceries from the supermarket (organized online in the neighborhood) are most promising sharing economy trends as they still require increased logistics professionalism. Hence, this trend bears the potential for future logistics service offers (see also Box 1).

Reconfiguration of the resource base: In general, enhanced capabilities with regard to intangible resources are used to exploit tangible resources to achieve a competitive advantage, especially in a dynamic environment (Wong and Karia, 2010). Therefore, it is important for logistics service providers to understand and exploit the causal relationships between different logistical resources and capabilities to achieve a unique advantage and enhance their LSR practices. For instance, information resources and capabilities are essential to exploit, integrate and reconfigure physical and human resources. Furthermore, relational resources are crucial to effectively combine different resources and enable integration and collaboration in differently structured supply chains. In addition, information exchange capabilities cannot fully be used without relational capabilities (Sanders and Promus, 2005). Moreover, learning capabilities and knowledge management skills focusing on core processes and technologies in a supply chain are the necessary basis for improving service capabilities.

Dynamic LSR capabilities: In line with Teece's (2007) micro foundations, reconfiguration and recombination of logistical resources is necessary to maintain an evolutionary competitive advantage. In order to link existing resources and dynamic capabilities' micro foundations, companies need to develop rules and procedures (routines) to design corporate renewal and to redesign the routines themselves. With regard to the controversial discussion in the literature about the direct link between dynamic capabilities and achieving a competitive advantage (Eisenhardt and Martin, 2000), the logistics service providers perspective adds new elements to this discussion. Following Lai (2004), Esper et al. (2007) as well as Gligor and Holcomb (2014), the most prominent logistical capabilities in the RBV related literature are service or customer focused capabilities, measurement capabilities, supply chain integration capabilities,

information exchange capabilities and logistical learning capabilities. Merging these logistical capabilities with the dynamic capabilities conceptualization in a SSCM context proposed by Beske (2012) and Beske et al. (2014), LSR specific dynamic capabilities can be derived from the existing RBV related capabilities (see Table 2.3 – Dynamic LSR capabilities). In this line, Figure 2-3 presents the full framework with its causal relationships between dynamic LSR- and SSCM-related capabilities, while Table 2.3 describes the single, dynamic LSR capabilities in detail. To further illustrate dynamic LSR capabilities, Box 1 discusses the case of sharing economy business models as opportunity to further enhance LSR practices.

Table 2.3: Dynamic LSR capabilities.

Logistics measurement	Logistics measurement capabilities refer to the degree to which a logistics service provider monitors the sustainability impact of their operations (Esper et al., 2007). To reconfigure internal and external logistical resources, logistics service providers' managers need to have access to relevant and reliable sustainability measures for decision making. Such measurement capabilities can also be developed with partners outside the supply chain, for instance from other industries (Halldórsson and Skøjt-Larsen, 2004). In this line, logistics service providers should be proactive in implementing an effective monitoring and auditing systems (Beske et al., 2014), not just for their own suppliers. Especially the setup of key performance indicators that reliably measure social performance (Yawar and Seuring, 2017), might turn the strategic orientation of the whole supply chain.
Information exchange	Logistics information exchange capabilities are generally seen as a source of competitiveness, as they are an IT-based prerequisite to achieve an integration of processes among supply chain members and collaborative decision making (Mellat-Parast und Spillan, 2014). The installation of information systems implies long-term relationships (Wei et al., 2012). If information systems can be extended from solely exchanging demand information across the supply chain (Mentzer et al., 2004) towards knowledge management, the exchange of sustainability information and knowledge might facilitate more sustainable inter-company processes. The combination of information sharing and knowledge management also allows tracking and tracing of process parameters and the automation of processes such as reporting (Wong and Karia, 2010). Assuming relevant and reliable sustainability measures are in place, new capabilities to optimize the sustainability of logistical processes can be achieved.
Logistics learning	According to Halldórsson and Skøjt-Larsen (2004), joint logistics solutions also enable members of the supply chain to learn from each other, based on the actors' knowledge and experience. From a joint learning perspective, partner development can be beneficial for both parties by assessing new (sustainable) competences (Halldórsson and Skøjt-Larsen, 2004). Generally, logistical learning capabilities consist of the ability to convert learning outcomes to new logistics management strategies, tactics and operations (Esper et al., 2007). From a sustainability perspective, logistics service providers should actively use their experiences from current LSR practices to further develop sustainable logistics services. Moreover, Wong and Karia (2010) stress the importance of managing the knowledge of human resources (skilled workforce) as a critical and hardly imitable resource since logistics services are " <i>a people-oriented business</i> " (Wong and Karia, 2010: 54). Hereby, logistics service providers can reduce skills shortage and, at the same time, improve competitiveness, company image and social sustainability performance.

Logistics integration	<p>Joint logistics solutions are characterized by long-term expectations and the willingness to share information as well as to solve problems jointly (Halldórsson and Skøtt-Larsen, 2004) so that companies can obtain operational and strategic efficiency. This positive impact on company performance has already been shown by several empirical studies (Mellat-Parast and Spillan, 2014). Here, the complexity of involving multiple organizations is named as a major challenge to achieving integration (e.g., Richey et al., 2010). Although joint action can improve the performance of all participants (Horvath, 2001), enhancing the competitive position of a single company might limit the integration beyond a certain level, especially when companies solely attempt to minimize their logistics and distribution costs through logistics service providers. Accordingly, logistics service providers should not just improve their relationships as resources, but they should also develop and implement new capabilities (Defee and Fugate, 2010) to increase their sustainability performance. Shaping new business models which imply that logistics service providers take over more supply chain responsibility, for instance by professionalizing online retailing by bundling cross-company commodity flows, provide the opportunity for sustainable supply chain re-conceptualizations.</p>
Logistics service capabilities	<p>To satisfy the increasing sustainability requirements of consumers, logistics service providers need to broaden the scope of their services and improve their service performance (Lai, 2004). Accordingly, dynamic capabilities enable logistics service providers to create and deploy logistical resources to satisfy the sustainability needs of consumers (Zhao et al., 2001; Lai, 2004; Gold et al., 2010). To offer customized logistics solutions, logistics service providers might integrate resources from different businesses (Lai, 2004). Therefore, logistics service providers need to influence other organizations' strategies. Such new ways of doing business and re-conceptualizing the supply chain need to target the consumer's sustainability expectation of being able to support sustainable logistics strategies with their monetary "votes" (Shaw et al., 2006). In a solely economic context, Zhao et al. (2001) already showed empirical evidence that service-focused capabilities are directly related and information-focused capabilities are indirectly related to company performance.</p>

Case example sharing economy businesses

Background: Botsman and Rogers (2011) identified a growing consumers' interest in shared consumption which is facilitated by innovations in information technologies. Here, shared consumption has the potential to raise the awareness for ecological and social aspects related to distribution channels. Heinrichs and Grunenberg (2012) distinguish three types of shared consumption. These are professional product-service-systems (e.g., car-sharing), re-distribution markets (e.g., platforms such as eBay) and collaborative lifestyles (e.g., sharing music files).

Business-to-business solutions: Considering business-to-business relationships, sharing economy solutions focus the shared use of resources and infrastructure by business partners within the supply chain. For instance, the cross-company use of vehicles might support a conversion to alternative technologies (like e-mobility), which currently are too expensive to operate at single company use. Moreover, shared warehouses are another possible approach, where several retailers access neutral stocks. Anyhow, such solutions require different relationships among the supply chain members. Truck drivers, for instance, have to share their vehicle as well as retailers need to accept a shared stock consolidation between possibly competing companies. Accordingly, logistics integration capabilities are coming to the fore, in particular on a horizontal supply chain level. In this line, an increased information availability due to advanced information exchange capabilities support the implementation of sharing solutions.

Business-to-customer solutions: Regarding business-to-customer relationships, practices such as "bringing along" of groceries from the supermarket (organized online in the neighborhood) as well as "car sharing agencies" for shopping tours are most prominent. Those sharing concepts are particularly highlighted from a sustainability point of view as the last mile is accountable for a large proportion of total CO₂ emissions along the supply chain (Edwards et al., 2011). Anyhow, those practices of delivering goods by private persons are controversially discussed. Here, the current legal regulations are a main argument against this form of last mile

configuration, since an official registration, compulsory insurances and load protection are missing. Accordingly, logistics service capabilities are necessary to professionalize such services and, at the same time, to keep the sustainability potentials. Hence, product-service-systems facilitated by sharing solutions can promote sustainable logistics services if positive sustainability impacts are transparent for the consumer. In this line, logistics measurement and knowledge management capabilities support a reliable communication to the end customer.

Box 1: Case example of sharing economy businesses.

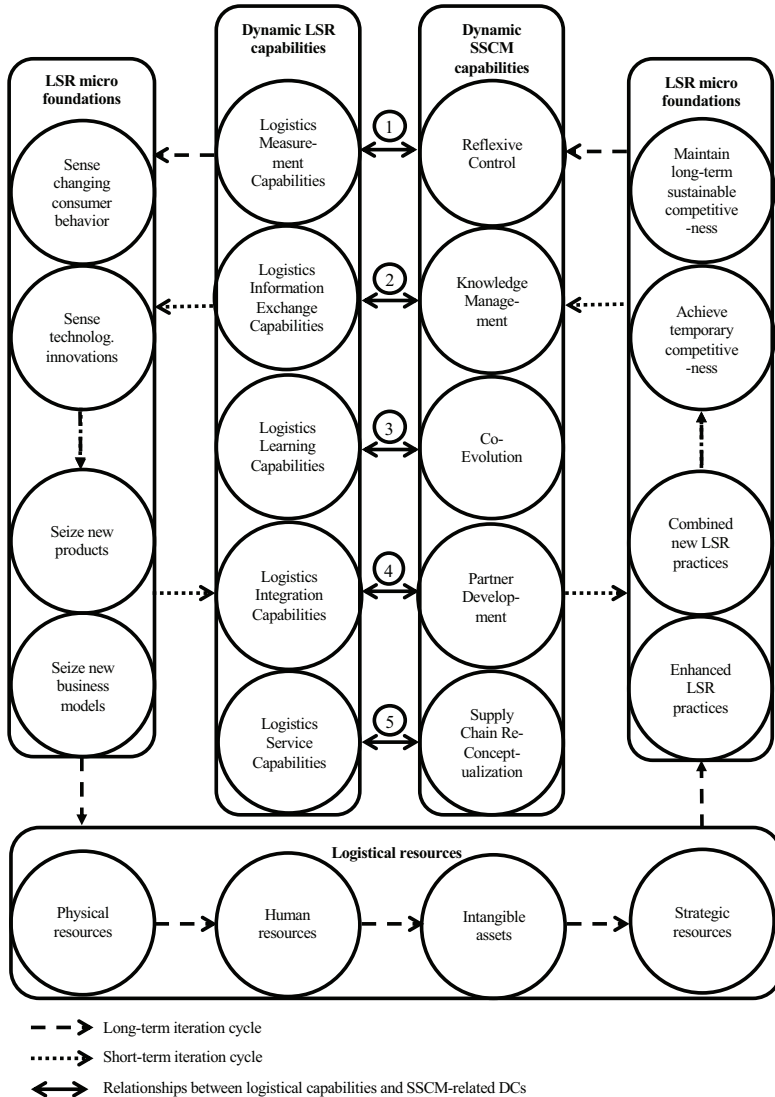


Figure 2-3: Conceptual framework.

2.7. Relationships between logistical capabilities and SSCM-related dynamic capabilities

While LSR-related dynamic capabilities were described in the last section, the relationships between logistical dynamic capabilities and the SSCM-related dynamic capabilities derived by Beske (2012) are now analyzed. In particular, the interlinkages (depicted by arrows 1-5) between LSR- and SSCM-related dynamic capabilities guide directions for future empirical research in sustainable operations management.

Reflexive control: Reflexive control encompasses the routines of information gathering, evaluation and sharing, and hence aims to control supply chain functionality (Beske, 2012; Beske et al., 2014). Thus, reflexive control dynamic capabilities are related to measurement and information exchange capabilities. In the literature, the evaluation of 3PL logistics service providers is seen as a critical step for the selection of appropriate business partners, mainly concentrating on cost, relationship, service, quality and flexibility criteria (Aguezoul, 2014). To date, there have been only a few studies which adopt social sustainability related criteria in the logistics sector. Recently, Jung (2017) presented an evaluation framework which summarizes logistics service providers relevant social sustainability criteria, particularly philanthropy, average salary, organizational learning, human rights policies as well as health and safety policies. Additionally, the evaluation framework proposed by Jung (2017) stresses the dependencies towards price and service criteria. Accordingly, setting up key performance indicators that reliably measure social performance (Yawar and Seuring, 2017) of logistics service providers would support transparent communication among supply chain members and, at the same time, might diminish the price pressure on logistics services. Therefore, the following research proposition (RP) can be formulated for future research:

RP1: Logistics measuring capabilities concerning sustainability-related logistics issues have a positive impact on transparent communication and appropriate pricing schemes among supply chain members.

Knowledge management: Knowledge management includes the acquisition of new and the evaluation of current knowledge related to the supply chain members (Defee and Fugate, 2010). Here, Defee and Fugate (2010) stress the assessment of skills and capabilities possessed by other supply chain members rather than acquiring their knowledge. Hence, the comprehension of existing capabilities across the supply chain and how to combine those best focuses on reducing competitive pressure among the single members. From a logistics service provider perspective, information exchange routines and learning capabilities are vitally important to build a knowledge management system considering sustainability related

information. With regard to information technology and information-focused capabilities, Zhao et al. (2001) could not investigate a direct link between information exchange capabilities and company business performance. Taking a rather holistic perspective, routines to exchange information about the sustainability impact of logistics services will contribute to the improvement of the reliability of logistics service providers' sustainability practices (Yawar and Seuring, 2017) and its company business performance (Liu et al., 2015). Just recently, Yang (2016) confirmed that logistics learning capabilities have an indirect effect on the company business performance in a Taiwanese context. Accordingly, such orientation towards inter-organizational learning about sustainable logistics practices might also contribute to achieving socially enhanced PSR practices and may ease the adaptation towards exchange technologies concerning sustainability-related information. Hence, the following RP can be stated for future empirical research activities:

RP2: Logistics information exchange and knowledge management capabilities concerning sustainability-related logistics information mutually support and moderate the sustainability performance of the supply chain.

Co-evolution: Co-evolution is characterized by the continuous creation of new capabilities and resources leading to a more efficient collaboration and cooperation among single supply chain members (Eisenhardt and Martin, 2000; Gold et al., 2010; Defee and Fugate, 2010). In this context, co-evolution intends to go beyond developing and launching new products and services by incorporating the market dynamics into a company's environment in inter-organizational evolutionary processes (Eisenhardt and Martin, 2000). Here, Defee and Fugate (2010) see dynamic learning routines based on innovative information sharing technologies as a prerequisite to creating new forms of resources. Such a learning orientation requires a set of methods for modifying existing operational routines over time (Zollo and Winter, 2002). Gold et al. (2010) stress that trust resulting from knowledge transfer and learning processes are a necessary condition to achieve and maintain effective collaboration with suppliers and customers. Therefore, an integration of logistics service providers' business partners through horizontal and vertical collaboration might enable the adaptation towards a more effective sustainability strategy of the supply chain and leads to the following RP:

RP3: Logistics learning capabilities concerning sustainability-related issues have a positive impact on a sustainable co-evolution of supply chain members.

Partner development: Partner development involves all activities to qualify supply chain partners to fulfill their (sustainability) responsibilities (Seuring and Müller, 2008). Nonetheless, only a limited number of studies have investigated partner development and integration from a logistics service provider perspective and they mainly concentrate on the financial performance of logistics service providers (Liu and Lai, 2016). In contrast, several studies have investigated the impact of stakeholder relationships on the adoption of environmental (logistics) practices. For instance, Kim and Lee (2012) found significant positive connections between stakeholder pressure and environmental logistics practices, mediated by an eco-oriented firm culture. Thus, open-minded logistics service providers could lead to a sustainable integration of new partnerships with partners not necessarily involved in the core business activities of the supply chain (e.g., NGOs; cf., Beske et al., 2014), and satisfy the needs for sustainability of their stakeholders at the same time. The related RP is the following:

RP4: Logistics integration and partner development capabilities concerning non-core business partners have a positive impact on the sustainability performance of the supply chain.

Supply chain re-conceptualization: Another set of routines deals with the re-conceptualization which describes the change of supply chain wide business models (Beske et al., 2014) and their relationships to each other. Here, the transformation of the supply chain in line with a strategic re-orientation of single members, particularly logistics service providers, might reduce the orientation towards the focal firm and competitive pressure. In this context, Ralston et al. (2013) investigated the impact of logistics salience (cf., Zacharia and Mentzer, 2004) on logistics innovativeness and logistics service differentiation. Within their study, they observed that putting logistical resources upfront can have a positive influence on developing logistics innovativeness and logistics service differentiation. In line with Mellat-Parast and Spillan (2014) who name logistics and supply chain process integration as the most significant predictor for a companies' competitive position, logistics service providers could lead the sustainable transformation and integration within supply chains by developing more sustainable logistics innovation and service differentiation capabilities. Here, the empirically confirmed relationship between logistics service capabilities and firm performance (Zhao et al., 2001; Yang, 2016) implies a link between logistics service providers' dynamic innovation and service capabilities and a holistic supply chain performance. Hence, the following RP can be stated for future empirical research activities:

RP5: Logistics service providers' service (differentiation) capabilities have a positive impact on sustainability innovations of the supply chain.

2.8. Discussion, conclusion and directions for future research

To overcome the main obstacles preventing an enhanced application of LSR practices, logistics service providers need to develop unique dynamic capabilities to unfold their sustainability potentials. In line with Teece (2007), sensing sustainability opportunities and threats through logistics measurement and information exchange capabilities increases the reliability and transparency of logistics service providers' practices across the whole supply chain. In contrast to the abilities of the focal firm, logistics service providers' capabilities to integrate widely distributed capabilities in the supply chain provides the opportunity to design new business models which entail that logistics service providers can lead the implementation of further LSR practices. To do so, logistics service providers require a set of advanced skills which exceed the functional logistics skills of inventory, warehousing and transportation management. As sustainable service capabilities are important to target the consumer's sustainability expectations and, at the same time, raise awareness for sustainable logistics, logistics service providers particularly benefit from taking a joint learning perspective stressing anti-competitive and performance purposes through enhanced LSR practices. Thus, the study on hand presents a conceptual framework describing the linkages between necessary logistical capabilities and the SSCM-related dynamic capabilities originally studied by Beske (2012). In this line, the framework provides the missing theoretical foundation to study dynamic capabilities in a LSR context. Thus, enhanced LSR practices can be achieved by the implementation of LSR specific routines.

Since the conceptual framework is developed from existing literature as well as RBV and dynamic capabilities theory, the discussion reflects on the controversial discussion in the literature about outcome and heterogeneity of dynamic capabilities (Barreto, 2010) from a logistics service providers' point of view. While studies already have shown that leveraging existing logistical resources (e.g., Lai, 2004) as well as environmentally sustainable (logistics) practices (e.g., Perotti et al., 2012 in an Italian setting) can have a positive effect on the economic and environmental performance of a (focal) company, the improvement of the social dimension of sustainability seems to require advanced (respectively higher-level) logistics service providers' capabilities. Broadening the scope to a supply chain perspective, Gold et al. (2010) denote inter-firm resources and capabilities on the one hand as a source for sustainable inter-firm competitive advantage and, on the other hand, as socially complex,

causally ambiguous as well as historically grown. Accordingly, the obstacles of logistics service providers preventing them from an enhanced application of LSR practices may result from the lack of inter- and cross-organizational collaboration. The cross-organizational collaboration stresses the need for a reliable measurement of the logistics service providers' social performance and anti-competitive purposes. According to Wang and Amend (2007), dynamic capabilities establishing a strategic supply chain and learning orientation (Defee and Fugate, 2010) are on the one hand important to recognize and capitalize emerging market opportunities and, on the other, to develop new products, services or markets. To do so, logistics service providers need to overcome the current high degree of homogeneity across current logistics practices which allows easy imitation by competitors. In contrast, social benefits of logistics services are particularly hard to imitate due to their complex nature. Moreover, branch-specific dynamic capabilities as suggested by Beske et al. (2014) and Land et al. (2015) help to increase the level of heterogeneity. Moreover, logistics service providers should not just work on improving their relationships to the focal firm as resources but should also develop and implement new service portfolio extensions and new business models by themselves or with other partners in the supply chain.

In terms of the discussion about supply chain managers' perceptions of being "*managers first and logisticians second*" (Mangan and Christophers, 2005: 180), the study at hand contributes to theory by linking the literature on LSR practices closer to the literature stream of (S)SCM. By softening the logistics service providers' fixed role within the ultimate supply chain as a provider of services towards taking over managerial skills, the perceived distance between logistics service providers and focal companies in the supply chain is reduced. At the same time, it eases a supply chain re-conceptualization towards the inclusion of more LSR practices. Explicitly considering environmental turbulences, the reconfiguration of inter-organizational routines requires proactivity of all supply chain members and, therefore, encourages a stronger position of logistics service providers in the supply chain in order to exploit further logistical capabilities which lead to new and enhanced LSR practices.

As not all underlying literature used to develop the conceptual model has been empirically (fully) tested, the separation into branch-specific dynamic capabilities helps to guide future empirical work. Consequently, survey research should follow up the proposed research proposition derived from the conceptualization of LSR-related dynamic capabilities. Moreover, further case study research needs to shed more light on the complex relationships between logistical capabilities and SSCM-related dynamic capabilities.

2.9. Acknowledgements

The authors designed the study jointly. Tim Gruchmann conducted the literature study and the analysis of the findings and, therefore, contributed mainly to theory building as well as to the writing of all sections of the article. Stefan Seuring contributed to the revision of the article.

3. Mapping logistics services in sustainable production and consumption systems: what are the necessary dynamic capabilities?

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3.1. Abstract

To face the challenges of a sustainable development, there is a need for advanced capabilities to fertilize sustainable corporate development on the level of operations management. Thus, this chapter describes the approach of PSM to fill knowledge gaps for required dynamic capabilities in the field of SSCM. Accordingly, the approach’s ability to solve issues in complex systems is applied to the question how logistics service providers can contribute to creating more sustainable production and consumption systems. The results derived from several workshops were mapped into a CLD describing relevant variables and their causal relations. Finally, these relations are discussed in a broader SSCM context to promote further theory building on dynamic capabilities.

3.2. Introduction

In recent years, logistics service providers had to respond to the increasing demand for sustainability of their stakeholders (Carter and Jennings, 2002). To meet this demand, logistics service providers can either reduce their ecological and social impacts in the supply chain, e.g., by building alternative supply chain infrastructures, implementing technological innovations and improving working conditions (Chapman et al., 2003; Lieb and Lieb, 2010), or support the sustainable transition of other supply chain members. In this line, it has been recognized that also end consumer behavior influences the sustainability performance along the supply chain. Consumers might exert this influence by supporting sustainable logistics strategies with their monetary “votes” (e.g., Shaw et al., 2006) or by changing their own consumption behavior such as using an ecological alternative of reaching the supermarket. In this context, consumers can also be understood as agents carrying out meaningful practices

(Sedlacko et al., 2014). Accordingly, the interdependence between CSR and so-called ConSR is referred to as “shared responsibility” which requires mutual support and cooperation (Schmidt, 2016).

To support responsible actions, there is a demand for sustainable production and consumption systems and, in this line, appropriate capabilities considering related effects of ecological and social trends as well as shifts in consumption patterns. To do so, SSCM (cf., Seuring and Müller, 2008; Carter and Easton, 2011) can promote the analysis of sustainability gaps at logistics service providers, in particular corrections in operational management practices as well as policy improvements in sustainable production and consumption systems. Although SSCM mainly focuses on the manufacturer and retailer (Huemer, 2012) rather than favoring the logistics service provider perspective, a sustainable logistics management can also be subsumed under SSCM literature. Hence, this study intends to facilitate the knowledge about sustainable supply chains for a needed sustainability transition in and across integrated systems of production, supply and consumption.

Taking into account dynamic capabilities theory, critical supply chain actors, in particular logistics service providers, will be examined in the study at hand to realize a conceptual integration beyond the level of the focal company. In this context, the use of PSM (Sedlacko et al., 2014) opens new perspectives for system alternatives with enhanced sustainability performance and operational efficiency. Thereafter, implications can be derived concerning specific SSCM dynamic capabilities to facilitate supply chain innovations in terms of infrastructure development as well as operations management practices. In detail, this research analyses the dynamic interactions of consumer behavior and sustainable logistics services and contributes to theory by improving the understanding of the logistics service providers’ role in sustainable production and consumption systems. Accordingly, the following research question guided our study: How can logistics service providers contribute to creating sustainable production and consumption systems and, at the same time, support more sustainable consumption patterns?

To answer this research question, several workshops together with relevant stakeholders following the principle of triple helix stakeholderhood (business practice, public management and policy as well as science) (Etzkowitz and Leydesdorff, 2000) were conducted, which included the use of participatory modelling and systems thinking brainstorming techniques. These research activities are embedded in the research project “ILoNa” (**I**nnovative **L**ogistics

for Sustainable lifestyles¹). The general objective of this research project is to investigate the interlinkages between innovative logistics services and sustainable lifestyles. Here, the research project analyzes production and consumption systems and related supply chain configurations in a participatory way to construct alternative and sustainable business options for logistics service providers. In addition, the study at hand is grounded in some of the results reported by Melkonyan et al. (2017). Here, Melkonyan et al.'s (2017) relevant findings are interpreted and extended through the theoretical lens of dynamic capabilities.

Accordingly, the structure of the study is the following: Section 3.3 describes the relevant literature streams regarding theory building in SSCM, while section 3.4 gives an overview on the methodological approach of PSM. The related literature towards System Dynamics (SD) modelling and CLDs is described in detail in section 3.5. Next, section 3.6 describes the results of the conducted PSM workshops, while section 3.7 discusses the derived CLD against selected theoretical SSCM frameworks. The last section 3.8 concludes the main findings of the study by providing an outlook on future research perspectives accordingly.

3.3. Theory building in SSCM

In the last two decades, social and environmental issues found their way into supply chain research, stressing the importance of cooperation among companies to maximize profitability while minimizing environmental impacts and maximizing the social well-being at the same time (Seuring and Müller, 2008; Carter and Rogers, 2008; Pagell and Wu, 2009). In contrast to the traditional SCM, which is usually intended to focus on economic performance, SSCM is characterized by the explicit integration of environmental and social objectives which extend the focus of the economic dimension to the TBL as suggested by Carter and Rogers (2008). Starting from a rather holistic and broad analysis of SSCM literature in the beginning of research in this field, recent publications concerning SSCM tend to focus on sub-bodies of the discipline. Hence, the detected literature gaps and the expressed future research directions of general literature reviews led to an increased research interest in social aspects of SSCM. Answering the increasing demand for addressing social aspects in SSCM in recent years, Yawar and Seuring (2017) as well as Quarshie et al. (2016) provided literature reviews linking SSCM and CSR improvements. 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 and Walker, 2015b; Matthews et al., 2016; Quarshie

¹ “Innovative Logistik für Nachhaltige Lebensstile (ILoNa)” in German language.

et al., 2016). Especially, the practical integration of concepts of sustainability and SCM is seen as the biggest challenge. Here, Hanke and Krumme (2012) criticized a missing reference of SSCM theory building to the conceptual achievements of sustainability science and advanced sustainability definitions and state a dominant orientation on (less helpful) weak sustainability models such as the TBL. In this line, Matthews et al. (2016) even argue that the omnipresent assumption of achieving economic, environmental and social goals at the same time needs to be reassessed to build an alternative theory. Following Halldórsson et al. (2007), Carter and Easton (2011) as well as Touboulic and Walker (2015b), most theoretical studies on (S)SCM use popular theories from other disciplines such as stakeholder theory (cf., Freeman, 1984), institutional theory (cf., DiMaggio and Powell, 1983), transaction cost theory (cf., Williamson, 1975) as well as the RBV (cf., Barney, 1991) and NRBV (cf., Hart, 1995; Hart and Dowell, 2011). Taking into account the underlying theories, their suitability for the proposed research question is discussed in the following.

With regards to stakeholder theory and institutional theory, both theories stress the influence of stakeholders and other parties as drivers for (S)SCM (Touboulic and Walker, 2015b; Quarshie et al., 2016). Although DiMaggio and Powell (1983) originally talk about organizational fields tending towards homogenization, most authors tend to use this theoretical lens to emphasize the role of large buyer firms in the supply chain. Due to their strong organizational and strategic view, stakeholder theory and institutional theory might not explain fully how logistics service providers can adopt further logistics and supply chain practices promoting more sustainable consumption patterns. Considering transaction cost theory, this theory stresses efficiency gains and cost reduction by entering inter-organizational arrangements, in particular through cooperation with external partners (Halldórsson et al., 2007). Due to the high impact of logistics services on the economic firm performance, logistical activities have been mainly studied from a transaction cost perspective to achieve low-cost logistics services (Mentzer et al., 2001) and customer satisfaction through inventory availability, on-time deliveries and less product failure (Esper et al., 2007). Therefore, the transaction cost perspective with its emphasis on leveraging the efficiency of logistics services might even be obstructive in reaching holistic sustainability goals.

Regarding RBV and NRBV, these theories focus on the competitive advantage that can be derived from managing resources as well as (sustainability-related) competencies (Touboulic and Walker, 2015b). Especially the NRBV perspective on the contingent nature of resources and capabilities allowed researchers to draw specific links between environmental and

financial performance (Hart and Dowell, 2011). Although Hart's (1995) key strategic capabilities of pollution prevention, product stewardship and sustainable development foster the environmental pillar of the TBL, the logistics service providers' impact on the environmental performance of a company and supply chain is distinct. Based on these theories, the concept of dynamic capabilities was derived from transferring the RBV and the NRBV into a dynamic environment (Beske, 2012). Dynamic capabilities theory aims to explain how companies can achieve a temporary or even long-term competitive advantage in dynamic markets (Teece et al., 1997; Teece, 2007; Eisenhardt and Martin, 2000). However, the research on dynamic capabilities in sustainability management and particularly in SSCM is relatively young, although it has accelerated in the last years because of its prevalence for purposefully changing business environments (Helfat et al., 2007). Recently, Amui et al. (2017) reviewed the literature on corporate sustainability and dynamic capabilities stating that this research area needs to be further explored by using qualitative and quantitative methods. To build on dynamic capabilities theory, the empirical results presented in this chapter are analyzed abductively based on the conceptualization of SSCM practices and dynamic capabilities proposed by Beske (2012) and Beske et al. (2014). Table 3.1 presents an overview about the SSCM related dynamic capabilities accordingly.

Table 3.1: SSCM related dynamic capabilities (Beske 2012; Beske et al. 2014).

Knowledge Management	Knowledge management includes the acquisition of new and the evaluation of current knowledge by the supply chain members (Defee and Fugate, 2010). From a logistics service providers' perspective, routines to generate, access and assess information about the sustainability impact of logistics services will contribute to improve the reliability on logistics service providers' sustainability performance (Yawar and Seuring, 2017). Moreover, the development and adaption of new technologies and practices may be eased.
Partner Development	Partner development involves all activities to qualify supply chain partners to fulfill their (sustainability) responsibilities (Seuring and Müller, 2008). In this line, the logistics service provider business partners on the horizontal and vertical levels should be able to decide on the adaptation towards a more effective sustainability strategy of the supply chain.
Supply Chain Re-conceptualization	Another set of routines deals with the re-conceptualization describing the change of supply chain wide business models (Beske et al., 2014). Here, the transformation of the supply chain in line with a strategic re-orientation of single members, particularly logistics service providers, might reduce the focal firm orientation and the competitive pressure (Gruchmann et al., 2016).
Co-evolution	Co-evolution is characterized by improved relationships of single supply chain members leading to more efficient collaboration and cooperation among the partners (Eisenhardt and Martin, 2000). In particular in dynamic and complex supply environments, co-evolution might lead to a certain equilibrium in the system (Choi et al., 2001). In the automotive industry for instance, when the original equipment manufacturer develops a supplier as a first-tier supplier, this action in turn creates a whole new set of second-tier suppliers who will deliver to this new system supplier.

Reflexive control	Reflexive control contains the comparison and evaluation of the supply chain functionality (Beske et al., 2014). Here, the setup of key performance indicators reliably measuring the social performance (Yawar and Seuring, 2017) of logistics service providers would support a transparent communication among supply chain members (Gruchmann et al., 2016).
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3.4. Participatory systems mapping

To understand the connection between logistics services and sustainable production and consumption systems, a systems thinking approach for integrating complex issues of the TBL is required (Krumme, 2016). Therefore, the PSM method was adopted to facilitate knowledge transfer, based on participatory modelling and application (Sedlacko et al., 2014). PSM generally aims to develop and analyze CLDs to provide insights into a particular issue, while using a facilitated group process to connect the mental models of participants through structured discussions (Sedlacko et al., 2014). To answer the proposed questions with the help of PSM, participants work in groups and follow a predefined script over a certain period of time guided by a moderator. This is to make the participants familiar with the CLD syntax and the given problem itself and gives the opportunity to discuss the scope and delineation of the topic. In the next phase, participants are instructed to determine causal connections to establish cause-effect relationships between the variables, followed by an attempt to lead back these effects directly to the causes (creating feedback loops). The main task during this phase is accordingly the identification of relevant variables in the system. Thus, the mappings in the second phase are based on suggestions from the participants to incrementally add and connect new variables to the CLD. This often leads to group discussions about causal connections and the corresponding supporting evidence. During the process, the participants experience effects of combined feedback loops, identify cascade effects (if present) and take new standpoints on emergent systems behavior. Through the inclusion of participants from different disciplines, the groups have the opportunity to obtain new input and are able to test the impact of the models and knowledge gaps. Therefore, knowledge sharing and breakthroughs usually take place in the discussions. These learning outcomes seem to originate mainly at the level of implicit knowledge (where mental models are normally located), and they leave only a few explicit traces in the memory of the participants in the evaluation of the usefulness of the exercise. During the third phase, still open knowledge gaps are identified in order to ascertain where further research is necessary to complete and specify the CLD. To summarize the integrated approach using the methods mentioned, Figure 3-1 graphically shows the described phases:

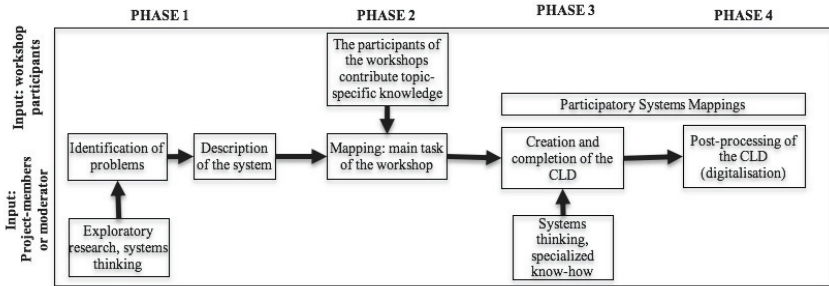


Figure 3-1: Applied methodology of causal diagrams and participatory system mapping.

While Sedlacko et al. (2014) use PSM in the field of sustainable consumption, the study at hand intends to contribute to theory by using PSM in the field of SSCM and sustainable logistics to facilitate more sustainable consumption patterns (including feedbacks as typical for mutual relationships). Accordingly, the exploratory method of PSM was carried out to develop (advanced) CLDs, based on the modelling language of qualitative SD modelling in conjunction with the concept of SSCM as a theoretical foundation of the study.

3.5. System dynamics modelling

To operationalize systems thinking methods such as PSM into SD modelling has a rich tradition not only in a sustainability context, but also for decades in traditional SCM (Tako and Robinson, 2012). Here, SD modelling is seen as a tested instrument to analyze problems of dynamic complexity in a wide range of settings (Sterman, 2000). Forrester (1968; 1977) was the first author who scientifically described SD modelling, namely as *“the investigation of the information-feedback character of industrial systems and the use of models for the design of improved organizational form and guiding policies”* (Forrester, 1977: 13). Moreover, Wolstenholme (1990), who incorporates the quantitative simulation concept, provides an extended definition. He defines SD as a *“rigorous method for qualitative description, exploration and analysis of complex systems in terms of their processes, information, organizational boundaries and strategies; which facilitates quantitative simulation modelling and analysis for the design of system structure and control”* (Wolstenholme, 1990: 3). Interpreting these definitions, SD modelling leads to a profound understanding of complex issues and systems as well as its circumstances. Sterman (2006) calls these issues *“needle-in-a-haystack problems”* when complexity arises from finding the right path in between a high number of possibilities. Accordingly, SD modelling deals with nonlinear behavior of complex systems over time (Morecroft, 1992) aiming to describe

systems with the help of qualitative and quantitative models, but also to understand how feedback structures determine system's behavior (Coyle, 1996). So far, SD modelling has established itself as a computer-aided simulation method. Here, feedback structures should be actively created and decision-making rules should be derived from the knowledge learned through simulation. Following Davis et al. (2007) SD simulation is also increasingly used as a methodology for theory development. Particularly for longitudinal and nonlinear processes, simulation can help to build a more comprehensive and precise theory from so-called simple theory (Davis et al., 2007).

Although CLDs are not part of the original process described by Forrester (1977), it is one of the most important qualitative modelling methods (Coyle, 1996; Sterman, 2000). Generally, CLDs comprise a set of nodes and edges, which consist of a set of variables connected by arrows denoting the causal influences among them. Here, a feedback loop contains two or more related variables that relate back to themselves. These relationships can be either positive or negative. In this context, CLDs fill the knowledge gaps in SD models to gain sense of non-linear systems behavior based on feedback structures and identify assumptions and underlying mechanisms in mental models (Sedlacko et al., 2014). Therefore, CLDs can be considered as the basis for simulation modelling. They fulfil additionally the central task of bringing people closer to the understanding of systems in the sense of "systemic thinking" (Coyle, 1996). However, CLDs are expressed in a formal language which needs practice to be understood properly (Forrester, 1968). Thus, it is recommended to translate the participants' statements into the CLD syntax in order to avoid misunderstandings. CLDs are excellent not only for a fast capturing of hypotheses to explain the dynamics of a model, but also for communicating the relevant feedbacks responsible for on the first sight "hidden" problems concerning the system (such as counterproductive rebounds or back-fire effects). They identify the most relevant feedback loops of a system, which are used to describe basic causal mechanisms hypothesized to generate a reference type of a system's behavior over time (Sedlacko et al., 2014). Although CLDs demand to capture a system in its whole complexity, they still simplify reality to provide the ability of focusing on specific issues.

3.6. Workshop results

For systematically creating results, a workshop platform integrating various perspectives of experts in the field of sustainable logistics, production and consumption was established following the principle of triple helix innovation (Etzkowitz and Leydesdorff, 2000). Within this platform, the trends in logistics services and consumption affecting the sustainability of

production and consumption systems were analyzed and discussed with representatives of logistics service providers, consumer advice agencies and academics within several conjoint workshops (Melkonyan et al., 2017). The workshops were based on the key aspects linking logistics services and sustainable consumption patterns which have recently been explored by Gruchmann et al. (2016). These key aspects contain in particular last mile² configurations, sharing economy solutions and raising the consumers' awareness for logistics services. In this line, the main task of the PSM workshops was to map the actors, success factors, challenges and strategies towards implementing sustainable logistics services in sustainable production and consumption systems in a joint manner in order to investigate relevant variables and their causal connections.

Last mile configuration: Within the workshops considering the last mile configuration, the participants differentiated between two types of consumer lifestyles (Melkonyan et al., 2017). The first lifestyle was defined as group of consumers who work full-time and have limited time for grocery shopping (for instance young and employed parents). Accordingly, these consumers need to plan their shopping activities carefully. In this context, the workshop participants saw online distribution channels such as “Click & Collect”³ (C&C) as well as home delivery services as an attractive distribution channel for this group, mainly due to possible time savings. Operating within online retailing channels, logistics service providers have the best opportunity to interact directly with consumers, and vice versa consumers can place their demand for more sustainable last mile configurations more easily (Gruchmann et al., 2016). The participants argued that the classical parcel delivery services are not sufficient enough to achieve a higher last mile sustainability performance. Instead, a more personalized parcel delivery including value-adding services, such as the handling of complaints, should be offered to increase convenience. The participants also warned that parcel pickup concepts like C&C present a business model to bypass the challenges in the last mile to the consumer. Hence, the performance with regard to sustainability aspects depends strongly on the mobility preferences of the consumers (Gruchmann et al., 2016). In contrast, the second lifestyle was defined as consumers who do not invest time in pre-consuming, but rather in the shopping activities itself seeking to be inspired from the product offers on the market (e.g., elderly

² The last mile serves as “meeting point” of retailers, logistics service providers and consumers. In the literature, the last mile is seen as the most expensive part of the supply chain (Schliwa et al., 2015) and accountable for a large proportion of total CO₂ emissions (Edwards et al., 2011). Furthermore, the last mile is one of the most complex parts of the supply chain, due to tight delivery time windows and a growing number of small orders (Kull et al., 2007; Punakivi et al., 2001).

³ C&C integrates online and stationary distribution services into a hybrid channel. Here, the consumer may order online while pick-up, return or exchange of goods stays in-store (Oh and Teo, 2010).

people). For this consumer group, conventional “brick and mortar” retailers seem to be still the most relevant distribution channel. Additionally, the participants argued that communication about sustainable mobility patterns is very important for this second group of consumers. Hence, the inclusion of consumers’ consumption and mobility preferences, also in the configuration of a conventional distribution channel, is crucial to achieve a better sustainability performance in the last mile.

Sharing economy solutions: From the workshop participants’ perspective, the concepts of sharing economy⁴ have potential for a more sustainable configuration of supply chains in general and the last mile in particular. Considering these solutions of a sharing economy, freight shipping services conducted by consumers themselves, especially in the last mile when consumers indicate the location of goods available for pickup and delivery, are seen as interesting trend from a sustainability point of view. In line with these crowd logistics concepts, it is possible to pick up or drop off goods on the way back from work for a small reward and at the same time achieve a positive effect on sustainability. These sharing concepts have been particularly highlighted by the workshop participants since the last mile efforts can be reduced significantly. Thus, sharing economy solutions could weaken the price pressure due to more logistical advantageous configurations on a local level.

Raising consumers’ awareness for logistics services: The participants also stated that a general consumer awareness not only for sustainable logistics issues, but also for logistics services in general as an integral part of a product should be raised as this is often barely noticeable for the consumer. In this context, an increased visibility and perceptibility of logistics services can lead to its higher recognition and esteem as well as a higher willingness to pay (Gruchmann et al., 2016). Therefore, the willingness to pay for sustainable products and services was defined as an important success factor, but simultaneously as a challenge (Melkonyan et al., 2017). In this line, the workshop participants argued that consumers who are willing to pay more for sustainable products, might be willing to pay more for sustainable logistics services as well. On the other side, the willingness to pay was considered as a challenge by the workshop participants, since a consumer has limited financial resources and once paying for the sustainable products, less income will be available to afford sustainable logistics services. In addition, the participants stated that communication and clear

⁴ Botsman and Rogers (2011) identified a growing consumers’ interest in shared consumption which is facilitated by innovations in information technologies. Here, shared consumption has the potential to raise the awareness for ecological and social aspects related to distribution channels. Heinrichs and Grunenberg (2012) distinguish three types of shared consumption. These are professional product-service-systems (e.g., car-sharing), re-distribution markets (e.g., platforms such as eBay) and collaborative lifestyles (e.g., sharing music files).

information about sustainability aspects concerning logistics services is considered to be a necessary condition for sustainable consumption behavior. Although it was mentioned that too much information could be a challenge as it might overburden the consumer, providing sufficient information about logistics services and its sustainability impact was considered to be predominantly positive (Melkonyan et al., 2017).

Causal loop diagram: Summarizing the results of all workshops, Figure 3-2 presents the CLD using all parameters highlighted by the participants together with their logical feedback mechanisms. As shown in Figure 3-2, there are six feedback mechanisms which influence the dynamics of the system (Melkonyan et al., 2017). The “Willingness to pay” feedback loop describes the stabilizing interconnection among the willingness to pay for the performance and the price of sustainable logistics services in dependence on the consumer income. The feedback loop “Investment in infrastructure” shows the positive impact of the demand for sustainable logistics services on investments in logistics infrastructure dependent on available resources. The option between the use of the private car and using logistics services representing the mobility preferences of consumers is clarified with the feedback mechanism “Choice of the distribution channel”. “Sustainability image” shows that the image of the firm and its communication efforts positively influence the supply of sustainable products. All feedback mechanisms are summarized in the main feedback loop called “ILoNa” (according to the research project’s name), which connects the awareness for sustainability aspects in logistics services (thus also the willingness to pay for them) with the image and reputation of the firm and, at the same time, supports sustainable consumption patterns.

3.7. Theoretical lens

In the following, the classification scheme of SSCM functions proposed by Hassini et al. (2012) is used to discuss the identified relevant causal relations in a broader SSCM context. The SSCM functions of Transformation, Delivery and Value Proposition were chosen as they imply linkages between logistic services and consumer decisions. Purpose of this section is to structure the findings of the PSM systematically and, at the same time, extend the SSCM functions pointed out by Hassini et al. (2012) by adding the logistics service provider’s causal relations and feedback mechanisms to the dynamic system. In this line, the logistics service provider’s potential for building more sustainable production and consumption systems as well as necessary logistics service provider’s dynamic capabilities in sustainable supply chains can be stressed. At the same time, insights into unfolding existing sustainability potentials through new business practices are derived.

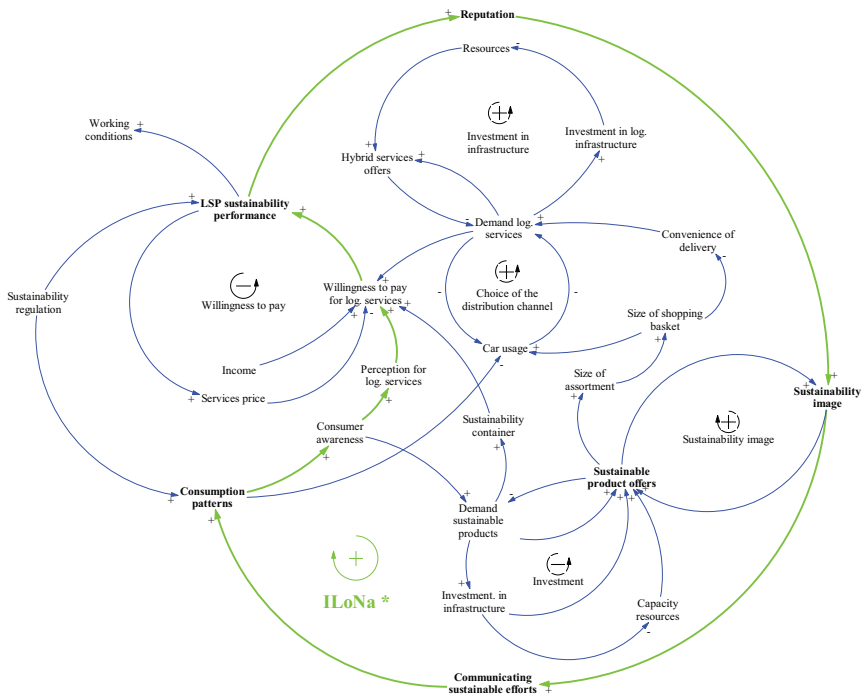


Figure 3-2: Causal Loop Diagram (Melkonyan et al., 2017).

Transformation: Following Hassini et al. (2012), the focal company in the supply chain may trigger an adaptation towards technologies and practices that result in engaging labor practices that are considered as fair and result in a lower impact on the environment. To achieve such a transformation, the members of a supply chain need to coordinate their cross-company activities in a network to share risks and rewards in a fair manner (Skjøtt-Larsen, 2000). Relevant SSCM practices for achieving supply chain collaboration are the joint development of new technologies, processes and products (Vachon and Klassen, 2008), technical and logistical integration as well as an enhanced communication (Beske et al., 2014). When it comes to more sustainable product and service offers, the necessary infrastructure and resources have to be provided by the actors in the supply chain. Accordingly, the coordination of such resources which are distributed and shared across the supply chain (Halldórsson et al., 2007) must solve or avoid conflicts in the interests of all members to realize a supply chain re-conceptualization. Here, technological innovations provide the opportunity to strengthen the position of logistics service providers and, at the same time, enable the creation of more sustainable and integrative production and supply systems. As technological innovations

require knowledge management capabilities, routines for knowledge sharing as well as knowledge acquisition and evaluation need to be developed (Beske et al., 2014). In this context, Chapman et al. (2003) see particularly high transformation potentials by investing in advanced information technologies such as web-based ordering, electronic data interchange, barcoding, vehicle routing and scheduling, inventory replenishments and automated storage. Moreover, the development of new partnerships, also with partners who are not necessarily directly involved with the business, can ease the re-conceptualization of the supply chain (Beske et al., 2014).

Delivery: Hassini et al. (2012) see the delivery process as a broad term to encompass multiple operational processes (like the choice of location, mode of transportation, etc.). Particularly with regard to sustainable logistics services and the possibilities of designing distribution channel options (stationary retailing, online retailing and hybrid configurations such as parcel stations or C&C), consumers' mobility preferences, especially their car usage, have to be considered to achieve more sustainable production and consumption systems. For instance, in regional settings with less stationary retailers, online retailing can be useful by bundling the flow of goods if additional private shopping trips can be avoided. Moreover, the convenience of the delivery is crucial for the consumers' choice of the distribution channel on the one hand side and the sustainability performance of the system on the other hand side. Thus, the offer of a large size of assortment has a negative impact on the convenience of the delivery, but, at the same time, is necessary to achieve less private shopping trips and demands for more sophisticated logistics services. Accordingly, distribution channels which simply bypass the last mile responsibility to the consumer such as C&C need to be accompanied by additional activities to achieve more sustainable consumption patterns. Therefore, a co-evolution of supply chain partners, in a first step between logistics service providers and retailers, would lead to more sustainable distribution channel options. In a second step, a co-evolution actively involving the consumer, for instance by organizing the last mile with the help of sharing economy solutions, might tap further sustainability synergies.

Value proposition: As the consumers' satisfaction is usually the primary goal of manufacturing or provided services, it is important that the product or the service is accepted by the consumer. Therefore, the performance measurement is not only defined and limited to financial and income related indicators, but also driven by performance indicators based on consumer wishes and judgments (Eisenhardt and Martin, 2000). Accordingly, the willingness to pay is balanced by price and performance. However, the consumers' perception of logistics

services as integral part of a product and its impact on sustainability (so-called sustainability container) is still rather low (Gruchmann et al., 2016). Thus, costs related to environmentally friendly or sustainable products and services cannot be easily passed onto the consumers. Consequently, the benefits of more sustainable products and services should be stressed to justify higher logistics service prices. Following Hassini et al. (2012), the key value proposition needs to be well communicated and understood by consumers in order to translate into alternative consumption patterns. Therefore, those consumers who are open-minded for social-ecological issues should be addressed first as they are more sensitive to a better sustainability performance (in a sense of “first movers” or “early innovators”). In this line, establishing a reflexive control with regards to measuring the impact on sustainability increases the awareness directly among supply chain members and indirectly, through a transparent and reliable communication, among certain consumer target-groups. In addition, the communication of a higher logistics service providers’ sustainability performance has a positive impact on the reputation and sustainability image of the company. Nonetheless, the setup of key performance indicators reliably measuring especially the social performance is still a challenge in supply chains (Yawar and Seuring, 2017).

3.8. Conclusion and outlook

On the way to identify more sustainable alternatives with respect to environmental and social externalities of production and consumption systems, the study at hand has shown the application of PSM that considers systems thinking (A) in terms of understanding a systems behavior and (B) the integration of available systems knowledge of experts in the field through a participatory process. This combined approach led to a system map based on perceptions and implicit knowledge stocks of the participating actors blending responsible consumership and SSCM into an integrated production and consumption system. The PSM approach explicitly incorporated the key issues for sustainable alternatives in system, in particular the last mile configuration, sharing economy solutions and the consumers’ awareness for logistics services. Thereby, the interplay of logistics services from the sphere of SSCM and consumer behavior from the sphere of lifestyles was represented on an empirical basis. The derived CLD, which describes the relevant parameters and their logical feedback mechanisms provides on a reliable representation which serves as a starting point for several next steps of future research such as SD simulation.

To theoretically concretize dynamic capabilities within sustainable supply chains and logistics service providers as supply chain facilitators, the initial anchor points of the PSM workshop

series (last mile configuration, sharing economy and awareness for logistics services) have been interpreted with the help of the theoretical frameworks proposed by Hassini et al. (2012), Beske (2012) and Beske et al. (2014). The SSCM functions of Transformation, Delivery and Value Proposition served to identify and structure dynamic capabilities from a logistics service provider's perspective with significant meaning for supply chain transitions towards sustainability. The findings indicate valuable elements for sustainable added value services and respective business models in sustainable production and consumption systems. From a consumer's perspective for instance, it is necessary to include ecological and social sustainability parameters into the price-performance ratio. Increased sustainability performance can only win a positive impetus if supply chain integrity is well communicated to the consumer and, if relevant effects and impacts of the system are made transparent. To conclude and highlight logistical dynamic capabilities, the study reveals a high relevance of collaborative management skills in line with a coherent implementation of integrated supply chain information and communication technologies to achieve reflexive control. From the viewpoint of logistics service providers, supply chain re-conceptualization with regard to shared financial and operational risks as well as interest conflict avoidance among supply chain members is seemingly a connected critical capability. A prerequisite for the identification of such risks and conflicts but also to spot opportunities, is an appropriate knowledge management (for sharing, acquisition, evaluation, enrichment and preservation of knowledge) about interfaces between subsystems in the vertical supply chain structure and in a horizontal order of main material and information flows with co-flows representing sustainability related issues such as energy, water, waste, or emissions. These issues represent promising potentials for more sustainable operations and are important to be actively considered by companies, such as enhanced consumer driven communication schemes in upstream information flows (sustainability demands) addressing vertical as much as horizontal structures and the internalization of external information through developing new partnerships, e.g., with mediate stakeholders (e.g., governmental organizations, non-governmental organizations (NGOs), independent expert groups). In addition, the capability of logistics service providers to channel also rich product assortments, especially on the basis of decentralized production sites, is attractive to win competitive advantages also for the backdrop of regional supply systems, while this combination is able to fulfil dominant consumer convenience aspects through the coordinative and consolidating role of logistics service providers. This asks for a stronger co-evolution between logistics service providers and retailers, logistics service providers and producers as well as logistics service providers

and consumers. In this light, especially a logistics service provider/retailers and logistics service provider/consumers co-evolution show sustainability potentials through the integration of sharing economy solutions and respectively collaborative consumption modes.

Nonetheless, the specific logistics service providers' characteristics could not be fully addressed by the used frameworks due to the logistics service providers' fixed role within the supply chain as provider of services (Mentzer et al., 2001). In line with Beske et al. (2014), the majority of dynamic capabilities are relationship-specific and aim to improve the relations among the different supply chain members in order to enable further transformation towards a more sustainable supply chain configuration. Considering the logistics service providers challenge to gain from developing new business practices stressing anti-competitive and performance enhancement purposes (Gruchmann et al., 2016), future research activities need to deduce logistics service provider specific dynamic capabilities from the existing SSCM related dynamic capabilities. In particular, future research might conceptualize LSR practices from a dynamic capabilities perspective to enhance the understanding of the logistics service providers' capabilities to shape alternative supply chain configurations and, therefore, to promote sustainability in supply chains. In this context, further research can also build on a stronger investigation of the resilience design based on the target levels of a sustainability transition. The theory of system resilience is not only offering concrete orientation for a sustainable economy discourse (Krumme, 2016), but, even more interesting in the context of this study, is naturally correlated to dynamic capabilities (Christopher and Peck, 2004). Current literature on dynamic capabilities for resilient supply chains shows a high concentration on the inherent dynamics of the supply chain structures, functions and actors with still an emphasis against an economically dominated background, but much less reflects on the wider system boundaries to explore the urgent relevance of sustainability related factors of SSCM.

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4. Assessing the intersections of Logistics and Consumer Social Responsibility in sustainable supply chains

A previous version of this article was presented by Tim Gruchmann at the 2016 EurOMA Conference in Trondheim, Norway. This study has been submitted for publication by the author of this dissertation, Imke Schmidt, Sarah Lubjuhn, Stefan Seuring and Martine Bouman and is currently under review at an international logistics journal. In the meantime, any reference to this chapter should be cited as:

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4.1. Abstract

In the ethics literature, researchers have attempted to generalize and advance the theoretical underpinnings of CSR in supply chains. While focusing on certain elements characterizing the supply chain, the CSR (sub)concepts of LSR and PSR emerged, constructing specific CSR dimensions. In addition, the people dimension in SCM is seen as a promising field as the behavioral dynamics of consumers is rarely investigated in supply chain research. Therefore, this study aims at an empirical analysis of the interplay between logistics services and sustainable consumer choices. Based on expert and in-depth consumer interviews, the authors conducted a qualitative, exploratory study with regard to sustainable logistics practices, explicitly taking a consumer-choice-centered perspective. In this line, the present study investigated promising sustainable logistics practices to promote corporate and consumer social responsibility in supply chains. The findings illustrate challenges and driving factors for logistics service providers in facilitating more sustainable consumer choices. Moreover, consumer-choice-centered LSR categories were identified and validated through consumer interviews. In particular, consumer communication is seen as a necessary prerequisite to enhance consumers' awareness of sustainable logistics services. Also, context- and situation-dependent supply chain configurations, as well as financial incentives for sustainable consumption patterns, promote more sustainable logistics services choices by end consumers. Therefore, this study contributes to theory by enriching the concept of LSR to include a consumer-choice-centered perspective and gives managerial implications accordingly.

Keywords: Corporate Social Responsibility, Consumer Social Responsibility, Logistics Social Responsibility, Sustainable Supply Chain Management

4.2. Introduction

Like any other company, logistics service providers must respond to the increasing demand for sustainability from their stakeholders (in particular, consumers and the government) (Carter and Jennings, 2002; Gold et al., 2010). In this context, sustainable logistics management can be interpreted as the realization of the companies' LSR (Carter and Jennings, 2002; Ciliberti et al., 2008; Miao et al., 2012). Most logistics activities linked to sustainability requirements, such as a sustainable transportation, warehousing, and inventory management are carried out by logistics service provider. These requirements address environmental, economic and social topics that include certain CSR dimensions such as diversity, working conditions, human rights, safety, philanthropy, and community involvement (Carter and Jennings, 2002). To meet these requirements, logistics service providers can, on the one hand, respond to their responsibility by reducing the ecological and social impact of the supply chain: e.g., by technological innovations or the improvement of working conditions (Chapman et al., 2003). On the other hand, it has been recognized that consumers also need to adapt to sustainability requirements (Vitell, 2015): e.g., by supporting sustainable logistics strategies with their monetary "votes" (e.g., Shaw et al., 2006) or by changing their own logistics behavior (e.g., using an environmentally friendly alternative to get to the supermarket). The interdependence between CSR and Consumer Social Responsibility (ConSR) is referred to as "shared responsibility," which requires mutual support and cooperation (Brinkmann, 2004; Schmidt, 2016; Schlaile et al., 2016). Therefore, the core assumption of this study is that logistics service providers can support sustainable development by facilitating more sustainable consumer logistics choices (e.g., choices referring to the distribution channels, the bundling of deliveries, and other logistics actions). Accordingly, the following research question guided our exploratory study: How and under which circumstances can LSR be accomplished if sustainable consumption consumer choices are taken into account?

To analyze sustainable logistics practices systematically, the scope of the study was narrowed to logistics service providers as a central actor in the supply chain to facilitate LSR. In this regard, the article presents findings of an exploratory study that investigated (potential) logistics practices supporting sustainable consumption consumer choices in different operational settings. Therefore, a structured and integrated analysis of logistics services and

consumer decisions is provided, such that possible supply chain configurations, including the interaction with the consumer, are assessed from a social sustainability point of view.

Accordingly, the article is structured as follows: In Section 4.3, the relevant literature stream regarding CSR, ConSR, and LSR is briefly presented. Section 4.4 describes the research design. In Sections 4.5 and 4.6, the findings of the exploratory study are reported. In particular, Section 4.6 presents strategies to further broaden the logistics service providers' LSR activities to explicitly include consumer choices. Moreover, Section 4.7 synthesizes these results in a framework, while Section 4.8 discusses the framework. Section 4.9 concludes the study and provides an outlook for future research directions.

4.3. Literature background

The literature on CSR has grown continuously over the last decades. Since CSR is an interdisciplinary topic, scholars have investigated the ethical basis, managerial implications, and strategies regarding consumer preferences, sustainability issues and the political role of the firm (e.g., Dahlsrud, 2008). As a consequence, it is not surprising that the term CSR has also been described as an umbrella term (e.g., Matten and Moon, 2008), which embraces all these definitions, implications, and issues. Thus, some common key concepts are summarized in the definition of CSR quoted above. Apart from those concepts, studies of practical business implementation, referring to concrete strategic approaches and challenges, emerged as well (e.g., branch-focused research, such as investigations of ConSR and LSR).

4.3.1. Consumer Social Responsibility

In this vein, the term - as well as the concept - of ConSR has gained attention in the recent debate about business ethics but has not yet reached a comparable systematic status to CSR (Vitell and Muncy, 2005; Brinkmann and Peattie, 2008; Caruana and Chatzidakis, 2014). Nevertheless, much research has been conducted on sustainable (e.g., Newholm and Shaw, 2007; Thøgersen and Schrader, 2012), political (e.g., Lamla, 2013; Micheletti, 2010), or responsible (e.g., Devinney et al., 2006; Schmidt, 2016) consumption that is spread between different disciplines and fields of study with accordingly different emphases and perspectives. The term CSR can describe sustainable consumption as an empirical phenomenon, the investigation of measures to promote sustainable consumption or the normative basis of attributing responsibility to consumers. Among the involved disciplines are general psychology, behavioral economics, sociology, ethics, and economics (Schmidt, 2016).

Within ConSR or sustainable consumption research, logistics has so far played a minor role, mostly in the discussion of local or regional shopping to avoid transportation services (van Acker et al., 2016; Reimers, 2013). With the increase in online orders, the focus has expanded toward last mile and crowd logistics and the social effects of individual deliveries (Castillo et al., 2017). In recent years, new consumer behavior models, such as the sharing economy, prosumption (consumers who engage in SC stages that generally belong to businesses, such as urban gardening or selling via Ebay), or other social grassroots innovations and their respective sustainability potentials have recently attracted researchers' attention (e.g., Arnold, 2017; Eden, 2015; Grabs et al., 2016; Hartmann, 2016; Smith et al., 2014). Research into these new consumption models is still in the early stages and has only dealt with logistics issues briefly, if at all.

4.3.2. Logistics Social Responsibility

Despite the importance of CSR in the logistics industry to address both social (e.g., Min and Lambert, 2002) and environmental issues (e.g., Feitelson, 2002; Edwards et al., 2011), the literature on LSR is relatively scarce (Mejías et al., 2016). So far, some LSR categories were derived from the analysis of sustainable logistics practices, particularly sustainable purchasing, transportation, warehousing, packaging and reverse logistics (Carter and Jennings, 2002; Ciliberti et al., 2008; Mejías et al., 2016), as summarized in Table 4.1. However, the existing LSR studies address single logistical functions and categories rather than cross-functional investigations (Ciliberti et al., 2008). Furthermore, research on CSR practices carried out by the focal company dominates the literature (Spence and Bourlakis, 2009), while logistics service providers are considered to play a rather passive role in adapting sustainable and responsible processes. Thus, logistics service providers mainly adapt to environmental "stand-alone" practices in transportation and packaging and assure the minimum social standards required by external stakeholders (in particular business-to-business customers and governmental bodies) (Seuring and Müller, 2008).

Accordingly, there is still a need for logistics service providers to adopt sustainable practices in all LSR categories, also from the consumer side (Wieland et al., 2016). As consumer satisfaction is usually the primary goal of manufacturing or services, it is also important that consumers accept logistics services. Thus, companies may fear rejection by private consumers if negative environmental and social issues are reported along the supply chain (Seuring and Müller, 2008). The analysis of existing literature on LSR practices offers evidence that single logistics service providers' activities are an essential element of SSCM strategies to satisfy the

consumer demand for sustainability. Since the literature has concentrated primarily on single LSR practices, research on logistics service providers' potential to support more sustainable consumer logistics preferences remains incomplete and unstructured. To close these literature and theory gaps and, in particular, to include logistics issues within new consumption models from a ConSR theoretical lens as well as the missing consumer orientation in existing LSR categories, further research is necessary to enrich the concept of LSR with a consumer-choice-centered perspective.

Table 4.1: Main constructs in the literature on LSR practices.

Category	Focus	Key literature
Sustainable purchasing	If a company adopts social and environmental standards, the purchasing function can be used to transfer them to (sub)suppliers. With regard to purchasing socially responsible logistics services, buying activities should be related to diversity, human rights, and safety topics. The main logistical topics so far are carrier selection as well as diversity in hiring logistics personnel and motor carriers.	Carter and Jennings, 2004; Carter and Rogers, 2008; Wolf and Seuring, 2010
Sustainable transportation	At this time, sustainable transportation research is mainly concerned with the economic and environmental dimensions of sustainability that focus on fuel efficiency and emissions reduction from transportation equipment. With regard to the social dimension, safety issues for motor carriers are still in focus. This research focus can be explained by external stakeholder pressure, such as existing governmental regulations.	Feitelson, 2002; Carter and Jennings, 2002; Ciliberti et al., 2008; Hassini et al., 2012
Sustainable warehousing	Sustainable warehousing covers practices of proper storing of hazardous materials, donation of excess or obsolete inventory to local communities, and training to operate forklifts safely. In comparison to sustainable transportation, sustainable warehousing is a rather small field, while the link between inventory holding and transportation efforts is neglected from a sustainability point of view. Thus, it can be seen as one of the least investigated issues in sustainable logistical practices.	Carter and Jennings, 2002; Ciliberti et al., 2008; Hassini et al., 2012; Mejias et al., 2016
Sustainable packaging	Sustainable packaging practices should effectively contain and protect products as they move throughout the supply chain, as well as support informed and responsible consumption. Although the focus on environmental impacts of packaging logistics has moved toward a more holistic view of life cycle impact, the literature is still dominated by investigations of the recurring impacts of using returnable and non-returnable packaging, from a single firm perspective. Only recently has research begun to investigate sustainable packaging logistics and its effects on sustainable efficiency in supply chains and also in the post-market phase.	Sarkis, 2003; Ciliberti et al., 2008; García-Arca et al., 2014; Molina-Besch and Pålsson, 2014
Sustainable reverse logistics	Sustainable reverse logistics practices implement processes that guarantee the use and reuse of products. In line with sustainable purchasing, the use of recycled raw materials is seen as a main LSR practice with high sustainability potential, especially the improvement of the overall environmental and financial performance of a company. Lately, authors have started to incorporate social aspects in reverse logistics systems, such as equity, diversity, health and safety practices, education, and stakeholder engagement.	Sarkis et al., 2010; Hassini et al., 2012; Nikolaou et al., 2013; Agrawal et al., 2016

Accordingly, this study intends to contribute by exploring how, and under which circumstances, logistics service providers can support sustainable consumer consumption choices in the realization of their LSR. In this line, a qualitative and exploratory approach was perused to focus on potential LSR practices beyond the current activities (see next section). Here, the scope was to investigate logistics service providers' drivers and barriers to implementing consumer-choice-centered LSR practices; and the potential role of logistics service providers in designing more sustainable supply chains, thus easing the consumers' realization of ConSR.

4.4. Research design

According to Voss et al. (2002), operations management is a dynamic field in which new practices continuously emerge. Since the aim of this study was to investigate potential linkages between logistics services and consumption consumer choices, a qualitative and exploratory research design was chosen. In the context of qualitative research, interviews are often used as a source for explorative knowledge production (Alvesson, 2003; Roulston, 2014). Based on an interview topic guide (see Appendix B), 28 qualitative, semi-structured interviews were accordingly conducted to find possible settings where logistics services enable sustainable consumption preferences. Since the research interest particularly addresses logistics services, the qualitative interviews were held with experts who are specialists in the field of logistics services and consumer decisions, with at least five years of experience in their field. Regarding the expert interviewee selection, six interviewees were chosen from the group of scientists (professors) holding a chair in logistics and SCM at a European university, while another six interviews were conducted with scientists who focus on sustainable consumption and production research. From the practitioners' side, three interviewees were selected from sustainability managers who work with Western European logistics service providers, while three interviewees worked with Western European non-governmental consumer organizations. In addition, ten qualitative, in-depth consumer interviews were conducted to validate the explored LSR categories and to show target-group-specific orientation patterns. This allows triangulating data among the two different interviewee groups. Regarding the consumer interviewee selection, consumers who covered a wide range of socio-demographical characteristics were chosen. Table 4.2 provides an overview of all interview partners.

Table 4.2: Interviewee settings and expertise.

Interviewee	Setting and expertise
Practitioners	
P1	German third-party food logistics provider (over ten years of experience)
P2	German third-party fashion logistics provider (over ten years of experience)
P3	Austrian third-party food and FMCG logistics provider (over five years of experience)
P4	German consumer advice agency (over five years of experience)
P5	Irish consumer engagement and information center (over five years of experience)
P6	Finnish sharing economy expert (over five years of experience)
Scientists in the field of (sustainable) logistics and SCM	
S1	Professor in transport and logistics management (over ten years of experience)
S2	Professor in retail logistics (over ten years of experience)
S3	Professor in SCM (over ten years of experience)
S4	Professor in logistics and service management (over ten years of experience)
S5	Professor in SCM (over ten years of experience)
S6	Scientist working in a research institute concerned with mobility research (over five years of experience)
Scientists in the field of (sustainable) consumption	
S7	Professor of consumer and household economics (over ten years of experience)
S8	Scientist in research group concerned with sustainable consumption and production (over five years of experience)
S9	Scientist in research institute concerned with responsibility research (over five years of experience)
S10	Scientist in research institute concerned with social innovation (over five years of experience)
S11	Scientist in research center concerned with environmental economics (over five years of experience)
S12	Scientist in research concerned with environmental economics (over five years of experience)
Consumer interviewees	
C1	Female, age 31-35, higher education entrance qualification, rural area (<2,000), no children
C2	Female, age 31-35, secondary school qualification, city (<1,000,000), no children
C3	Male, age 26-30, university degree, village (<20,000), no children
C4	Male, age 20-25, university degree, city (<1,000,000), no children
C5	Female, age 26-30, university degree, village (<20,000), no children
C6	Female, age 36-40, secondary school qualification, town (<100,000), one child
C7	Male, age 36-40, university degree, city (<1,000,000), one child
C8	Female, age 31-35, secondary school qualification, city (<1,000,000), four children
C9	Male, age 20-25, secondary school qualification, city (<1,000,000), no children
C10	Female, age 36-40, university degree, city (<1,000,000), 2 children

The data collection from the interviews was stopped when no significant new insights could be gained (Yin, 2003). In total, 28 interviews were conducted. The interviews lasted up to 60 minutes and were tape-recorded, transcribed or important quotes were summarized (Voss et al., 2002; Riege, 2003). The transcripts, summaries and important quotes were analyzed with the qualitative content analysis approach in a structured, abductive manner (Mayring and Fenzl, 2014; Schreier, 2014) to investigate linkages between logistics services and consumption consumer decisions, as well as to identify auspicious strategies to facilitate production and consumption patterns. In the first step, the category system was derived

inductively with an iterative process (Mayring and Fenzl, 2014). Following Mayring and Fenzl (2014), steps that defined the structural dimensions through clustering themes, determining the level of abstraction, and iteratively building the analytic categories were executed. By doing so, an emergent, rather than predetermined, coding scheme was developed (Dahlsrud, 2008). The final coding scheme is displayed in Table 4.3.

Table 4.3: Coding scheme.

Structural dimension	Analytic categories
Challenges in enhancing LSR activities	Focal firm (stakeholder) orientation
Factors driving further LSR activities	Competitive pressure
	Horizontal collaboration
	Vertical collaboration
Raising awareness and communication	Logistics professionalism and social performance
	Visibility and perceptibility of logistics services
	Comprehensive communication
	Acceptance of communication instruments
	Reliable communication
Target-group-oriented supply chain configurations	Product preferences
	Purchasing preferences
	Consumer characteristics
Incentives for sustainable consumption choices	Positive financial incentives
	Charging the true costs of a product/service

In the second step, the interview transcripts, summaries and important quotes were coded with the final coding scheme deductively by using the software tool MAXQDA. Due to the complexity of qualitative interviews, careful interpretations of the interview results are necessary to analyze the extent to which the findings serve the research purpose (Alvesson, 2003). According to Yin (2003), quality procedures with regards to internal validity, external validity, construct validity, and inter-rater reliability need to be in place when analyzing qualitative data and documents to ensure methodological rigor. Regarding internal validity, the transcript coding was performed by two researchers, also ensuring inter-rater reliability. To further strengthen internal validity, the insights from the expert interviews were triangulated with the data from the consumer interviews. In terms of external validity, comparisons with literature were conducted, as suggested by Riege (2003). To further strengthen external validity, an expert workshop was performed with scientific participants from various German universities (none of whom was an interviewee) discussing the approach to evaluate the inductive coding scheme as well as the strategic categories derived from the qualitative content analysis approach. Construct validity was built by collecting data

from multiple sources while reliability was achieved by exposing relevant parallels across multiple sources.

4.5. Findings: challenges and driving factors

In line with the research design of the exploratory study, structural dimensions describing current challenges, driving factors, and emerging trends were derived and linked, whenever possible, to existing literature. First, logistics service providers' main obstacles in enhancing their LSR activities are stressed, namely competitive pressure, focal firm orientation, and dependence on other supply chain members. Second, the expert's implications are presented regarding the factors and trends that drive the application of sustainable logistics practices beyond current LSR activities. In particular, supply chain collaboration and integration, as well as the integration of sharing economy solutions and new digital technologies, have been identified through the qualitative content analysis approach. In a last step, the consumer interviewees' knowledge, attitudes, and actions toward supporting sustainable logistics strategies within their consumption patterns are presented.

4.5.1. Logistics service providers' challenges in enhancing LSR activities

Recently, Heidbrink et al. (2015) stated that dependence on other supply chain actors, as well as fierce competition, is a major challenge for logistics service providers to implement LSR practices. In this line, logistics service providers would gain from developing new business practices that stress anti-competitive and performance enhancement purposes. In the experts' opinion, the focal company in the supply chain is still the main trigger for adopting technologies and practices that result in labor practices considered to be fair, and that result in a lower impact on the environment (P1; P2; S1) (see Table 4.1, LSR category sustainable purchasing). Despite external pressures on focal companies to act sustainably, a strong focal firm orientation might even prevent logistics service providers from implementing further LSR practices, considering the empirical results. With regard to communication of sustainable aspects, for instance, retailers need to strengthen the value of their brand to differentiate themselves from competitors as cross-company retailing slackens the consumers' brand loyalty to a single trading firm (P1; P3). Although logistics service providers and retailers need to cooperate to achieve a clear and consistent communication about sustainable logistics aspects, retailers have little interest in doing so, fearing the dilution of their own brand identity (P1; P3).

Moreover, the interviewed experts still often see a sole association with environmentally (not socially) friendly logistics when it comes to sustainable logistics services (S1; S5).

Nevertheless, there is a need for logistics service providers to guarantee minimum social standards due to the increasing internationalization of the logistics industry (in line with the engagement of foreign employees, often employed through sub-contractors). Therefore, the experts highlighted the need for compliance with social and legal standards when operating logistics across borders (P1; P2; P3; S2). In this context, the retailers' high price sensitivity concerning logistics services (e.g., as a consequence of not charging shipping costs to the consumer) supports a low consumer willingness to pay for logistics services (P2; P3; S1; S2; S4). However, some of the interviewees did not exclude consumers who are willing to pay more for better sustainability performance, particularly those target groups that are open-minded toward social and ecological issues (P1, P2, P3, S2, S4), and, at the same time, decrease competitive pressure. To meet this goal, it would be mandatory to coordinate pricing activities across the whole supply chain to assure social standards (S2). Currently, the experts see rather small chances to realize such a transformation toward more sustainability due to the high competition within the logistics industry (P1; P2; P3; S2; S4; S5). Nonetheless, logistics-oriented retailers, such as Amazon, are already changing consumers' attitudes toward new business practices, creating new competitive pressures for "traditional" business practices that may lead to structural changes within supply chains.

"If a logistics service provider, for instance, would run an online supermarket and, at the same time, offering transportation services to retailers, this would cause a clear conflict of interest. The logistics service provider would be a competitor to its own customer. This is not our self-comprehension." (P1)

4.5.2. Factors and trends driving further LSR activities

"I think, the problem is, the industry is changing, the social structure is changing, and the technology is changing. Logistic service providers have to either follow or lead these changes. Certainly, one logistic service provider, one company does not have enough room, [...] skills and the resources to make this change happen. So, in that case, collaboration, establishing joint trading programs, defining what will be required in the next five to ten years, being proactive is the key in my opinion." (S4)

The key to achieving a balance between a customer orientation and operating cost-effectively is SCM, where logistical thinking acts as a common thread through vertical and horizontal collaboration (Vachon and Klassen, 2008). In line with the trend of manufacturing companies and logistics service providers to focus more upon core processes while transferring single functions to sub-contractors (Lemoine and Dagnæs, 2003), the interviewees stressed the

importance of coordinating activities among the supply chain actors (S1; S2; S3; S4; S5). During the interviews, the question of how to configure supply chains under such conditions was discussed. With regard to trends like leasing or renting vehicles and warehouses, the interviewees focused on the shared use of resources and infrastructure among logistics service providers (P1; P6; S3; S4; S6; S10; S11). Here, several third-party logistics service providers no longer operate their own truck fleet in favor of coordinating material and information flows (P1; P2; P3; Chapman et al., 2003). On the one hand, this was seen as a chance for sustainable logistics services since, for instance, the cross-company use of vehicles might also support conversion to alternative technologies (like e-mobility), which are currently too expensive for one single company to operate (P1; P6; S6). On the other hand, these practices were controversial when discussed by the interviewees. They argued that a paradigm shift is required to achieve stronger horizontal collaboration (P1; P2; P3; S3; S4). For instance, truck drivers would have to share their vehicles and retailers would need to lower their competitive foreclosure thinking in consolidating commodity flows (P1). Currently, the experts see better chances of achieving efficiency potentials for the entire supply chain by the joint development of advanced technologies (S2; S3; S4; S6).

In addition, possibilities to expand logistics service offerings on a vertical supply chain level in regard to manufacturing (e.g., by using 3D printing) and to online retailing were discussed in the interviews (P1; S2; S4; S8). With 3D printing, a more sustainable supply chain configuration is achievable in terms of decentralized production (S2; S4). 3D prints can be produced in logistics service providers' warehouses, or the printing raw material can be supplied for production directly at the consumers' site (S4). This change would simplify the supply chain configuration and reduce efforts (e.g., less traffic). Although technological innovations, such as 3D printing on a vertical level or e-mobility on a horizontal level, would provide the opportunity to strengthen the position of logistics service providers and, at the same time, enforce a more sustainable supply chain configuration, many interviewees recognized that such an implementation might be difficult (P1; S2; S4; S8). Due to the role of logistics service providers as a link between manufacturer, retailer, and consumers, a strategic reorientation that extends the logistics service providers' portfolio might conflict with the interests of other supply chain actors (P1). In the opinion of the interviewees, the highest potential for sustainability currently lies in professionalizing online retailing in terms of last mile logistics: for example, by bundling cross-company commodity flows (P2; S2).

From the interviewees' point of view, the trend of the "sharing economy" (cf., Hamari et al., 2015) has potential for more sustainable configurations of Business-to-Customer relationships in general, and last mile logistics in particular (P2; S2; S4; S8; S10; S11). Botsman and Rogers (2011) identified a growing consumer interest in shared consumption by sharing, lending, or renting, facilitated by innovations in information technologies. In this line, shared consumption affects last mile logistics considerably since products must be transported by consumers to consumers (S11). During the interviews, the question of how to configure last mile logistics was discussed, with a focus on crowd logistics business models (S2; S4). In crowd logistics business models, the offered services are mostly fulfilled by consumers and not by the staff of a company (cf., Frehe et al., 2017). The interviewees mentioned storage services, freight shipping, local delivery services and freight forwarding (P2; W2; S4). In particular, local delivery practices such as "bringing along" services of groceries from the supermarket (organized online in the neighborhood), as well as car sharing agencies for shopping trips, were seen as the most promising trends in the sharing economy with regard to logistics professionalism and sustainability impact (S8; S10; S11). However, in the opinion of the interviewees, the sharing economy business practices that are embedded in macrosocial trends linked to sustainable consumption preferences still require further logistical professionalism to cope with system and technological complexity (S8; S10; S11). Moreover, the interviewees considered logistics practices carried out by private parties to be controversial. The current social performance of sharing services is the main argument against this form of last mile configuration, since an official registration, compulsory insurances, and load protection are missing (P2; S2; S4). Accordingly, logistical sharing business practices should assure at least the social minimum standards in such settings, including compulsory insurances, fair wages, and accident prevention regulations.

"New logistic service providers are coming, trying to develop Peer-to-Peer services in order to facilitate the exchange of logistics services on a platform. [...] But you use a professional provider for Peer-to-Peer transactions. [...] In the sharing economy, you need some logistics that can be done by the consumers themselves." (W11)

4.5.3. Consumer's awareness of sustainability impacts of logistics services

During the in-depth interviews, consumers were asked about their level of knowledge with regard to general sustainability aspects as well as LSR related aspects (e.g., the environmental impact of transportation processes, assuring social standards while delivering goods, and packaging issues). The questions were based on the stages of behavior change theory

(Prochaska et al., 1992). In this context, four stages of change are differentiated: (1) no knowledge/awareness, (2) knowledge/awareness, (3) intention to act, and (4) action and maintenance. The interview results show that the majority of the consumer interviewees can be assigned to the first and second stages of behavior change when considering LSR practices. These types of consumers have no or little awareness of logistics-related issues. Independent of the level of education, six of the interviewees stated that they generally do not think about sustainability aspects while shopping (C1, C2, C5, C6, C7, C8). Some interviewees mentioned that they were aware of logistics-related sustainability issues for the first time during the interviews (C1, C5, C6). Some of the interviewees, independent of their level of education, indicated that they would respond to sustainability and logistics-related shopping offers if concrete alternatives were available. In contrast to that response, interviewees who do extensive online shopping (C1, C2, C5) emphasized that sustainability-related alternatives should not limit their shopping activities. Three of the consumer interviewees with a higher level of education (C3, C4, C10) can be assigned to higher stages of behavior change (stage 3 or 4) as they already included some sustainability and logistics aspects in their shopping behavior. Nonetheless, these interviewees specified that considering ConSR in real action requires more effort, particularly due to missing transparency and alternatives.

“I read a study stating that Germany is world champion in using most packaging for delivering goods. I asked myself how this could be and how we can change this. There are already a few shops which promote sustainability aspects and use less packaging. A positive example is Waschbär (shop). I ordered shoes in this shop. They completely do without plastics and use carton boxes, [...] very simple and very clever.” (C10)

4.6. Findings: consumer-choice-centered LSR categories

In this section, the identified consumer-choice-centered LSR categories of raising awareness for logistics services and communication of sustainability impacts, target-group-oriented supply chain configurations, as well as financial incentives for sustainable consumption choices, are presented and validated using the in-depth consumer interviews.

4.6.1. Raising awareness and communication of sustainability impacts

Expert perspective: The interviewed experts stated that awareness not, only of sustainable logistics issues but of logistics services in general as an integral part of a product, should be raised, as these issues are often barely noticeable by the consumer (P3; P4; S1; S2; S4; S7; S11; S12). The interviewees pointed out that increased visibility and perceptibility of logistics services would lead to higher recognition and appreciation. Therefore, using advertising, as

well as information and communication technologies (e.g., computer terminals at the point of sale), were suggested as possible strategies to raise consumers' awareness (P3; P4; S1; S2). The experts assumed a higher acceptance of information and communication technologies among the supply chain members since the incurred outlay is low and the demand for information by interested consumers can be satisfied (S1; S2). From the experts' point of view, the implementation of such information spots is easier to achieve in an online retail environment than in "brick and mortar" stores, as information concerning logistics services can be accessed with less effort.

Generally, communication is seen as an important instrument to convey the legitimacy of the firm's socially responsible behavior (Amaeshi et al., 2008) and to create a loyal customer base (Du et al., 2010). In this line, there are different ways to communicate sustainability impacts to the consumer. For instance, the carbon footprint can serve as an indicator, placed on the product itself or integrated into the sales receipt (P3; P4; S1; S2; Kronborg Jensen, 2012). Thus, advantageous sustainable configurations, such as supply chains organized on a regional level, can be highlighted. In this context, labeling is seen as a way to gain legitimacy in the eyes of external stakeholders (e.g., Koos, 2011). While the experts have, in general, agreed on the need to increase consumer awareness for sustainable logistics services, the concrete implementation has been controversially discussed and the interviewees advised against using additional (logistics) labels or footprints (P3; S1; S2; S7). The discussion has focused primarily on the methodology of the necessary calculations and assessments of sustainability impacts that would be communicated to the consumers, as well as the incurred outlay and problems concerning feasibility (P3; S1; S2). In particular, the lack of reliable indicators to measure social performance (cf., Holmberg, 2000; Yawar and Seuring, 2017) hinders trustworthy communication. Furthermore, there is a fear that the consumers are overburdened with content (S7; S11; S12). Accordingly, communication efforts with regard to sustainable logistics efforts should be linked with the general sustainability communication, rather than communicating these efforts directly (S7). In this line, the consumer perception of sustainability as a "container construct" provides the opportunity to include the logistics perspective into existing sustainability communication strategies (e.g., the label for organic or local food) and, at the same time, avoid consumer overload (S7). Such an approach of conjoining motives, which align with existing consumer awareness, has the potential to increase appreciation for logistics services and its sustainability impacts.

“For most of consumers, what we found in our segmentation studies, it appears that consumers consider sustainability as container construct.” (S7)

Consumer perspective: During the in-depth interviews, consumers were asked about their preferences in information and communication instruments: in particular, online applications and computer information terminals at the point of sale, as well as the sustainability (logistics) label. With regard to information and communication technologies, the majority of the interviewees appreciated this option of raising awareness and communicating sustainability impacts. Those interviewees who were not willing to use an app or information terminal (C3, C6, C9) stated that their use is too time-consuming. With regards to the sustainability (logistics) label, this instrument was also evaluated positively by the interviewees. In particular, consumer interviewees with a higher level of education showed an interest in labels if they are transparent and reliable, as well as issued by a well-respected public organization (C1, C5, C4, C10). Consequently, private organizations should not issue sustainability (logistics) labels by themselves. In considering the content to be communicated, the interviewees were mainly interested in the following information: the origin of the product and supplying companies, CO₂ emissions, transport modes, and routes as well as working conditions in transportation and warehousing. In this line, the consumer interviews confirmed the experts’ opinion on not issuing an additional logistics label.

“If every company creates its own label, there is no reliability. I would wish for a label that is issued by a central organization such as a government or the European Union. [...] There are just a few labels I really trust. [...] I don’t know what they mean and if they are really sustainable or just an image campaign. Such labels, which are not centrally controlled, should not be printed on a product.” (C4)

4.6.2. Target-group-oriented supply chain configurations

Expert perspective: As discussed in the previous section, consumer cooperation is essential to support sustainable supply chain configurations but cannot be presumed, especially when sustainable solutions are more expensive. Studies on sustainable consumption show that consumers want more sustainable options, but do not often buy these more sustainable offerings in everyday life (Heidbrink and Schmidt, 2011). For some consumers, one reason is the higher price of sustainable products (Schmidt, 2016). In contrast, the experts recognized that consumers devoted to sustainability are willing to pay more for sustainable products (P1; P2; P3; S2; S4; S9; S11). They assume that those consumers are willing to spend more on sustainable logistics services as well. Therefore, target groups should be defined regarding the

factors that influence purchasing preferences, such as specific last mile schemes. Approaches should be designed for each target group to make sustainable choices more likely, especially within online retailing where logistics service providers have the best opportunity to interact directly with the consumers. In addition, consumers can demand sustainable last mile configurations more easily in an online environment. The interviewed experts discussed several options for online last mile configurations, such as parcel mailboxes, parcel stations, and C&C (P2; S2) (cf., Oh and Teo, 2010: C&C integrates online and stationary distribution services into a hybrid channel. Here, the consumer may order online while pick-up, return or exchange of goods stays in-store.). Despite the potential to reduce multiple trips for parcel service providers with the help of a parcel mailbox when the recipient is not present, the main obstacle is the lack of space to install such mailboxes (S2).

“People take into account the sustainability aspects when (they) buy products. For fruits and vegetable, it is becoming more and more important in terms of organic and local production.” (S11)

Nevertheless, older adults or people who live in rural areas, and who therefore have fewer shopping opportunities, might replace personal shopping trips with online shopping if parcels can always be dropped in the first run (S2; S7). Also, parcel stations suit the purpose of consolidating parcel flows. On the one hand, service providers can perform a bundled distribution with higher efficiency and drop-off rates. On the other hand, the sustainability performance depends strongly on the characteristics of the consumer. For example, when a parcel is being picked up by a consumer who uses a car, it is important to avoid any extra trips (e.g., through stations at supermarkets, petrol stations, etc.) as this further impacts the environmental performance outcomes (P2; S2). In this line, parcel pickup concepts like C&C present a business practice to bypass the challenges in the last mile to the consumer (S2). Accordingly, the performance of sustainability practices depends strongly on the mobility preferences of the consumer.

“Maybe that is a solution for older people, who cannot do the shopping themselves or pick up the stuff themselves.” (S7)

Consumer perspective: The analysis of the consumer interviews shows that gender differences might affect the consumption patterns and, accordingly, the sustainability performance of a certain supply chain configuration. When buying products via online distribution channels, particularly clothes, women use more emotional terms than men. In this

context, female interviewees describe online shopping with the following terms: “emotional” (C1, C4), “unscheduled and spontaneous” (C1, C2, C8), or even “arbitrary or contingent upon the mood” (C5, C6). In contrast, male consumers tend to shop “straight forward” (C3, C4, C7). Two male interviewees even perceived shopping as “rather annoying” (C3, C9). Moreover, male interviewees stated that they often buy more clothes in stationary retail shops compared to their female partners. The consumer interviewees also indicated that female interviewees, independent of their level of education, return parcels more often when shopping online (C1, C2, C5, C6, C8, C10). In comparison, three of the male interviewees stated that it is rather cumbersome to send parcels back (C3, C4, C7). With regard to geographical characteristics, interviewees living in both urban and rural areas buy products online. Nonetheless, interviewees from rural areas were more dependent on this distribution channel (C1, C5, C6) as there is a lack of stationary shopping alternatives in the countryside. Moreover, longer travel distances to shops and insufficient public transportation hinder an increased use of this distribution channel. The analysis of the in-depth interviews also showed that interviewees with a low level of education (C2, C6, C8) are less willing to use alternative supply chain configurations, such as parcel mailboxes, parcel stations, or C&C in comparison to interviewees with a higher level of education (C3, C7, C10). Also, an interviewee stated that proximity to the domicile is a necessary precondition to alternative distribution channels (C3). In this line, the consumer interviews confirmed the experts’ opinion on target-group-oriented online distribution channels, in particular with regard to urban and rural areas as well as gender.

“I have to admit that I order a lot (online), always. [...] I return about 80% of the goods ordered. Sometimes I take two sizes of the same cloth. Being honest, I don’t care about how much I return.” (C5, female)

“I don’t like to send back (parcels). To put everything in the original packaging, to bring it to the post office, that’s too stressful.” (C4, male)

“For a couple of months, I am working in the city center. I have to say that I changed my buying habits. Now, I buy my stuff after work (in stationary retail shops). I did not do this before. I was more dependent on online shopping as I had to drive to the city center first.” (C6)

4.6.3. Financial incentives for sustainable consumption choices

Expert perspective: Following the literature, consumers with increased awareness and openness toward sustainability-related topics might not necessarily realize more sustainable behavior and consumption patterns (cf. attitude-behavior gap) (Newholm and Shaw, 2007; Devinney et al., 2010; Schmidt, 2016). The experts attribute this to the fact that consumers are rarely confronted with incentive schemes that promote more sustainable consumption choices (P5; S4; S5). Besides incentives related to communication and advertisement, the pricing system is an important incentive to influence consumer behavior (Bolderdijk and Steg, 2015). Prices often do not reflect the true costs of a product or service. Accordingly, more sustainable alternatives that consider the ecological and societal costs are more expensive, and consumers tend to choose the conventional, cheaper product or service (Heidbrink and Schmidt, 2011). Accordingly, positive financial incentives can support more sustainable logistics behavior of the consumers themselves (e.g., a rebate or bonus for using an environmentally friendly alternative to get to the supermarket). Here, the experts see the highest potential in reducing return shipments (P5; S5) and argue for easing consumer decision-making through sustainability incentive schemes, while the cooperation between logistics service providers and retailers is seen as a crucial prerequisite.

“The customer is the way he or she is. [...] In the end, the consumers’ aims and preferences are decisive. In my opinion, it needs to be clearly stated where the advantage is, the win-win situation while offering a sustainable solution. Otherwise, the customer will not buy it, accept it.” (S5)

Consumer perspective: With regard to incentive schemes, the consumer interviewees were strongly in favor of a rebate and bonus system to avoid return shipments. Such a system could either comprise a limited number of free returns or a discount on the next purchase when nothing has been sent back. When considering fees for returning goods, the interviewees were less enthusiastic. In particular, those who return a considerable proportion of their purchases stated that they are unwilling to spend extra money. Moreover, interviewees with only a few return deliveries were also reluctant to pay for delivery fees, as they have only a small impact in comparison to heavy users. In this line, the consumer interviews confirmed the experts’ opinion on positive financial incentives to support more sustainable logistics behavior.

“As a person who does not purchase a lot online, I don’t want to pay as much for sending something back as persons who return a lot. That’s silly. [...] With an incentive scheme, it would be different. That’s great.” (C7)

4.7. Synthesized empirical results

Despite the role of logistics service providers as a link between manufacturer, retailer, and consumers, little effort has yet been made to match supply chain structures and LSR practices of logistics services to support sustainable production and consumer consumption decisions. Considering the logistics service providers' fixed role within the ultimate supply chain as a provider of services, a theoretical framework in the style of Mentzer et al.'s (2001) ultimate supply chain has been developed to match existing LSR categories with supply chain structures and extend those categories based on the empirical findings. Accordingly, the synthesized framework and related constructs are presented in Figure 4-1 and Table 4.4. Here, the required mutual interaction between certain supply chain members (Schmidt, 2016) derived from the literature is depicted in dotted lines, while the empirical findings are drawn in solid lines.

The theoretical framework shows the three core actors conducting consumer-choice-centered LSR practices to accomplish more sustainable production and consumption choices, as well as the identified constructs that describe required interrelations between them. Moreover, Figure 4-1 depicts external factors: in particular, emerging trends in production and consumption, as well as environmental conditions that influence the system. Here, the current environmental conditions of a high focal firm orientation, competitive pressure, and a low consumer awareness tend to affect the system negatively. In contrast, emerging trends led by technological and social changes can be seen as predominantly positive circumstances that support sustainable development, assuming the required supply chain structure. Accordingly, the empirical results answer the proposed research question by taking explicitly sustainable production and consumption consumer choices into account and, at the same time, build upon the theory in regard to LSR.

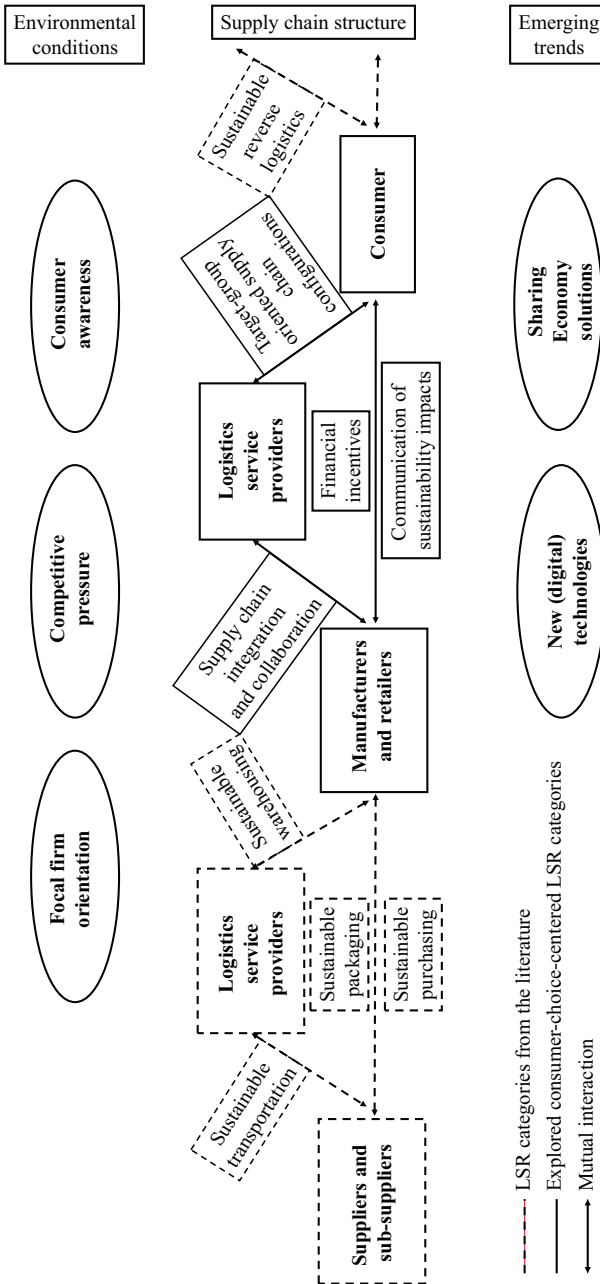


Figure 4-1: Theoretical framework.

Table 4.4: Summary constructs.

Environmental conditions	
Focal firm orientation	A firm's orientation that sustainable practices are solely triggered by the focal firm in the supply chain.
Competitive pressure	Fierce competition leads to a pressure on prices for logistics services, which causes logistics service providers to justify higher prices for more sustainable services.
Low consumer awareness	Current consumption behavior barely considers logistics services as part of the product. Consequently, consumers' appreciation for logistics services and their sustainability impact is low.
Emerging trends	
Logistics professionalism and social performance through new technologies and sharing economy solutions	Led by technological and social changes, the integration among supply chain actors bears the potential for more sustainable configurations. As competitive pressure might prevent such structural changes, logistics service providers should consider a strategic reorientation that takes over manufacturing or retailing activities downstream from the supply chain as well as promoting sharing economy solutions upstream of the supply chain.
Extended LSR categories	
Sustainable purchasing	See Table 4.1
Sustainable transportation	See Table 4.1
Sustainable warehousing	See Table 4.1
Sustainable packaging	See Table 4.1
Sustainable supply chain collaboration	Combining cross-company resources, such as logistical infrastructure in transportation and warehousing, facilitates more sustainable supply chain configurations.
Raising awareness and communication of sustainability impacts	Emphasizing logistics services as an integral part of a product is a necessary prerequisite to raise consumers' awareness. Before implementing communication instruments, easy accessibility to information regarding logistics services needs to be assured to avoid additional hurdles for consumers and other stakeholders. The communication content needs to be transparent and must be based on reliable indicators. Overburdening with content should be avoided; thus, sustainable logistics services should be incorporated into existing communication strategies.
Target-group-oriented supply chain configurations	Logistics services need to support consumers' preferences in buying a sustainable product. Also, logistics services need to consider consumers' general purchasing preferences when offering last mile solutions while considering further consumer characteristics, such as regional setting, mobility preferences, age, and gender.
Incentives for sustainable consumer choices	To ease consumers' decision-making, positive and negative incentive schemes support bridging the attitude-behavior gap.
Sustainable reverse logistics	See Table 4.1

4.8. Discussion

Following the aim of the study and, in particular, moving beyond the existing conceptualization of LSR by exploring potential linkages between LSR practices and sustainable consumption consumer choices, the empirical results derived from expert and consumer interviews inform the current concept of LSR by enlarging the perspective from a rather narrow focal firm perspective toward the inclusion of a consumer-choice-centered

perspective. In the previous conceptualization of single LSR categories, namely sustainable purchasing, sustainable transportation, sustainable warehousing, sustainable packaging and reverse logistics (Carter and Jennings, 2002; Ciliberti et al., 2008; Mejías et al., 2016), these sustainable practices mainly refer to improving the supply chain structure between manufacturers, retailers, and their (sub)suppliers, as well as - at least partially - contribute to achieving supply chain collaboration and integration (Vachon and Klassen, 2008). Using a consumer-choice-centered perspective, new LSR categories were investigated to enrich the current LSR conceptualization accordingly.

In this line, a set of sustainable logistics practices deals with the generation and assessment of information about the sustainability impact of logistics services (Yawar and Seuring, 2017) and the clear communication of such knowledge to reduce consumers' lack of awareness. Another set of practices deals with consumers' product and purchasing preferences, as well as consumer characteristics, to offer target-group oriented logistics services in the supply chain - especially in the last mile. The third set of practices deals with financial incentives to promote more sustainable logistics behavior by the consumers themselves. In addition, the investigated LSR categories consider emerging trends: in particular, the use of new digital technologies as well as sharing economy solutions. Thus, these sets of LSR practices support a supply chain re-conceptualization toward more sustainable supply chain configurations by changing supply chain-wide business practices (cf., Beske, 2012). Here, the transformation of the supply chain, in line with a strategic reorientation of logistics service providers, might reduce focal firm orientation and competitive pressure and, therefore, needs to be prioritized (cf., Gruchmann and Seuring, 2018).

In contrast to that transformational approach, previous studies rather recommended overcoming the ignorance of related environmental concerns (e.g., Wolf and Seuring, 2010). Although environmental concerns still play a major role in sustainable logistics practices, especially the reduction of CO₂ emissions through last mile strategies (Edwards et al., 2011), logistics service providers also gain from developing new business practices that stress anti-competitive and performance enhancement purposes.

By exploring how, and under which circumstances, logistics service providers can support sustainable production and consumption consumer choices in the realization of their LSR, this study contributes to tying the literature on LSR and ConSR practices closer to the literature stream of SSCM, which have largely evolved separately so far (Quarshie et al., 2016). In this context, the potential of LSR practices to contribute to satisfaction of the demand for

sustainability - not just for single upstream SC members, but also for the end consumer - strengthens the link toward a more sophisticated SSCM and Supply Chain Risk Management (SCRM) (Beske, 2012), thereby addressing the threat of being rejected by consumers if negative environmental and social issues are reported along the supply chain (Seuring and Müller, 2008). While other studies have mainly concentrated on single LSR practices, the results of this study support the implementation of a broader LSR strategy in SSCM to further unfold the logistics service providers' potential to support sustainable production and consumption preferences in general, and to continue answering the demand to address social (logistical) aspects in supply chains in particular. By doing so, the authors also respond to the call by Matthews et al. (2016) to reassess the omnipresent assumption of achieving economic, environmental, and social goals at the same time and, consequently, build alternative theory in tying the concept of CSR closer to SSCM research, both of which also developed largely independently of each other (Quarshie et al., 2016). Acknowledging that SSCM scholars mainly ground their research to the triple bottom line as suggested by Carter and Rogers (2008) and business ethics scholars draw more on the concepts of CSR, social responsibility, and ethics (Quarshie et al., 2016), this study provides a common theoretical basis for future research on sustainable logistics in supply chains from both research perspectives - SSCM and business ethics. Thus, this study is one of the first attempts to build a common theoretical basis that focuses on the ethical role of the logistics service provider in sustainable supply chains. In this context, the study also contributes to the research agenda proposed by Quarshie et al. (2016) by transforming and engaging a certain type of organization across the supply chain.

4.9. Managerial implications, limitations, and outlook

Since today's consumers rarely consider logistic services as part of the product and, therefore, the appreciation for logistics services and its sustainability impacts is low, communication is a necessary prerequisite to enlarge the consumer's awareness. One reason is that costs related to environmentally friendly or sustainable products are usually passed on to the consumers. Consequently, retailers need to support logistics service providers by stressing the benefits of more sustainable products to justify higher prices for more sustainable logistics services. Another reason is that placing information about sustainable logistics on the product itself (e.g., labeling) is perceived as hardly feasible. Therefore, producers, retailers, and logistic service providers must cooperate to avoid conflicts between single supply chain actors. In general, holistic communication and advertising, as well as pricing schemes, need to be set up to influence the consumption behavior and achieve sustainable "logistics" lifestyles. Due to

regional settings, as well as mobility preferences of the consumers, it is important to achieve a context- and situation-dependent configuration of the different distribution channels to provide an incentive for more sustainable logistics services choices by the consumer. Therefore, last mile configurations which simply pass the last mile responsibility to the consumer, especially those like C&C, need to be accompanied by additional activities to achieve a sustainable “logistics” lifestyle for the consumer. Sharing economy activities may be useful in developing last mile solutions. In general, logistics service offers need to be tailored to single target groups because sustainability criteria influence the buying and logistics decisions of different target groups. Here, a limitation lies in the attitude-behavior gap that describes the problem of translating a person’s intention into actual behavior. Thus, further psychological research concerning decision-making processes for logistical services needs to be carried out.

Despite providing valuable insights, an empirical study is not without limitations. While aiming to complete the picture of how logistics service providers can support sustainable production and consumption systems in the realization of their LSR, it was not possible to consider extensively all parts of the supply chain within the expert interviews. Furthermore, the interviews might have been biased by personal expectations and desires. Also, the extent of the results of the explorative study is limited by the fact that no truly sustainable logistics providers and supply chains currently exist (Pagell and Wu, 2009). Another limitation, generally perceived in qualitative research, lies in the limited number of (consumer) interviews, allowing no generalization of the findings. Accordingly, future research needs to test the results using survey research. Moreover, the investigations of links between the developed theoretical framework and classical management theory, such as the RBV (cf., Barney, 1991) and the NRBV (cf., Hart, 1995) will support the understanding of linkages between certain constructs.

At the moment, it still seems difficult for logistics service providers to overcome the main obstacles that prevent them from the enhanced application of LSR practices. In this line, logistics service providers need to develop new capabilities to unfold their potential to support sustainable production and consumption. In the literature on dynamic capabilities, for instance, several routines have been identified through which managers can pool their knowledge and skills to generate new knowledge, solutions, or resource configurations (Eisenhardt and Martin, 2000). By using these routines strategically, managers can purposefully change the business environment (Helfat et al., 2007) by forming new

partnerships or changing the relationships between partners in the supply chain. Therefore, future research should specifically foster exploration of links between LSR and dynamic capabilities.

4.10. Acknowledgements

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The authors designed the study jointly. Tim Gruchmann and Imke Schmidt conducted the data collection of the interviews P1-P6 and S1-S6 and the analysis of the interviews. Moreover, Rosa Strube and Thomas Wagner from the Collaborating Centre on Sustainable Consumption and Production (CSCP) in Wuppertal conducted the expert interviews S7-S12 while Sarah Lubjuhn and Martine Bouman from the Center for Media & Health (CMH) in Gouda conducted the consumer interviews C1-C10. Tim Gruchmann contributed mainly to theory building as well as to the writing of all sections of the article. Imke Schmidt also contributed to the writing of section 4.3.1. Stefan Seuring contributed to the revision of the article.

5. Assessing the role of sustainable collaborative strategies in local food businesses: a dynamic capabilities perspective

This study was presented by Tim Gruchmann at the 2018 EurOMA Sustainability Forum in Kassel, Germany. This article has been submitted for publication by the author of this dissertation and is currently under review at an international logistics management journal. So far, any reference to this chapter should be cited as:

Gruchmann, T. (2018), “Assessing the role of sustainable collaborative strategies in local food businesses: a dynamic capabilities perspective”, forthcoming in: S. Seuring (Ed): *Logistics Social Responsibility and Dynamic Capabilities: Conceptualization and Empirical Analysis*, Kassel University Press, Kassel, Germany.

5.1. Abstract

Purpose – The food industry and its supply chain and distribution solutions are often put in the center of sustainability related arguments. Accordingly, this study intends to shed light on how dynamic capabilities drive SSCM oriented business practices in the food industry through the professionalization and expansion of local food networks.

Design/methodology/approach – The present study analyzes sustainability-related practices in six local food production and distribution networks in Germany and Austria. By applying a within- and cross-case study approach the study analyzes empirical data derived from these networks and, accordingly, provides insights on how dynamic capabilities can facilitate SSCM practices within the food industry.

Findings – The empirical findings provide evidence that supply chain orientation, coordination and innovation practices and strategies have high relevance for small-scale local and organic food business networks to reach up-scaling effects in regional markets. In this line, necessary SSCM dynamic capabilities and related routines were identified and validated based on the empirical findings.

Originality/Value – Altogether, customers’ growing demand for more sustainable food products has led to an increased importance of local food production and distribution networks. Although these networks of small farmers include sustainability aspects in their core business, particularly with regard to resource usage, environmental friendliness, and social standard assurance, a missing professionalism limits growth such that these businesses remain often in a niche. In this respect, the study builds on dynamic capabilities theory by

identifying and describing core SSCM practices and capabilities and, at the same time, is among the first to extend the use of the dynamic capabilities perspective in a specific industry setting.

Limitations – Despite providing valuable insights, an empirical and qualitative study is not without limitations. While aiming to complete the picture of how local food businesses can extend sustainability in the food industry, it was not possible to consider extensively all parts of the supply chain. Another limitation, generally perceived in qualitative research, lies in the limited number of interviews, allowing no generalization of the findings.

Keywords: Sustainable Supply Chain Management; Corporate Social Responsibility; Dynamic Capabilities; Local Food; Food Industry

5.2. Introduction

Altogether, customers' growing demand for local food has led to an increased importance of local food production and distribution networks (Bosona and Gebresenbet, 2011; Beske et al., 2014). One core enabler for such local food supply is having coordinated networks in place, which are capable of supplying customers from decentralized production entities in an efficient manner (Gruchmann et al., 2018). In this sense, the present study is generally embedded in the research stream of supply chain coordination (SCC) as collaboration and planning between several entities of a supply chain take center stage in this research. Skjøtt-Larsen (2000) defines SCC as coordinated collaboration between several companies in a network to share opportunities and risks, using an integrated planning based on a common information system. Similarly, Simatupang and Sridharan (2002) see SCC as a collaboration of independent companies to operate more efficiently as if operations are planned and carried out separately. So far, the related literature highlights how effectively coordinated relationships can help manage potential economic supply chain risks (Scholten and Schilder, 2015), e.g. by mitigating risks coming from global food production and supply. Therefore, the necessity for logistics and technological coordination capabilities to facilitate sustainable practices and businesses are coming to the fore as concerns for environmental and social issues within the society and at consumer side rise, which was recently explored for sustainable consumption models (Carbone et al., 2018). Consequently, these capabilities can be interpreted as a key determinant for sustainability in supply chains.

In this line, local food production and distribution networks, in contrast to conventional, globally operating food supply chains, have the potential to create positive regional economic

development impacts, health and nutrition benefits (Bimbo et al., 2015), and impacts on food security (Llazo, 2014) as well as effects on energy use (Hara et al., 2013) and greenhouse gas emissions (Martinez et al., 2010). In particular, local food networks can reduce food safety risks by means of decentralized production (Peters et al., 2009) as well as support the preservation of farmland and cultivar genetic diversity (Goland and Bauer, 2004). Besides these benefits with regard to health and the environment, local food systems include the development of social capital in a community, thus facilitating social sustainability through income generation (Watts et al., 2011) and gender equality (Zirham and Palomba, 2016). In a local context, research related to changing logistics structures in the food industry is seen as crucial for the application of sustainable logistics practices and for evaluating the impact on delivery performance and the environment (Pålsson and Kovács, 2014; Carbone et al., 2018). Although some authors already acknowledged that up-scaling of local food business is a major challenge (e.g., Balázs et al., 2017), none of the existing studies investigated practices and related dynamic capabilities to promote sustainability aspects of local businesses in the food industry. On this point, the study intends to shed light on necessary dynamic capabilities to tap further increases in sustainable business practices through the professionalization and expansion of local food networks. Accordingly, the following research question guided our study: How does a dynamic comprehension of the food supply and distribution chain enable local businesses in improving their sustainability impact?

In this regard, SSCM practices can be considered as routines that form dynamic capabilities in the supply chain and lead to improved environmental and social performance (Beske, 2012). In particular in dynamically evolving supply chain areas such as omnichannel distribution in the last mile (Castillo et al., 2017), dynamic capabilities are a promising theoretical lens due to their ability to purposefully change business environments by forming new partnerships or by changing the relationships between partners in the supply chain (Helfat et al., 2007). By applying a multiple case study approach, the present study contributes by investigating relevant SSCM practices to gain insights as to which dynamic capabilities facilitate the transferability and scaling of local businesses in the food industry.

To analyze the selected cases systematically, the scope of the study was narrowed to the last mile since the last mile serves as the “meeting point” of farmers, retailers and consumers. In the literature on sustainable last mile strategies thus far (e.g., Bosona and Gebresenbet, 2011; Bask et al., 2013), CO₂ emissions as an indicator still play a major role. Here, the last mile is seen as the most expensive part of the entire supply chain (Schliwa et al., 2015) and, at the

same time, is accountable for a large proportion of total CO₂ emissions (Edwards et al., 2011). Furthermore, the last mile is considered to be one of the most complex units of a supply chain. This complexity is generated by tight delivery time windows, customer density, and a growing number of small orders that have to be delivered to rural areas (Punakivi et al., 2001). Acknowledging this strong focus on environmental practices in the last mile, the case studies focus in particular on social and strategic initiatives concerned with the decentralized production of local food and its distribution using online applications. Thus, the unit of analysis of the case studies was set to the interconnections between the entrepreneurs acting as network integrators (technological and/or logistics), farmers, and customers.

Accordingly, the structure of the study is as follows: section 5.3 gives an overview of the relevant literature with regard to SSCM practices in the food industry and SSCM-related dynamic capabilities. The research design of this within-case and cross-case study is shown in section 5.4. Next, section 5.5 describes the single case studies in detail, while section 5.6 analyzes cross-case patterns. Section 5.7 shows the developed, theoretical framework while the last sections discuss the main findings as well as provide managerial implications.

5.3. Literature background

5.3.1. Related SSCM practices in food supply chains

Acknowledging the negative sustainability effects of highly industrialized food supply systems such as excessive land use, pollution of soils and water as well as exhaust emissions (Bazzani and Canavari, 2013), researchers attempted to study more sustainable alternatives to conventional food supply chains, in particular short food supply chains (SFSCs) and local food supply chains. Especially, SFSCs are a rather young research field, which has started to gain increasing popularity in the last years. However, with regard to reviewing overarching SSCM practices in the food industry, Bazzani and Canavari (2013) and Beske et al. (2014) provide literature reviews in which sustainable practices in food supply chains can be structured. Accordingly, Table 5.1 gives an overview of the SSCM categories originally proposed by Beske et al. (2014) as well as related practices.

With regard to SCM practices supporting or enabling a sustainable development, Beske (2012) and Beske and Seuring (2014) provide a related category system. Such practices are relevant for the food industry (Punakivi et al., 2001; Bazzani and Canavari, 2013; Beske et al., 2014) in which sustainable practices in food supply chains can be structured. Accordingly, Table 5.1 gives an overview of the SSCM categories originally proposed by Beske and Seuring (2014) as well as related practices in the food industry.

Table 5.1: SSCM categories and related practices in the food industry.

SSCM category	Related practices in the food industry
Supply chain orientation (describes the dedication to SCM by an organization as well as its orientation toward the TBL (Beske, 2012).	Orientation towards stakeholder groups (e.g., Khan and Prior, 2010), awareness for pressures from non-governmental organizations (NGOs) (e.g., Gold et al., 2010), and legal requirements (e.g., Liu et al., 2011), as well as supplier selection according to ability and willingness to engage in sustainability practices (e.g., Wiskerke and Roep, 2007).
Supply chain continuity is concerned with the way supply chain members interact with each other on a permanent level, particularly building long-term relationships (Beske et al., 2014).	Assistance and teaching of new farming methods for suppliers, and financing the costs required to convert to more sustainable farming (e.g., Ras et al., 2007), as well as governmental initiatives to facilitate sustainable agriculture, such as subsidies (e.g., Smit et al., 2009).
Supply chain coordination (SCC) focuses on the collaboration of independent companies to operate more efficiently as if operations are planned and carried out separately (Simatupang and Sridharan, 2002), e.g., through cross-company information and resource sharing (Skjøtt-Larsen, 2000).	Collaborative practices to increase transparency, especially in regard to food origin, production, and processing methods and ingredients or inputs used (e.g., Paloviita, 2010), such as labeling (e.g., Fulton and Giannakas, 2004), and fair trade (e.g., Maloni and Brown, 2006), as well as logistics, technological and financial integration through intermediaries (e.g., Gruchmann et al., 2018).
SCRM leads companies to the implementation of practices to mitigate risks deriving from their business activities (Carter and Rogers, 2008; Seuring and Müller, 2008). Here, a wider set of stakeholders is actively engaged in the supply chain to counter further pressures and benefit from stakeholder knowledge (Pagell and Wu, 2009).	Food safety and traceability practices (e.g., Kuznesof and Brennan, 2004), adoption of standards and certifications such as ISO14001 or SA8000 (e.g., Vermeulen, 2010), governmental pressures to increase animal welfare (e.g., Hubbard et al., 2007) and decrease health risk coming from the perishable nature of food (e.g., Feame and Hughes, 1999).
Supply chain innovation plays a major role in extending the value proposition of the supply chain (Chapman et al., 2003). In accordance to Kandampully (2002), three drivers for innovation promoted by SCM can be observed: technology, knowledge, and relationship networks.	Adoption of new innovative technologies and processes using open innovation approaches (e.g., Wolfert et al., 2010), life cycle assessment involving on-farm activities, such as used inputs, packaging and transportation (e.g., Peacock et al., 2011), reinforcing consumers' involvement in the local development (e.g., Giampietri et al., 2018).

5.3.2. Dynamic capabilities to achieve supply chain sustainability

Although there is no consensus about a unified definition of local and SFSCs, core characteristic is a coordination of decentralized production entities (farmers) with consumers and a minimized number of intermediaries (Ilbery and Maye, 2005). Hence, collaboration and integration practices are coming to the fore when studying SFSCs. Also, in general SSCM contexts, coordination and collaboration practices play a major role in achieving a superior sustainable supply chain performance (Dao et al., 2011). Here, collaboration is often perceived through a collaborative culture of sharing information, skills and resources (Stank et al., 2001). So far, a significant amount of research is devoted in discussing collaborative

supply chain practices and their economic as well as green performance implications (Vachon and Klassen, 2008; Wolf and Seuring, 2010; Perotti, 2012). In this regard, scholars mainly investigated into two types of collaborative practices: logistics and technological (Vachon and Klassen, 2008). However, in the context of small agricultural suppliers, Touboulic and Walker (2015a) argue that collaboration need to tackle the dynamic nature of supply chain relationships.

Coordination practices in particular and SSCM practices in general have been often explained through the theoretical lenses of the RBV and NRBV (Halldórsson et al., 2007; Carter and Easton, 2011) as these theories focus on the competitive advantage that can be derived from managing resources as well as (sustainability-related) skills (Touboulic and Walker, 2015b). In particular the NRBV perspective on the contingent nature of resources allowed researchers to draw specific links between environmental and financial performance (Hart and Dowell, 2011). Along these lines, the concepts of dynamic capabilities derived from transferring the RBV and NRBV into a dynamic environment addressing their static nature unable to explain necessary routines to manage dynamic changes (Beske, 2012). In this vein, dynamic capabilities theory aims to explain how companies can achieve a temporary or even long-term competitive advantage in dynamic markets (Teece et al., 1997; Teece, 2007; Eisenhardt and Martin, 2000). As the food industry is characterized by a very dynamic market environment with constant changes in customer demand (Wiengarten et al., 2011) and constant innovations in omnichannel distribution (Castillo et al., 2017), the dynamic capabilities theoretical lens is promising to explain further sustainable practices through the expansion and professionalization of local food networks.

To cope with dynamic markets, companies in food supply chains have to reconfigure their resources to absorb effects related to a changing environment as well as learning and knowledge diffusion (Meinlschmidt et al., 2016). Hence, firms require dynamic capabilities that enable them to integrate, reconfigure, gain, and release resources to match and include market change (Teece et al., 1997; Vanpoucke et al., 2014). In particular Beske et al. (2014) stress that most of the dynamic capabilities are relationship-specific with the aim to improve the relations among the different supply chain members to enable further transformation towards a more sustainable supply chain configuration. Recently, Amui et al. (2017) reviewed the literature on corporate sustainability and dynamic capabilities, stating that this relatively young research area needs to be further explored by using qualitative and quantitative methods. In the context of sustainable supply chains, Mathivathanan et al. (2017) see dynamic

capabilities as inherent capabilities developed through the implementation of sustainable supply chain practices. In this line, SSCM practices and dynamic capabilities are embedded in a continuous iterative process of reconfiguring the resource base to align the company's and supply chain's strategy to its dynamically changing environment (Gruchmann and Seuring, 2018). This leads to continuously emerging new practices and adopted capabilities.

Taking into account the relationships between SSCM practices, SSCM dynamic capabilities and the resource base, only a few studies conceptualized concrete causalities. To the best of our knowledge, none of these studies provided empirical evidence. To further build on dynamic capabilities theory in the context of sustainable supply chains accordingly, the present study analyzes company cases based deductively on the conceptualization of SSCM-related dynamic capabilities proposed by Beske (2012), Beske et al. (2014), Kurci and Seifert (2015), Mathivathanan et al. (2017) as well as Gruchmann and Seuring (2018). In particular, the single capabilities are structured following the dynamic capabilities micro foundations (Teece, 2007) as proposed by Kurci and Seifert (2015). In this line, Table 5.2 presents an overview of the SSCM-related dynamic capabilities, which will serve as a coding scheme too.

Table 5.2: SSCM-related dynamic capabilities.

<p>Knowledge and innovation management capabilities (sensing opportunities)</p>	<p>Knowledge management includes the acquisition of new and the evaluation of current knowledge by the supply chain members (Defee and Fugate, 2010). In this regard, organizational routines to generate, access, and assess information about the sustainability impact of a supply chain will contribute to improving the reliability of a firm's sustainability performance (Yawar and Seuring, 2017). Moreover, innovation management may ease innovation processes and adaption toward technologies and practices while generating new ideas to also create new business opportunities (e.g., Lawson and Samson, 2001). Both knowledge and innovation management capabilities draw on human resources and intangible assets (knowledge and relationship resources) (Wong and Karia, 2010).</p>
<p>Reflexive control and measurement capabilities (sensing opportunities)</p>	<p>Reflexive control encompasses the routines of information gathering, evaluation and sharing, and hence aims to control supply chain functionality (Beske et al., 2014). Thus, reflexive control dynamic capabilities are related to measurement and information exchange capabilities. Here, the setup of key performance indicators reliably measuring social performance (Yawar and Seuring, 2017) would support transparent and reliable processes among single supply chain members. In this regard, organizational routines to monitor internal and external operations as well as to support strategic planning and decision making (Gligor and Holcomb, 2012). Both reflexive control and measurement capabilities rely on strategic resources.</p>

<p>Partner development and alliance management capabilities (seizing opportunities)</p>	<p>Partner development involves all activities to qualify supply chain partners to fulfill their (sustainability) responsibilities (Seuring and Müller, 2008). Here, business partners collaborating on a horizontal or vertical supply chain level should be able to decide on the adaptation toward a more sustainable supply chain configuration. From a joint learning perspective, partner development can be beneficial for both parties by assessing new (sustainable) competences (Halldórsson and Skjøtt-Larsen, 2004). Moreover, external resources can be deployed by capabilities to form new alliances and acquisition routines (Eisenhardt and Martin, 2000). However, most of the studies have investigated partner development from a financial performance perspective, in particular with regard to logistics service partners (Liu and Lai, 2016).</p>
<p>Co-evolution capabilities (seizing opportunities)</p>	<p>Co-evolution is characterized by improved relationships of single supply chain members, leading to more efficient collaboration and cooperation among the partners (Eisenhardt and Martin, 2000). In this line, co-evolution intends to go beyond developing and launching new products and services by incorporating the market dynamics into a company's environment in inter-organizational evolutionary processes (Eisenhardt and Martin, 2000). Again, external resources can have a major impact on the co-evolution of supply chain partners, in particular when successfully functioning processes and systems are applied from one business domain to another (Teece, 2007).</p>
<p>Flexibility and re-conceptualization capabilities (transformation)</p>	<p>With regard to short-term changes, routines to achieve logistics, supply, operations, information systems, organizational and market flexibility are coming to the fore (Alinaghian, 2012). Another set of routines deals with re-conceptualization and describes the change of supply chain-wide business models on a long-term basis (Beske et al., 2014). Such a transformation of the supply chain in line with a strategic re-orientation of single members might reduce the focal firm orientation and competitive pressure (Gruchmann and Seuring, 2018). In this line, supply chain re-conceptualization capabilities contribute to purposely reconfiguring the supply chain's resource base (Beske et al., 2014). Here, Kotzab et al. (2015) found out that internal SCM resources affect joint SCM resources, which influence collaborative practices and SCM execution.</p>
<p>Logistics and leveraging capabilities (transformation)</p>	<p>In contrast to the capabilities of the focal firm, logistics service providers' capabilities to integrate widely distributed resources in the supply chain provides the opportunity to design new business models which entail that logistics service providers can lead the implementation of further sustainable practices (Gruchmann and Seuring, 2018). Here, studies already have shown that leveraging existing logistical resources (e.g., Lai, 2004) as well as environmentally sustainable (logistics) practices (e.g., Perotti et al., 2012) can have a positive effect on the economic and environmental performance of a company. Moreover, incorporating further higher-level capabilities provide opportunities to extend the logistics service providers' service portfolio (Gruchmann and Seuring, 2018).</p>

5.4. Research design

According to Voss et al. (2002), operations management is a highly dynamic field in which new practices are continuously emerging. Considering the aim of the study, particularly to deepen the understanding of how dynamic capabilities can tap further increases in CSR-oriented business practices in local food networks, a within- and cross-case study approach was used as the nature, complexity, and boundaries of the phenomenon are not fully clear (Yin, 2003). Case studies are particularly well suited for complex structures as they allow intense interaction with the informant and draw on multiple sources of information, leading to robust data (Eisenhardt and Graebner, 2007). Although the sustainability potentials of local

food supply networks are evident in the literature (e.g., Bosona and Gebresenbet, 2011), how to develop, transfer, and scale these potentials has not been fully addressed in the literature thus far. Hence, a combined within- and cross-case study approach is used.

Case sampling and selection: Following the scope of the study, in particular to investigate promising sustainability-oriented practices in the last mile operated by local food entrepreneurs using online applications, cases were chosen from the population of existing e-food business focusing on the decentralized production and distribution of food. E-food business in such a context generally can be assigned to certain sustainable business model archetypes, in particular by adopting a stewardship role and repurposing the business strategy for society and the environment (Bocken et al., 2014). Therefore, cases were selected from business (arche)types using one of the three online distribution channel options: Click&Collect (C&C), home delivery, and local online department stores. As a hybrid channel, C&C integrates online and stationary distribution services. Here, goods are selected and paid for by the consumer online, while the pick-up, return, or exchange of goods stays in-store (Oh and Teo, 2010). In contrast, home delivery services and local online department stores cover the entire last mile by delivering goods directly to the customer. Respectively, two case companies operating within one of the three online distribution channel options - six in total - were chosen to predict similar results within the same option cases and diverse results across the different options. In this context, the case companies NETs.werk and Marktschwärmer (C&C), Lokaso and Lokavendo (local online department stores), and Flotte Karotte and Hoflieferant (home delivery) were chosen as they implement sustainability in the core of their local food business models. Finally, six local food networks were sampled according to Eisenhardt's (1989) suggestion of four to 10 cases. The following Table 5.3 gives an overview of the observed business networks and initiatives. Moreover, the case companies were categorized by firm size based on number of employees (Ahire and Golhar, 1996). Hence, case companies with fewer than 100 employees were classified as small, between 100 and 500 as medium, and more than 500 as large.

Data collection: In qualitative research, interviews are generally used as the methodology for knowledge production (Alvesson, 2003). Hence, 12 qualitative interviews were conducted with key respondents (see Table 5.3) based on an interview topic guide (see Appendix C). This interview guide was sent to the interviewees in advance to assure that the interviewees were properly prepared (Voss et al., 2002). The interviews lasted from 37 up to 81 minutes and were tape-recorded and then transcribed in their entirety. To ensure inter-rater reliability,

the interviews were conducted by two persons, one person leading the interview and the other person taking notes independently. In addition, secondary data were collected from publicly available reports, internal company documents, websites, and newspaper articles to triangulate the findings. Moreover, expert workshops with the case companies were performed to collect additional data and to avoid biases. The data collection from each case was ended when no significant new insights could be gained (Yin, 2003).

Table 5.3: Case characteristics.

Case	Scope	Firm size	Number of interviews	Respondents
NETs.werk , Hörsching Austria	C&C distribution of local (and organic) food products	Small	3	Farmer (1), logistics service provider (2,3)
Marktschwärmer , Germany	C&C distribution of local food products	Small (Start-up)	2	Project manager (4), consultant (5)
Lokaso , Siegen Germany	Online department stores for local retailers	Small	2	CEO (6), operating service provider (7)
Lokavendo , Velbert Germany	Online department stores for local retailers	Small (Start-up)	1	CEO (8)
Flotte Karotte , Bochum Germany	Home delivery of local (and organic) food products	Small	3	CEO (9), partnered food associations (10,11)
Hoflieferant Marquardt , Hamburg Germany	Home delivery of local (and organic) food products	Small	1	CEO (12)

Coding and data analysis: Due to the complexity of qualitative interviews, careful interpretations of the interview results are necessary to analyze the extent to which the findings serve the research purpose (Alvesson, 2003). The transcripts were analyzed using a qualitative content analysis approach (Mayring and Fenzl, 2014; Schreier, 2014). To ensure methodological rigor, the content analysis of the interviews was done in a structured manner by abductively using the category system proposed by Beske et al. (2014) (Mayring and Fenzl, 2014). In terms of internal validity, the transcript coding was performed by two researchers, also ensuring inter-coder reliability. Following Eisenhardt's (1989) suggestion of conducting a two-step analysis, the data within each case were analyzed deductively in a first step (see section 5.5), and cross-case patterns were investigated inductively in a second step (see section 5.6). In this respect, the level of each SSCM-related practice and dynamic

capability is rated as high (observed in at least five of cases), Medium (observed in three to four of the cases), or low (observed in one to two of the cases).

Quality procedures: Due to the complexity of qualitative interviews, careful interpretations of the interview results are necessary to analyze the extent to which the findings serve the research purpose (Alvesson, 2003). According to Yin (2003), quality procedures with regards to internal validity, construct validity, and inter-rater reliability need to be in place when analyzing qualitative data and documents to ensure methodological rigor. Regarding internal validity, external validity, the transcript coding was performed by two researchers, also ensuring inter-rater reliability. In terms of external validity, comparisons with literature were conducted, as suggested by Riege (2003). Construct validity was built by collecting data from multiple sources while reliability was achieved by exposing relevant parallels across multiple sources.

5.5. Within-case analysis

For this contribution, we first analyzed within six cases of local food production and distribution networks. The within-case analysis is the process of data reduction and data management aiming to structure, define and make sense of the available data (Miles and Huberman, 1994). In general, all case companies intend to extend the production, processing, and distribution of local food in coordinated networks. Three cases (NETs.werk, Flotte Karotte, and Hoflieferant) additionally focus exclusively on organic food products. Table 5.4 summarizes the within-analysis of the single cases following the deductive coding scheme presented in Table 5.1. Analyzing the single cases, it can be seen that the observed local food networks apply and extend SSCM practices in the food industry (Table 5.1), in particular with regard to integrating a sustainable consumption perspective (high level). When it comes to supply chain orientation practices, local food business not just stresses sustainable production practices tackling animal welfare, arable farming, health, and safety issues (c.f., Maloni and Brown, 2006) addressing certain stakeholder pressures, but also try to promote sustainable consumption patterns, e.g. by connecting local producers and consumers at the point of sale (high level). With regard to supply chain continuity practices, those local food businesses which cover the whole SFSC apply long-term contracts with their suppliers (medium level). In addition, all observed cases try to achieve synergies in value proposition of their business partners by providing an additional distribution channel (high level). In contrast to food retail and distribution in global supply chains, not just the primarily retailing (focal) companies are

capable of obtain critical interfaces with important stakeholders such as customers, but also the farmers.

Table 5.4: Within-case analysis*.

SSCM category	Concrete practices	Level	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Supply chain orientation	Promoting sustainable consumption	High	X				X	X
	Connecting local producers and consumers	High	X	X	X	X	X	X
	Initiative to support stationary retail	Low			X	X		
	Delivery service for organic farm produce	Medium	X				X	X
Supply chain continuity	Long-term agreements with suppliers willing to engage in sustainable practices	Medium	X				X	X
	Partner synergies through providing an additional distribution channel	High	X	X	X	X	X	X
SCC	Logistics integration through service provider	Medium	X		X		X	X
	Technical integration through online platform	High	X	X	X	X	X	X
SCRM	Adoption toward organic certification	Medium	X				X	X
	Organization within umbrella organization	Low					X	
Supply chain innovation	Combining business-to-business and business-to-customer logistics services	Low	X					
	Partner development and learning through trainings	Low		X				
	Including local stakeholders such as municipalities or marketing and financial experts	High	X	X	X	X	X	X

* The single case description can be found in the Appendix D.

With regard to downstream SCC through technological and logistics integration practices (medium to high level) (cf., Vachon and Klassen, 2008), the observed cases show that such forms of collaboration lead to a higher environmental performance, e.g. through more efficient distribution processes. Thus, so far mainly used collaborative practices in conventional food supply chains to increase transparency such as certification and labels lose their importance when it comes downstream SCC in SFSCs (low to medium level). However, the adoption toward an organic certification still plays an important role in the observed cases

to mitigate risks coming from arable farming (e.g., use of pesticides) and animal welfare (e.g., use of antibiotics and hormones) as well as to communicate sustainable benefits to consumers. With regard to upstream customer orientation, supply chain innovations play a major role in extending the value proposition of local food networks. Here, the three main characteristics for service innovation could be observed: technology; knowledge; and relationship networks (cf., Kandampully, 2002). Here, the central intermediary companies in the investigated cases place considerable importance on relationships and networking downstream through incorporating local stakeholders in the core business activities (high level), but also upstream the supply chain to enhance customer satisfaction and firm performance through new forms of last mile distribution.

5.6. Cross-case analysis

The cross-case analysis is concerned with finding patterns across various cases. As the main aim of this study is to compare six successful local food business models while applying a dynamic capabilities theoretical lens, key capabilities and routines were identified and compared across the single cases to gain insights with regard to the transferability and scaling of these regional business models. To do so, primarily categorization, matching patterns and data reduction was performed (Miles and Huberman, 1994; Yin, 2003). In this line, Table 5.5 summarizes the cross-case analysis for each dynamic capabilities' category and related routines. Next, the single routines forming knowledge and innovation management capabilities, reflexive control and measurement capabilities, partner development and alliance management capabilities, co-evolution capabilities, flexibility and re-conceptualization capabilities, logistics and leveraging capabilities as well as consumer orientation capabilities are discussed and summarized in a theoretical framework.

Knowledge and innovation management capabilities (sensing capabilities): Generally, knowledge and innovation management capabilities promote routines to share and leverage (logistics) resources and activities to reach a common goal (Esper et al., 2007; Defee and Fugate, 2010; Beske, 2012). The cases utilize common ICT systems to connect the partners in the network as well as to share local expertise (high level). In particular those businesses that also focus on strengthening local retailing (NETs.werk, Lokaso, and Lokavendo) additionally use a franchise system while extending business activities toward new regions and, at the same time, build local knowledge (medium level). In addition to the routines observed by Beske et al. (2014) as well as Kirct and Seifert (2015), the knowledge management routines are mainly carried out by the technological network integrators in local food businesses and

explicitly consider the specific characteristics of a certain region to achieve their sustainability goals. In this line, the SSCM practices of technological integration as well as logistics learning and innovation can be considered as important in local food businesses.

“It is a franchise system [NETs.werk], there are several [locations] in Austria, at least in Upper Austria, which trade under the name NETs.werk. [In Hörsching] there are two farmers, individual enterprises operating the NETs.werk umbrella brand.” (3)

Reflexive control and measurement capabilities (sensing capabilities): As reflexive control capabilities are concerned with transparency, information gathering, monitoring, and evaluation (Holmberg, 2000; Parmigiani et al., 2011; Beske, 2012; Piecyk and Björklund, 2015), most of the case companies foster monitoring routines through advanced ICT infrastructure (high level) while some cases also apply third-party certification routines (in particular organic standards in NETs.werk, Flotte Karotte, and Hoflieferant) (medium level). In contrast to the routines observed by Beske et al. (2014) as well as Kırçı and Seifert (2015), reflexive control routines are not necessarily carried out by the focal (retailing) company of the supply chain but also by farmers (e.g., NETs.werk) and other actors (Marktschwärmer, Flotte Karotte). Above these lines, the SSCM practices of technological integration as well as standards and certification can be seen as important.

“The ERP systems of the associated retailers are connected with Lokaso, so the inventories are automatically recorded.” (6)

Partner development and alliance management capabilities (sizing capabilities): As partner development capabilities foster routines that enable the supply chain partners to follow common sustainability goals such as supply chain collaboration and knowledge assessment (Stank et al., 2001; Carter and Rogers, 2008; Defee and Fugate, 2010; Beske, 2012). Although only the Marktschwärmer case explicitly offers partner trainings (low level), all e-food entrepreneurs try to extend the classical business of the farmers and retailers to include an additional distribution channel to achieve synergies for a higher sustainability performance both downstream and upstream in the supply chain (high level). In addition, existing partnerships are extended through alliances with local partners. In contrast to the routines observed by Beske et al. (2014) as well as Kırçı and Seifert (2015), partner development routines are not necessarily carried out only by the top management in the focal (retailing) company of the supply chain but also by farmers (organized in a cooperation or initiative, e.g., NETs.werk) and new partners in the supply chain (such as Marktschwärmer

and the umbrella organization from the Flotte Karotte case). In this regard, the SSCM practices of long-term relationships, logistics integration, and learning through trainings can be seen as highly relevant in a local food context.

“And in particular we train our hosts, because they already have a small entrepreneurial role. It’s about running a small business. Therefore, the hosts touch many areas: communication, press, marketing, sales, acquisition of producers and customers, coordination - a lot of different competences. Some hosts do not have these competences at the beginning; it is important to give them guidance.” (4)

Co-evolution capabilities (sizing capabilities): Co-evolution capabilities aim to promote the overall performance of the partner in the supply chain through enhanced (personal) communication and trusting relationships (Defee and Fugate, 2010; Pagell and Wu, 2010; Beske, 2012). Interestingly, the observed cases apply either performance optimization (high level) or enhanced personal communication (e.g., regular meetings) (low level) routines to evolve. In line with Beske et al.’s (2014) as well as Kirci and Seifert’s (2015) findings, the investigated cases mainly focus on improving the sustainability performance of the entire chain, in particular the last mile, by fostering supply chain continuity (NETs.werk, Flotte Karotte, and Hoflieferant) and collaboration practices as well as communication and follow-up routines. Accordingly, the SSCM practices of technological and logistics integration, enhanced communication, and partner development through trainings can be important in the local food context.

“First of all, we are evolving continuously, in particular with regard to the technical and organization level, we are always in motion.” (9)

Flexibility and re-conceptualization capabilities (transformation capabilities): While flexibility and re-conceptualization capabilities deal with the inclusion of new and innovative actors in the supply chain (competitors, NGOs, communities, certification bodies) (Chapman et al., 2003; Pagell and Wu, 2010; Beske, 2012), all cases extend the classical business models of the farmers and retailers toward new services by collaborating with new actors (high level). These actors might either contribute in achieving technological and/or logistics integration (NETs.werk, Lokaso, Flotte Karotte, and Hoflieferant) or tackle important stakeholder and pressure groups (NETs.werk, Lokaso, Lokavendo, Flotte Karotte, and Hoflieferant). In addition to the routines observed by Beske et al. (2014) as well as Kirci and Seifert (2015), these new actors can also take over the role of the top management/focal

company (e.g., Lokaso). Hence, the SSCM practices of technological and logistics integration, standards and certification, and pressure group and stakeholder management are crucial in local food settings.

“We offer communities a white-label solution. [...] The cities see the issues as we do: their small-scale enterprises have a problem, and they need to do something about it. Therefore, there are many, many cities that think about providing a local (online) market place. [...] And they [the cities] can do marketing under their own brand.” (8)

Logistics and leveraging capabilities (transformation capabilities): Generally, most authors still stress the logistics service providers’ contribution to a company’s competitive advantage through creating cost leadership and differentiation (e.g., Halldórsson et al., 2007). Considering the logistics service providers’ integration capabilities solely from an economic and ecological standpoint (Gligor and Holcomb, 2014), the achievement of a competitive advantage through on-time logistics services (Mentzer et al., 2004) and customer satisfaction through inventory availability (Esper et al., 2007) fall short of reaching holistic sustainability goals. With regard to the empirical findings, however, sustainability benefits can be leveraged through more professional operations resulting from logistics and technological integration, for instance through standardizing procedures while keeping personalized relationships as well as extending the value proposition toward offering more sustainable last mile alternatives in the NETs.werk case (medium level). Therefore, SSCM practices of technological and logistics integration as well as enhanced communication are coming to the fore. In this line, the empirical findings support the proposed conceptual framework by Gruchmann and Seuring (2018) with regard to the food industry.

“The focus of the logistics service provider is clearly sustainability. Therefore, they encourage the electrification of their vehicles, also because consumers who particularly buy organic and sustainable food will require this. Hence, the mode of the delivery is very relevant.” (1)

Consumer orientation capabilities: In addition to the capabilities studied by Beske et al. (2014) as well as Kurci and Seifert (2015), the observed cases provide empirical evidence that service capabilities are important for facilitating the sustainability performance of other supply chain members - in particular, consumers. In operations management, customer service capabilities are often also discussed in a logistics context. Therefore, specific dynamic capabilities might enable logistics service providers to create and deploy logistics resources to

satisfy the sustainability needs of consumers (Zhao et al., 2001; Lai, 2004; Gold et al., 2010). In local food businesses, logistics services in particular can help to facilitate the sustainability performance of the last mile (NETs.werk, Lokaso, and Lokavendo), and at the same time, increase satisfaction through personalized customer relationships (medium level). In addition, local food entrepreneurs increase the awareness of the consumer toward sustainability-related issues (high level). In this regard, SSCM practices such as personalized customer relationships (e.g., direct contact with farmers) and last mile logistics services need to be considered to facilitate a sustainable service orientation. In this line, the empirical findings support the proposed conceptual framework by Gruchmann and Seuring (2018) with regard to the food industry.

“I have voted for bridging [the gap between producers and consumers] for years, thus for decades I have connected with [farmers and] end consumers in the city.” (12)

Table 5.5: Observed dynamic capabilities and related routines.

Case company	Level	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Knowledge and innovation management capabilities (sensing capabilities)							
Local expertise acquisition	High	X	X	X	X	X	X
Common ICT infrastructure	High	X	X	X		X	X
Sharing routines (franchise)	Medium	X		X	X		
Reflexive control and measurement capabilities (sensing capabilities)							
Monitoring through ICT	High	X		X	X	X	X
Transparency (certification)	Medium	X				X	X
Partner development and alliance management capabilities (sizing capabilities)							
Partner training routines	Low		X				
Partner synergies through additional channel	High	X	X	X	X	X	X
Co-evolution capabilities (sizing capabilities)							
Performance optimization	Medium	X		X		X	X
Personal communication	Low		X				
Flexibility and re-conceptualization capabilities (transformation capabilities)							
Inclusion of new actors	High	X	X	X	X	X	X
Inclusion of new services	High	X	X	X	X	X	X

Case company	Level	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Logistics (service provider) and leveraging capabilities (transformation capabilities)							
Extended value proposition toward logistics services	Medium	X		X		X	X
Integration routines through service provider	Low	X		X			
Service orientation capabilities (transformation capabilities)							
Personalized relationship	Medium	X	X			X	X
Foster consumer awareness	High	X	X	X	X	X	X
Consumer assistance	Low		X	X			

5.7. Extended theoretical framework

The present empirical study provides insights into which SSCM practices derived from specific dynamic capabilities are important in local food businesses to facilitate CSR in the food industry. By conceptualizing the findings in the context of the food industry, the dynamic capabilities' theoretical underpinnings can be informed and validated by the empirical findings. In this line, observed SSCM practices can be assigned to single dynamic capabilities categories according to the ratings (see Table 5.6). In this respect, the empirical results answer the proposed research question of how a dynamic comprehension of the food supply and distribution chain can enable local businesses in improving their sustainability impact and, at the same time, contribute in building on dynamic capabilities theory.

Further analyzing the observed cross-case patterns, it can be seen that there are not necessarily unidirectional causal relationships between SSCM practices and related dynamic capabilities, but often at least bidirectional relationships. Moreover, there are causal relationships where SSCM practices rather enforce dynamic capabilities (e.g., partner development based on long-term contracts) and the opposite direction (e.g., technological integration through monitoring routines). In this line, the empirical results strengthen Beske's (2012), Beske et al.'s (2014), and Gruchmann and Seuring's (2018) theoretical conceptualizations of SSCM practices and dynamic capabilities being embedded in a continuous iterative process of reconfiguring the company's resource base. Moreover, it can be stated that dynamic capabilities promoting SCC and innovation practices play a prominent role in decentralized local food production and distribution networks. Accordingly, the synthesized framework is presented in Figure 5-1,

while potential pathways for promoting sustainability in the food industry by scaling local food networks.

Table 5.6: Synthesized results.

Overlapping routines	Supply chain orientation	Supply chain continuity	SCC	SCRM	Supply chain innovation
Knowledge, innovation management capabilities			Technological integration through common ICT infrastructure		(Logistics) learning through local expertise acquisition
Reflexive control, measurement capabilities			Technological integration through ICT monitoring	Transparency through standards and certification	
Partner development, alliance management capabilities		Partner learning based on long-term contracts	Partner synergies through logistics integration		
Co-evolution capabilities			Performance optimization through technological and logistics integration		Enhanced, personal communication through partner trainings
Flexibility, re-conceptualization capabilities			Technological and logistics integration of new actors		New services through including local stakeholders
Logistics, leveraging capabilities	Extended value propositions through technological and logistics integration		Technological and logistics integration through service provider		
Consumer orientation capabilities	Personalized relationships through connecting local producers and consumers				Increased consumer awareness through including local stakeholders

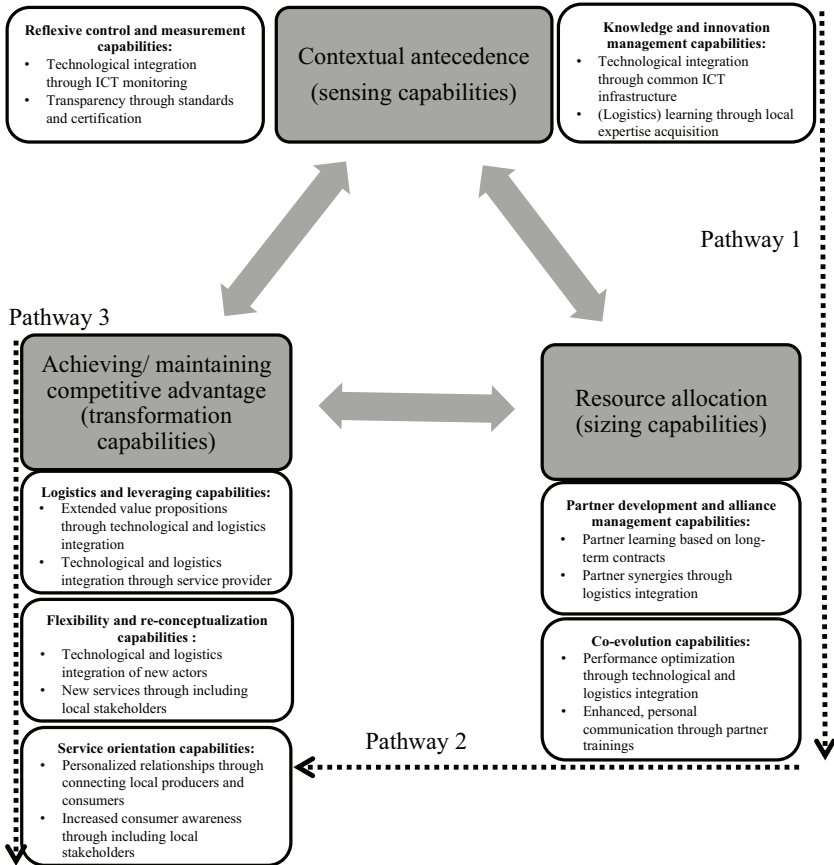


Figure 5-1: Extended theoretical framework of SSCM dynamic capabilities in the food industry.

5.8. Discussion

Enhancing the discussion on the sustainability performance of conventional food supply chains in comparison to local food supply chains and SFSCs (cf., Brunori et al., 2016), the present study provides insights into the necessary dynamic SSCM capabilities to tap further sustainability potentials in the last mile distribution of food products. In this context, recent studies have shown that it is generally more environmentally sustainable to pick up conventionally produced food by foot than driving by car to the organic food shop (Clark and Tilman, 2017) pointing toward efficient logistics in the last mile. However, most of these studies fall short in taking a holistic view on the last mile, in particular in assessing additional

logistics distribution services in e-food businesses as well as the soci(et)al (sustainability) dimension of businesses (Zeng et al., 2017). The empirical findings indicate that dynamic capabilities are essential to enforce necessary SCC routines such as technological and logistics integration to promote more sustainable and innovative logistics distribution services in the last mile, also with regard to social sustainability. Analyzing the findings, dynamic capabilities can further promote economical, ecological and social sustainability in local food networks on three main levels of their businesses, in particular on the very core of the business model, its downstream SCC as well as its upstream customer orientation. Accordingly, more concrete pathways for sustainability can be deduced with regard to these three main levels.

Pathway 1: With regard to downstream SCC and development, the present study could show that knowledge and innovation management capabilities supported by reflexive control routines do not just lead to a higher transparency, but also contributes to a more sustainable resource allocation. For instance, the sensing capabilities of the supply chain partners were enabled through deploying a common ICT technology in most of the cases. This enabled further effects on social sustainability through integrative partner development and co-evolution between production entities and (partly new) retailing structures.

Pathway 2: With regard to upstream customer orientation, service innovation plays also a major role in extending the value proposition of local food networks. Hence, the central intermediary companies in the investigated cases do not just place considerable importance on relationships and networking downstream, but also upstream the supply chain to enhance customer satisfaction and communication. In this line, the investigated local food businesses show that the integration responsibility lies not necessarily with the focal retailer, as is common in conventional food supply chains, but with different actors (e.g., farmers) or new initiatives in the chain.

Pathway 3: Tackling the core of the observed sustainable business models, green process performance improvements could be achieved through transforming structures and relationships, in particular in the last mile, as well as stakeholder-tailored business strategies to decrease sustainability-related risks and to build new capabilities. Thus, social benefits could be achieved through incorporating (local) stakeholders in operational business activities, e.g. (logistics) service providers in the NETs.werk and LOKASO case. Accordingly, the creation of logistically and technologically integrated networks also further transformed the business paradigms of local food networks by numerous green and social

benefits such as the achievement of greater process efficiency; increased customer satisfaction; better strategic planning; and more flexibility and adaptation to market changes.

Nevertheless, none of the investigated local food business cases reaches the level of conventionally and internationally acting benchmarks in the food industry so far since most of the local food production networks still operate in a niche. Considering the proposed pathways, however, the present study does show that dynamic SSCM capabilities promoting innovative supply chain services represent a driving factor of these businesses. Thus, innovative supply chain services and the related (logistics) infrastructure of network integrators could demonstrate their relevance for scaling up (sustainable) businesses while contributing to a greener and more socially responsible food industry. Effects on environmentally sustainable benefits, such as CO₂ emission reduction and higher resource efficiency, are enabled by the stronger network integration and coordination of small-scale farms or local retailers. But, the study has also shown that there seem to be limits to the scalability of the mentioned effects since the number of producers and retailers in a region is limited and represents a hurdle for expansion accordingly. Therefore, the present study rather points toward expansion potentials in the multiplication on the producer and distributor levels into other regions as well as addressing inefficiencies in their logistics.

5.9. Conclusion and outlook

Altogether, customers' growing demand for more sustainable food products has led to an increased importance of local food production and distribution networks (Bosona and Gebresenbet, 2011; Beske et al., 2014). Although these networks of small farmers include sustainability aspects in their core business, particularly with regard to resource usage, environmental friendliness, and social standard assurance, it can be argued that missing professionalism with regard to technological, logistics and financial integration prevent them from achieving a higher sustainability performance (Gruchmann et al., 2018). Moreover, an insufficient integration and consolidation of decentralized production entities limits growth such that these business cases remain often in a niche (Willer and Lernoud, 2013). Consequently, this missing broad effect hinders necessary investments in infrastructure and more innovative distribution channels, limiting competitiveness against conventional food supply chains.

Concluding the present study, it can be centrally argued that dynamic capabilities in general as well as technological and logistics integration as well as innovation practices in particular have high relevance for small-scale local and organic food business networks to reach up-

scaling effects in regional markets. It was demonstrated that SSCM-related dynamic capabilities and routines can effectively contribute to a sustainability value added supply chain for the main interacting supply chain partners: local food producers and distributors, network integrators, and (responsible) consumers in a regional market. Hence, necessary dynamic capabilities can help local food networks to achieve a higher sustainability performance by leveraging the companies' embedded sustainability potentials in their core business and support a sufficient coordination which facilitates necessary investments in infrastructure and more innovative distribution channels, increasing the competitiveness against conventional food supply chains. In addition, the empirical findings provide evidence that the incorporation of the people dimension into an SSCM can unlock further sustainability potentials (cf., Wieland et al., 2016), in particular by taking a consumer-choice-centered perspective through service orientation dynamic capabilities accompanied by enhanced communication among the single supply chain actors. In this line, the present study contributes to Wieland et al.'s (2016) research agenda.

Despite providing valuable insights, an empirical and qualitative study is not without limitations. While aiming to complete the picture of how local food businesses can extend sustainability in the food industry, it was not possible to consider extensively all parts of the supply chain within the interviews. Furthermore, the interviews might have been biased by personal expectations and desires. Also, the extent of the results of the explorative study is limited by the fact that no truly sustainable supply chain currently exists (Pagell and Wu, 2009). Another limitation, generally perceived in qualitative research, lies in the limited number of interviews, allowing no generalization of the findings. Accordingly, future research needs to test the results using survey research.

5.10. Acknowledgements

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The author designed the study by himself. Tim Gruchmann and Simon Hauser conducted the analysis of the empirical findings. Further, Tim Gruchmann contributed fully to theory building as well as to the writing of all sections of the article.

6. Local and sustainable food businesses: assessing the role of supply chain coordination

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6.1. Abstract

In food supply chains, products and services are continuously expanded and adapted according to changing customer demands. As concerns for environmental and social issues within societies grow, sustainable business practices in supply chains are coming to the fore. Altogether customers’ growing demand for local food has led to an increased importance of local food production and distribution networks. In this context, the present study analyzes sustainability related practices in two local food production and distribution networks in Germany and Austria applying a multiple-case study approach in order to understand how business models can facilitate sustainable practices within the food industry. By comparing the selected cases, insights were derived with regard to sustainable business model elements in local food networks, in particular promoting logistics and financial coordination in the supply chain. By doing so, the article builds on academic literature by identifying and describing key elements of sustainable business models in local food networks. At the same time, it is argued that sustainable business models have to be accepted by consumers such that sustainability advantages aspects need to be stressed through external communication. In addition, managerial implications with regard to transferability and scaling of regional food businesses are provided accordingly.

6.2. Introduction

Local food, understood as food production geographically close to the consumer, is a growing trend (Feldmann and Hamm, 2015). Here, specific methods of food production such as the absence of chemical fertilizers or pesticides, fair farm labor, and animal welfare practices as well as specific supply chain attributes such as simplified and direct distribution, clear information about the products’ origin via labeling, and closer personal communication along the supply chain often characterize local food businesses. The reasons for this trend, taking place in mostly Western societies, are manifold. According to Vermeir and Verbeke (2006),

factors such as food scandals in regard to the globalization of food supply chains as well as dedication to support the local economy can be identified as reasons for the increasing number of concerned consumers who prefer to obtain their food from local sources. In addition, consumers associate local food products with freshness, higher quality, and healthiness (Khan and Prior, 2010). Consequently, more sustainable local alternatives, such as community-supported agriculture and farmers' markets have become increasingly popular in many Western countries (Feldmann and Hamm, 2015; Sirieix et al., 2013).

Following this change of consumers' perception, many managers of conventional, corporate agri-businesses have invested in the niche of organic food and benefit from the change in consumer needs and expectations. In this line, many conventional food business models were adapted by including a more sustainable value proposition. However, Willer and Lernoud (2013) argue that it is not possible to meet this increase in demand by means of national supply alone. Hence, organic food became a globalized product. Following this observation, two different options have been mostly discussed in the literature as a direct response to the described market shifts, recognizing the need to secure customer's demand for sustainable products and the underlying sustainable business model archetypes (Bocken et al., 2014): either focusing on the question to which extent organic demand can potentially be met by local/regional food production or discussing a possible conversion of conventional food production into organic ways of production.

So far, it can be seen that an insufficient integration and coordination of decentralized local food production networks still limits growth such that local food businesses often remain in a niche (Willer and Lernoud, 2013). Accordingly, the following research questions guided our study: How can SCC contribute to transferability and scaling of local food businesses and their sustainability efforts? How is this reflected in their business model?

Therefore, we aim to shed light on tapping further increases in sustainability-oriented business practices in local food business models and inquire how network coordination approaches can contribute to the success of regional companies and their sustainability efforts. Specifically, we are interested which business model elements in local food networks are promising to promote sustainability in the food industry. For the analysis, we focus on two regional food networks in Austria and Germany, the connections between the network members and the networks' central intermediary company. Both networks aim at the promotion of sustainable food production, regional distribution and, to the furthest extent possible, a closing of regional value chains. The analysis of both cases follows the conceptualization of business models

proposed by Osterwalder and Pigneur (2009), which we extend with regard to sustainability-aspects according to Boons and Lüdeke-Freund's (2013) and Upward and Jones (2016). Based on this analysis, we develop an extended business model conceptualization for local and sustainable food networks.

The structure of the study is as follows: Section 6.3 gives an overview of relevant literature with regard to (sustainable) business models. The research design of this contribution is presented in section 6.4. Next, section 6.5 lays out the main results for both cases and provides a combined analysis of both cases that lead to a new sustainable business model conceptualization for local food networks. The last sections 6.6 and 6.7 discuss the findings against the literature on SCC and conclude them accordingly.

6.3. Literature background

Business models have been extensively discussed and defined in the literature (Zott et al., 2011). Linked to strategy and innovation literature, the business model approach describes the ways in which a business creates and delivers value to their customers through designing the value creation, delivery, and capture mechanisms (Osterwalder and Pigneur, 2002, 2009). These elements of business model design generally include features embedded in the product/service; determination of the benefit to the customer when consuming/ using the product/service; identification of targeted market segments; confirmation of the revenue streams and design of the mechanisms to capture value (Teece, 2010). Focusing on conventional business models, four main business areas were identified while creating business models: in particular the value proposition, for which customers are willing to pay; the relationships with the customers; the infrastructure and network of the partners; as well as financial aspects (cost and revenue structures) (Ballon, 2007; Boons and Lüdeke-Freund, 2013).

The business model perspective can be linked to the context of sustainability and has been of growing interest to scholars (Stubbs and Cocklin, 2008) in recent years, since it highlights the logic of value creation and allows for new/ rediscovered governance forms such as cooperatives, public private partnerships or social businesses (Schaltegger et al., 2016). Accordingly, Schaltegger et al. (2016: 6) define the role of a business model for sustainability as: *“it helps describing, analyzing, managing, and communicating (i) a company's sustainable value proposition to its customers and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social and economic capital beyond its organizational boundaries”*. Hence, the existing business model definitions have been aligned with the TBL approach

(Carter and Rogers, 2008; Seuring and Müller, 2008) to not only foster economic, but also social, and environmental value creation. Extending the conventional business frameworks in accordance with the TBL, Boons and Lüdeke-Freund (2013) define the key parameters in sustainable business models as (i) value proposition of products and services should focus on ecological, social and economic value; (ii) overall infrastructure and logistics of the business guided by the principles of sustainable supply chain management; (iii) interface with customers enabling close relationships between customers and other stakeholders to improve co-responsibility in production and consumption; and (iv) equal distribution of economic costs and benefits among all actors involved. Broadening the systems' scope further, Neumeyer and Santos (2017) see business models as part of the whole entrepreneurial ecosystem, particularly dependent on the stakeholder's social network. Over the last few years, authors have started to consolidate the literature on sustainable business models by introducing sustainable business model ontologies and archetypes (e.g., Bocken et al., 2014; Upward and Jones, 2016). Here, Bocken et al. (2014) distinguish between nine different sustainable business model archetypes, particularly promoting maximization of material and energy efficiency, creation of value from waste, substitution with renewable and natural processes, delivery of functionality rather than ownership, adoption of a stewardship role, encouraging sufficiency, repurposing products and services for society and environment, as well as the development of scale up solutions. However, Lüdeke-Freund et al. (2016) see research in the field of sustainable business models as still rather limited, in particular with regard to empirical analyses. Moreover, industry and branch specific sustainable businesses need to be analyzed to access business model elements and archetypes which support the management of voluntary social and environmental activities in certain environments. Taking into account the different paradigms to include sustainability in a companies' business model, the main contribution of this study is to compare two successful local food business networks and analyze how sustainability aspects are reflected within single business model elements. Within the few frameworks given in the literature, the extended sustainable business conception developed by Boons and Lüdeke-Freund (2013) is adapted and used as the deductive scheme for the analysis. In this line, Table 6.1 describes the related sustainable business model elements while Figure 6-1 depicts the adapted framework.

Table 6.1: Key elements in sustainable business models.

Value proposition	The value proposition of a company is decisive for a customer's buying decision. Here, products and services form a bundle covering the needs of a specific customer segment (Osterwalder and Pigneur, 2009). According to Schaltegger et al. (2016), the value proposition has to create, deliver, and capture both environmental and social as well as economic value by offering products and services. Therefore, a sustainable value proposition must identify trade-offs between product and service performance as well as social and environmental effects (Boons and Lüdeke-Freund, 2013). So far, a reduced resource consumption and potentially increased ecosystem services are the core of sustainable business models to reduce the environmental footprint (Stubbs and Cocklin, 2008). Further key activities focus on the access to markets, the perpetuation of customer relationships and achieving positive revenue streams (Osterwalder and Pigneur, 2009).
Supply Chain	The company or its network partners need to have access to key resources as a prerequisite for value creation. These key resources can be generally categorized as physical resources, financial resources, human resources, and intangible assets (Osterwalder and Pigneur, 2009). This perspective is relevant as sustainable innovations may require changed terms of competition and collaboration among the actors engaged in the supply chain (Boons and Lüdeke-Freund, 2013). In this line, the importance of incorporating a stakeholder approach is increasingly understood in sustainable supply chains and sustainable business models (Seuring and Müller, 2008; Lüdeke-Freund et al., 2016). For instance, the stakeholder approach requires that a company engages suppliers in its sustainable supply chain management to tackle environmental and social issues (Boons and Lüdeke-Freund, 2013; Seuring and Müller, 2008). In this line, the last mile distribution can be considered to be one of the most complex units of a supply chain (Schliwa et al., 2015). This complexity is generated by tight delivery time windows and a growing number of small orders which have to be delivered to rural areas (Punakivi et al., 2001).
Customer Interface	Company relationships can motivate customers and other company stakeholders to take responsibility for their consumption behavior (Boons and Lüdeke-Freund, 2013). Accordingly, the customer interface enables close relationships with customers and other stakeholders to be able to take responsibility for the production and consumption systems (Schaltegger et al., 2016). In order to approach the customer interface individually, customer groups are segmented by differentiating between different customer characteristics. Business models can either target a specific customer segment or produce for mass markets (Boons and Lüdeke-Freund, 2013). Moreover, a company operating on multi-sided platforms (multi-sided markets) serves different customer segments independently, if applicable (Osterwalder and Pigneur, 2009). Hence, the customer interface might help to develop approaches to advance business models into platforms for multi-stakeholder integration and value creation (Lüdeke-Freund et al., 2016).
Financial Model	Value creation is linked to the use of resources and, consequently, linked to costs. In this context, sustainable business models foster the shift away from purely monetary-oriented paradigms of value creation (Lüdeke-Freund et al., 2016). Therefore, the comparisons of cost structures between similar business cases are essential to gain insights into how a business creates and delivers value to their customers (Osterwalder and Pigneur, 2009). Accordingly, the cost and revenue structure reflects the distribution of economic costs and benefits among actors in the business model (Maas and Boons, 2010). According to Stubbs and Cocklin (2008), shareholders often have to accept lower returns on investment in the short-term so that the company can directly invest profits into structural changes to support social and environmental improvements, which in turn can result in reduced costs. Thus, sustainable business models treat nature as a stakeholder, too, and promote environmental stewardship (Stubbs and Cocklin, 2008). In this line, renewable resources should be used instead of non-renewable resources (natural capital). Here, technological innovations should minimize and eventually eliminate non-recyclable waste and pollution. Related terms such as clean technologies are also used for innovations that have a superior environmental performance (Boons and Lüdeke-Freund, 2013).

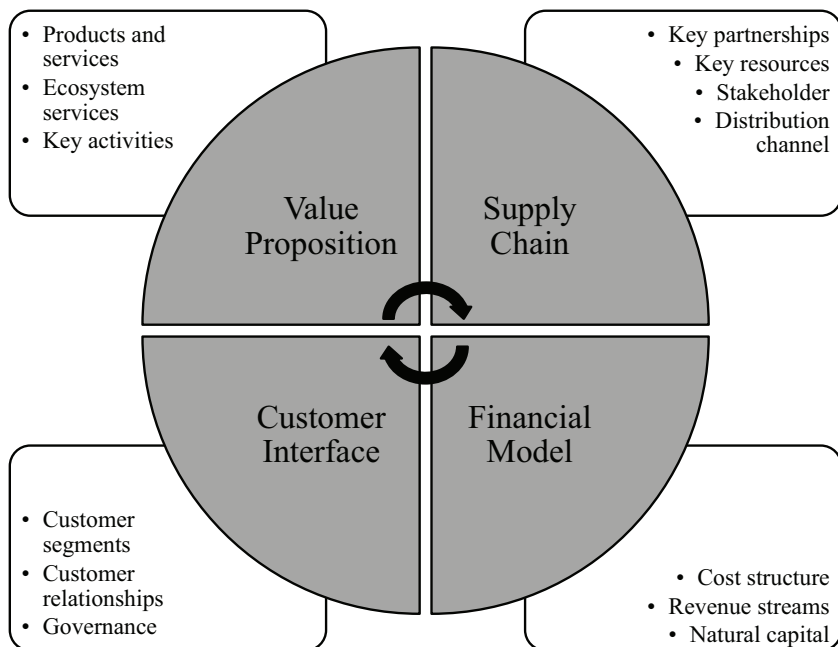


Figure 6-1: Key parameters in sustainable business models.

6.4. Research design

Considering the aim of the study, particularly the identification of promising business model elements to further promote sustainability in food business models, a case study approach was used as the boundaries of the phenomenon, its full scope and context were not entirely described beforehand (Yin, 2003). Case studies are also well suited for complex structures as they allow intense interaction with the informant and draw on multiple sources of information leading to robust data (Eisenhardt and Graebner, 2007). Although the sustainability potential of local food supply networks is evident in the literature (Bosona and Gebresenbet, 2011), how to implement and develop sustainable practices in such networks is not clear. Hence, a combined case study and business model approach is used to analyze local food production and distribution networks in Germany and Austria.

Case selection: In accordance with the scope of the study, two companies from the food sector, which act as a hub in their respective network, were selected. Both networks focus their operational activities on decentralized and organic food production and its local

distribution. The cases NETs.werk⁵ Hörsching and Regionalwert AG⁶ (RWAG) Freiburg were chosen as they focus on sustainability at the core of their business models. Moreover, these business cases were selected to cover different parts of the supply chain (upstream and downstream) in order to gain insights into as many aspects of sustainability as possible during the value creating process. The data collection from each case was stopped when no further significant new insights could be gained (Yin, 2003). The following Table 6.2 gives an overview of the observed business networks.

Data collection: In qualitative research, interviews are generally used as a methodology for knowledge production (Alvesson, 2003). Based on an interview topic guide (see Appendix C) developed with the help of a literature analysis, eight qualitative interviews were conducted. The interviews lasted up to 60 minutes and were tape-recorded and transcribed in their entirety. Quotations from the interviews are translated into English and used to exemplify the results in section 4; the interviewees were anonymized and labelled by using capital letters and numbers (cf., Table 6.2). In addition, secondary data was collected from publicly available reports, internal company documents, web sites, and newspaper articles.

Table 6.2: Case characteristics.

Attributes	NETs.werk Hörsching	RWAG Freiburg
Location	Linz, Region Upper-Austria, Austria	Freiburg, Germany
Start of operation	2014	2007
Scope	Production and online distribution of organic food products and groceries to support local farmers	Investment in and facilitation of companies producing, processing, and distributing organic food products
Number of companies in the network	36	25
Respondents	Farmer (F1), CEO (C1), Logistics service provider (L1, L2)	CEO (O1), three network companies (U1, U2, U3)

Coding and data analysis: The transcripts were analyzed by using a qualitative content analysis approach (Mayring and Fenzl, 2014; Schreier, 2014). To ensure methodological accuracy, the content analysis of the interviews was carried out in a structured manner by

⁵ “NETs.werk” can be translated as “network”.

⁶ “Regionalwert AG” can be translated as “regional value public limited company”.

deductively using the business model canvas system adapted from Osterwalder and Pigneur (2009), Boons and Lüdeke-Freund (2013), and Upward and Jones (2016) (Mayring and Fenzl, 2014) (see Figure 6-1). Thus, the structural dimensions of cost structure, customer relationships, customer segments, distribution channels, ecosystem services, governance, key activities, key partnerships, key resources, natural capital, stakeholder, revenue streams and value proposition were chosen to code the interview transcripts. The results of the deductive analysis can be found in the next sections 6.5.1 and 6.5.2. In a second step, the results of the coding were analyzed inductively with a comparative process. Following Mayring and Fenzl (2014), the steps of clustering themes, determining the level of abstraction, and iteratively building new analytic categories were executed. The results of the inductive, comparative analysis can be found in section 6.5.3.

Quality procedures: Due to the complexity of qualitative interviews, careful interpretations of the interview results are necessary to analyze the extent to which the findings serve the research purpose (Alvesson, 2003). According to Yin (2003), quality procedures with regards to internal validity, external validity, construct validity, and inter-rater reliability need to be in place when analyzing qualitative data and documents to ensure methodological rigor. In terms of internal validity, the transcript coding was performed by two researchers, also ensuring inter-coder-reliability. In terms of external validity, comparisons with literature were conducted, as suggested by Riege (2003). To further strengthen the external validity, multiple expert workshops were carried out to discuss the results with other researchers. Construct validity was built by collecting data from multiple sources while reliability was achieved by exposing relevant parallels across multiple sources.

6.5. Case analysis

For this contribution, we carried out an in-depth analysis of two cases of food production and distribution networks in Austria and Germany. All network companies intend to extend the production, processing, and distribution of local food in a coordinated manner. In addition, the cases focus exclusively on organic food products. In the following, the networks and the intermediary enterprises that govern the networks are described and analyzed. The analysis follows the deductive coding structure as presented in Figure 6-1.

6.5.1. NETs.werk Hörsching

The food cooperation NETs.werk is an association with the mission to facilitate sustainable consumption patterns (<http://hoersching.netzwerk.at>). To do so, NETs.werk runs an e-food online platform to distribute locally produced organic food from small farmers in the Linz

region in Austria. So far, customers order once a week via an online shop and pick up their order at one of the NETs.werk branch offices by themselves.⁷ To drive the environmental performance in the last mile distribution, NETs.werk started collaborating with a local logistics service provider to offer a direct delivery service operated by electric vehicles. In this line, the intention is to acquire new customers, increase the service quality and decrease CO₂ emissions by avoiding single consumers' car rides and bundling the goods flow. Accordingly, NETs.werk governs the supply network through logistics and technological coordination and achieves positive environmental effects by integrating cleaner technologies. This partnership can be considered as logistics coordination of the network.

“Right now, [...] the products are transported [...] by the farmers themselves. Then the products are commissioned and put into boxes. Afterwards every Thursday, Friday and Saturday 80 to 100 customers drive to the NETs.werk branch offices with their own car to pick up their boxes - worst case. Hence, the sustainability of the product [...] is gone.” (F1)

Besides the organic products themselves, the value proposition accordingly includes a local and sustainable delivery service allowing an expansion of the consumers' catchment area. Key activities to run the NETs.werk distribution network are the processing of the customer orders including payments, the temperature-controlled transportation of the goods as well as the management of the returned packaging.

“The focus of the logistics service provider is clearly sustainability. Therefore, they encourage the electrification of their vehicles, also because consumers who particularly buy organic and sustainable food will require this. Hence, the mode of the delivery is very relevant.” (C1)

Customer segments are people who work full-time and have limited time for grocery shopping (e.g., young and employed parents) as this segment needs to plan their shopping activities and is often sensitive towards health and sustainability related issues. Future customer segments are expected in business-to-business supply of restaurants, kindergartens, and nursing homes. Although the customer interaction while ordering is automated, NETs.werk builds personalized customer relationships via the drivers of the electric vans to offer additional customer services such as claim and retour management. To avoid anonymity and increase the transparency of the local farmers' production network, farm festivals are regularly organized, and a rating system will be installed on the online platform.

⁷ In this line, NETs.werk follows a C&C approach.

“This is also a possibility to win new customers. Therefore, we deliver on demand [...] a low-carbon, organic product.” (F1)

“You need to communicate the benefits of fewer CO₂ emissions which result from the bundled delivery to the customer.” (C1)

Key partnerships of NETs.werk are the local farmers and Schachinger Logistik, a local logistics service provider who can combine the afternoon business-to-customer food deliveries with a business-to-business parcel delivery service in the morning. Hence, the logistics service provider is able to reduce operational costs per delivery by increasing the usage of the electric vans. In general, important key resources in the distribution network are the human resources, existing logistics infrastructure (such as trucks and warehouses) as well as NETs.werk’s ICT.

“NETs.werk wants to cooperate for transportation with Schachinger [...] while commissioning and warehousing stays with the farmers.” (L2)

“Schachinger Logistik is part of the DPD network in Austria. [...] Therefore, more or less every B2B [business-to-business] parcel delivered in Upper and Lower Austria is done by Schachinger. [...] In the end, it is about conducting B2B deliveries in the morning and [...] B2C [business-to-customer] deliveries in the afternoon because the probability that the customer is at home is higher.” (L1)

To operate this infrastructure, the main variable cost related to the energy consumption of the electric vehicle, driving and picking personnel and running the online platform while fixed costs are mainly related to investments into logistics and ICT infrastructure. According to the financial model, revenue streams are generated by charging the customers for a part of the delivery costs and co-financing the delivery service from the product margin.

“Delivery costs of 1.90€ are easily acceptable for the consumer to pay. 3€ is much harder. When you look at yourself, you don’t want to pay 3€ for dispatch and delivery [...] but 1.90€, particularly when you order products for 40 or 50€, that’s okay.” (L2)

To summarize the NETs.werk case, Table 6.4 depicts the single business model elements.

Table 6.4: Sustainable business model elements NETs.werk.

Category	Constructs	Concrete observation
Value proposition	Products and services	Low-carbon delivery service, certified organic production
	Ecosystem services	Organic food production
	Key activities	Low-carbon delivery service, certified organic production
Supply chain	Key partnerships	Logistics service provider, integration with other services of him
	Key resources	Logistics infrastructure and ICT
	Stakeholder	Integrated stakeholder approach intended to extend further
	Distribution channel	Online distribution (parcel delivery, Click & Collect)
Customer interface	Customer segments	People who work full-time and have limited time for grocery shopping, intention to extend further
	Customer relationships	Automated while ordering, personalized while delivering
	Governance	Logistical and technological integration
Financial model	Cost structure	Energy consumption electric vehicles, driving and picking personnel, online platform, investments into logistics and ICT infrastructure
	Revenue streams	Delivery costs are partially charged, partially financed by the product margin
	Natural capital	Delivery service operated by electric vehicles

6.5.2. Regionalwert AG Freiburg

RWAG was founded in 2006 and began its operation in 2007. By following the concept of a public limited company - without being listed at the stock exchange and mainly relying on local and regional citizens to buy shares of the network - RWAG strives to show the societal and ecological importance of locally produced and distributed certified organic food products (<https://www.regionalwert-ag.de>). It governs 25 companies along the supply chain financially or with organizational advice and strategically connects these companies in a regional network. Therefore, RWAG's main scope is "the participation (and share of capital), the support and foundation of companies in the field of ecological farming, forestry and wine agriculture. Also, the retail and wholesale trade sector in these fields and the food sector in the region of Freiburg should be enhanced with ecological goods" (Hiß, 2014: 41).

RWAG can be considered an intermediary between the network companies which are either partly owned by RWAG or licensed partners without financial involvement. For the co-owned companies, RWAG is becoming more than an intermediary but rather a strategic parent organization. This partnership can be considered as financial coordination of the network. In sum, RWAG's value proposition:

- promotes certified organic food production and consumption and offers social and ecological returns to its mainly local stockholders and the region,
- offers potential financial return to its stockholders with the premise that all social and ecological goals are achieved,
- promotes the exchange between different companies along the value chain of certified organic food and their ability to work together,
- supports entrepreneurs in planning and financing their businesses in the certified organic food sector (production, processing, wholesale and retail) as land and equipment are capital-intensive,
- and creates awareness for the different benefits of certified organic food production besides monetary gains, such as ecological and social criteria.

"I hope to be able to have a 'perfect' balance sheet in five years. A balance sheet with all the information one needs – whether social, ecological, regional-economical, or financial. [...] We hope to have new tools in accounting as well, in order to be able to track those improvements." (O1)

While the network companies and licensed partners are also recipients of RWAG's value proposition, RWAG's customer segments are very heterogeneous, mostly due to the network organization. We understand the RWAG head-company as a hub for innovation, being the central actor in the network. Thus, its customers are primarily the particular network member companies that use the RWAG's services. Accordingly, the RWAG itself only holds shares of the network partners but does not engage with final customers on its own. End customer relationships are only indirectly addressed through the network companies: The network's products are distributed to consumers in the region either via supermarkets stocking RWAG products, via restaurants run by the RWAG, via delivery services or on farmer's markets. Interestingly, none of the network members relies completely on the RWAG network

members, but especially the businesses on the first steps of the value chain – the ones in the agricultural sector – argue that RWAG is good to reach out to business customers.

“These customers are our most important customers. The “Frischkiste”⁸ is our most important customer. Since last year, even Naturkost Rinklin [a wholesaler] is part of RWAG. This was the last really important customer that didn’t use to be a part of RWAG.” (U1)

RWAG has developed a unique financial model adapted to their business model. RWAG holds the majority of every network member that is co-owned by RWAG. Accordingly, these companies do not bear the entire economical risk themselves and can seek practical and additional financial help from RWAG. RWAG’s financial capital stems from registered shares with restricted transferability that are mainly sold to private people in the region⁹. This makes RWAG an organization carried by mostly private actors and requires a high degree of transparency that is reflected in how figures are made public.

“We have grown a lot in the region in the last couple of years. The retailers, for example a supermarket [...], they have tripled their economic turnover in five years, compared to their foundation. This is just one example. [...] Even if you look at all network partners in one, the income is increasing, I think it is 17 per cent; some single ones are increasing their turnovers by 30 to 40 per cent. And these are important effects.” (O1)

Concerning the supply chain, the RWAG is the central strategic actor in the network, while others – like the Regionalwerk UG – are the key to network cooperation by organizing workshops and spaces for network members to meet and get in touch. Its key partners in the sense of human and physical resources are mainly the businesses within the network. All companies along the supply chain are important, even though some might be more central to the network than others (e.g., the producing partners; U1). A key activity for the network is, in addition, the administration of RWAG itself. They assist the network companies not only with capital but support the businesses especially in strategic questions and help to create future visions for them. In terms of financial resources, the RWAG’s shareholders are crucial. They are essential for the business model to work because their investments are securing the RWAG’s financial opportunities.

⁸ The “Frischkiste” is a delivery service of locally and organically grown goods. Their products are distributed to the door of each customer.

⁹ The price for one share has differed between the last rounds of increase in capital. In 2016, one share was sold for 500 €.

To summarize the RWAG case, it is important to keep in mind that every partner, member or customer might have changing roles for the value proposition through the different key activities mentioned, as well as for other categories mentioned in the business model. This role depends on the perspective of the actor and on the activity in question and enforces the understanding of a network of companies working together, with the RWAG itself being the network's hub.

To summarize the RWAG case, Table 6-5 depicts the single business model elements.

Table 6.5: Sustainable business model elements RWAG.

Category	Constructs	Concrete observation
Value proposition	Products and services	Financial and organizational support for certified organic food production, processing and distribution
	Ecosystem services	Ecological farming, forestry and wine agriculture
	Key activities	Organizing network and stakeholder dialogue, assisting in development of businesses strategies
Supply chain	Key partnerships	Network members
	Key resources	Relational resources, financial resources through the shareholders
	Stakeholder	Integrated stakeholder approach for stockholders, key partners, and end customers
	Distribution channel	Online and stationary retail, restaurants (network members)
Customer interface	Customer segments	Network companies (customers because they use services and funds, only indirect engagement with end consumer)
	Customer relationships	Private and network meetings with member companies
	Governance	Financial integration to govern most parts of the supply chain
Financial model	Cost structure	Shift from a company-specific perspective to a more regional and holistic value chain and network-perspective: RWAG holds majority of every network member, sharing the economic risk across the network
	Revenue streams	
	Natural capital	Measurable societal and ecological benefits

6.5.3. Analyzing driving factors for sustainability

As the main aim of this study is to compare successful business models while using the sustainable business model framework adapted from Boons and Lüdeke-Freund (2013) (see Figure 6-1), driving factors and specific characteristics were identified which promote

sustainability, transferability and scaling of these regional business models (see Figure 6-2). Analyzing both cases, the use of local resources has the potential to extend a conventional to a more sustainable value proposition, particularly in the food sector (Kneafsey, 2010; Collits and Rowe, 2015). In the case context, the investigated businesses include additional logistics and financial services in their value proposition. Accordingly, intermediary organizations within the networks can coordinate sustainable production and consumption patterns through these services.

With regard to the empirical findings, sustainability benefits can be leveraged through more professional operations resulting from logistics, technological and financial integration, for instance through standardizing procedures while keeping personalized relationships as well as extending the value proposition toward offering more sustainable last mile alternatives in the NETs.werk case. Here, more efficient operations in line with a lower ecological footprint due to regionalization result from shorter distanced and generally less complex supply networks, potentially leading to a lower energy consumption, fewer CO₂ emissions, or a reduced water footprint amongst other positive benefits for sustainability (Hudson, 2007).

Another argument often used for regionalization is the support of local or regional value chains leading to positive impulses for regional economic development (Wiskerke, 2009) and strengthening the regional economy through stronger intraregional communication within the networks (Paloviita, 2010). In terms of financial coordination within local food supply chains, the cases provide evidence that products and services can become more competitive compared to conventional and globalized food supply chains, in particular through sharing economic risks and co-evolving of the supply chain partners. For example, the RWAG case fosters cooperation and exchange among the network members to build and keep (social) capital within the region.

The cases also have shown that there seem to be limits to the scalability of the mentioned effects since the number of producers and retailers in a certain region is limited and thus represents a hurdle for expansion. Within the observed cases, potentials for sustainability deriving from financial and technological coordination of local food production and distribution networks still show room for further (green) expansion, for instance by increasing the number of member companies and citizens in the RWAG case. However, the business cases indicate that logistics and financial supply chain services generally represent a driving factor for leveraging sustainability potentials in the investigated business cases. Here, supply chain services and the related infrastructure of network integrators demonstrated their

relevance for the acquisition of new customer segments as well as to scale up (sustainable) businesses while contributing to necessary critical market shifts. Measurable effects in quantitative terms of sustainability benefits, such as CO₂ emission reduction and generally higher resource efficiency, are enabled by the stronger network integration and coordination of small scale farms and production sites. Further effects on social sustainability are enabled through integrative co-evolution between production and (partly new) retailing structures as well as stakeholder-tailored business strategies to decrease (sustainability-related) risks and to build new (knowledge-based) capabilities. Accordingly, the investigated driving factors extend current empirical knowledge about local food networks. To summarize the findings from the NETs.werk and RWAG case, Table 6.6 names the new analytic categories derived from comparing the single sustainable business model elements.

Table 6.6: Driving factors for local food networks.

Analytic category	NETs.werk Hörsching	RWAG Freiburg
Extending the value proposition towards additional services	Logistics service: Providing additional infrastructure to implement a new distribution channel.	Financial services: Supporting entrepreneurs in financing their businesses and cooperating in a local network; one of the foci is on succession of farms.
Personalization of operational processes	Providing additional customer services such as claim and return management.	Network members meet four times a year for personal exchange (also for initiation of business cooperation).
Efficient and green operations with the help of network integrators	Service provider Schachinger as network integrator: consolidating and bundling of goods flows with the help of e-vans, increased resource usage through extending an existing service; NETs.werk as network integrator: access to advanced ICT.	RWAG as network integrator: access to financial resources through RWAG (production or use of organic products as precondition).
Co-evolution with local partners	Cooperation with local logistics experts.	Cooperation and exchange mainly with partner companies.
Sharing supply chain costs and risks among network members	Charging customers for a part of delivery costs and co-financing the delivery service from the product margin.	Diversified investments into the network companies help to reduce risks; a scheme for profit redistribution among members is planned.
Scalability on local level	Limited number of local farmers limits growth on the supply side, therefore there is only the possibility of multiplying the business model in other regions.	Through regional growth, diversification, and financial investments RWAG is able to increase the number of network member companies.

Investments in infrastructure	Use of Schachinger’s existing infrastructure, higher volumes are necessary to build independent logistics infrastructure.	High investments are financed through profit sharing or new rounds of capital increase.
Acquiring new customer segments	Business-to-business customers such as restaurants, kindergartens, and nursing homes.	Through new rounds of capital increase, citizens in the region can become shareholders.

To conceptualize the findings, a sustainable business model framework is constructed informing the sustainable business conception developed by Boons and Lüdeke-Freund (2013) in the context of local food businesses. Figure 6-2 depicts the conceptual sustainable business model accordingly.

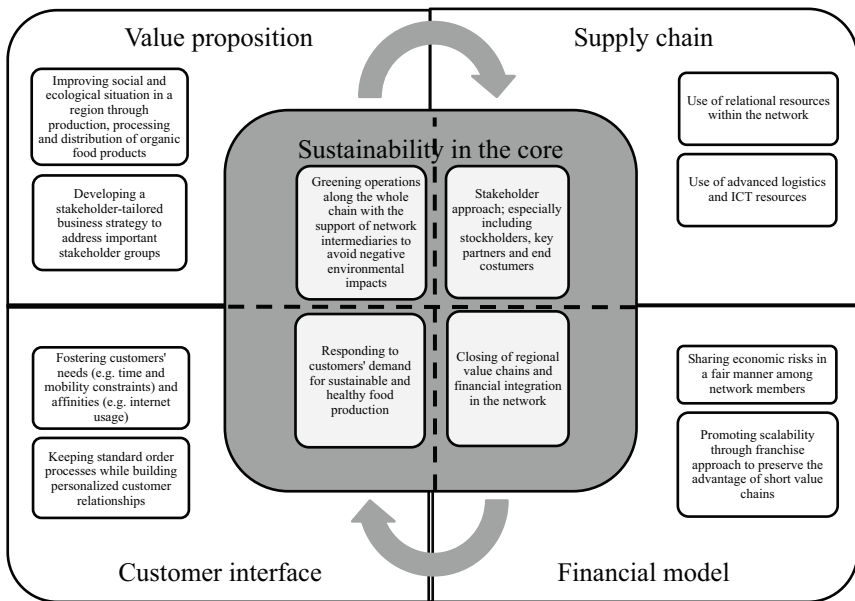


Figure 6-2: Conceptual sustainable business model framework for local food networks.

6.6. Discussion

In this study, we were able to construct an example for a possible sustainable business model by analyzing two networks with a business case closely connected to particular ideas of sustainability. Thus, we could show that a sustainable business case needs to be approached in a systematic manner. In this sense, the present study is generally embedded in the research

stream of SCC as coordination and planning between several entities of a supply chain take center stage in this research. Skjøtt-Larsen (2000) defines SCC as coordinated collaboration between several companies in a network to share opportunities and risks, using an integrated planning based on a common information system. Similarly, Simatupang and Sridharan (2002) see SCC as a collaboration of independent companies to operate more efficiently as if operations are planned and carried out separately. In this context, Kanda and Deshmukh (2008) provide an SCC classification model where specific coordination mechanisms are described. With regard to these SCC mechanisms, they distinguish between contractual coordination, coordination through information technology, coordination by information sharing, and joint decision making. So far, the related literature highlights how effectively coordinated relationships can help manage potential economic supply chain risks (e.g., Scholten and Schilder, 2015). Therefore, logistics and financial coordination practices used to have a supportive role to primary functions such as purchasing, manufacturing, and sales in conventional business models (Halldórsson and Skjøtt-Larsen, 2004). Although the definition of logistics services has been expanded in the last years to also cover warehousing and transportation activities, purchasing, distribution activities, inventory management, packaging, manufacturing, and even customer service (Bowersox and Closs, 1996), they are still often analyzed from a purely economic point of view aiming to achieve competitive advantage (e.g., McGinnis et al., 2010). However, the necessity for logistics, technological and financial coordination capabilities to facilitate sustainable practices and businesses are coming to the fore as concerns for environmental and social issues within the society and at consumer side rise. Consequently, these capabilities can be interpreted as a key determinant for sustainability in supply chains.

Including the extended sustainable business conception developed by Boons and Lüdeke-Freund (2013), drivers to further promote economical, ecological and social sustainability in local food networks were identified on three main levels of the business model, in particular on the very core of the business model, its downstream SCC as well as its upstream customer orientation. With regard to downstream SCC through technological, logistics and financial integration (cf., Vachon and Klassen, 2008), the present study could show that such forms of collaboration do not just lead to a higher environmental performance, but also contribute to the social dimension of sustainability. With regard to upstream customer orientation, service innovations play a major role in extending the value proposition of local food networks. In accordance to Kandampully (2002), three characteristics for service innovation promoted by SCC could be observed: (i) technology; (ii) knowledge; and (iii) relationship networks. The

knowledge sharing and co-evolution of the supply chain partners was enabled through deploying ICT technology in the Nets.Werk case and through setting up a separate company in the RWAG case that i.a. is responsible for the personal exchange within the network. Hence, the central intermediary companies in the investigated cases do not just place considerable importance on relationships and networking downstream, but also upstream the supply chain to enhance customer satisfaction and firm performance. Tackling the core of the observed sustainable business models, green process improvement could be achieved through redesigning structures and relationships, in the Nets.Werk case particularly in the last mile. Moreover, social benefits could be achieved through incorporating stake- and shareholders in operational business activities, and vice versa motivating farmers as well as retailers to become shareholders of the network, in particular in the RWAG case. Accordingly, the creation of logistically, technologically and financially integrated networks improves the current business paradigms of local food networks by numerous green and social benefits such as the achievement of greater process efficiency, increased customer satisfaction, better strategic planning, as well as more flexibility and adaptation to market changes.

Highlighting these possibilities and the three core characteristics for service innovation discussed above, this work also shows the importance to shed light on communicating sustainability benefits. Sustainable supply chains need to be managed well internally – and thus well-communicated – and they need to be recognized externally as well. Lüdeke-Freund (2014: 311) was able to show that reputational effects were *“the most important driver but also the most complex and hard to manage one”*. This refers mainly to external communication, forming the basis for reputation. There are numerous approaches to external communication of social and ecological engagement: Ruppert-Winkel et al. (2017) published a brochure presenting the possible ways to communicate social and ecological measures externally. Amongst them are brands, sustainability reports and the usage of social media. Their usage is vital to get recognition for the actions taken and this might also be of importance for companies moving towards sustainable business models, because also their benefits need to be recognized. The academic debate in this regard is still only beginning and offers gaps for future research.

The same is true for internal communication. Companies operating with sustainable business models - just like the two network examples discussed in this study - need to reinforce the values and norms incorporated in the business model. At the same time, the employees need to recognize the business model themselves and reinforce its authenticity. Therefore, also the

communication internally is central for sustainable business models. Also, this aspect is highly under-researched. One possibility to approach this gap would be, again, to turn to literature on CSR communication, such as Stehr and Struve (2017).

Besides the lacking focus on communication in the literature discussing business models, the present study also shows that the benefit of SCC also has limits when it comes to scaling local food business. Although a sufficient integration and coordination of decentralized production entities can promote growth, the present study sees further expansion potentials in the observed cases rather in multiplying in other regions on the producer and distributor level as well as improving efficiency in their (small scale) logistics.

6.7. Conclusion and outlook

So far, only a minority of local business cases reaches international benchmarks of the food branch, since most local food production networks still operate in a niche and often lack integrated logistics and ICT designs, and related skills to a large extent (Bosona and Gebresenbet, 2011). Hence, necessary logistics and financial capabilities can help local food networks to achieve a higher sustainability performance by leveraging the companies' embedded sustainability potentials in their core business. Moreover, a sufficient coordination facilitates necessary investments in infrastructure and more innovative distribution channels, increasing the competitiveness against conventional food supply chains.

In addition, trends in various other industries parallel to the food sector show a tendency towards decentralization and a strong need for integrated and consolidated services on the operational levels of the supply chain, particularly with respect to future sustainable economic systems and transition pathways. However, how far the role of decentralization accompanied with logistics and financial coordination can be transferred into other branches (material and chemical industry, mobility services, fashion, electronic sector, etc.) is a matter for further research. The food sector shows a high potential for especially regional patterns of production and consumption, unlike other sectors, where such potentials might be much harder to implement.

Concluding the present study, it can be argued that SCC have a high relevance for small-scale local and organic food business networks to achieve up-scaling effects in regional markets. It was demonstrated that specific sustainable business model elements can effectively contribute to a sustainable value-added chain for the main interacting supply chain partners: local food producers, processing and distributors, network integrators and (responsible) consumers in a

regional market. Accordingly, the study at hand shows that in particular logistics and finance can play a fundamental role in pointing out alternative operational modes in business models of a future green economy system, with respect to the content instigated in the food industry.

6.8. Acknowledgements

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The authors designed the study jointly. Tim Gruchmann and Simon Hauser conducted the data collection and analysis of the NETs.werk case. Further, Tim Gruchmann contributed mainly to theory building as well as to the writing of all sections of the article. Madeleine Böhm and Simon Funcke conducted the data collection and analysis of the RWAG case. They also contributed to the writing of section 6.5.2. Klaus Krumme contributed to the writing of section 6.5.3. All authors contributed to the revision of the article.

To build further on the consumer perspective in local food, Tim Gruchmann co-authored the following already published consumer study:

Wenzig, J., and Gruchmann, T. (2018), “Consumer preferences for local food: testing an extended norm taxonomy”, *Sustainability*, Vol. 10(5), pp. 1-23.

7. Contribution of the dissertation thesis

This chapter contains a reflection on theory building at the intersection between different literature streams. This includes a debate on the research design and methodologies applied. The five underlying research questions of this dissertation thesis are then revisited, drawing on the contributions and conclusions of the five different articles (chapters 2-6). Also addressed are the limitations of this research, followed by final remarks and suggestions for future research.

7.1. Theory building at the intersections between different literature streams

To develop sustainable logistics strategies, it is necessary to discuss sustainable logistics practices from multiple perspectives, such as the SSCM perspective to coordinate and plan between several entities of a supply chain, the CSR perspective as ethical background of relevant actors in the supply chain, and the dynamic capabilities perspective as theoretical underpinning to understand necessary abilities of relevant actors in the supply chain. Accordingly, the present dissertation intends to contribute to theory at the intersections of SSCM, CSR, dynamics capabilities and sustainable business model literature (see Figure 7-1) by answering the proposed research questions through conducting an abductive, explorative and qualitative research in the context of the food production, retailing and consumption.

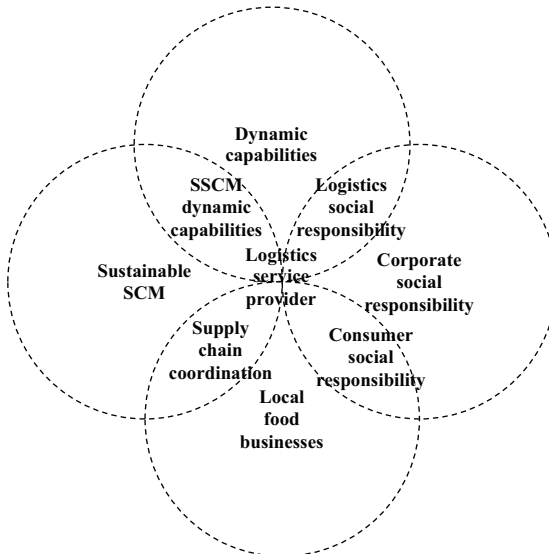


Figure 7-1: Theory building at the intersection between different literature streams.

The qualitative, case focused design of this dissertation was chosen as several previous studies called for further research at the intersection of dynamic capabilities and SSCM through case studies (Beske, 2012; Beske et al., 2014). Due to the context dependency of dynamic capabilities (Eisenhardt and Martin, 2000), the operationalization of dynamic capabilities for different actors in the supply chain, in particular logistics service providers, as well as for different industry contexts, in particular for local food businesses, provided research opportunities for this dissertation.

7.2. How can dynamic capabilities theory add to the understanding of LSR practices in sustainable supply chains?

The second chapter of this dissertation presents a conceptual study at the intersection of dynamic capabilities and CSR literature focusing on logistics service providers. Accordingly, this study conceptually explores the role of SSCM dynamic capabilities for achieving LSR. Here, the developed conceptual framework attempts to contribute to the literature by shifting and broadening the focus from not only looking at practices to employ a capability perspective on logistics service providers but also to investigate their potential to directly coordinate sustainable actions in the supply chain. In line with Weick (1995), developing conceptual frameworks or diagrams belongs to the first steps of the theorizing process and, therefore, represents the first step in this dissertation.

From a methodical point of view, this study reviewed 55 selected papers from the last two decades. The paper selection was guided by four recent literature reviews focusing on sustainable supply chain practices and their interlinkages to dynamic capabilities, namely the literature reviews provided by Ciliberti et al. (2008), Beske et al. (2014), Mejias et al. (2016) and Amui et al. (2017). Based on this pre-selection, relevant papers were chosen and clustered deductively following their self-reported focus on LSR, green logistics, PSR, logistics capabilities, SSCM and dynamic capabilities. Conducting such a qualitative approach, the study intended to explore new research directions guiding the theory building along the entire dissertation. As a result, the study proposed possible, new research directions:

RP1: Logistics measuring capabilities concerning sustainability-related logistics issues have a positive impact on transparent communication and appropriate pricing schemes among supply chain members.

RP2: Logistics information exchange and knowledge management capabilities concerning sustainability-related logistics information mutually support and moderate the sustainability performance of the supply chain.

RP3: Logistics learning capabilities concerning sustainability-related issues have a positive impact on a sustainable co-evolution of supply chain members.

RP4: Logistics integration and partner development capabilities concerning non-core business partners have a positive impact on the sustainability performance of the supply chain.

RP5: Logistics service providers' service (differentiation) capabilities have a positive impact on sustainability innovations of the supply chain.

In particular, the dissertation was able to address RP4 and RP5 while analyzing empirical data from expert and consumer interviews as well as local food cases focusing on logistical integration and coordination (see sections 7.3, 7.4, 7.5, 7.6). Here, the empirical findings provide evidence that logistics service providers' SCC and innovation capabilities have a positive impact on the sustainability performance of the supply chain.

7.3. How can logistics service providers contribute to creating sustainable production and consumption systems and, at the same time, support more sustainable consumption patterns?

The third chapter of this dissertation presents a participatory study at the intersection of dynamic capabilities and SSCM literature. The general objective of this study was to map relevant structures in sustainable production and consumption systems in a participatory way to construct alternative and sustainable business options for logistics service providers. In particular those settings were identified as relevant by the panel where complexity is high, for instance with regard to multi- and omni-channel retailing (c.f., Hübner et al., 2016). In this way, potential (last mile) configurations could be observed, where additional logistics service providers' dynamic capabilities promote more sustainable supply chains. As a result, those SSCM functions were identified which explicitly take a consumer-choice-centered perspective when it comes to alternative logistics service providers business models, in particular the functions of transformation, delivery and value proposition (cf., Hassini et al., 2012). In this line, the participatory study still explored new research directions guiding the theory building along the dissertation, especially toward including a consumer-choice-centered perspective in SSCM by "borrowing" dynamic capabilities' constructs from the strategic management discipline.

From a methodical point of view, PSM was used as a methodology in which a structured process is used to inductively design cause and effect relationships between different factors and elements in a defined system. It provides a multi-perspective understanding of problems and can help to formulate effective policies for complex sustainability issues taking into account necessary dynamic capabilities in the system. The participatively constructed system was represented through a CLD to assist in developing strategies and recommendations for more sustainable supply chains, where consumers are creating a dynamic environment through quickly adapting their consumption habits, for instance in the food industry. Such a dynamic system requires business innovation lead by important actors in the supply chain.

By taking a consumer-choice-centered perspective, supply chain innovation cannot just be defined in the boundaries of a product or service, but also as process or routine, or any other object which is considered to be new by customers. The term innovation requires acceptance from customers in order to be successful, but it also requires considering customers' behavioral patterns and habits, for instance consumer mobility aspects and preferences. Innovations can be sometimes neglected by customers because of barriers such as the price of the product or the service, sustainable image, etc. In such cases, certain SSCM dynamic capabilities are important for transitions facilitating a higher consumer acceptance toward a more sustainable system alternative.

7.4. How and under which circumstances can LSR be accomplished if sustainable production and consumption consumer choices are taken into account?

The fourth chapter of this dissertation presents an explorative, qualitative study at the intersection of CSR and SSCM literature. Taking into account the results from the previous chapters, the focus of this study was to examine the relationship between sustainable logistics services and consumer consumption decisions. Thus, this chapter of the dissertation intends to extend LSR from a consumer-choice-centered perspective. Therefore, the present findings contributed to a more complete constitution of LSR theory. By doing so, the study also tied the literature on LSR practices closer to the literature stream of SSCM, which have been developed rather separate research streams so far.

From a methodical point of view, qualitative data inductively derived from the expert interviews were triangulated with data from additional consumer interviews and the literature in order to validate the explored, consumer-centered LSR categories and show target-group specific patterns. Conducting such a two-stage approach, it was possible to achieve the required consumer perspective as well as to link the results to the LSR theoretical lens. As a

result, current consumption behavior hardly considers logistics services as part of the product. Hence, communication is necessary to expand the consumer's awareness. By doing so, retailers should support logistics service providers by stressing the benefits of sustainable products as well as implementing more sustainable pricing schemes. Due to regional settings, as well as the mobility preferences of consumers, it is also important to differentiate distribution channels to provide incentives for more sustainable logistics services choices by the consumer. Possible activities to organize distribution channels more sustainably might include sharing economy solutions.

In recent publications, the qualitative findings of this study were partially tested by quantitative methods providing further empirical evidence for communicating sustainability impacts as well as positive incentives for sustainable consumption choices. With regard to providing sustainability information at the point of sale in fashion online shopping and stationary grocery retail, Stöckigt et al. (2018) showed with a choice-based conjoint analysis that sustainability-related attributes such as environmental impact and working conditions have a higher relevance than most other attributes within the decision-making process when sustainability information is present. With regard to positive incentives for sustainable consumption choices, Gelbrich et al. (2017) showed with two experimental studies the positive effect of keep rewards within the return decision-making process in an online retailing context. Although there is a trend of integrating multi-channel into omni-channel logistics networks (Hübner et al., 2016), to the best of our knowledge, none of the existing studies investigated consumer target-group oriented supply chain configurations. However, following the call for incorporating the people dimension into SCM to unlock further sustainability potentials (cf., Wieland et al., 2016), future research needs to include existing findings from other disciplines, such as psychology, into the (S)SCM literature. According, it is possible to build a more comprehensive theory at the intersections of (S)SCM and consumer research.

Also considering the results of the previous studies, logistics service provider either rely on cooperations with other supply chain members while stressing logistics benefits or have to acquire necessary capabilities in order to strengthen their position in comparison to other supply chain members. As necessary logistics service providers' collaborations and alliances on the one side and dynamic capabilities on the other side might vary in different industry contexts, the developed theoretical conceptualizations need to be tested empirically in case studies. Thus, it is necessary to apply SSCM dynamic capabilities theory within a specific

industry and test the generalizability and validity, as well as narrow the framework to enable a more realistic model for empirical testing. Therefore, the following empirical case studies were focusing on the food industry to study related SSCM practices and dynamic capabilities from a logistics service providers perspective and validated them in the light of concrete business cases. The food industry was chosen as logistics services are being currently expanded and adapted in accordance with changed customer demands local food products.

7.5. How does a dynamic comprehension of the food supply and distribution chain enable local businesses in improving their sustainability impact?

The fifth chapter of this dissertation conducts a case study approach of local food businesses to promote theory building at the intersection of dynamic capabilities and SSCM literature. In order to validate the findings of the previous studies, the observed cases were analyzed in particular with regard to SSCM practices and dynamic capabilities routines and compared to sustainable practices already known from the literature to deduce relevant dynamic capabilities. In conventional food supply chains so far, researchers attempted to generalize and advance the theoretical underpinnings of sustainability and constructed certain categories for global food production highlighting the specific CSR dimensions of animal welfare, biotechnology, environmental concerns, fair trade, health and safety as well as human and labor rights (Maloni and Brown, 2006). Focusing on food retail and distribution in global businesses, Spence and Bourlakis (2009) stress the focal companies' role as large buying companies capable to promote PSR as they obtain critical interfaces with important stakeholders including customers and suppliers. By doing so, CSR practices in food retailing can mitigate risks coming from seasonal supply (e.g., temporary labor), high competition, hygiene, animal welfare (e.g., use of antibiotics and hormones), arable farming, perishable goods as well as packaging and labeling (Spence and Bourlakis, 2009). Considering the results of the present study, however, the observed cases highlight SSCM practices rather than CSR related production and distribution practices. In particular, SSC as well as supply chain and logistics innovation practices were found to be relevant in order to facilitate transferability and scalability of sustainability in the food industry. In this line, the empirical findings provide a certain evidence that that the RPs 4 and 5 (see section 7.2) can be supported in the context of local food businesses and contribute to building a more complete theory of SSCM dynamic capabilities.

The findings generally led to a framework refinement providing insights for several actors in local food businesses. Taking a logistics service provider's perspective, their capabilities to

facilitate sustainable practices in food supply chains are coming to the fore and are no longer determined in purely monetary terms (e.g., Halldorsson and Skjøtt-Larsen, 2004). In the light of the empirical findings, capable logistics service providers support (alternative) entrepreneurs acting as network integrators or even have the chance to take over the role of the network integrators. At the same time, logistics service providers contribute to business professionalism in local businesses with regard to technological and logistics integration and, accordingly, enable a higher sustainability performance. To do so, concrete pathways for sustainability could be deduced from cross-analyzing the different case studies.

However, despite providing valuable insights, qualitative case study research is not without limitations. A limitation, generally perceived in qualitative research, lies in the limited number of interviews, allowing no generalization of the findings. Accordingly, future research needs to test the results using survey research. Taking into account the proposed pathways as well as the level of each SSCM-related practice and dynamic capability, the following, additional RPs can be deduced:

RP6: Service innovation routines have a positive impact on relationships and networks downstream the supply chain.

RP7: Service innovation routines have a positive impact on customer satisfaction and communication.

RP8: The incorporation of (local) stakeholders in operational business have a positive impact on the sustainability performance of the supply chain.

RP9: The incorporation of (local) stakeholders have a positive impact on dynamic capability building.

7.6 How can supply chain coordination contribute to transferability and scaling of local food businesses and their sustainability efforts? How is this reflected in their business model?

In order to enhance the generalizability of the findings, it was necessary to carry out a similar study and include an additional business perspective. Therefore, the sixth chapter of this dissertation presents a case study of local businesses to discuss the implementation of sustainable production and consumption systems in the food industry and intends to contribute to theory building at the intersection between business model and SSCM literature. To do so, the empirical interview data from a new case (RWAG) and a previous case

(NETs.werk) was analyzed deductively and compared from a sustainable business model perspective. As a result, the findings provide evidence that logistics, technological and financial SSC as well as supply chain and logistics innovation practices facilitate transferability and scalability of local businesses in the food industry and, therefore, also confirm the results from the previous chapters.

Especially the SCC literature highlights how effective relationships can help manage potential supply chain risks (Scholten and Schilder, 2015), e.g., mitigating risks coming from global food production and supply. However, the findings of the dissertation also suggest that in a mid- to long-term horizon, SCC generally tackles the strategic integration of technical and logistical processes (Vachon and Klassen, 2008) and, therefore, might actively influence the environmental social sustainability performance of a supply chain in a positive manner. In this context, Kanda and Deshmukh (2008) provide an SCC classification model where the relevant coordination functions, interfaces and mechanisms can be identified for the research problem. In matters of SCC mechanisms, they distinguish between contractual coordination, coordination through information technology, coordination by information sharing and joint decision making. To contribute to this literature, such coordination practices can be included in business models of logistics service providers. In this context, the business models of shippers and logistics service providers are categorized by means of their service range and structure (Köylüoğlu and Krumme, 2015). A popular classification scheme of logistics business model archetypes is the 1PL to 5PL scheme (Merkel and Heymans, 2003). Hence, the integration of SCC strategies can be discussed in line with the 1PL to 5PL logistics businesses in the context of single-, multi- and omni-distribution-channels.

1PL (Single Service Provider): Single service providers execute a single logistics service, as e.g., a freight carrier (transportation) or stock keeper (warehousing). Accordingly, single service providers currently concentrate most on methods to decrease the environmental impact of their logistical assets, and, accordingly mitigate risks from these operational processes. With regard to multi-channel grocery retailing, single service providers either run distribution centers to store products or carry out transports between suppliers, distribution centers and retail stores (Hübner et al., 2013). In addition, picking processes can be carried out as contract logistics services by single service providers. Within those conventional business models, logistics measurement and information exchange capabilities are most important as single service providers coordinate only small parts of the supply chain.

2PL (2nd Party Logistics Provider): The 2nd party logistics provider executes all classical logistics functions of transportation, handling and warehousing which represents the typical business model for freight forwarders, ocean carriers and parcel service providers. As they operate different transport modes, the selection of the best modal split becomes an important instrument to increase the environmental performance of their logistical activities. With regard to online retailing, last mile delivery services of groceries are becoming more relevant for 2nd party logistics provider, in particular parcel service providers. Due to nature of food products, requirements considering hygiene, perishability as well as packaging and labeling (Spence and Bourlakis, 2009) are also tackling service providers in the last mile. Hence, specific packaging (isolated boxes) or transport processes (in different temperature zones) might have negative impacts on the sustainability performance (Wollenburg et al., 2018). Although 2nd party logistics providers still coordinate limited parts of the supply chain such as the last mile, logistics integration and logistics service capabilities are coming to the fore to decrease the travel distance and increase the drop-off rate.

3PL (3rd Party Logistics Provider): The 3rd party logistics provider extends the classical logistics function with neighboring logistics services such as cross docking, inventory management and packaging design. In this line, 3rd party logistics providers are often globally acting companies that contract with their customers “at eye level” (Wolf and Seuring, 2010). Hence, they have the opportunity to implement more advanced SSC strategies. Here, portfolio extensions using existing logistics infrastructure might not just enhance efficiency, but also the social sustainability performance, in particular in the last mile. In this line, 3rd party logistics providers are generally capable to run omni-channel distribution channels. However, decentralized organizations like cooperatives have more and higher hurdles when implementing centralized online solutions and distrust logistics service providers when it comes to a safe handling of food products (Wollenburg et al., 2018). This is why omni-channel retailers often deliver their products by themselves rather than using a 3rd party logistics providers. Accordingly, co-evolution, partner development and supply chain re-conceptualization capabilities are vital to increase logistics professionalism and integration in omni-channel grocery through outsourcing logistics processes to 3rd party logistics providers.

4PL (4th Party Logistics Provider) and 5PL (so-called Lead Logistics Provider): The 4th party logistics provider provides comprehensive supply chain solutions to coordinate and integrate all supply chain members using e-business and ICT applications such as EDI. 4th party logistics providers are often specialized consulting companies not carrying out any

operations (so-called non-asset-owning service providers). In contrast, lead logistics providers carry out certain operations by owning or buying the necessary physical logistics infrastructure. Accordingly, coordination mechanisms such as information sharing and joint decision making are relevant to achieve more sustainable supply chain configurations. Hence, reflexive control and knowledge capabilities are important to coordinate wider parts of the supply chain. In addition, lead logistics providers might realize alternative business models through the concrete integration of consumer-centered businesses such as circular and sharing economy solutions in their service portfolio to achieve further positive sustainability effects.

Mapping logistics businesses in a wider entrepreneurial ecosystem, classical and future logistics business models can be derived and clustered in accordance to their supply chain position (upstream, downstream) (see Figure 7-2).

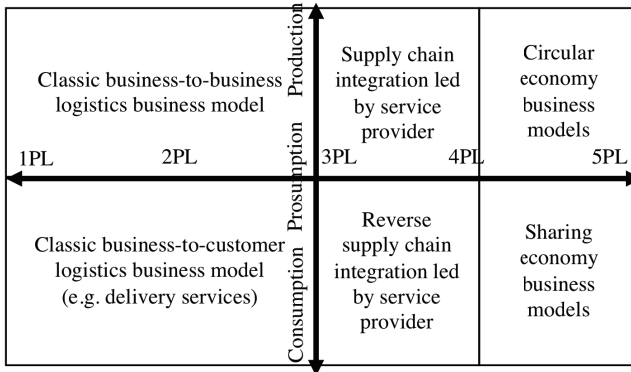


Figure 7-2: Mapping logistics businesses in the supply chain.

7.7. Overarching limitations and future research directions

However, this dissertation applying mainly qualitative research methods is not free of limitations that can be addressed in future research activities. The limitations for each study have been stated in the corresponding chapters, but some overarching limitations are highlighted in this section. Due to the deductive nature of the conceptual study (see chapter 2) and the case studies (see chapter 5 and 6), some dynamic capabilities or SSCM practices worthy of further investigation might have been excluded. To address this limitation, the rather inductive PSM study (see chapter 3) and LSR/ConSR (see chapter 4) brought up new categories with a strong focus on consumer-choice centered SSCM practices and capabilities. However, such a strong consumer focus could not be observed in the cases studies being

designed to build on the explorative results of the previous studies. Therefore, future work may further address the people dimension for SSCM, for instance by testing the theoretical framework presented in Figure 4-1 with a consumer survey. Moreover, the logistics and food industry comprised the primary focus of this dissertation. Hence, the findings are not generalizable for other industry contexts and, accordingly, provide opportunities for future research. In general, all data samples are not representative for the observed industries, countries and customer segments as this is usually not feasible in qualitative research. Opportunities to address these research limitations lie therefore in testing the constructed theory with the help of survey research.

From a theory perspective, dynamic capabilities require long-term observations to observe decision making processes in a dynamic environment. In this line, the dissertation provides rather an ex-post than a longitudinal analysis of routines. As longitudinal case studies are hardly feasible within the limited time span available in a dissertation project, future research should replicate the case studies and analyze differences in the observed routines due to changes in the market. Another limitation within the theory lies within the hierarchical order distinguishing between ordinary capabilities allowing a firm to run its business in the short term, substantive capabilities to solve problems and dynamic capabilities to change ordinary capabilities (Winter, 2003). In this line, ad-hoc activities which are non-repetitious and, therefore, not routine, are hard to capture with a dynamic capabilities lens although these activities might be valuable to create or adapt to change (Zollo and Winter, 2002; Winter, 2003). Hence, investigating personal capabilities on an individual level, and not on an organizational or even supply chain level, are an interesting future research direction. In addition, the degree of heterogeneity of dynamic capabilities is a theoretical limitation and, at the same time, research opportunity. On the one hand, it is assumed that dynamic capabilities are essentially company specific and unique (Teece et al., 1997; Makadok, 2001). On the other hand, some authors assume that dynamic capabilities have at least a few commonalities across companies (Eisenhardt and Martin, 2000). Accordingly, it is not just worth to replicate the dissertations research design in different industry contexts, such as the electronics sector, but also within the food industry to analyze company specific capabilities and possible tensions between industry commonalities.

In addition, future research activities can be seen in developing alternative logistics service providers' business models including circular and sharing economy solutions.

7.8. Managerial implications

Generally, there is a broad spectrum of reasons for companies to adopt SSCM practices in the realization of their CSR. For instance, consumers, government, and other stakeholders can require sustainability externally (Gold et al., 2010). As the consumer's satisfaction is usually the primary goal of manufacturing or provided services, it is important that the product or the service be accepted by the consumer. Therefore, the performance measurement is not only defined and limited to financial indicators but also driven by indicators based on consumer wishes and judgments (Eisenhardt and Martin, 2000). Accordingly, companies may fear rejection by the end customer if environmental and/or social issues have been reported along the supply chain (Seuring and Müller, 2008). In this line, Rabinovich and Bailey (2004) developed a theoretical framework for physical distribution service quality in a general online retailing context. Others, like Punakivi et al. (2001) and Yrjölä (2001) examined different last mile configurations in online retailing to increase the economic profitability of e-commerce distribution channels explicitly taking consumer behavior into account. However, only a few studies have examined the (socially) sustainable logistics services from a consumer-choice-centered perspective to give related managerial implications.

Taking into account that consumers rarely consider logistic services as part of the product so far and, accordingly, the appreciation for logistics services and its sustainability impacts is low, it is not surprising that no strong logistics focus could not be observed in the cases studies yet. Revisiting the developed conceptual sustainable business model framework for local food networks, logistics service providers should be more proactive in building business relationships with such networks as a sufficient (logistics) infrastructure is still a crucial point. On the other side, decentralized production and distribution networks are often open to include new business partners with local expertise. While logistics as a part of the product-service-system might become more prominent in such business models, it can be expected that logistics also will take more into consideration by the consumer. Hence, logistics service providers need to take part in up-scaling processes of local food network although turnover and profits are still limited. Therefore, logistics service portfolio extensions are a first step and, at the same time, can achieve synergies by increasing the use of existing logistics infrastructure.

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Appendices

Appendix A

Table A1 – Coded literature¹⁰.

Analyzed papers	Journal	Aim/main topic
LSR: Carter and Jennings (2002) Ciliberti et al. (2008) Sarkis et al. (2010) Miao et al. (2012) Nikolaou et al. (2013) Mejias et al. (2016)	<i>JBL</i> <i>IJPE</i> <i>CSREM</i> <i>IJPE</i> <i>JCLP</i> <i>IJOPM</i>	Integrative framework for LSR LSR adoption and practices in the Italian context Reverse logistics and social sustainability Antecedents of LSR in the Chinese context Reverse LSR evaluation framework Framework for LSR practices
Green logistics: Murphy and Poist (2002) Aronsson and Brodin (2006) Perotti et al. (2012) Kim et al. (2012) Tacken et al. (2014) Abbasi and Nilsson (2016)	<i>SCM</i> <i>IJLM</i> <i>IJPDLM</i> <i>IJLM</i> <i>IJLM</i> <i>TRPD</i>	Environmental logistics practices Environmental impact of changing logistics structures Environmental logistics practices in the Italian context Adoption towards environmental logistics practices Examining of CO ₂ reduction within German logistics sector LSP's challenges adapting environmental logistics practices
PSR: Carter and Carter (1998) Maignan et al. (2002) Carter and Jennings (2004) Reuter et al. (2010)	<i>DC</i> <i>EMJ</i> <i>JBL</i> <i>JSCM</i>	Determinants of environmental purchasing Socially-responsible purchasing Purchasing in CSR Sustainable global supplier management
Capabilities in logistics: Zhao et al. (2001) Esper et al. (2007) Lai (2004) Halldórsson et al. (2004) Wong and Karia (2010) Ralston et al. (2013) Mellat-Parast et al. (2014) Gligor and Holcomb (2014) Liu and Lai (2016) Yang (2016)	<i>JBL</i> <i>JBL</i> <i>TRPE</i> <i>IJOPM</i> <i>IJPE</i> <i>IJLM</i> <i>IJLM</i> <i>IJLM</i> <i>IJLM</i> <i>IJLM</i>	Effect of logistics capabilities on firm performance Leveraging logistics through learning capabilities Service capabilities in logistics Logistics capabilities in 3PL relationships Competitive advantage of LSPs Logistics salience impact on logistics capabilities Competitive advantage of logistics integration Supply chain agility through logistics capabilities Logistics integration capabilities of 3PLs Leveraging logistics through learning capabilities
Supply chain responsibility Maloni and Brown (2006) Spence and Bourlakis (2009) Andersen et al. (2009) Yawar and Seuring (2017)	<i>JBE</i> <i>SCM</i> <i>SCM</i> <i>JBE</i>	CSR in global supply chains Supply chain responsibility CSR in supply chains Social issues in supply chains

¹⁰ **AOM** = Academy of Management Proceedings; **BJOM** = British Journal of Management; **CSREM** = Corporate Social Responsibility and Environmental Management; **DS** = Decision Science; **EMJ** = European Management Journal; **IJLM** = The International Journal of Logistics Management; **IJMR** = International Journal of Management Reviews; **IJOPM** = International Journal of Operations & Production Management; **IJPDLM** = International Journal of Physical Distribution & Logistics Management; **IJPE** = International Journal Production Economics; **JBE** = Journal of Business Ethics; **JBL** = Journal of Business Logistics; **JCLP** = Journal of Cleaner Production; **JOM** = Journal of Management; **JPSM** = Journal of Purchasing and Supply Management; **JSCM** = Journal of Supply Chain Management; **SCM** = Supply Chain Management: An International Journal; **SMJ** = Strategic Management Journal; **TRPD** = Transportation Research Part D; **TRPE** = Transportation Research Part E

Theory in SSCM		
Carter and Rogers (2008)	<i>IJPDLM</i>	Theoretical framework of SSCM
Seuring and Müller (2008)	<i>JCLP</i>	Review and theoretical framework of SSCM
Pagell and Wu (2009)	<i>JSCM</i>	Framework of SSCM practices
Gold et al. (2010)	<i>CSREM</i>	SSCM and inter-organizational resources
Carter and Easton (2011)	<i>IJPDLM</i>	Review and future research agenda
Tachizawa and Wong (2014)	<i>SCM</i>	Review and theoretical framework of multi-tier SSCM
Touboulic and Walker (2015b)	<i>IJPDLM</i>	Review on theories in SSCM
Matthews et al. (2016)	<i>JSCM</i>	Alternative theories on SSCM
Quarshie et al. (2016)	<i>JPSM</i>	Review on theories in SSCM
Capabilities in (S)SCM:		
Agarwal and Selen (2009)	<i>DS</i>	Dynamic capability building in service value networks
Defee and Fugate (2010)	<i>IJLM</i>	Capabilities in the dynamic supply chains
Beske (2012)	<i>IJPDLM</i>	Dynamic capabilities in SSCM
Beske et al. (2014)	<i>IJPE</i>	SSCM practices and dynamic capabilities in food supply chains
Land et al. (2015)	<i>AOM</i>	SSCM practices and dynamic capabilities in automotive supply chains
Liu et al. (2015)	<i>IJLM</i>	Supply chain integration through IT capabilities
Tatham et al. (2017)	<i>IJLM</i>	Skills to sense and seize opportunities
General dynamic capabilities literature		
Teece et al. (1997)	<i>SMJ</i>	Explaining dynamic capabilities
Eisenhardt and Martin (2000)	<i>SMJ</i>	Explaining dynamic capabilities
Makadok (2001)	<i>SMJ</i>	Merging RBV and dynamic capabilities views
Winter (2003)	<i>SMJ</i>	Explaining dynamic capabilities
Helfat and Peteraf (2003)	<i>SMJ</i>	Dynamic RBV
Teece (2007)	<i>SMJ</i>	Dynamic capabilities' micro foundations
Wang and Ahmed (2007)	<i>JMR</i>	Review and future research agenda
Easterby-Smith et al. (2009)	<i>BJOM</i>	Current debate and future research agenda
Barreto (2010)	<i>JOM</i>	Past research and future research agenda

Appendix B

Interview topic guide

0. Introduction

- 0.1 Introduction to the study, its aims, and the researcher
- 0.2 Assurance of confidentiality and anonymity

1. Logistics and sustainability

- 1.1 What are the most important sustainability hot spots related to logistics services (incl. the last mile) from a social, ecological, and economic perspective?
- 1.2 What are the main drives for sustainable logistics services? Which trends support sustainable logistics services?
- 1.3 What are the main barriers to sustainable logistics services? Which trends constrain sustainable logistics services?

2. Designing more sustainable supply chains

- 2.1 What role do logistics service providers play in designing a more sustainable supply chain?
- 2.2 What role do other actors in the supply chain play?
- 2.3 How can Sharing Economy solutions contribute to designing a more sustainable supply chain?

3. Sustainable logistics and sustainable consumption

- 3.1 To what extent do logistics service providers consider consumer choices within their business strategy?
- 3.2 Which consumer choices influence logistics service providers most?
- 3.3 Which retailing trends impact the service offers of logistics service providers?

4. Interaction between logistics service providers and consumers

- 4.1 Where/when do logistics service providers interact directly/indirectly with consumers?
- 4.2 How important are information technologies to bring logistics service providers and consumers together?
- 4.3 Are there any initiatives to inform consumers about sustainable logistics services?

Appendix C

Interview topic guide

0. Introduction

- 0.1 Introduction to the study, its aims, and the researcher
- 0.2 Assurance of confidentiality and anonymity

1. Business model

- 1.1 Can you describe the business model and its related products and services?
- 1.2 To what extent do you consider the business model innovative?
- 1.3 To what extent does the business model rely on existing infrastructure and/or competencies?

2. Business strategy

- 2.1 Which strategic targets do you want to achieve with the business model in short-term and in long-term?
- 2.2 Do you measure the achievement of these targets?
- 2.3 Are you aiming to work cost-covering?

3. Sustainability

- 3.1 Are there any social or environmental impacts of your business model?
- 3.2 Which advantages/ disadvantages do you see with regard to sustainability in comparison to conventional business models (e.g., stationary retail)?

4. Cooperation

- 4.1 Which cooperation is important for you?
- 4.2 What about the consumer perspective?

5. Drivers and barriers

- 5.1 Which societal trends drive your business model?
- 5.2 Does digitalization has an impact on sustainability?
- 5.3 Which barriers hamper the scaling of your business model (e.g., other supply chain members)?
- 5.4 Which opportunities do you see with regard to scaling your business model?
- 5.5 Are there any business adaptations planned for the future?

Appendix D

Case descriptions

Case 1: NETs.werk

The food cooperation NETs.werk (“network”) runs an e-food online platform to distribute organic food produced by local, small farmers in the region of Linz, Austria (<http://hoersching.netzwerk.at>). So far, customers order once a week via the platform and pick-up the order by themselves at one of the NETs.werk branch offices. To drive environmental performance within the last mile, NETs.werk started a collaboration with a local logistics service provider to also offer a direct delivery service operated by electric vehicles.

“So far [...] the products are transported [...] by the farmers themselves. Then the products are commissioned and put into boxes. Afterwards, every Thursday, Friday, and Saturday 80 to 100 customers drive to the NETs.werk branch offices with their own cars to pick up their boxes - worst case. Hence, the sustainability of the (organic) product [...] is gone.” (1)

Although the customer interaction while ordering is automated, NETs.werk builds a personalized customer relationship via the sales personnel (partially the farmer themselves) in the branch offices as well as the drivers of the electric vans to offer additional services such as claim and return management. To further avoid anonymity and increase the transparency of the local farmers’ production, courtyard parties are organized regularly. Key partner of NETs.werk is Schachinger Logistik, a local logistics service provider, who combines the afternoon business-to-customer food deliveries with a morning business-to-business parcel delivery service. Hence, Schachinger is able to decrease operational costs per delivery by increasing the usage of the electric vans.

“Schachinger [...] is part of the DPD network in Austria. [...] Therefore, more or less every business-to-business parcel delivered in Upper and Lower Austria is done by Schachinger. [...] In the end, it is about conducting business-to-business deliveries in the morning and [...] business-to-customer deliveries in the afternoon because the probability that the customer is at home is higher.” (2)

Thus, important key assets in the network are the existing logistics infrastructure (such as trucks and warehouses) as well as ICT. To operate this logistics infrastructure, revenue streams are generated by charging the customers partially with delivery costs and co-financing the delivery from the product margin.

Case 2: Marktschwärmer

Marktschwärmer (“market revelers”) was originally launched in France with the aim of bringing consumers and regional food producers together to reduce the cost and effort for direct marketing to a minimum (<https://marktschwaermer.de>). Marktschwärmer’s distribution channel is conceptualized as a combination of an online shop and farmers’ market, which functions as follows: customers order and pay for locally produced food products online and pick them up once a week in a so-called “Schwärmerei” (“revelers’ room”), where they can meet the growers of the products.

“Consumers obtain regionally produced food and are given the opportunity to get to know the farmers and exchange ideas with them. The farmers acquire an additional direct marketing option, which offers them more flexibility, security, and fair prices.” (5)

The Schwärmereien are founded, organized, and taken care of by independent hosts. As a result, Marktschwärmer is a network of local communities where fair prices are achieved for all parties involved. Here, a “no-risk weekly market” for the farmers takes place, as only those goods that were previously ordered online are harvested and transported. This reduces food waste to a minimum. One of the key activities is the provision of the ICT infrastructure. Another very important aspect is the schooling, training, and further education of the hosts because they carry out business activities on a self-employed basis, such that there is often a need for specific skills such as accounting.

“On one hand, we are an IT infrastructure, and on the other hand, we are the reference for the network. This means when a farmer has a question with regard to registration, with regard to the product offers, with regards to tax issues, we support him. It is the same when customers have a question and need an answer; we are the point of contact.” (4)

In addition, Marktschwärmer is the point of contact responsible for customer communication and relationships and optimizes the logistics of producers to the Schwärmereien. Additional key partnerships are held with a multitude of local cooperative activities, which are often initiated by the hosts. When a product is sold, a certain percentage of the income goes to Marktschwärmer, and the same percentage to the host. Moreover, there is deliberately no requirement that only organic food should be sold because, according to the interview partners, this would mean that farmers who work in an environmentally sound way but have not acquired the expensive certification would be excluded.

Case 3: Lokaso

The online retailing initiative Lokaso (<https://siegen.lokaso.de>) aims to support stationary retail shops in Siegen, a small-sized town in Germany, by providing an easily accessible local online distribution channel and, accordingly, contributing to social sustainability. Using this online platform, customers can buy food and non-food products from different local retailers within a single order.

“With regard to online retailing, most of the turnover is created by nationwide operating providers. [...] But this should be different. Therefore, Lokaso intends to make local retailers more visible and to extend their operating distance.” (6)

The sold goods are picked up by Lokaso in a milk-run tour, commissioned decentralized on the van and, if ordered before 3 p.m., delivered to the customers on the same day. The related delivery costs are intentionally not charged to the customers to keep barriers for this distribution channel low and avoid strategic disadvantages against established nationally and internationally operating online retailers.

“Our delivery service is free of charge. This distinguishes us from competitors [...] who have a similar business model. At least in Siegen, we also have no minimum order value.” (7)

As Lokaso’s customers often request a personalized customer relationship and technical assistance, Lokaso established a customer service hotline. The hotline provides individual guidance and allows phone orders as well as investigates wishes for additional products that are currently not available on the online platform. Moreover, the van drivers offer additional services, such as card payment at the front-door. Besides the delivery service, Lokaso’s value proposition for the retailing companies includes easy and affordable access to the online market to increase sales opportunities in declining stationary retail markets, especially in small towns and villages in rural areas. Here, retailers with their specific knowledge of the local market are important key partners in covering a wide spectrum of consumers’ needs. Therefore, key activities are the connection to the retailers’ Enterprise Resource Planning (ERP) systems, including master and article data maintenance as well as order management.

“Lokaso provides the key resources of software and ICT infrastructure, including interfaces to the inventory management systems.” (6)

Accordingly, key resources in the distribution network are not just the logistics infrastructure but also the ICT infrastructure with reliable interfaces to the retailers’ subsystems. Moreover, Lokaso focuses on key partnerships with local logistics and marketing expertise. To generate revenue streams from the key activities, Lokaso charges a monthly base fee to the retailers. In contrast, the logistics service is paid through a commission on the retailers’ turnover and, therefore, reduces the product margin. Nonetheless, the products are offered at the same prices as in stationary retail.

Case 4: Lokavendo

The start-up Lokavendo (<https://www.lokavendo.de>) was founded with the aim to provide an alternative online distribution channel for stationary book retailers that does not exclusively favor the few multinational online retailers with dominant market power.

“Three years ago, we thought, we have to do something to re-establish book retailing as more and more sales are made online [...] and stationary book shops are falling behind. [...] This was our first attempt - that we find a fair solution, and the customer can still buy books online.” (8)

Thus far, the Lokavendo online platform offers a much wider range of items than only books. In the long-run, Lokavendo aims to cover a full product range offered by local retailers who do not yet have their own websites. In this line, only products that are sold geographically close to the end customer are shown at the Lokavendo online platform. This helps to reduce the environmental impact in the last mile. However, the final choice of how to distribute to its customers is up to the single retailer. Therefore, it is possible that the retailer may accept only cash payments such that the end customers have to physically go the shop. Also, C&C and other delivery options can be pre-selected by the retailers. The main activity of Lokavendo is programming and hosting the ICT infrastructure and its support. Its main partners are (potential) franchisees and municipalities aiming to strengthen their local retail. In this vein, Lokavendo provides the necessary ICT infrastructure while the customer contact stays with local partners. Due to the fact that local print media are on a decline, smaller businesses lack opportunities to address their target groups. Considering this circumstance, Lokavendo also cooperates with advertising agencies to better reach local end customers. In general, advertising takes center stage in the business model of Lokavendo as it represents Lokavendo’s main revenue source. In addition, a basic fee and a commission on the retailers’ turnover are charged when the end customer orders a product from distance more than five kilometers from the retailer.

“Lokavendo tries not to be just one of the next online platforms but actually to promote local value creation, such that no fees are charged on the locally made turnover of the retailers.” (8)

Case 5: Flotte Karotte

Flotte Karotte (“speedy carrot”) is a delivery service for organic farm produce, which aims to make the freshest possible products available to consumers (<https://www.flottekarotte.de>). Flotte Karotte has therefore eliminated the long process of retailing and carries out its key tasks: purchasing, order picking, and invoicing as well as taking care of the last mile, the delivery.

“Now we have what we call ‘100-percent-organic’, thus only organic goods, and not any organics but preferred goods from the association, and there are very strict rules [...] and that’s one way we distinguish our name.” (9)

Flotte Karotte belongs to the umbrella organization Ökokiste e. V., which, alongside the contract farmers, is one of the key partners. The umbrella organization carries out tasks such as nationwide marketing, the development of logistics processes, and the definition of quality criteria that go beyond the EU’s organic (bio) label.

“We are an umbrella organization with certain indicators of quality, and we use the (umbrella) organization for everything that extends beyond our members’ companies.” (10)

By far the most important partners are the contract farmers with whom long-term contracts have been concluded on fair terms so that quality and stability in the supply chain can be guaranteed. If goods cannot be delivered by the farmers, Flotte Karotte has also a long-standing relationship with two wholesalers, through which products from organic farms can also be purchased. Ordering is supposed to be as simple as possible and can be done via app, website, or telephone. Customers can put together their own boxes from the range of products or choose a

standard, pre-configured selection, including a box containing exclusively seasonal and regional products. In addition, the company endeavors to pursue an integrated sustainability approach. The social aspect of sustainability benefits from respectful dealings with employees and suppliers, which is expressed, among other things, by fair remuneration and long-term business and employment relationships. The customer relationships are established and maintained via the internet, although the driver also plays an important role. Next to the sales prices, another source of income is the delivery rate (which does not cover costs).

Case 6: Hoflieferant

Hoflieferant Marquardt (“supplier farm Marquardt”) is based in Hamburg, Germany (<http://www.bio-hoflieferant.de>). The business model is that of a classic organic food box.

“That is why the goal was then and still is today to deliver fresh, good quality vegetables at a reasonable price and at the right time. [...] We carry out the tasks of a retailer as well as some others and try to make ourselves as small as possible in order not to claim too high margins.” (12)

The value proposition of Hoflieferant consists of 1,000 organic food products, which are, when possible, regionally grown and delivered to the customer’s doorstep at fixed time slots on certain days of the week. Customers can order mixed boxes with varying contents and/or “à la carte” by phone, smartphone, browser, or e-mail (similar to the Flotte Karotte case). When marketing the products, the focus is on the farms as the place of production. A binding agricultural plan is carried out annually with the farms as key partners. Thanks to the concept of mixed boxes, farmers can be met with flexibility even in the event of unforeseen crop shortfalls or surpluses.

“The binding agricultural plan and the elimination of the retailer between consumer and farmer enable a stable amount of purchases to be achieved at higher prices. Seasonal boxes provide another flexible instrument that can also be used to keep food loss to a minimum.” (12)

Other important key partners are the subcontractors carrying out the deliveries, who have been commissioned with a few routes. The goods are delivered by the farmers and picked up on the company’s premises and, if necessary, stored temporarily - Hoflieferant, however, tries to avoid this to save costs and ensure maximal freshness. In the evening, the boxes, that is, the orders previously placed online or by telephone, are packed and delivered the next morning by the drivers during fixed time slots - right to the customer’s doorstep. The company sees itself as a bridge between producers and consumers. Branded wooden boxes provide high recognition value. However, the delivery service is given the highest priority. The most important stakeholder is the city council, or public transport, because vehicles must be parked at short notice for delivery. The revenue is derived from a service charge on orders and a minimum order value. However, this does not cover the costs of delivery; the remainder is offset by the margin on the products sold. For a long time, the company did not charge a service fee, but it became necessary due to rising prices for logistics, and the owners did not want to continuously raise the prices of their products.

Appendices

Schriftenreihe **Supply Chain Management**

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Prof. Dr. Stefan Seuring, Universität Kassel

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Logistics Social Responsibility (LSR) emerged as a concept to integrate sustainability throughout logistics-oriented processes in the supply chain. Hence, logistics services are linked to sustainability requirements. To meet these requirements, logistics service providers can respond to their responsibility by reducing the ecological and social impact in the supply chain. Moreover, it has been recognized that consumers also need to adapt to sustainability requirements: e.g., by supporting sustainable logistics strategies with their monetary “votes” or by changing their own consumption behavior. This “shared responsibility” requires mutual support and cooperation. Therefore, the core of this dissertation is that logistics service providers can further support sustainable development by facilitating more sustainable consumer choices.

To enhance LSR activities, the link to the dynamic capabilities theory is investigated. Here, several capabilities have been identified through which managers can pool their knowledge and skills to generate new knowledge, solutions or resource configurations. Using these capabilities in a strategic manner, logistics service providers can purposefully change their business environment by forming new partnerships or changing existing relationships to gain from developing new business practices stressing sustainable purposes.