

Design of Interorganizational Incentive Mechanisms for Sustainability Management of Logistics Service Providers

DISSERTATION
of the University of St. Gallen,
School of Management,
Economics, Law, Social Sciences
and International Affairs
to obtain the title of
Doctor of Philosophy in Management

submitted by

Nicole Luisa Kudla

from

Germany

Approved on the application of

Prof. Dr. Wolfgang Stölzle

and

Prof. Dr. Volker Hoffmann

Dissertation no. 4024

The University of St. Gallen, School of Management, Economics, Law, Social Sciences and International Affairs hereby consents to the printing of the present dissertation, without hereby expressing any opinion on the views herein expressed.

St. Gallen, May 11, 2012

The President:

Prof. Dr. Thomas Bieger

Vorwort

Die vorliegende Dissertation ist das Ergebnis meiner Forschungstätigkeit am Lehrstuhl für Logistikmanagement der Universität St. Gallen (LOG-HSG), sowie der durch den Schweizerischen Nationalfonds geförderten Zusammenarbeit mit dem Lehrstuhl für Nachhaltigkeit und Technologie der ETH Zürich (SusTec).

Die Motivation dieser Arbeit erwuchs aus der Fragestellung, wie nachhaltige Logistikdienstleistungen durch verladende Unternehmen gezielt gefördert werden können. Die enge Zusammenarbeit mit Logistikdienstleistern sowie Unternehmen der Chemie-, Lebensmittel-, Verpackungs- und Montagetechnik-Industrie ermöglichte mir ein umfassendes Verständnis der praxisrelevanten Problemstellung und deren organisationstheoretische Verankerung.

Dieses Vorwort soll dazu dienen, all jenen zu danken, die mich auf meinem Dissertationsweg begleitet, unterstützt und gefördert haben.

An erster Stelle möchte ich mich bei meinen Referenten Prof. Dr. Wolfgang Stölzle und Prof. Dr. Volker Hoffmann bedanken, die mich in den letzten Jahren persönlich und fachlich begleitet und motiviert haben, sowie mit wertvollen Impulsen das Gelingen dieser Arbeit ermöglichten.

Grosser Dank gilt auch Dr. Thorsten Klaas-Wissing und Dr. Timo Busch, die den Entstehungsprozess durch zahlreiche kritische Diskussionen und Anregungen grundlegend unterstützten und mir persönlich zur Seite standen.

Mein Dank richtet sich ebenso an meine Kollegen am LOG-HSG, die durch das freundschaftliche Arbeitsumfeld für mich einen besonderen Lebensabschnitt geschaffen haben in dem gleichermaßen konstruktive Diskussionen wie auch gemeinsame Sport- oder Abendaktivitäten seinen Platz fanden. Namentlich hervorheben möchte ich meinen langjährigen Bürokollegen Patrick Beck, der alle Hoch- und Tiefpunkte des Dissertationsprozesses mit mir durchlebte und mir immer ein offenes Ohr schenkte. Zudem möchte ich mich bei den Kollegen am SusTec bedanken, die mir eine zweite Anlaufstation boten und mich herzlich aufnahmen.

Der Erfolg praxisorientierter Forschung ist darüber hinaus massgeblich von der Unterstützung ausserhalb des universitären Umfelds abhängig. Daher möchte ich mich an dieser Stelle bei allen Projektpartnern für Ihre Offenheit und Ihr Engagement in den Interviews und Workshops bedanken.

Der größte Dank gilt meiner Familie und meinen Freunden, die mir auf dem zum Teil beschwerlichen Weg der Dissertation bedingungslos Kraft, Stabilität, Motivation und

notwendige Ablenkung schenken: meinen Eltern Eva Just und Witold Kudla, meiner Grossmutter Helene Just, meinem Stiefvater Ramiz Nino sowie Ada und Peter Schnitfeld. Darüber hinaus meinen Freunden, die auch in der Ferne stets für mich da waren: Mirjam Pekar-Milicevic, Verena Hassler, Ramona Pourziai und David Schmitz. Unschätzbarer Dank gilt schliesslich meinem Lebensgefährten Till Schnitfeld, der mich mit seiner liebevollen, unermüdlichen Art in den schwierigen Zeiten auffing, in den arbeitsintensiven Zeiten motivierte und mir zeigte wie wichtig die richtige Balance für das Leben und Arbeiten ist.

Meiner Familie und meinen Freunden sei daher diese Arbeit gewidmet.

London im Juli 2012,

Nicole Kudla

Table of Contents

List of Figures	vi
List of Tables.....	viii
List of Abbreviations.....	x
Summary	xi
1 Introduction	1
1.1 Managerial Relevance	1
1.2 Theoretical Relevance	3
1.3 Objectives and Research Questions	6
1.4 Positioning of Research within Scientific Theory	9
1.5 Outline of the Thesis	12
2 Conceptual Background	14
2.1 Sustainability Management.....	14
2.1.1 <i>Understanding of Sustainability</i>	14
2.1.2 <i>Corporate Sustainability Strategies</i>	16
2.1.3 <i>Interorganizational Sustainability Management</i>	19
2.2 Logistics Services.....	24
2.2.1 <i>Understanding of Logistics Services</i>	24
2.2.2 <i>Sustainable Logistics Services</i>	29
2.3 Incentive Mechanisms.....	30
2.3.1 <i>Understanding of Incentive Mechanisms</i>	30
2.3.2 <i>Interorganizational Incentive Mechanisms</i>	33
3 Theoretical Background	35
3.1 Overview of Organizational Theories Applied in the Research Context.....	35
3.2 Selection of Theoretical Lenses Regarding the Research Problem	41
3.2.1 <i>Agency Theory</i>	43
3.2.2 <i>Institutional Theory</i>	45
4 Research Framework.....	47

4.1	Definition of the Research Framework	47
4.2	Research Design: Paper A	49
4.3	Research Design: Paper B	50
4.4	Research Design: Paper C	50
5	Summary of Key Findings and Contributions	52
5.1	Key Findings and Contributions: Paper A	52
5.2	Key Findings and Contributions: Paper B	53
5.3	Key Findings and Contributions: Paper C	54
6	Conclusion.....	56
6.1	Scientific Contributions.....	56
6.2	Managerial Contributions.....	57
6.3	Limitations and Future Research	58
	Appendix	60
A	Sustainability in Shipper-Logistics Service Provider Relationships: A Tentative Taxonomy Based on Agency Theory and Stimulus-Response Analysis.....	61
A.1	Abstract	61
A.2	Introduction	61
A.3	Literature Review	63
A.4	Research Framework.....	65
A.5	Methodology	68
A.5.1	<i>Case Selection and Data Collection</i>	68
A.5.2	<i>Data Analysis</i>	70
A.5.3	<i>Taxonomy Development</i>	71
A.6	Results	72
A.6.1	<i>Stimuli for Sustainability in Shipper-LSP Relationships</i>	72
A.6.2	<i>Responding Sustainability Activities of LSPs</i>	75
A.7	Discussion: Development of a Tentative Taxonomy	80
A.7.1	<i>Responsive Low Performers (Quadrant A)</i>	82

A.7.2	<i>Responsive High Performers (Quadrant B)</i>	82
A.7.3	<i>Proactive Low Performers (Quadrant C)</i>	83
A.7.4	<i>Proactive High Performers (Quadrant D)</i>	83
A.7.5	<i>Agency Problems of Sustainability in Shipper-LSP Relationships</i>	84
A.7.6	<i>Limitations</i>	85
A.8	Implications for Future Research and Conclusion.....	86
B	Determinants of Interorganizational Sustainability Management in Dyadic Relationships: An Agency- and Institutional-Theoretic Analysis	88
B.1	Abstract	88
B.2	Introduction	88
B.3	Institutional Perspective on Interorganizational Sustainability	90
B.4	Agency Perspective on Interorganizational Sustainability	91
B.5	Research Framework on Interorganizational Sustainability	93
B.6	Methodology	95
B.6.1	<i>Case Selection</i>	96
B.6.2	<i>Data Collection</i>	97
B.6.3	<i>Data Analysis</i>	98
B.7	Results	102
B.7.1	<i>Findings on Intraorganizational Sustainability Management</i>	102
B.7.2	<i>Findings on Interorganizational Sustainability Management</i>	108
B.8	Determinants of Interorganizational Sustainability Management	111
B.8.1	<i>Environmental Characteristics: Market Regulation and Customer Demands</i> 113	
B.8.2	<i>Firm Characteristics: Decoupling</i>	114
B.8.3	<i>Measurability Difficulties</i>	115
B.8.4	<i>Uncertain Added Value</i>	116
B.8.5	<i>Goal Conflicts</i>	116
B.8.6	<i>Trust</i>	118
B.8.7	<i>Institutional Pressures outside the Principal-Agent-Dyad</i>	119
B.9	Discussion and Conclusion	119
B.9.1	<i>Contributions</i>	119

B.9.2	<i>Limitations and Future Research.....</i>	122
B.9.3	<i>Managerial Implications.....</i>	123
C	Designing Interorganizational Incentive Mechanisms for Sustainable Logistics Services: An Agency-Theoretic Analysis of Influential Factors	124
C.1	Abstract	124
C.2	Introduction	124
C.3	Literature Review	126
C.4	Theoretical Background and Research Framework	128
C.5	Methodology	131
C.5.1	<i>Case Selection</i>	<i>131</i>
C.5.2	<i>Data Collection</i>	<i>132</i>
C.5.3	<i>Data Analysis</i>	<i>135</i>
C.6	Results	136
C.6.1	<i>Findings on Sustainable Logistics Performance Criteria.....</i>	<i>136</i>
C.6.2	<i>Assessment of Sustainable Logistics Performance Criteria Regarding Influential Factors.....</i>	<i>139</i>
C.6.3	<i>Assessment of Incentive Mechanisms Regarding Influential Factors.....</i>	<i>141</i>
C.7	Incentive Mechanisms for Sustainable Logistics Services	143
C.7.1	<i>Incentives under Low Behavior Measurability, Low Goal Conflict and High Outcome Uncertainty</i>	<i>145</i>
C.7.2	<i>Incentives under Low Behavior Measurability, Low Goal Conflict and Low Outcome Uncertainty</i>	<i>146</i>
C.7.3	<i>Incentives under Low Behavior Measurability, High Goal Conflict and High Outcome Uncertainty</i>	<i>146</i>
C.7.4	<i>Incentives under Low Behavior Measurability, High Goal Conflict and Low Outcome Uncertainty</i>	<i>147</i>
C.7.5	<i>Incentives under High Behavior Measurability, Low Goal Conflict and High Outcome Uncertainty</i>	<i>148</i>
C.7.6	<i>Incentives under High Behavior Measurability, Low Goal Conflict and Low Outcome Uncertainty</i>	<i>149</i>
C.7.7	<i>Incentives under High Behavior Measurability, High Goal Conflict and High Outcome Uncertainty</i>	<i>149</i>

C.7.8	<i>Incentives under High Behavior Measurability, High Goal Conflict and Low Outcome Uncertainty</i>	<i>150</i>
C.8	Discussion and Conclusion	151
C.8.1	<i>Contributions.....</i>	<i>151</i>
C.8.2	<i>Limitations and Future Research.....</i>	<i>153</i>
C.8.3	<i>Managerial Implications.....</i>	<i>154</i>
References		155

List of Figures

Figure 1:	Relevant Issues within Sustainable Supply Chain Management Research.....	4
Figure 2:	Summary of Research Objectives	7
Figure 3:	Framework of Theory and Practice in Applied Sciences Research	10
Figure 4:	Outline of the Thesis	13
Figure 5:	Understanding of Sustainability	16
Figure 6:	Levels of Analysis of Interorganizational Relationships	20
Figure 7:	Definition of Logistics Services	24
Figure 8:	Understanding of Incentive Mechanisms	33
Figure 9:	Institutional Pressures Regarding Sustainable Behavior of Organizations	45
Figure 10:	Research Framework	48
Figure 11:	Scopes of Papers within the Research Framework	48
Figure 12:	Summarized Research Designs of the Papers	49

Appendix A

Figure A - 1:	Research Framework Based on Agency Theory and the S-O-R Model	67
Figure A - 2:	Overview of Responding Sustainability Activities / Sustainability Performance of LSPs	80
Figure A - 3:	Tentative Taxonomy by Contrasting Sustainability Stimulus and Response in Shipper-LSP Relationships.....	81

Appendix B

Figure B - 1:	Research Framework	95
Figure B - 2:	Process Steps of Data Analysis	100
Figure B - 3:	Framework of Determinants for Interorganizational Sustainability Management	120

Appendix C

Figure C - 1:	Research Framework	130
Figure C - 2:	Data Collection Process	133

Figure C - 3: Concluding Findings and Recommendations on Incentive Mechanisms
Regarding Characteristics of Sustainable Behavior153

List of Tables

Table 1:	Scientific-Theoretic Position of the Research	11
Table 2:	Corporate Sustainability Strategies	18
Table 3:	Definitions of Sustainable Supply Chain Management	21
Table 4:	Characterization of Logistics Services	26
Table 5:	Specific Attributes of Logistics Services	28
Table 6:	Control of Behavior and/or Outcome with Respect to Task Characteristics ...	32
Table 7:	Selection of Theoretical Lenses Regarding the Research Problem.....	42
Table 8:	Characteristics of Agency Problems	44

Appendix A

Table A - 1:	Case Sample	69
Table A - 2:	Stimuli for Sustainability in Shipper-LSP Relationships.....	72
Table A - 3:	Opportunities, Challenges and Needs Linked with Sustainability in Shipper-LSP Relationships	75
Table A - 4:	Responding Sustainability Activities of LSPs in an Economic Context.....	76
Table A - 5:	Responding Sustainability Activities of LSPs in an Environmental Context..	77
Table A - 6:	Responding Sustainability Activities of LSPs in a Social Context.....	79
Table A - 7:	Overview of Agency Problems of Sustainability in Shipper-LSP Relationships..	85

Appendix B

Table B - 1:	General Reflection of Institutional and Agency Characteristics.....	93
Table B - 2:	Case Sample	96
Table B - 3:	Data Sources (Archival Data and Interviewees)	98
Table B - 4:	Findings on Intraorganizational Sustainability Management of Shippers I...	104
Table B - 5:	Findings on Intraorganizational Sustainability Management of Shippers II .	105
Table B - 6:	Findings on Intraorganizational Sustainability Management of LSPs I	106
Table B - 7:	Findings on Intraorganizational Sustainability Management of LSPs II	107

Table B - 8: Findings on Interorganizational Sustainability Management.....	108
Table B - 9: Challenges Regarding Interorganizational Sustainability Management	110
Table B - 10: Summary of Findings.....	111

Appendix C

Table C - 1: Agency-Theoretic Propositions on the Influence of Task Characteristics on Incentive Design.....	129
Table C - 2: Case Sample	132
Table C - 3: Interviewees / Experts of the Case Sample	135
Table C - 4: List of Sustainable Logistics Performance Criteria.....	138
Table C - 5: Assessment of Sustainable Logistics Performance Criteria Regarding Influential Factors.....	139
Table C - 6: Ratios of Sustainable Logistics Performance Criteria Assigned to Influential Factor Levels	140
Table C - 7: Intended Types of Interorganizational Incentives for Sustainable Logistics Services.....	141
Table C - 8: Assessement of Intended Types of Interorganizational Incentives Regarding Influential Factors.....	142
Table C - 9: Contrast of Theoretically Proposed Incentives and Intended Incentives by Case.	144

List of Abbreviations

3PL	Third Party Logistics
CEP	Courier-Express-Parcel
CSR	Corporate Social Responsibility
EC	European Commission
EMT	Ecological Modernization Theory
EU	European Union
FMCG	Fast Moving Consumer Goods
GRI	Global Reporting Initiative
I-O	Input-Output
IT	Information Technology
KPI	Key Performance Indicator
LSP	Logistics Service Provider
LSR	Logistics Social Responsibility
QM	Quality Management
RBV	Resource-Based View
RQ	Research Question
SCM	Supply Chain Management
SSCM	Sustainable Supply Chain Management
SME	Small and Medium-sized Enterprises
S-O-R	Stimulus-Organism-Response
SQAS	Safety and Quality Assessment System
TCE	Transaction Cost Economics
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
VAS	Value-Added Service
WCED	World Commission on Environment and Development

Summary

The increasing political, societal and managerial relevance of sustainability, reflecting the tripartite understanding of economic, environmental and social concerns, confronts organizations with operationalization challenges within and across their boundaries. At present, sustainability strategies predominantly address the corporate level of the focal organizations of supply chains. On an interorganizational level, focal organizations develop codes of conduct or voluntary sustainability initiatives that primarily concern their manufacturing suppliers. Despite awareness of the external effects of logistics services and thus the presumed high relevance for sustainable development, logistics has been rarely taken into account by scholars and practitioners regarding interorganizational sustainability management. Therewith, performance criteria to assess and evaluate sustainable behavior, as well as related incentives concerning logistics service providers (LSPs), are a vastly unexplored arena.

The dissertation at hand addresses this arena by its investigation of the design of interorganizational incentive mechanisms for sustainability management of LSPs. It provides thorough insights regarding the current state of sustainable logistics services and interorganizational incentive mechanisms. As a cumulative thesis, it presents three empirical studies of explorative natures that analyze dyadic relationships of shipping organizations and LSPs. Based on the power structures in shipper-LSP relationships, agency theory is applied as a core organization theoretic lens, which is integrated with institutional theory within one of the studies.

The contributions of the thesis address scientific and practical issues regarding the research context. From a scientific point of view, the thesis contributes by its exploration of interorganizational sustainability management from an agency and institutional theoretic perspective. It indicates information asymmetries regarding the sustainable behavior of LSPs and discusses the empirical findings and incentive design suggestions from an agency theoretic standpoint. Beyond this, it observes determinants that influence the design of incentive mechanisms that can be related to agency and institutional theory.

From a managerial point of view, the dissertation is of interest to purchasers of logistics services, sustainability managers and executives within the logistics industry. It provides an empirically derived set of sustainable logistics performance criteria that are relevant as targets for incentive mechanisms. Moreover, managerial recommendations for the design of information, control, penalty and reward structures regarding sustainable logistics services are given.

1 Introduction

The research project aims to give recommendations on the design of incentive mechanisms for the sustainability management of logistics service providers (LSPs). The following paragraphs outline the managerial and theoretical relevance of the research at hand. Based on a twofold perspective of the research problem, the central research questions are derived. To conclude, the research is positioned within scientific theory and the outline and structure of the thesis are given.

1.1 Managerial Relevance

Since the World Commission on Environment and Development published its global agenda for sustainable change in 1987, the role of sustainability to "(...) meet the needs of the present without compromising the ability of future generations to meet their own needs" (*WCED* 1987) has increased noticeably in governmental, managerial and societal debates (*Sharma and Vredenburg* 1998). The ratification of the Kyoto Protocol¹ (*UN* 1998) in particular, its ongoing extension discussions based on the Cancun Agreements and the Bali Action Plan² (*UNFCCC* 2008; *UNFCCC* 2011a; *UNFCCC* 2011b) and increasing media attention to climate change, have led to a rethinking of organizations and society regarding the reduction and avoidance of environmental impacts. Beyond this, global value chains and the increased outsourcing degrees of multinational organizations have evoked extensive awareness of media and society concerning international working conditions and the social impacts of globalization (*Amaeshi et al.* 2008; *Foerstl et al.* 2010; *Kortelainen* 2008; *Matten and Moon* 2008; *Pullman et al.* 2009; *Scherer and Palazzo* 2011).

Against this background, organizations nowadays face growing stakeholder demands to balance the so-called triple bottom line concept of economic, environmental and social concerns on a supply chain level (*Carter and Easton* 2011; *Carter and Rogers* 2008; *Cuthbertson* 2011; *Elkington* 1997; *Pagell et al.* 2008). This fact leads to the convergence of

¹ The Kyoto Protocol, which was adopted in 1997 and ratified in 2005, sets emission reduction targets for 37 industrialized nations and the European Union (cf. *UN* 1998).

² Since the Kyoto Protocol will expire in 2012, the United Nations Convention Framework on Climate Change (*UNFCCC*) seeks for an advancement (based on the Cancun Agreements of 2010 and the Bali Action Plan agreed on in 2007), by the working group founded in the Durban meeting in late 2011. The Bali Action Plan sets the course for negotiation processes on climate change with the participating legal authorities. It mapped a long-term vision of climate change actions regarding five major categories: shared vision, mitigation, adaption, technology and financing (*UNFCCC* 2008). Based on the Action Plan as well as on the outcomes of the Copenhagen advancements, the Cancun Agreements lead to a commitment of all parties to make their emission reduction targets official now and beyond 2012. Thereto, the formed working group within the Durban meeting aims to develop a unitized action plan until 2015, which shall become effective from 2020 onwards (*UNFCCC* 2011a).

sustainability and supply chain management concepts (*Kudla and Stölzle 2011*). Sustainability research and practice in the 1990s and early 2000s predominantly dealt with the reasoning of sustainable behavior and the alignment of the economic, environmental and social dimensions on a corporate level (*Bansal and Roth 2000; Campbell 2007; Carroll and Shabana 2010; Ransom and Lober 1999*). Extension to an interorganizational level leaves focal companies with new challenges to assess and actuate the sustainable behavior of their suppliers (*Pagell and Wu 2009; Seuring and Müller 2008a*). Hence, focal companies demand solutions to reduce information and behavioral uncertainties by means of adequate incentive mechanisms, i.e. supplier management processes such as supplier evaluation, selection and development (*Foerstl et al. 2010; Hofmann et al. 2008*). Thereto, proactive voluntary sustainability initiatives and codes of conduct have been developed and discussed in recent years (*Kenny 2007; Meisner Rosen et al. 2002; Pedersen and Andersen 2006; Peters et al. 2007; Peters and Hofstetter 2008; Peters et al. 2011; Prieto-Carrón 2008; Sobczak 2006*). Nonetheless, voluntary sustainability initiatives and codes of conduct predominantly address manufacturing suppliers, whereas service providers have been rather disregarded in interorganizational sustainability management research and practice (*Seuring 2008; Wolf and Seuring 2010*).

Logistics and transport services especially have vast potential and have been named among the seven core priorities of the EU strategy for sustainable development (*Bretzke and Barkawi 2010*). Freight transports and road transports in particular are outlined as growing faster than the EU's gross domestic product (GDP), with severe noise, air pollution and health impacts. Hereto, the EU has committed to sourcing 10% of its transport fuel consumption from renewable energy sources by 2020 (e.g. biofuel, renewable electricity and hydrogen). Moreover, further internalization of external costs³ and promotion of energy-efficient road transport vehicles and intelligent transport systems are planned (*Brenck et al. 2007; EU 2009; Himanen et al. 2005; Piecyk and McKinnon 2007*).

Against this background of sustainable logistics services, a recent analysis of *Nehm et al. (2010)* is taken into account. The authors analyze the current status of sustainability management tasks and actions among the 150 LSPs with the highest revenues in the German logistics market. According to their results, the majority of the LSPs still observe the changing environment and hesitate to implement and invest in sustainable actions. They relate their findings to uncertainties regarding how governmental and shipper requirements

³ The external costs of transports refer to the external effects that are caused by transport but paid by third parties. These external effects include noise, emissions, congestion, land consumption and pollution, as well as accident, safety and health impacts. Therefore, the internalization of external costs, i.e. the causer-compatible deduction of external costs, is a major task of transport policy (e.g. *Brenck et al. 2007; Himanen et al. 2005; Piecyk and McKinnon 2007*).

will change in the near future. Nonetheless, the authors point out the strong dependence of LSPs on shippers' requirements as a starting point to actuate sustainable behavior (*Nehm et al.* 2011). Consequently, this leads to the question of how shippers can design incentive mechanisms in order to balance the opportunistic behavior of LSPs and stimulate sustainable logistics services.

Logistics services are a core outsourcing function of manufacturers (*Logan* 2000; *Osman et al.* 2003; *Razzaque and Sheng* 1997) and hold a prominent role in interorganizational sustainability management (*Reuter et al.* 2010). Nonetheless, shipping companies struggle regarding whether and how to deal with logistics in their sustainability management. According to recent studies of *Lieb and Lieb* (2010) and *Wolf and Seuring* (2010), shippers face measurability and evaluation difficulties regarding the sustainability performance of LSPs (*Carter and Easton* 2011; *Carter and Rogers* 2008). Furthermore, they need to align traditional selection criteria such as "(...) cost, quality, lead time, features, aesthetics, reliability, trust-level, brand equity, service level, product variety offered, customization, additional services provided, etc. (...)" (*Wolf and Seuring* 2010, p. 95) with new environmental and social objectives. Shippers, thus, need to adapt their supplier performance measurement and management systems in line with their newly developed strategic sustainability objectives. Performance management, hereby, cascades strategic values to the operational level by means of adequate performance measures and integrates coordination and controlling tasks (*Stölzle* 2002).

Considering the outlined relevance of sustainable logistics services, the core objective of this dissertation is to derive recommendations for the design of interorganizational incentive mechanisms. It aims to explore the current status and determinants of interorganizational sustainability management in shipper-LSP relationships. Moreover, it contributes to a further understanding of operationalizing the concept of sustainability. It aims to provide a starting point for shippers to design adequate incentive mechanisms and for LSPs to prepare for desirable sustainability management tasks and actions.

1.2 Theoretical Relevance

From a theoretical point of view, the research on interorganizational incentive design in shipper-LSP relationships is allocated within the arena of sustainable supply chain management (SSCM). In the following section, the research problem is introduced from this perspective in order to present the research problem from its organization theoretic viewpoint.

Figure 1 summarizes recent theoretical SSCM frameworks and illustrates corresponding research issues relevant to this dissertation. It centers focal organizations and their multi-tier suppliers embedded in their institutional environments in the style of *Gold et al. (2010)* and *Seuring and Müller (2008b)*. According to the framework of *Carter and Rogers (2008)*, the SSCM concept is based on the convergence of the triple bottom line and supply chain management (SCM) concepts. Thereto, economic, environmental and social performance objectives are achieved by strategic, transparent integration with intraorganizational and interorganizational supply chain management functions⁴ (*Gibson et al. 2005; Mentzer et al. 2001; Mentzer et al. 2008; Stock and Boyer 2009*). First, the intraorganizational level encompasses strategy formulation, organizational culture, performance management and reporting, as well as the design and production of sustainable products (*Carter and Rogers 2008; Pagell and Wu 2009*). Second, the interorganizational perspective evolves from intraorganizational sustainability management of the focal organizational and concerns incentive mechanisms by means of supplier management processes such as supplier evaluation, selection and development (*Reuter et al. 2010; Seuring and Müller 2008b*). The latter aspects are also identified as core issues and opportunities for future research by the Delphi study of *Seuring and Müller (2008a)*. Finally, both levels address the distinct functions of SCM, namely material suppliers, purchasing, production, logistics, marketing and material, information or finance flow facilitating systems.

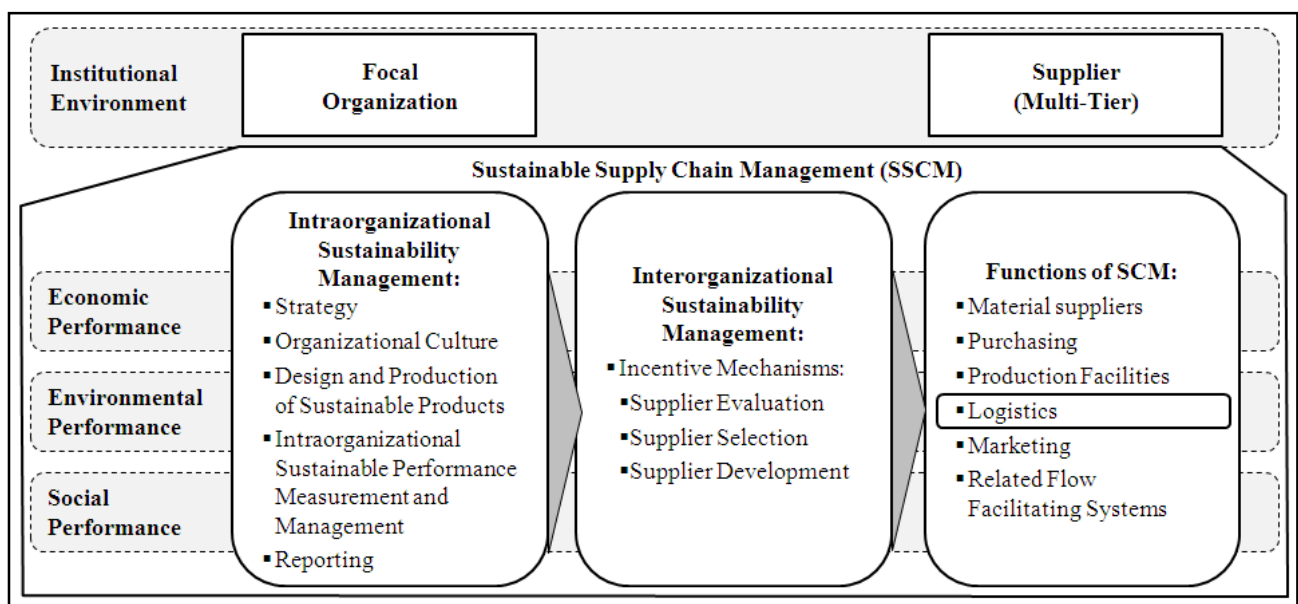


Figure 1: Relevant Issues within Sustainable Supply Chain Management Research

⁴ Figure 1 follows the definition of *Stock and Boyer (2009)*, who define SCM as "the management of a network of relationships within a firm and between independent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing and related systems that facilitate the forward and reverse flow of materials, services, finances and information" (p. 706).

Based on the presented initial framework, the research at hand centers the integration of three core research issues: sustainability management, incentive mechanisms and logistics services⁵. It focuses on contractual relations regarding logistics services and aims to design incentive mechanisms applicable for shippers to actuate the sustainable behavior⁶ of LSPs and subcontractors of LSPs⁷. According to the highlighted research issues, suitable organizational theoretical lenses are contemplated⁸. Sustainability is traditionally analyzed from perspectives such as the resource-based view (*Bansal 2005; Daily and Huang 2001; Reuter et al. 2010*), institutional theory (*Campbell 2007; Jennings and Zandbergen 1995; Meisner Rosen et al. 2002; Peters and Hofstetter 2008; Peters et al. 2011; Ransom and Lober 1999*) or stakeholder theory (*Bremmers et al. 2007; Carroll 1991; Delmas and Toffel 2004; Jamali 2008*). However, scholars contemplating the interorganizational perspective of SSCM outline that "there is a deficit in the take-up of theoretical background, both from within the supply chain or operations management, as well as from a wider perspective, such as new institutional economics and strategic management" (*Seuring and Müller 2008b*, p. 1706). This finding may be linked with incentive and logistics services research. In an interorganizational context, incentive research is related to buyer-supplier relationships, which are often investigated with new institutional economics lenses (*Albers 2005; Stölzle 1999*). This is valid for logistics services as well, since researchers have widely analyzed outsourcing and contract design from new institutional economics viewpoints (*Logan 2000; Maloni and Carter 2006; Osman et al. 2003; Razzaque and Sheng 1997; Selviaridis and Spring 2007*). In this context, transaction cost theory and agency theory play prominent roles, whereas property rights theory seems to play a minor role (*Stölzle 1999*). Transaction cost theory is suitable for the design of buyer-supplier relationships, whereas property rights theory deals with the allocation of operational and mandate rights. However, explanations of behavioral uncertainties and solutions for optimal incentive design are predominantly investigated from agency theoretic viewpoints.

Agency theory centers a contractual relation between an ordering party (the principal) and the contractor (the agent) under the constraints of information asymmetries, uncertainties

⁵ The state of the research regarding the highlighted issues is contemplated in Sections 2.1-2.3.

⁶ Throughout the course of this dissertation, sustainable behavior and sustainability performance refer to the understanding of sustainability as a tripartite concept of economic, environmental and social performance (see Section 2.1.1). Therewith, the understanding needs to be distinguished from the term sustainable competitive advantage (e.g. *Barney 1991; Oliver 1997*) or the temporal meaning of sustainable, implying 'long-term'.

⁷ In the remainder of this research, the multi-tier perspective is reduced to a dyadic perspective in order to reduce complexity and allow for a higher generalizability of the findings. However, the implications derived are meant to be transferrable to multi-tier suppliers and, thus, subcontractors of LSPs as well. A detailed explanation is given in Section 2.1.3.

⁸ The following paragraph summarizes the detailed insights given in Chapter 3 and the three research papers. For a presentation of the organization theoretic lenses applied regarding the research context and an assessment of the suitability of these viewpoints refer to Chapter 3.

and risk allocation (*Eisenhardt* 1989a). It analyzes typical problems and provides mechanisms such as incentives and control and information systems to cope with these problems and the opportunistic behavior of principals and agents (*Ebers and Gotsch* 2002).

According to a recent organizational theoretic literature review of *Sarkis et al.* (2011), agency theory belongs to the rather seldom applied theoretical lenses to sustainability research that show promise in contributing to the investigation of interorganizational incentive and reward structures. Furthermore, it benefits from a natural fit with supply chain management (*Ketchen and Hult* 2007, *Sarkis et al.* 2011). Therefore, the dissertation at hand applies agency theory as the core organizational theoretic lens. Nonetheless, agency theory has its boundaries and limitations. First, it is often criticized for its restricted view on contractual relations, neglecting the institutional environment (*Gomez-Mejia et al.* 2005; *Gomez-Mejia and Wiseman* 2007; *Worsham et al.* 1997). Second, sustainability is often referred to as legitimacy-driven, whereas agency theory postulates efficiency as the core objective of organizations (*Bansal and Roth* 2000; *Berrone and Gomez-Mejia* 2009; *Eisenhardt* 1988; *Oliver* 1991). Third, agency theory neglects the role of trust and recurrent contractual relationships, but buyer-supplier relationships are based on prior experiences and reputation (*Beccerra and Gupta* 1999; *Shapiro* 2005). Considering these restrictions, the cumulative dissertation takes other theoretical lenses into account and critically discusses the identified boundaries. Within the first research work, agency theory is combined with a behavioral scientific approach in order to explore the current state of incentives and LSP behavior. The second paper integrates agency and institutional theory in order to consider all named boundaries and provide a holistic approach to the determinants of interorganizational sustainability management. The third paper addresses agency theoretic influences regarding the design of incentive mechanisms. However, it stresses the limitation that LSPs may face diverging incentives from their stakeholders.

1.3 Objectives and Research Questions

As illustrated in Figure 2, the research objectives are defined from a managerial and theoretical perspective. From a managerial point of view, the dissertation aims to explore the current state of incentive mechanisms applied by shippers and the responding sustainable behavior of LSPs. Hereby, a basic understanding of challenges and agency theoretic problems is obtained. Beyond this, determinants for interorganizational sustainability management are discovered. These determinants outline aspects worth considering by shippers when developing interorganizational incentive mechanisms. Finally, sustainable logistics behavior is defined and its characteristics are investigated.

Herewith, the research aims to provide anchors and recommendations for incentive design. LSPs may rely on these findings in order to develop their sustainability management based on actions desired by their shippers.

From a theoretical perspective, the research project contributes to the field of interorganizational sustainability management and thus SSCM research. The identified research gap on the design of interorganizational incentive mechanisms is contemplated from a new institutional economics point of view. In terms of in-depth analysis of the contractual relationship between shippers and LSPs, agency theory is applied as the core organizational theoretic lens. Since the contemplation of principal-agent problems under sustainability objectives is lacking in research and goes beyond the basic assumptions of opportunism and efficiency rationales, the present research contributes to sustainability, logistics and organizational research. Beyond this, it adds to theory building in SSCM research, based on an approach that bridges agency theory and institutional theory.

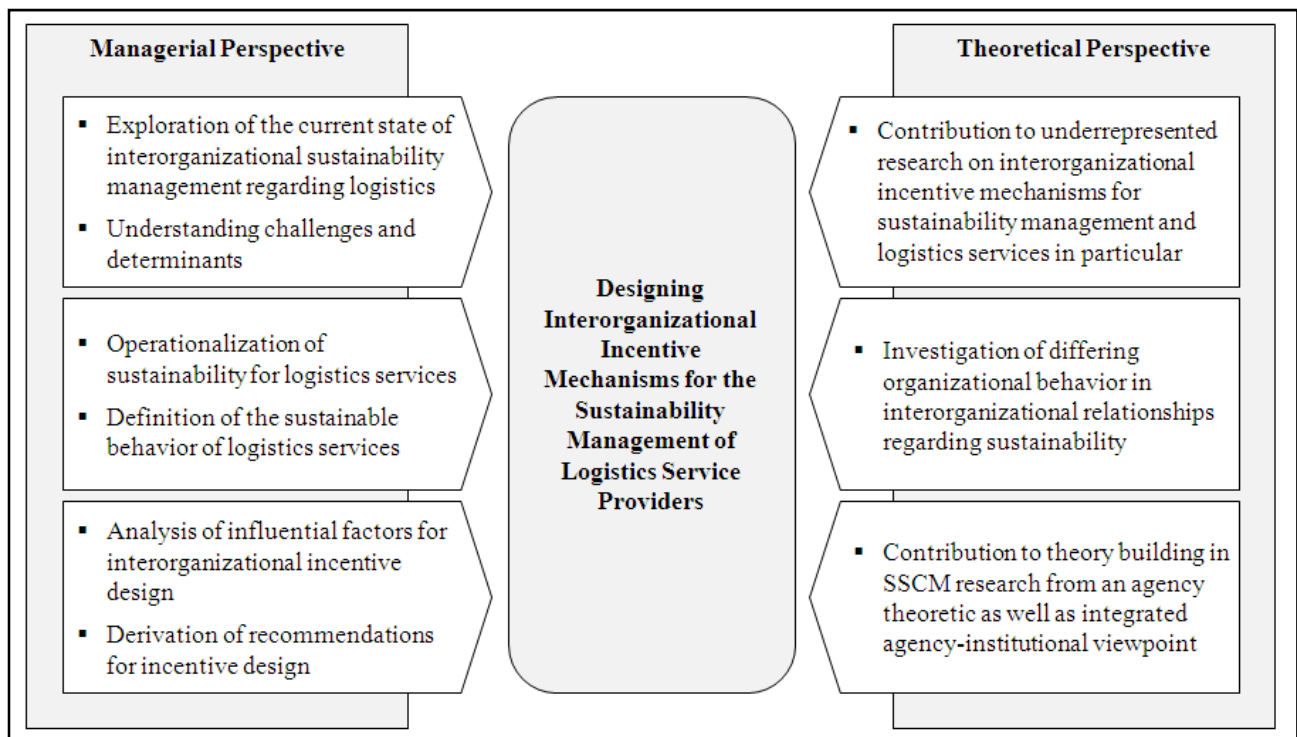


Figure 2: Summary of Research Objectives

Based on the outlined research objectives, the primary research question is formulated as:

RQ: *How can interorganizational incentive mechanisms be designed by shippers in order to actuate the sustainable behavior of LSPs?*

In order to adequately address the primary research question and elucidate the research objectives, a set of more distinct, subordinated research questions needs to be determined.

The first subordinated research question concerns the current state of interorganizational incentive mechanisms for sustainable logistics services. It covers an explorative analysis of stimuli by shippers and responding activities by LSPs. Thereby, it aims to explore and distinguish types of sustainably engaged LSPs through the development of a taxonomy. Beyond this, the research question facilitates the identification of agency problems regarding sustainability in shipper-LSP relationships.

RQ 1: How is sustainability stimulated by shippers requirements and how do LSPs respond to these?

The second subordinated research question aims to provide a deeper understanding of differing sustainable organizational behavior in shipper-LSP relationships. In order to derive adequate incentive mechanisms, it is essential to gain insights into determinants that influence the transfer of the intraorganizational sustainability management of shippers to an interorganizational level. Hence, the research question targets the development of a framework that explains how incentive mechanisms, implying supplier evaluation, selection and development, are subject to internal and external aspects of contractual relationships.

RQ 2: What determines the conferment of interorganizational sustainability management in dyadic relationships?

The third and fourth subordinated research questions are closely interrelated and target the concrete design of incentive mechanisms. Thereto, the research questions follow the essentials of incentive design described by *Kaplan and Henderson* (2005). The authors claim to identify what should be rewarded in order to design what should be done. The contribution of these research questions lies in providing a more detailed understanding of interorganizational incentive design for sustainability from an agency theoretic perspective. They aim to define suitable sustainable logistics performance criteria, as well as to assess their characteristics, i.e. behavior measurability, goal conflict and outcome uncertainty. Finally, recommendations for incentive design related to the characteristics of sustainable behavior shall be derived.

RQ 3: What sustainable logistics performance criteria are relevant as targets for interorganizational incentives?

RQ 4: How can interorganizational incentives for sustainable logistics services be designed regarding the characteristics of behavior measurability, goal conflict and outcome uncertainty?

1.4 Positioning of Research within Scientific Theory

The following section provides a deeper understanding of the dissertation project, linking it to its scientific-theoretic background. Scientific theory is generally understood to be the philosophy of science (*Bunge 1996*). It provides propositions regarding the objectives of science, its predications and fundamental methodological sets. Thereby, it differentiates rigorous scientific work and induces principles for scientific problem solving (*Raffée and Abel 1979*).

Business research is generally classified as a real science that follows theoretical and pragmatic objectives (*Ulrich and Hill 1979*). The theoretical objectives focus on the development of hypotheses that explain past circumstances in order to predict future situations (*Chmielewicz 1979*). Principally, this system of hypotheses builds theories that are derived by deduction. Deduction hereby implies the process of universally valid hypothesis generation by means of logical conclusion (*Popper 2002*). Therefore, the theoretical objectives of real sciences aim to provide a deductive explanation of empirical extracts of the real world. Applied real sciences center the pragmatic objectives and analyze organizational and individual action alternatives (*Ulrich and Hill 1979*). Hereby, the term "applied" implies that existing theoretical knowledge is utilized to evoke practical application (*Schanz 1979*). Thereto, pragmatic objectives in applied real sciences are achieved by inductive argumentation. The principle of induction states that individual observations and experiences are generalized by inductive conclusion (*Chalmers 2007*; *Chmielewicz 1979*; *Petri 1976*; *Seiffert 1996*). Consequently, the theoretical and pragmatic objectives of business research lead to the explication and generalization of subjectively perceived extracts of the real world in order to derive recommendations for its design (*Ulrich and Hill 1979*). Against this background, deductive and inductive methodologies need to be integrated in order to conduct rigorous business research instead of theory-lacking empiricism (*Raffée and Abel 1979*).

Hence, the research at hand is designed in relation to the framework of applied sciences of *Ulrich (1995)*, which is illustrated in Figure 3. The framework maps seven steps that indicate the design of applied sciences research. It starts with the identification of a problem in practice and the indication of its managerial relevance. The second step refers to the linkage of the practice problem with suitable theoretical knowledge. Third, a problem-relevant methodology needs to be selected in order to adequately address and investigate the problem. In a fourth step, the research problem is investigated empirically. The following steps relate to the in-depth analysis of the data and the derivation of recommendations for theory and practice.

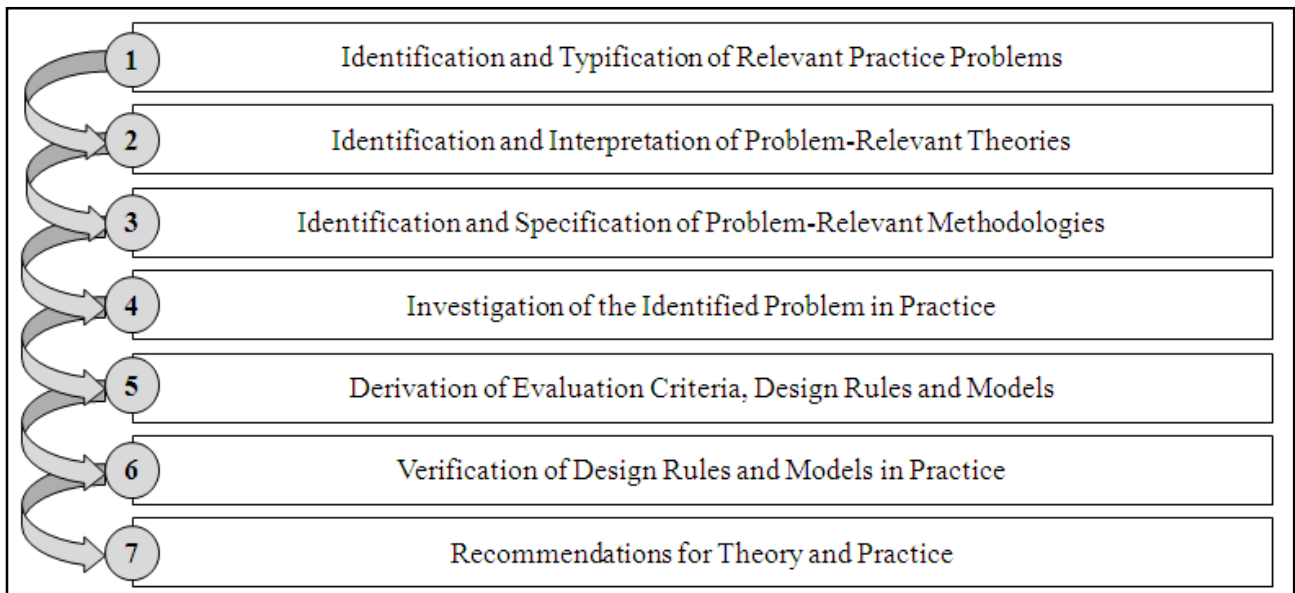


Figure 3: Framework of Theory and Practice in Applied Sciences Research
(Adapted from *Ulrich* 1995, p. 193)

The design of interorganizational incentive mechanisms for the sustainability management of LSPs indicates a still vastly unexplored business research problem of a transdisciplinary nature (cf. sustainability, logistics and incentive mechanisms). In order to derive practically applicable recommendations and theoretically valuable insights, the dissertation follows theoretical and pragmatic research objectives. The theoretical objective aims to describe and explain elements of interorganizational sustainability management and their coherences regarding incentive design against the described research context. Hereby, the dissertation draws on conceptual and theoretical cognizance⁹ of the outlined transdisciplinary research topics. In order to derive explicative propositions, the structurization and description of the research context are in the foreground. Thereto, it is essential to integrate conceptual knowledge and adequate theoretical approaches through a heuristic research framework¹⁰ (*Ulrich et al.* 1976). The pragmatic objective concerns the derivation of practicable recommendations and explanations regarding incentive design. Therefore, a purely deductive methodology based on existing conceptual and theoretical knowledge is unsuitable. A solely inductive methodology based on empirical findings would lead to insufficient scientific rigor. Hence, the research at hand chooses a deductive-inductive approach. The conceptual and theoretical knowledge deductively forms relevant conclusions, delimitations and predications of the research problem, whereas the explorative, empirical analysis of shipper-LSP relationships allows for inductive theory building inferences, as well as practical recommendations. The position of this research within scientific theory is summarized in Table 1.

⁹ See Chapters 2 and 3.

¹⁰ See Chapter 4.

Scientific Approaches / Characteristics	Theoretical Sciences Approach	Applied Sciences Approach	Dissertation Approach
Origin of Problem	▪ Within Science	▪ Within Practice	▪ Within Science and Practice
Type of Problem	▪ Disciplinary	▪ Transdisciplinary	▪ Transdisciplinary (Sustainability, Logistics and Incentive Mechanisms)
Research Objectives	▪ Theory Building and Testing ▪ Explanation of Existing Phenomena	▪ Development of Possible Realities	▪ Description and Explanation of Organizational Behavior ▪ Recommendations for Incentive Design
Scientific Adjustment Factor	▪ Truth	▪ Applicability	▪ Theory Building ▪ Applicability for Shippers and LSPs
Advancement Criteria	▪ General Validity ▪ Explanation Strength ▪ Prediction Strength	▪ Strength to Solve Practice Problems	▪ Explanation Strength ▪ Strength to Solve the Practice Problem
Knowledge Base	▪ Deductive	▪ Inductive	▪ Integrated Deductive-Inductive Approach

Table 1: Scientific-Theoretic Position of the Research
(Adapted from *Ulrich* 1984, p. 165)

The scientific-theoretic basis of the dissertation induces that the data in focus needs to be of a natural and empiric source indicating actual organizational behavior. From an epistemological point of view, incentive design regarding sustainable behavior cannot be isolated from the context in which it occurs (*Meredith et al.* 1989). Therefore, the research is based on an interpretive perspective. To conclude, both the epistemological perspective as well as the source and nature of the data lead to action research and case studies as the proposed methodologies (*Meredith et al.* 1989). This choice is also underlined by the early stage of incentive mechanisms for sustainable logistics services in practice. Due to this initial stage, a large-scale theory-testing approach would not have been suitable due to the rare occurrence of incentive mechanisms in practice. However, the research at hand aims to formulate and illustrate coherences and causal relationships that may be tested in future research.

1.5 Outline of the Thesis

Based on the outlined managerial and theoretical relevance, as well as the derived research objectives and questions, the following section presents the structure of the thesis, which draws from the illustrated framework of *Ulrich* (1995) (see Figure 3). As demonstrated by Figure 4, the cumulative dissertation is divided into six chapters and an appendix, which includes the three research papers.

Chapter 1 presented the introduction and relevance of the research from a managerial and theoretical viewpoint. Furthermore, it outlined the research objectives and positioned them in the scientific-theoretic background of applied sciences research.

Chapter 2 provides the state of the literature and thus the conceptual background of the thesis. Since the unit of analysis is of a transdisciplinary nature involving sustainability, logistics services and incentive mechanisms research, a subchapter is dedicated to each research arena to introduce the terminology and delimitations.

Chapter 3 starts with the identification of relevant organizational theories regarding the research context. It introduces a problem-oriented selection process, which leads to the selection of agency theory as the core theoretical base and institutional theory as a complementary theoretical base. To conclude, it presents the contributions and specifications of both theoretical approaches to the research.

Chapter 4 integrates the conceptual and theoretical background. Thereby, it elucidates the core elements and constructs relevant to the research and defines the heuristic research framework. The core task of the framework is to structure the research process. Thereby, it provides a holistic view on the research design of all three papers.

Chapter 5 briefly summarizes the key results and contributions of the three papers included in the Appendix.

Chapter 6 gives an overall conclusion and highlights the key scientific and managerial implications of the research. Finally, it presents the limitations and prospective opportunities for future research.

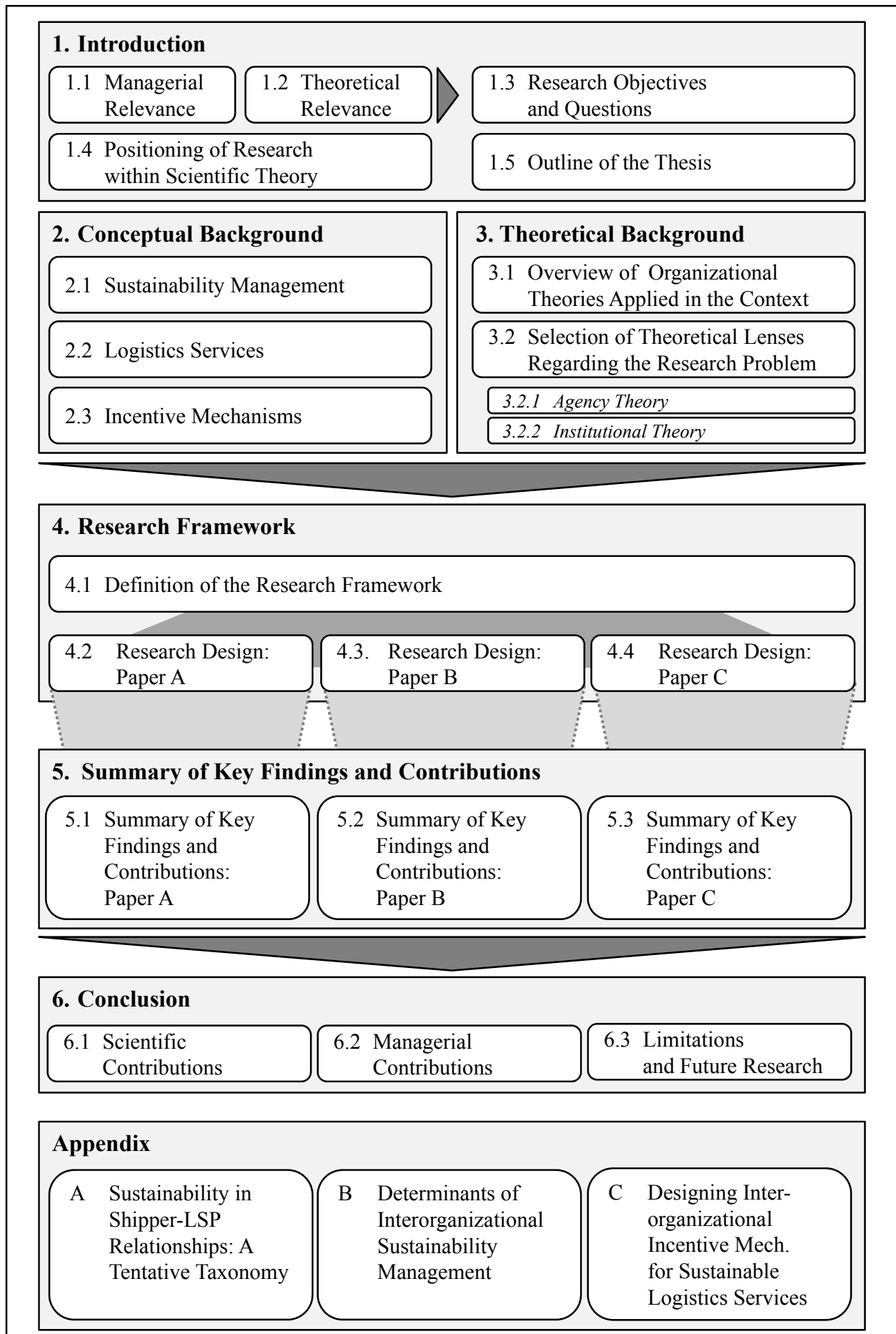


Figure 4: Outline of the Thesis

2 Conceptual Background

The following chapter provides the conceptual background of the thesis. It introduces a basic understanding of the relevant transdisciplinary research fields of sustainability management (Section 2.1), logistics services (Section 2.2) and incentive mechanisms (Section 2.3). Furthermore, relevant concepts and the state of the research are presented.

2.1 Sustainability Management

In order to define and introduce sustainability management concepts and ideas, it is essential to distinguish the corporate or intraorganizational level of sustainability and the interorganizational perspective. Therefore, the first paragraph provides a basic understanding of sustainability. The second paragraph elucidates sustainability strategies and relevant concepts on an intraorganizational level. Third, the intraorganizational level of sustainability management is expanded to include the supply chain perspective and an interorganizational perspective. Thereto, the state of the research and relevant issues identified are provided¹¹.

2.1.1 Understanding of Sustainability

Despite the fact that ‘sustainability’ has evolved as a buzzword in business, media, societal and political debates nowadays, its definition and applied terminology varies significantly, both in research and in practice. In the context of sustainability, numerous terms are applied, such as corporate responsibility (e.g. *Bansal and Roth* 2000; *Waddock* 2009), sustainable development (e.g. *Endress et al.* 2005; *Gudmundsson and Höjer* 1996; *Lélé* 1991; *Shrivastava* 1995; *Starik and Rands* 1995; *Taylor* 1994; *Wilson* 2003), corporate governance (e.g. *Hezri and Dovers* 2006; *Kacperczyk* 2009), citizenship (e.g. *Crouch* 2006; *Windsor* 2006) or even philanthropy (e.g. *Brink* 2009; *Jamali and Mirshak* 2007; *Porter and Kramer* 2006; *Yadong* 2006). The diversity of terms applied in organizations and theory demonstrates the variety of understandings of sustainability. However, the underlying traditional understanding, which is the basis for this thesis, is defined by the triple bottom line concept (*Elkington* 1997). It encompasses "(...) economic development, environmental stewardship and social equity" (*Sikdar* 2003, p. 1928).

In this context, the economic dimension is generally in line with the traditional understanding of 'the business of business' (*Baron* 2007; *Scherer and Palazzo* 2011):

¹¹ This section summarizes the findings of a literature review on SSCM by *Kudla and Stölzle* (2011). Moreover, it includes parts of the more specified literature reviews regarding the research papers in the Appendix.

"Economically sustainable companies guarantee at any time cashflow sufficiency to ensure liquidity while producing a persistent above average return to their shareholders" (*Dyllick and Hockerts* 2002, p. 133).

"Economic prosperity involves the creation and distribution of goods and services that will help to raise the standard of living around the world. Open, competitive, international markets that encourage innovation, efficiency, and wealth creation are fundamental aspects of sustainable development" (*Bansal* 2005, p. 198).

The environmental dimension of sustainability centers the reduction and avoidance of environmental impacts by economic actions:

"Ecologically sustainable companies use only natural resources that are consumed at a rate below the natural reproduction, or at a rate below the development of substitutes. They do not cause emissions that accumulate in the environment at a rate beyond the capacity of the natural system to absorb and assimilate these emissions. Finally they do not engage in activities that degrade eco-system service" (*Dyllick and Hockerts* 2002, p. 133).

Finally, the social dimension displays the contribution of organizations towards the quality of life of the societal community (*Carroll* 1991):

"The social equity principle ensures that all members of society have equal access to resources and opportunities. (...) Human needs not only include basic needs such as food, clothing, and shelter, but also include a good quality of life such as health care, education, and political freedom" (*Bansal* 2005, p. 198).

In contrast to these scientific definitions, organizations' understanding of sustainability ranges from normative-ethical approaches, whereby managers need to do the right thing regardless of how such decisions affect firm performance (cf. *Brink* 2009; *Donaldson and Davis* 1991; *Husted and Allen* 2000), to strategic-instrumental approaches, whereby "(...) the firm's ideal level of corporate social responsibility can be determined by cost-benefit analysis" (*McWilliams and Siegel* 2001, p. 117). Thereto, *Bansal* (2002) illustrates how the societal understanding of sustainability (the understanding within this dissertation) differs from the traditional understanding of sustainability by firms. This difference is illustrated in Figure 5, where the triple bottom line of sustainability is illustrated by the integrated sustainability triangle of *Kleine and Von Hauff* (2009).

However, there are also significant discordances regarding the understanding of sustainability in the extant literature. Within their review, *Kudla and Stölzle* (2011) identify that researchers either focus on one of the dimensions exclusively or apply an integrated understanding of sustainability. Nonetheless, there is still a major historically driven focus

on environmental sustainability, whereas the societal dimensions and the integrated view have caught up slowly in recent years. Against this background, this dissertation follows a holistic understanding of sustainability.

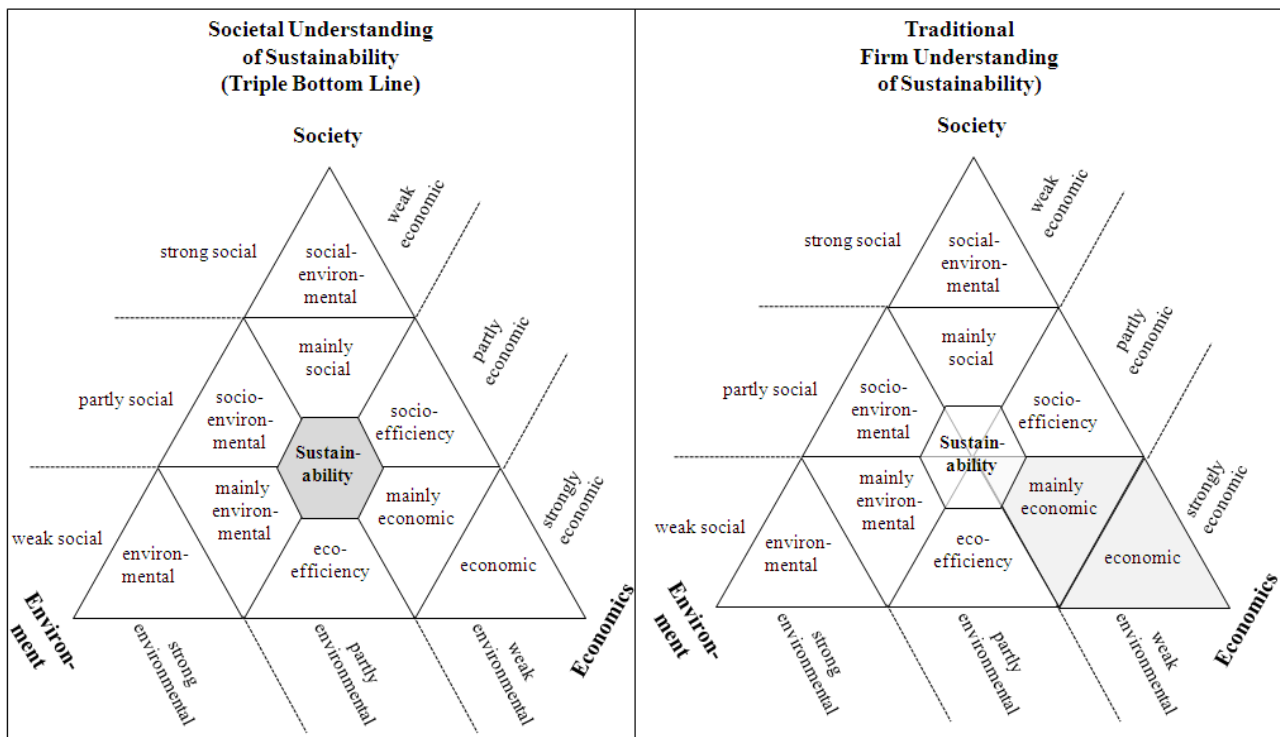


Figure 5: Understanding of Sustainability

(Adapted from *Bansal* 2002, p. 125; *Dyllick and Hockerts* 2002, p. 138 and *Kleine and Von Hauff* 2009, p. 523)

2.1.2 Corporate Sustainability Strategies

The following section centers the differentiation of corporate sustainability strategies and thus the tripartite understanding and reflection of sustainability within organizational strategies and actions. Thereto, it is assumed that the sustainability strategy is part of the corporate strategy of an organization (*Orsato* 2009). Contemplating the contrasting positions of the traditional understanding of firms and normative-ethical approaches, it becomes clear that sustainability strategies differ noticeably. As summarized in Table 2, the extant literature distinguishes various continuum approaches and typologies of sustainability strategies. A continuum of strategic approaches classifies different developmental stages of sustainability, whereas a typology reflects conceptually interrelated ideal types of sustainability strategies (*Kolk and Mauser* 2002). Moreover, strategic approaches are based on distinct reasoning as to why firms engage sustainably. According to *Van Marrewijk* (2003), organizations are either obliged to act sustainably, they want to do it or they are made to it.

The continuum approaches to sustainability strategies appeal to two predominant paradigms: the first is compliance or reactivity and the second is proactivity (*Aragon-Correa* 1998; *Carroll* 1979; *Darnall et al.* 2008; *Hunt and Auster* 1990; *Kolk and Mauser* 2002; *Oliver and Holzinger* 2008; *Wartick and Cochran* 1985). A reactive or compliant posture responds to changes in the institutional environment, implying pressures by governmental regulations or other stakeholders (*Aragon-Correa and Sharma* 2003). By contrast, a proactive posture reflects voluntary or anticipatory strategies of organizations in order to alter their operations and products sustainably (*Lin and Darnall* 2010).

A well-known and wide-spread classification of environmental management strategies, which is transferable to sustainability, is provided by *Hunt and Auster* (1990). This classification distinguishes five stages, ranging from beginners to proactives. The authors present a set of criteria, such as management commitment and involvement, resource commitment, performance objectives, reporting structures and integration within an organization, to distinguish the development and comprehensiveness of sustainability strategies and subsequent actions.

In contrast, the typology of *Orsato* (2009) distinguishes sustainability strategies regarding the competitive advantages that organizations seek. The typology is based on the competitive focus of an organization, which is determined by the organization's position within an industry, the types of market relevant to an organization and the organization's capabilities to acquire resources and to implement innovative strategies.

However, both classification approach types suffer limitations. Whereas continuum approaches are criticized for the difficulty in determining the stage that an organization falls into, typological approaches provide interrelated strategies, which may be applied simultaneously (*Hass* 1996; *Kolk and Mauser* 2002).

The dissertation at hand has its foundations in continuum approaches. It is assumed that sustainability management implies a development process that traverses distinct stages of sustainable behavior and engagement, from a beginning stage to high sophistication and comprehensiveness. Thereto, the dissertation proposes that within interorganizational relationships, organizations of distinct developed stages of sustainability management encounter one another. Therefore, the described research problem of designing incentive mechanisms for sustainability management implies that shippers or buying organizations of a more advanced stage actuate their LSPs or suppliers by incentive mechanisms to provide similar or specified sustainable behavior. Thereby, incentive mechanisms fulfill the task of activating sustainable development processes.

Source	Continuum of Stages or Choices of Sustainability Strategies				
	Beginner	Firefighter	Concerned Citizen	Pragmatist	Proactive
<i>Hunt and Auster (1990)</i>					
<i>Müller and Koechlin (1992)</i>	Inactive	Reactive	Proactive		Hyperactive
<i>Roome (1992)</i>	Non-Compliance	Compliance	Compliance Plus	Commercial and Environmental Excellence	Leading Edge
<i>Orsato (2009)</i>	Strategy 1 Eco-Efficiency	Strategy 2 Beyond Compliance Leadership	Strategy 3 Eco-Branding	Strategy 4 Environmental Cost Leadership	
<i>Hart (2010)</i>	Pollution Prevention	Clean Technology	Product Stewardship	Base of the Pyramid	
<i>Lin and Darnall (2010)</i>	Pollution Control Reactive	Pollution Prevention	Product Stewardship	Clean Technology Proactive	
<i>Carroll (1979); Wartick and Cochran (1985)</i>	Reactive	Defensive	Anticipatory / Accommodative	Proactive	
Characteristics (adapted from <i>Henriques and Sadorsky 1999</i> , p. 88)	- No involvement of top management - Sustainability management is not necessary - No reporting - No employee training and involvement	- Piecemeal involvement by top management - Sustainability issues only dealt with when necessary - Satisfy sustainability regulations - Little employee training and involvement	- Some involvement by top management - Sustainability management is a worthwhile function - Internal reporting but little external reporting - Some employee training and involvement	- Top management support and involvement - Sustainability management is an important business function - Internal and external reporting - Employee training and involvement encouraged	

Table 2: Corporate Sustainability Strategies

(Adapted from *Hass 1996; Henriques and Sadorsky 1999; Kolk and Mauser 2002*)

2.1.3 Interorganizational Sustainability Management

Based on the previously introduced understanding of sustainability, corporate sustainability strategies and related management concepts, the following paragraph presents another level of analysis. Thereto, the classification of *Sharma* (2002) is considered, which distinguishes sustainability research by five different levels of analysis:

- (1) The *global level*, which is defined as the macro level. It deals with the international interplay of political environments, organizations and NGOs regarding sustainability issues.
- (2) The *institutional level*, which is concerned with the cooperation of state, federal and local agencies.
- (3) The *interorganizational level*, which reflects how supply chain networks, alliances and buyer-supplier relationships cope with sustainable development.
- (4) The *intraorganizational level*, which responds to the previously described corporate level of sustainability strategies and actions.
- (5) The *individual level*, which considers the sustainable behavior of citizens, individuals and customers.

Whereas the intraorganizational, institutional and global levels have been the focus of sustainability research in the past, the interorganizational level still demands extended research efforts (*Carter and Easton* 2011). According to *Sharma* (2002), the interorganizational perspective of sustainability research and practice deals with the interplay of organizations within supply chains, alliances or buyer-supplier relationships. Therefore, the differentiation of supply chains, alliances and buyer-supplier relationships is focused on first. Next, the interorganizational perspective of sustainability management is reviewed and the core issues stated in the extant literature are presented.

When considering interorganizational relationships and supply chains, these notions are often found in relation to the concept of supply chain management (SCM). SCM¹² originates in logistics literature (*Bechtel and Jayaram* 1997) and describes the coordination and collaboration of entities regarding business functions and flows between suppliers and customers (*Mentzer et al.* 2001; *Mentzer et al.* 2008). SCM literature provides various definitions that differ with respect to the number of entities involved and the type of business functions considered (*Cooper et al.* 1997; *Stock and Boyer* 2009). According to

¹² A comprehensive and recent definition of SCM, which is applied within the research at hand, is given by *Stock and Boyer* (2009): "The management of a network of relationships within a firm and between interdependent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction" (p. 706).

Harland (1996), the scope of the supply chain determines the definition of SCM. He distinguishes four traditional understandings: the internal chain, the dyadic relationship, the supply chain and the extended supply chain or supply chain network.

The *internal chain* includes all business functions involved with the flow of materials, services, finances and information within an organization.

The *dyadic relationship* centers the contractual relationship regarding outsourced business functions, which are bought from and executed by immediate suppliers.

The *supply chain* includes immediate relationships between focal companies and their suppliers and customers.

Thereto, the *extended supply chain* or *supply chain network* encompasses multi-tier suppliers and customers involved in upstream or downstream flows of products, services, finances and/or information (Mentzer et al. 2001).

Against the background of the described three forms of interorganizational relationships, the term ‘alliance’ is specified by an existing contractual agreement involving inter-business relationships of two or more partners (Albers 2005). Therefore, cooperative alliances may be found among dyadic relationships, supply chains or supply chain networks. Nonetheless, not all interorganizational relationships may be referred to as alliances (Das and Teng 2001).

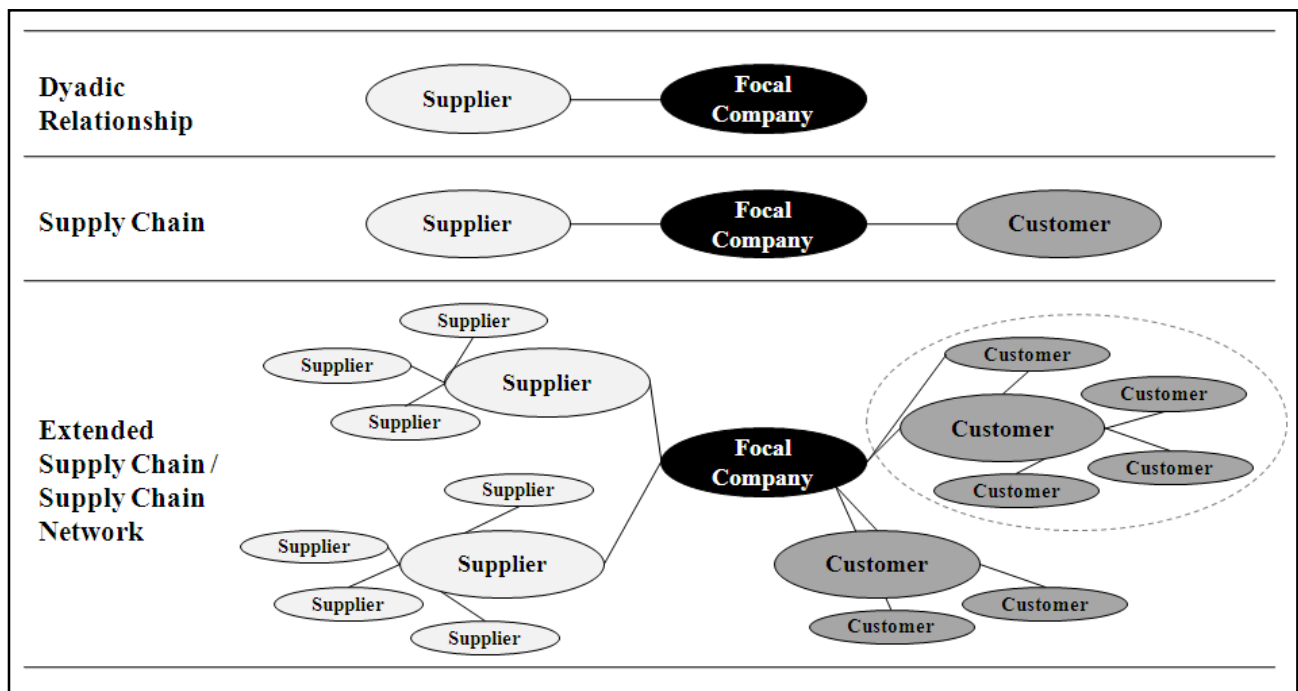


Figure 6: Levels of Analysis of Interorganizational Relationships
(Adapted from Cooper et al. 1997; Harland 1996; Kempainen and Vepsäläinen 2003)

The dissertation at hand considers interorganizational relationships and thus their three forms, as described previously: dyadic relationships, supply chains and supply chain networks (see Figure 6). As outlined by *Harland* (1996), analysis of dyadic relationships allows deeper insights into interorganizational behavioral aspects that are transferable to supply chain and network perspectives. Therefore, the empirical basis of this research is set on the level of dyadic relationships between focal organizations (or ‘shippers’) and their third-party logistics service providers. Nonetheless, the empirical findings and recommendations shall provide transferable results for sustainable development at the supply chain and supply chain network level.

Since the term ‘interorganizational sustainability management’ is not commonly used in the literature (*Peters et al.* 2011), the research at hand is positioned within sustainable supply chain management (SSCM) research. SSCM is a young and significantly growing research field. It centers the convergence of sustainability and the SCM concept and thus extends corporate understanding of the triple bottom line concept through an interorganizational perspective on its business functions. Table 3 summarizes the rare definitions available that describe the concept of SSCM.

Author	Definition of SSCM
<i>Carter and Rogers</i> 2008, p. 368	"The strategic transparent integration and achievement of an organization's social, environmental and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains."
<i>Seuring and Müller</i> 2008b, p. 1700	"The management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals of all three dimensions of sustainable development, i.e. economic, environmental and social, into account which are derived from customer and stakeholder requirements."
<i>Pagell and Wu</i> 2009, p. 38	"To be truly sustainable a supply chain would at worst do no net harm to natural or social systems while still producing a profit over an extended period of time; a truly sustainable supply chain could, customers willing, continue to do business forever."

Table 3: Definitions of Sustainable Supply Chain Management

The integration of the interorganizational perspective with the concept of sustainability leads to several issues in research and practice. An in-depth analysis of SSCM literature of *Kudla and Stölzle* (2011) identifies five major deficiencies and issues that are related to this dissertation:

-
- (1) Conceptual frameworks on the convergence of the concepts of sustainability and SCM.
 - (2) Operationalization of SSCM within relevant business functions.
 - (3) Identification of sufficient sustainability performance indicators.
 - (4) Incentive mechanisms in SSCM (supplier selection, supplier development, policies and standards).
 - (5) Customers' willingness to pay and economic performance in the context of SSCM implementation.

First, sustainability concepts and frameworks within the extant literature predominantly deal with theoretical disquisition and empirical testing of the sustainability dimensions, as well as exogenous and endogenous influences on an intraorganizational level. Thereto, the extant works comprehensively analyze motivations and drivers for sustainable entrepreneurship (e.g. *Bansal and Roth* 2000; *Campbell* 2007) and aim to understand managerial decision-making processes (e.g. *Basu and Palazzo* 2008; *Salam* 2009; *Zhu and Sarkis* 2006; *Zhu et al.* 2007). While the majority of articles deal with intraorganizational CSR concepts (e.g. *Gladwin et al.* 1995; *Matten and Moon* 2008; *Scherer and Palazzo* 2007; *Starik and Rands* 1995; *Windsor* 2006), SSCM frameworks outlining the scope of and investigating underlying motivations and drivers on a supply chain level are still underrepresented (*Carter and Rogers* 2008; *Pagell and Wu* 2009; *Seuring and Müller* 2008b). Thereto, this research aims to provide detailed insights into the current state, determinants and challenges of interorganizational sustainability management and consequently the SSCM concept.

Second, both research and practice struggle with the operationalization of sustainability within business processes. Regarding SSCM, there is a need to answer questions on the kind and extent of business processes that need to be integrated. Currently, green logistics processes that concern reverse logistics, closed-loop supply chains and waste management are the center of attention (*Bansal and McKnight* 2009; *Georgiadis and Besiou* 2008; *King and Shaver* 2001; *Schliephake et al.* 2009; *Sheu et al.* 2005; *Wu and Dunn* 1995; *Zhu* 2008). Furthermore, green product design, development and marketing play major roles (*Baumann et al.* 2002; *Chen* 2001; *Irland* 2007). Above this, purchasing is playing an increasingly prominent role in sustainability operationalization research. This is based on the fact that sustainable products imply sustainable purchasing activities within the supply chain (*Carter* 2004; *Carter and Jennings* 2004; *Krause et al.* 2009; *Pagell et al.* 2010). Against the background of operationalization, the research at hand focuses on logistics services but extends the environmental discussion to a comprehensive tripartite picture of sustainable logistics services.

Third, the definition of applicable sustainability performance measures and related reporting structures presents a further issue. A large amount of sustainability publications deals with

environmental performance regarding life-cycle assessment (LCA) and greenhouse gas emission determination (e.g. *Faruk et al.* 2001; *Hellweg et al.* 2005; *Hill* 2001; *Kim et al.* 2010; *Magerholm Fet and Michelsen* 2000; *Meisterling et al.* 2009; *Pleanjai et al.* 2009; *Tan and Khoo* 2005). In contrast, the social and comprehensive sustainability perspectives are still underrepresented (e.g. *Hutchins and Sutherland* 2008). Hence, the transparency of sustainability performance within interorganizational relationships plays an essential role in incentive design.

The fourth aspect of incentive mechanisms is closely related to the prior named operationalization and performance measurement issues. Contemplating the state of the research on sustainability incentives, an imbalance between the dimensions of sustainability with respect to environmental issues can be noticed (*Carter and Easton* 2011; *Gold et al.* 2010; *Kudla and Stölzle* 2011; *Seuring and Müller* 2008b). Environmental performance criteria and their applicability to supplier evaluation and selection have received vast attention in the past decade (e.g. *Darnall et al.* 2008; *Handfield et al.* 2005; *Handfield et al.* 2002; *Hervani et al.* 2005; *Humphreys et al.* 2003; *Kolk and Mauser* 2002; *Min and Galle* 1997; *Noci* 1997; *Noci* 2000; *Sarkis* 2003; *Schaefer* 2007; *Walton et al.* 1998; *Zendejdel et al.* 2008; *Zhu et al.* 2008). In contrast, social performance indicators, as well as comprehensive approaches integrating economic, environmental and social impacts, have received far less attention within the debates (*Jiang* 2009; *Keeble et al.* 2003; *Labuschagne et al.* 2005; *Pullman et al.* 2009). An integrated perspective of all three sustainability dimensions in supplier evaluation and selection is contemplated in a recent article by *Bai and Sarkis* (2010). The authors introduce a conceptual example for sustainable partner selection but highlight that practical applicability may be limited by measurability and information issues. Above these supplier selection issues, incentive research traditionally also takes the opportunistic behavior of supply chain partners into account. Thereto, *Pedersen and Andersen* (2006) contemplate agency problems in supply chains regarding code of conduct management and suggest that the design of codes of conduct and incentive mechanisms demands a deeper understanding of supplier abilities in order to adopt the necessary practices. Thereto, the research at hand applies a comprehensive approach that takes knowledge of dyadic relationships into account. Beyond this, it provides insights into characteristics of sustainable behavior in order to derive recommendations for incentive design.

Fifth, incentive mechanisms are closely related to the perceived financial outcome of sustainable behavior. Therewith, it is essential to consider debates of practitioners and scholars regarding the economic success or business case of sustainability strategies and activities (e.g. *Carroll and Shabana* 2010; *Dyllick and Hockerts* 2002). The willingness of

customers to pay for sustainable, green or fair-trade products is thus fundamental (e.g. *Casadesus-Masanell et al. 2009; Toolsema 2009*). In this field, a lack of supply chain orientation is identified due to the fact that the financial consequences of sustainability engagement have not yet been evaluated for 1st, 2nd or 3rd tier suppliers. Against this background, the dissertation contemplates trade-offs (*Hahn et al. 2010*) faced by shippers and LSPs regarding interorganizational sustainability management.

2.2 Logistics Services

In order to define and introduce logistics services, the first paragraph of this section provides a basic understanding of the scope of logistics. It presents a research-related characterization of third-party logistics services as well as specific attributes. Second, the state of the current research on sustainable logistics services is given and related to the dissertation.

2.2.1 Understanding of Logistics Services

Primarily, logistics is defined as the science of transfer activities in economic processes (*Klaus 2002*) or as the functional specialization of spatiotemporal transfers of goods (*Murphy and Poist 2000b; Pfohl 2010; Weber and Kummer 1998*).

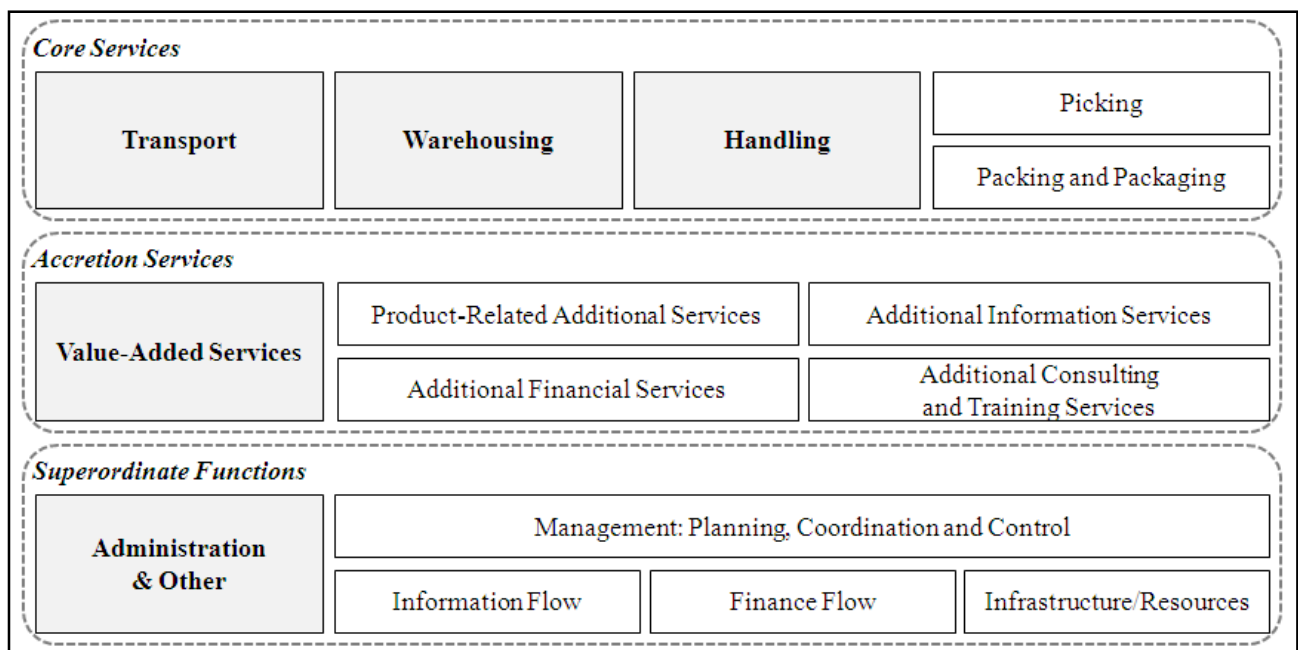


Figure 7: Definition of Logistics Services

(Adapted from *Bretzke 2010; Fleischmann 2008; Klaus 2002; Klaus and Krieger 2008; Pfohl 2010*)

The core processes involved are transport, handling and warehousing. These include supplementary processes such as picking, packing and packaging. Beyond this, logistics services may encompass value-added services that refer to value accretion by product-related services or additional information, financial, or consulting and training services (*Klaus and Krieger 2008*). Finally, the material flow is accompanied by information and finance flows that are planned, coordinated and controlled by superordinate administrative functions (*Bretzke 2010; Fleischmann 2008; Pfohl 2010*). With respect to the dissertation at hand, Figure 7 outlines the basic understanding and structure of logistics services applied throughout the course of research.

Logistics services may further be classified regarding five major criteria (*Aberle 2009; Kummer 2006; Stölzle et al. 2011; Tyssen 2010*). These criteria are taken into account for a further delimitation of the research scope.

- (1) Executing Party
- (2) Comprehensiveness of Service
- (3) Transport Mode
- (4) Type of Goods
- (5) Assignment of Subcontractors

First, logistics services are accomplished either by a third-party LSP or the shipper's internal logistics units. Due to the predominant role of logistics services as an outsourced function (*Logan 2000*), this research focuses on third-party logistics. The reasons for logistics services being outsourced by focal companies are cost reduction, service improvements and the buyer's focus on core competences (*Maloni and Carter 2006*). The dissertation at hand applies the following understanding of interorganizational relationships regarding logistics services:

"Relationships between interfaces in supply chains and third-party logistics providers, where logistics services are offered, from basic to customized ones, in a shorter or longer-term relationship, with the aim of effectiveness and efficiency" (*Bask 2001, p. 474*).

Second, the prior definition outlined a further delimitation of logistics services: the comprehensiveness of service. Against this background, LSPs offer either single services that refer to transport, warehousing or handling; combined services that encompass two or more services, such as transport and warehousing; or system services that outline a high service width and outsourcing degree. The last service type reflects customized services that contain, for instance, transport, warehousing and value-added services where the LSP takes

over the final assembly or quality assurance (Tyssen 2010). Within this dissertation, all three described service types are considered.

Third, logistics services that encompass transportation are distinguished with respect to the transport mode: road, rail, sea, inland water, air and intermodal (Aberle 2009; Kuchenbecker 1998). Due to the high relevance of transport processes, particularly road transports, for sustainable development of logistics services (Bretzke and Barkawi 2010; Kudla 2010; McKinnon 2010), the dissertation at hand considers logistics services that predominantly involve the 'road' transport mode¹³.

Fourth, logistics services are distinguished regarding the type of goods. Hereby, three types traditionally play major roles: bulk cargo, mixed cargo, and courier, express and parcel (CEP) goods. Bulk cargo consists of goods that are of a liquid, granular or bulky condition. Mixed cargo refers to goods that are transportable in one piece, either packed or unpacked, such as textiles or food. CEP goods are linked to postal services, so such goods are of rather light weights and small volumes¹⁴. Within the dissertation at hand, all types of goods are considered. Since goods of sustainability-sensitive industries fall into all three groups stated, a further delimitation is not suitable for the research context.

Characteristics of Logistics Services						
(1) Executing Party	Logistics Service Provider			Shipper's Internal Logistics Unit		
(2) Comprehensiveness of Service	Single Service		Combined Service		System Service	
(3) Transport Mode	Road	Rail	Sea	Inland Waterway	Air	Inter-modal
(4) Type of Goods	Bulk Cargo		Mixed Cargo		CEP	
(5) Assignment of Subcontractor(s)	Yes			No		

Table 4: Characterization of Logistics Services
(Adapted from Aberle 2009; Kummer 2006; Stölzle et al. 2011; Tyssen 2010)

A fifth classification criterion is the usage of internal resources in contrast to the complete or partial assignment of subcontractors by LSPs. While focal companies outsource their logistics services to an LSP, third-party logistics providers may in turn assign

¹³ This delimitation is significant for the theoretical sampling processes in the research papers, since it induces a criterion for case study selection.

¹⁴ Further insights on the segmentation of logistics services are given by Stölzle et al. (2011) and Hofmann and Wessely (2010).

subcontractors with parts of the mandated services. Especially in carrying businesses, this form of subcontractor assignment is playing a more and more important role¹⁵. Traditionally, subcontractors are self-employed small-sized organizations that utilize their own fleet or vehicles (*Klaus and Krieger* 2008). Within this dissertation, both types of logistics services are contemplated: those that employ subcontractors and those that do not. However, the empirical datasets center the dyadic relationships between focal organizations and their direct LSPs. Nonetheless, the findings shall be transferable to subcontractors. Table 4 summarizes the presented classification criteria of logistics services and the position taken regarding the research context.

In the final step of this section, specific attributes of logistics services are discussed that illustrate the managerial and theoretical challenges that need to be taken into consideration regarding logistics research (*Hoffmann and Resch* 2010; *Pfohl* 2010). Table 5 presents the eight specific attributes of logistics services, which are given in terms of service character and specifics of logistics. These attributes are finally contemplated concerning their relevance to the design of interorganizational incentive mechanisms for sustainable logistics services.

First, logistics services are dependent on external factors, implying the mandate and requirements of shippers. Transferring this dependence to the research background, it may be assumed that LSPs rather react on shippers incentives than proactively engage sustainably.

Second, logistics services are of intangible nature, so that they are not observable for shippers during the production process. This immaterial and intangible nature is reinforced regarding sustainable logistics services and hampers sustainability performance management for logistics.

Third, logistics services are produced and used at the same time. Hence, logistics services may not be stored or replaced after production. Transferred to sustainability, this attribute implies that sustainable behavior that relates to the production of logistics services, may not be enhanced afterwards. This attribute underlines the relevance of adequate selection mechanisms for LSPs according to their sustainable engagement.

Fourth, logistics services are subject to a broad spectrum of customer demands. Therefore, strategy development of LSPs faces difficulties to align shippers interests. Regarding to incentive mechanisms for sustainable behavior, LSPs may face diverging requirements of their shippers that are relevant to incentive design.

¹⁵ According to approximations of *Klaus and Krieger* (2008), subcontractors are appointed for 60% of long-haul transports and 80% of dispersion transports by carrying businesses in Germany.

	Specific Attributes of Logistics Services	Significance for Logistics Services	Significance for the Research Context
Service-Specific Attributes	Integration of the External Factor	- Heteronomy of services - High demands for flexibility ➔ High dependence on shipper requirements	Due to the high dependence of LSPs on shipper requirements, sustainable behavior may need to be required by shippers instead of proactive engagement of LSPs
	Immateriality and Intangibility	- Logistics services are not directly observable by shippers - Dominance of experience and trust attributes ➔ Shippers conclude process and outcome quality from potential quality	- Sustainable behavior of LSPs is intangible and difficult to assess - Shippers may act reluctantly regarding incentive mechanisms, due to measurability difficulties - LSPs may not act sustainably due to measurability difficulties
	Simultaneity of Production and Usage (Uno Actu Principle)	- Concurrent production and usage of services - No opportunity to store, return or replace a service ➔ High relevance of experiences with LSPs	- Sustainability performance may not increase after production - High relevance of selection criteria regarding sustainable logistics services
Logistics-Specific Attributes	Heterogeneity of Customer Demands	- Broad spectrum of customers ➔ Difficulties to define explicit competitive strategies for LSPs	Difficulties to define sustainability strategies that align distinct shipper requirements
	Heterogeneity of Service Offerings	- Provision of a wide range of services and related resources in order to meet the broad spectrum of customer demands ➔ High specificity of logistics services	High specificity confers to sustainable logistics and hampers the definition of incentive targets and mechanisms
	Costs of Readiness	- Initialization of resources (facilities, fleet, information systems and personnel) ➔ High amount of fixed costs	- Investments into sustainable resources increase the fixed costs - Reluctant, opportunistic behavior of LSPs regarding sustainability
	Fluctuating Demand	- Derivative demands of logistics services - Seasonal fluctuations according to targeted industry ➔ Forecasting and capacity planning difficulties	Shippers and LSPs may perceive the demand for sustainable logistics services as unstable and act reluctantly
	Dependence on Exogenous Circumstances	- Involvement within distinct legal environments - Dependence on governmental regulations / transport policies - Dependence on public infrastructure ➔ Direct influence of exogenous circumstances on prices and service offerings	- Transport policies may influence sustainable development of logistics services positively and negatively - Different legal environments may influence sustainable logistics - Shippers may rely on transport policies to ensure sustainable behavior of LSPs instead of developing incentive mechanisms

Table 5: Specific Attributes of Logistics Services
(Adapted from *Bachmann 2008; Hoffmann and Resch 2010; Pfohl 2010*)

Fifth, logistics services demand for a broad spectrum of resources due to their specificity and distinct customer demands. This attribute is enhanced by the specificity of sustainable resources for logistics services and hence may be transferred directly to the research context.

Sixth, the initialization of resources for logistics services results in high amounts of fixed costs or costs of readiness. Consequently, LSPs hesitate to invest in sustainable logistics resources, which may increase the costs of readiness.

The seventh aspect relates to fluctuating demands for logistics services. Logistics is known as a derivative industry that depends on production processes and their economic developments. Demand fluctuations result in forecasting difficulties for capacity planning and are closely related to costs of readiness. Proactive investments in sustainable resources by LSPs are therewith either taken at high risks of the providers or may be avoided.

The eighth attribute refers to the dependence on exogenous circumstances and the involvement of LSPs within diverse legal environments. Therewith, governmental regulations in terms of transport policies (e.g. tolls or ban of driving) have direct influence on prices and service offerings. Against this background, it is expected that transport policies have a direct positive or negative influence on the sustainable development of LSPs as well¹⁶.

2.2.2 Sustainable Logistics Services

The presented definition, characterization and delimitation of the research perspective on logistics services raise the issue of trends in logistics research and the role of sustainability. From a historical viewpoint, *Poist* (1989) started the discussion in the early 1990s by stating that there were four eras of logistics research: the pre-logistics era, dealing with efficient transport; the logistics era, concerned with the design of logistics systems; the neologistics era, which was linked with the total enterprise approach; and finally the second neologistics era, where total responsibility plays a prominent role (*Murphy et al.* 1996, p. 191). The last one underlines the beginning of the relevance of environmental and sustainability concerns within the field.

Due to the significant environmental effects of transportation (e.g. direct and indirect greenhouse gas emissions, noise, health and air quality) (*Bretzke and Barkawi* 2010; *Cullinane and Edwards* 2010; *Himanen et al.* 2005), environmental sustainability (or green logistics) has been identified as a core issue in logistics research (*Skjoett-Larsen* 2000a).

¹⁶ In correspondence to reactive sustainability strategies described in Section 2.1.2, the research at hand assumes that governmental regulations form basic sustainable requirements to which LSPs are compliant. Incentive mechanisms by shippers, investigated within this research, are presumed to go beyond governmental regulations.

Nonetheless, academic research regarding green logistics is still in an early state that may be distinguished regarding three major categories:

- Approaches to environmental performance measurement (*McIntyre et al.* 1998; *Sarkis et al.* 2004; *Sheu et al.* 2005; *Wu and Dunn* 1995).
- Managerial decision-making processes and green network design (*Günther and Greshner Farkavcová* 2010; *Lee et al.* 2010; *Quariguasi Frota Neto et al.* 2008; *Sanchez-Rodrigues et al.* 2010; *Sbihi and Eglese* 2010; *Ubeda et al.* 2011).
- Environmental management strategies (*Murphy and Poist* 2000a; *Murphy et al.* 1996).

The social dimension (*Sarkis et al.* 2010) and the integrated sustainability point of view are again underrepresented in the extant literature (*Bretzke* 2011). Two of the pioneers in the field of sustainable logistics are *Carter and Jennings* (2002). They were the first to integrate logistics and CSR research. Within their study, they developed a framework that defines socially responsible logistics activities¹⁷ regarding purchasing, transportation and warehousing services from a manufacturing company's point of view. Moreover, they identify antecedents and consequences of socially responsible logistics activities. Since their study serves as an initial framework, the authors claim a change of viewpoints is necessary to gain insights from dyadic or LSP perspectives. This claim shall be addressed by the dyadic perspective taken within this thesis.

2.3 Incentive Mechanisms

The following section aims to introduce the understanding of incentive mechanisms within the dissertation. Thereto, it reveals a basic understanding of organizational behavior in interorganizational relationships and the reasoning for incentive mechanisms, implying information and control systems as well as incentives. Within the subsequent paragraphs, these layers of incentive mechanisms are transferred and delimited regarding interorganizational relationships and subsequently related to the concepts of supplier evaluation, selection and development.

2.3.1 Understanding of Incentive Mechanisms

In order to understand and define incentive mechanisms, it is essential to contemplate the coherence of organizational behavior and motivation. Based on the origins of incentive design in economics research, *Barnard* (1938) postulates that organizations are systems of

¹⁷ *Carter and Jennings* (2002) coined the term 'logistics social responsibility' (LSR). In their understanding, logistics social responsibility encompasses six core categories: environment, ethics, diversity, human rights, safety and philanthropy.

consciously coordinated actions or powers of two or more individuals. Against this background, *Barnard* (1938) understands organizations as a system of actions instead of focusing on the constituents such as humans, machines and/or facilities (*Berger and Bernhard-Mehlich* 2002). This system of actions consists of individual actions. The management of organizational behavior thus centers coordination and control in order to align diverse individual actions¹⁸. Hereto, it is essential to fully understand the individual motivations and expectations that organizations face (*Simon* 1957). *Barnard* (1938) anticipates that individual motivations differ and that the alignment of individual actions is subject to conflicts of interest (opportunistic, self-interested behavior) and a lack of information exchange (bounded rationality) (*Simon* 2008), which hamper the determination of adequate incentives (*Levitt and March* 1995). Against this background, incentive mechanisms are defined as ties between the motivations of individuals and desirable behavior in order to enforce organizational performance.

"The contributions of personal efforts which constitute the energies of organizations are yielded by individuals because of incentives. The egotistical motives of self-preservation and self-gratification are dominating forces; on the whole, organizations can exist only when consistent with the satisfaction of these motives, unless, alternatively, they can change these motives. The individual is always the basic strategic factor in organizations. Regardless of his history or his obligations he must be induced to cooperate, or there can be no cooperation" (*Barnard* 1938, p. 139).

Based on the outlined understanding of incentive mechanisms and the interdependent issues of gaining information on the motivations and actions of individuals, the understanding of incentive mechanisms within this dissertation distinguishes between two layers: systems of information and control, and reward and penalty structures. Therewith, the definition follows the claim of *Kaplan and Henderson* (2005) of the need to understand and identify the targets of incentives as a first step to be able to adequately design incentives that actuate the desired target in a second step.

The two interrelated layers (e.g. *Miner* 2007) presented in Figure 8 indicate this general understanding. First, information and control systems aim to monitor behavior and/or the outcome of individual actions (*Albers* 2005; *Picot et al.* 2008; *Stölzle* 1999). The differentiation of performance measures regarding the behavior of an individual and/or the outcome of behavior corresponds to organizational theoretic viewpoints of control. As illustrated in Table 6, *Ouchi* (1979) and *Eisenhardt* (1985) suggest that the type of control is

¹⁸ According to *Barnard* (1938), individuals within organizations are not limited to employees but also include market participants such as customers, suppliers, shareholders and other stakeholders.

determined by the measurability characteristics of a task or an action. Moreover, the assessment of performance measures may be distinguished by objective or subjective conduction. While an objective information and control system provides clear targets for an individual, which lead to a penalty or reward, a subjective form leaves the performance assessment to organizational authorities, which decide whether an incentive is granted (*Baker et al.* 1988).

Ability to Control and Measure Behavior and Outcome		Behavior Measurability	
		<i>High</i>	<i>Low</i>
Outcome Measurability	<i>High</i>	Behavior or Output Control	Outcome Control
	<i>Low</i>	Behavior Control	Other Forms of Behavior or Output Control

Table 6: Control of Behavior and/or Outcome with Respect to Task Characteristics
(Adapted from *Ouchi* 1979, p. 843 and *Eisenhardt* 1985, p. 135)

Second, penalty and reward structures imply positive compensation and negative sanctions regarding possible violations of desired behavior and/or outcomes. Therewith, the second layer refers to the traditional definition of incentives¹⁹. Following the premises of *Clark and Wilson* (1961) and *Miner* (2007)²⁰, the design of penalty and reward structures (or incentives) should consider the following characteristics:

- (1) Incentives should tailor rewards and penalties to what individuals perceive as desirable or restrictive.
- (2) Incentives should be applied scarcely in order to induce behavior properly.
- (3) Incentives should be designed with respect to available organizational resources and the overall outcome of the targeted behavior in order to prevent incentives from inducing organizational imbalance.
- (4) Incentives should be applied in a righteous and transparent manner, so that individuals perceive that high performance leads to high rewards.

Beyond these characteristics, incentives are distinguished by their nature and their recipients. The nature of penalties and rewards (incentives) is either material or immaterial and thus tangible or intangible. Material incentives are of monetary value or are easily translatable to monetary values. In contrast, immaterial or intangible incentives are of a solidary or purposive nature. While solidary incentives imply the association of organizations and individuals and related benefits by socialization and membership,

¹⁹ The traditional understanding of incentives is often detached from information and control systems (cf. *Clark and Wilson* 1961).

²⁰ Within his statements, *Miner* (2007) further develops and discusses the findings of *Porter and Lawler* (1968).

purposive incentives reflect the cooperative achievement of organizational goals (*Clark and Wilson 1961*). Beyond the nature of incentives, the recipients provide a further classification. Thereto, incentives are distinguished by whether they address a single individual or a group (*London and Oldham 1977*). Whereas the understanding of an individual as a recipient of incentives is straightforward, group-based incentives imply incentives that are based on group or organizational performance and are distributed to a group.

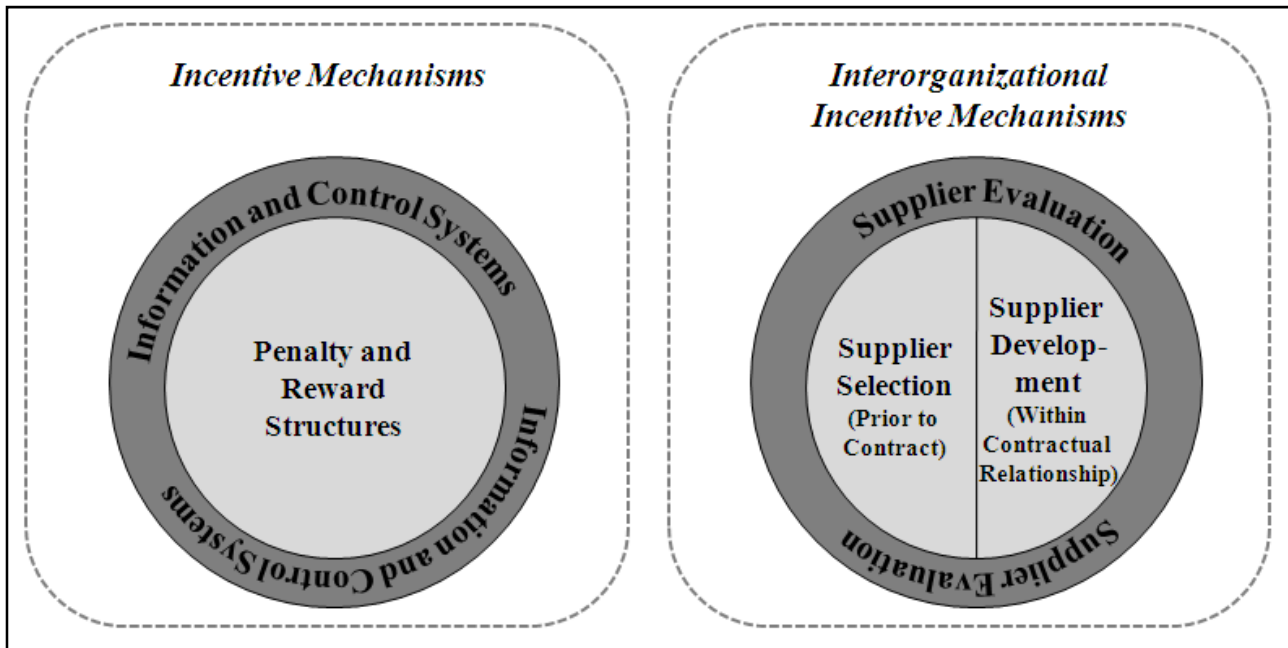


Figure 8: Understanding of Incentive Mechanisms

2.3.2 Interorganizational Incentive Mechanisms

Within this dissertation, the contemplated background and understanding of incentive mechanisms is transferred to interorganizational relationships. Thereto, the traditional research on incentives from an employer-employee background (e.g. *Chen 2005*; *Holmstrom 1982*; *Jenkins Jr. et al. 1998*; *Wright 1989*) is translated to buyer-supplier relationships and the subject of sustainable behavior in logistics services. Since the extant literature on incentive mechanisms in a sustainability context (e.g. *Cerin and Karlson 2002*; *Chan 2009*; *Clemens 2006*) and in an interorganizational context (e.g. *Bogetoft and Olesen 2004*; *Cohen et al. 2007*; *Yao et al. 2004*) is little, different terminology is applied for interorganizational incentive mechanisms. As illustrated by Figure 8, interorganizational research on incentive mechanisms applies the term ‘supplier evaluation’ to the layer of information and control systems, while penalty and reward structures are reflected by supplier selection and supplier development processes (e.g. *Giannakis and Croom 2004*). Since the literature on supplier evaluation, selection and development regarding sustainable

behavior is little, the following passages integrate the general reflection of incentive mechanisms with the research background at an initial stage.

The first layer refers to supplier evaluation. Supplier evaluation aims to assess the sustainability performance of an LSP. Thereto, it is essential to define the sustainable behavior in scope and to define measures that indicate sustainability performance. Next, the characteristics of sustainable behavior need to be determined in order to decide whether behavior-based or outcome-based control and incentive design are suitable. Against this background, the shipping company also needs to decide whether an objective (e.g. a multi-criteria rating model) or a subjective (e.g. sustainability audit) form of monitoring is used. The research at hand focuses on an explorative analysis of sustainable behavior and its characteristics, since methodological approaches on multi-criteria evaluation and selection schemes exist (*Handfield et al.* 2002; *Noci* 1997) and are transferable to future research once sustainable behavior and characteristics are defined. Beyond this, the time of the evaluation becomes relevant. Whereas positive supplier evaluation prior to contract leads to supplier selection as the reward, supplier evaluation within a contractual relationship may be related to sustainable supplier development.

As outlined above, the second layer reflects rewards and penalties as a consequence of information gained by the first layer. Supplier selection reflects the first type of penalty or reward structure in the scope of this research. It actuates sustainable behavior by granting contracts. Thus, it is highly dependent on the supplier evaluation scheme chosen. Recent articles within the field have predominantly addressed the environmental dimension and the development of suitable tools and methodologies (e.g. *Bai and Sarkis* 2010).

Supplier development reflects incentives within a contractual relationship. These incentives may be designed regarding the premises of incentive mechanisms given in the prior chapter (see Section 2.3.1). Hereto, it is worth noticing that sustainable behavior that is identified as a target for incentive mechanisms may not be induced by purely economic reasons but also by legitimacy reasons. Therefore, the research at hand analyzes incentive mechanisms from a viewpoint that may demand a relaxation of the opportunism principle.

3 Theoretical Background

This chapter provides the theoretical background of the research at hand. It introduces organizational theories of relevance to the research problem and the conceptual background stated. Consequently, the suitability of the presented organizational theories is discussed and the reasoning for the selection of the applied theoretical lenses is given. In the final paragraphs, agency theory and institutional theory are discussed as the core and supplementary theoretical viewpoints for this dissertation, respectively.

3.1 Overview of Organizational Theories Applied in the Research Context

The conceptual background sharpened the research problem and provided a more thorough understanding of the relevant research streams. It elucidated two major facets of the research problem, namely the interplay of interorganizational and sustainability research or, on a more aggregated level, the interplay of efficiency and legitimacy objectives of organizational behavior. In a first step the ties of these facets to organizational theories are in scope. The target is to derive adequate organization theoretic lenses regarding the research context. Since logistics and incentive mechanisms provide further delimitations of the research context, these delimitations shall be involved in the further discussion of suitability of organizational theoretic lenses and the subsequent selection process.

Within their organizational theoretic literature review, *Sarkis et al.* (2011) identify nine theories that have been applied in at least two articles in the extant sustainability literature. In alphabetic order, these theories are: complexity theory, ecological modernization theory (EMT), information theory, institutional theory, resource-based view (RBV), resource dependence theory, network theory, stakeholder theory and transaction cost economics (TCE). Furthermore, the authors suggest four organizational theories that show promise to enable further understanding and investigation of sustainability issues within and across organizations, namely agency theory, path dependency theory, social embeddedness theory and structuration theory. According to *Carter and Easton* (2011), who analyze a similar field of sustainability research within their review, stakeholder theory and the RBV are highlighted as playing prominent roles. Moreover, the authors identify that the majority of articles apply multiple theoretic lenses.

Regarding interorganizational research, numerous reviews on relevant organizational theoretic lenses are available (*Halldorsson et al.* 2007; *Ketchen and Hult* 2007; *Miles and Snow* 2007; *Stölzle* 1999). *Halldorson et al.* (2007) point out the roles of agency theory, TCE, network theory and the RBV. *Miles and Snow* (2007) highlight the contributions of strategic choice theory, the resource-based view and the knowledge-based view (as a further

development of the RBV). *Ketchen and Hult* (2007) add resource-dependence theory, institutional theory, game theory and social capital theory to the discussion. Finally, *Stölzle* (1999) systematically assesses the theoretical contribution of transaction cost economics, agency theory, resource-dependence theory, the IMP interaction approach, network theory and game theory to industrial relationships. The author concludes that agency theory and transaction cost economics benefit from high applicability to different research contexts and provide the highest theoretical contributions to the design of interorganizational relationships.

In order to limit the set of organization theories highlighted by sustainability and interorganizational scholars, the procedure of delimitation is as follows. First, theories that have been named by only one of the articles are contemplated briefly regarding their suitability for the research problem, namely (a) complexity theory, (b) EMT, (c) information theory, (d) path dependency theory, (e) social capital theory, (f) social embeddedness theory and (g) structuration theory. Second, theories that have been underlined repeatedly are the focus of more detailed consideration.

- (a) *Complexity theory* is concerned with the complexity of sustainability issues regarding their implementation and operationalization within managerial tasks and their dependence on complex institutional environments (*Sarkis et al.* 2011). Due to its close relationship to matters of transaction cost economics (*Choi and Krause* 2006), network theory and institutional theory, complexity theory is assumed to have a rather low theoretical contribution to recommendations regarding incentive mechanisms as a standalone theory.
- (b) *EMT* is characterized as an eco-innovation theory that links technological modernization with an integrated eco-efficiency approach. Thereby, it has been applied in the context of governmental policies and industrial restructuring (*Murphy and Gouldson* 2000). Since EMT focuses on eco-efficiency and is criticized for promoting ‘greenwashing’, as well as for its broadness and lack of theoretical foundation (*Sarkis et al.* 2011; *York and Rosa* 2003), the research at hand excludes EMT from further consideration.
- (c) *Information theory*, as described by *Sarkis et al.* (2011), centers information asymmetries and signaling processes regarding sustainability issues within and across organizations. Thereby, information is the critical essence to coordinate and control economic, environmental and social concerns. However, due to a lack of reporting structures and information exchange between involved parties in the current early state of sustainability management, information asymmetries occur (*Delmas and Montiel* 2009). Against the background of this research, information theory seems to be of high relevance. However, the fundamentals of information theory, which are characterized

by information asymmetries, are akin to agency theory. Furthermore, institutional and stakeholder theory are closely related, so the three theories will be taken into deeper consideration.

- (d) *Path dependency theory* explains the adoption and diffusion of sustainability among organizations and their supply chains. It considers the adoption of sustainability as a self-reinforcing mechanism that experiences further development dependent on the spread of adoption (Sarkis et al. 2011). According to the evolutionary development that is akin to institutional theoretic fundamentals of diffusion (North 1990), the dissertation at hand assumes a stronger theoretical and design contribution from institutional theory than from path dependency theory.
- (e) *Social capital theory* understands organizations and interorganizational relationships as a set of people and their interpersonal relationships that determine organizational outcomes. Due to distinct backgrounds, experiences and values, organizations face a mix of varying objectives and goal conflicts that limit their performance. Hence, social capital theory argues for an alignment to improve organization or supply chain performance (Ketchen and Hult 2007). Since social capital theory presents an extract of agency theoretic assumptions on opportunistic behavior, as well as on the duality of structures and actions indicated by structuration theory (Lin 2001), it is argued that social capital is a concept (Lin et al. 2008) rather than a theory and it is therefore excluded from further consideration.
- (f) *Social embeddedness theory* centers the embeddedness of an organization within its network, its institutional environment and its stakeholder environment. Thereby, it outlines the relevancy of understanding coherences of structures and actions, as well as the cruciality of relational dependence on partnering firms (Sarkis et al. 2011, Uzzi and Gillespie 2002). Since the research at hand centers dyadic relationships, social embeddedness theory seems to provide a rather organization-oriented viewpoint. Furthermore, it is closely related and rarely distinguished from stakeholder, network and institutional theoretic approaches.
- (g) *Giddens's structuration theory* (Giddens 1984) is identified by Sarkis et al. (2011) as a useful framework to further understand the interdependences of the duality of structures and actions regarding sustainability, implying the evolution and diffusion on a corporate and interorganizational level. Thereby, structuration theory elucidates clear overlaps with institutional theories regarding the role of institutional pressures, as well as diffusion principles. Against this background, structuration theory is criticized for its eclecticism and high abstraction level (Walgenbach 2005), so it is excluded from further contemplation.

The second part of this section contemplates organization theories that have shown repeated referencing by scholars as sufficient theoretical approaches for interorganizational and/or sustainability research problems: (h) game theory, (i) institutional theory, (j) network theory, (k) principal-agent theory, (l) resource-dependence theory, (m) the RBV, (n) strategic choice, (o) stakeholder theory and (p) TCE. In order to further develop the delimitation of suitable organizational theoretic viewpoints, the following paragraphs present general reflections on and the contributions of each theory. In addition, the explanatory power or proposed research design of each of the theories is contrasted with the research objectives. Finally, a conclusion regarding the suitability of the organization theory and further consideration is given.

- (h) *Game theory* aims to derive recommendations regarding interdependent choices and actions. Thereto, it applies mathematics and micro-economic scenarios to identify the effects of rationally behaving decision-makers (*Ketchen and Hult 2007*). According to the assessment of *Stölzle (1999)*, game theory has a high theoretical attractiveness and explanatory power to solve problems in interorganizational relationships. However, the author argues that the modeling character and restrictive conditions hamper applicability. Empirical analyses in particular thus have restricted generalizability when supported and derived by game theory. Against the research objective to derive recommendations based on an explorative analysis of sustainable behavior in the interorganizational relationships of logistics services, game theory seems to be insufficient due to its experimental character.
- (i) *Institutional theory* elucidates the adoption of legitimate organizational structures and actions as a consequence of coercive, mimetic and normative pressures by the institutional environment (*DiMaggio and Powell 1983*). Herewith, institutional theory assumes the isomorphistic development of organizations, implying that the sustainable development of firms diffuses and that organization behavior respects conformity principles (*Boxenbaum and Jonsson 2008*). Against the background of the research at hand, institutional theory assumes that LSPs are acting on behalf of shippers and their institutional environments when adopting sustainable actions. Therewith, institutional theory, which is widely applied within sustainability research (*Bansal and Roth 2000; Campbell 2007; Delmas and Toffel 2004; Husted and Allen 2006*), is of significant relevance to this dissertation. However, institutional theory lacks deeper considerations of information asymmetries, goal conflicts and opportunistic behavior within interorganizational relationships. Hence, it contributes to explain sustainable organizational behavior but does not provide sufficient explanations or solutions for incentive mechanism design.

-
- (j) *Network theory* provides a descriptive, conceptual analysis of reciprocity in interorganizational relationships. It states that combined resources and competitive advantages may be achieved by long-term and trustful relationships (*Halldorsson et al.* 2007). Although network theory has rarely been applied in the context of sustainability, *Sarkis et al.* (2011) identify three possible fields of contributions. First, the analysis of sustainable added value by contemplating focal companies and their suppliers. Second, a deeper consideration of the diffusion of sustainable practices among organizations. Third, the contemplation of organizational learning as a consequence of organizational diffusion of sustainable actions. The outlined contributions of network theory in the context of sustainability indicate an overlap with institutional theoretic contributions. Beyond this, network theory is often applied to delimit the object of investigation by mapping actors, processes and resources within interorganizational relationships (*Halldorsson et al.* 2007). This predominantly descriptive character lacks a sophisticated theoretical foundation (*Stölzle* 1999), which leads to the exclusion of network theory for this dissertation project.
- (k) *Principal-agent theory* offers a natural fit with interorganizational research issues (*Halldorsson et al.* 2007; *Ketchen and Hult* 2007). It centers the contractual relations of so-called principals and their agents who act on their behalf. Agency theory assumes information asymmetries and goal conflicts based on the bounded rationality and self-interested behavior of involved parties. Thereto, it identifies agency problems prior to contract and within contractual relationships and provides solutions by means of efficient incentive design to balance those information asymmetries and agency problems (*Eisenhardt* 1989a; *Shapiro* 2005). Despite its rare application within sustainability research, *Sarkis et al.* (2011) highlight the theory as promising in terms of explaining sustainable behavior within interorganizational relationships and helpful in structuring penalties and rewards. Therewith, agency theory is highly suitable to the research problem within this dissertation. *Stölzle* (1999) underlines the high suitability of agency theory for industrial relationships but indicates that the theoretical contribution is determined by the restrictions and limitations of the theory. Hereto, it is worth noting that agency theory contemplates a static principal-agent relationship and neglects the institutional environment. Moreover, it assumes opportunistic behavior that may not occur in the context of sustainability. Bearing these limitations in mind, agency theory seems to provide the highest suitability regarding the research context. Therefore, it demands a critical reflection and contemplation of complementary theories regarding its limitations.

-
- (l) *Resource-dependence theory* states that firms are dependent on other firms within their supply chains. This is due to the codependence of resources that may be provided by partnering firms in long-term relationships in order to achieve competitive advantages (Halldorsson et al. 2007; Ketchen and Hult 2007). Resource-dependence theory is stated as fruitful to understand the relevance of sustainable behavior within supply chains (Sarkis et al. 2011). However, it is closely related to institutional and stakeholder theory (Palovita and Luoma-Aho 2010) and lacks the explanatory power and concrete theoretical constructs that would be essential for its application within this research (Stölzle 1999).
- (m) *The resource-based view* proposes that competitive advantages are gained by resources that are valuable, rare, imperfectly imitable and non-substitutable (Barney 1991). It argues that differences in the performances of organizations are subject to the distinct availability of resources (Miles and Snow 2007). Researchers that have applied the RBV to sustainable supply chains argue that the establishment of interorganizational capabilities and knowledge resources may enforce the sustainability performance and market positions of organizations within sustainable supply chains (Gold et al. 2010; Peters 2010). Nonetheless, it is arguable how the high abstraction levels of the RBV may be transferred to define capabilities and resources (Kraaijenbrink et al. 2010). Furthermore, interorganizational sustainability management may not always be implemented to achieve competitive advantages, implying that broad sustainable development may not take place if the capabilities and resources needed are imperfectly imitable and rare. Due to these limitations and the RBV's restricted ability to provide insights on designing incentive mechanisms, it is excluded from further consideration.
- (n) *Strategic choice theory* centers the role of managerial decisions regarding the efficiency and effectiveness of a firm (Child 1972). In terms of interorganizational relationships, the perspective is expanded to the collaborative choices or detached decisions that are made within a supply chain network. Miles and Snow (2007) propose that the interorganizational perspective of strategic choice theory leads to new insights on managerial decision-making processes and their effects. Thereto, the theory may support the development of interorganizational strategies. Since this is not in the scope of this dissertation, the application of strategic choice theory is not taken into further account.
- (o) *Stakeholder theory* is an explanatory theory that elucidates the interdependences of the organization's market and resources (Freeman 1984). It argues that firms produce externalities, which impact internal and external stakeholders. Vice versa, these stakeholders induce pressures to reduce negative effects and increase positive ones
-

(Sarkis et al. 2011). Therewith, stakeholder theory holds a significant role in explaining sustainability in interorganizational relationships. However, stakeholders take a similar role to institutions: this implies an overlap with institutional theory. The theoretical constructs of stakeholder theory are of a higher abstraction level and are thus less applicable than those of institutional theory. Additionally, reviews on organizational theories regarding interorganizational relationships have not underlined the relevance of stakeholder theory (Halldorsson et al. 2007; Miles and Snow 2007; Stölzle 1999), so it is exempt from further contemplation.

(p) *Transaction cost economics* centers the internal and external costs involved in the completion of an organizational task within the organization's institutional environment (Williamson 1981)²¹. Thereby, it provides a natural fit with supply chain management, since one of the core decisions in the scope of TCE is 'make-or-buy'. TCE distinguishes transaction costs prior to contract and ex-post contract in order to maximize performance and minimize costs (Ketchen and Hult 2007). Hence, TCE assumes opportunistic behavior and bounded rationality (implying a lack of information) akin to its neo-institutional economic companion: the principal-agent theory (Kim and Mahoney 2005). Based on transaction cost analysis, TCE suggests different forms of governance structures that center the specificity of the transaction (Williamson 1979). Against the background of sustainability, Sarkis et al. (2011) argue that TCE could support the determination and influence of negative environmental and social effects on outsourcing decisions. However, TCE is often criticized for its restricted perspective and the dominance of transaction costs (Groenewege 1996). Since sustainable activities may be of a long-term nature and there is uncertain added value at the early stages of interorganizational sustainability management, it is argued that TCE might provide insufficient results if applied in the context of incentive mechanisms for sustainability.

3.2 Selection of Theoretical Lenses Regarding the Research Problem

Based on the explications on relevant organizational theories regarding the research context, this section aims to summarize the outlined strengths and weaknesses of the nine discussed theories (h)-(p) in Table 7.

It has been shown that agency theory has the strongest suitability to the research problem, since it provides a structuration of the information asymmetries and agency problems that

²¹ The extant literature takes different standpoints regarding whether transaction costs include contracting, control, information and communication costs only (Sarkis et al. 2011) or whether production and distribution costs are considered transaction costs as well (Halldorson et al. 2007; Picot 2005; Stölzle 1997).

Theory	Strengths (Regarding the Research Problem)	Weaknesses (Regarding the Research Problem)	Suitability for the Research Problem
Game Theory	Mathematical derivation of recommendations regarding interdependent choices and actions, e.g. regarding the design of incentive mechanisms for sustainable logistics	- Highly restricted viewpoint - Requires scenario modeling - Low generalizability and applicability for explorative empirical findings on shipper-LSP dyads	
Institutional Theory	- Defines coercive, normative and mimetic pressures that lead to the sustainable behavior of organizations - Explains conforming organizational behavior with respect to legitimacy objectives	- Lack of understanding of non-conforming organizational behavior - Provides no explanations for incentive mechanism design	
Network Theory	Descriptive character that may be used to map the interplay between shippers and LSPs regarding sustainable logistics services	Lack of theoretical foundation and explanatory power of mapped interplay	
Principal-Agent Theory / Agency Theory	- Structuration of the design of incentive mechanisms regarding information asymmetries and agency problems (ex-ante and ex-post contract) - Derivation of recommendations for incentive design with respect to the suggestions of agency theory	- Restricted view on static shipper-LSP relationships - Determinant of efficiency objectives and opportunistic behavior that may conflict with legitimacy-driven sustainable behavior	
Resource-Based View	Insights into the capabilities and resources that are required to achieve competitive advantages regarding sustainability	- Possible conflicts of resource definition as imperfectly imitable and rare regarding sustainable development - Lack of explanatory power regarding incentive mechanisms	
Resource-Dependence Theory	Achievement of competitive advantages regarding sustainability is related to resources that depend on the partnering of shippers with LSPs	- Lack of explanatory power regarding incentive mechanisms - Lack of theoretical constructs - Close relation to institutional and stakeholder theory	
Stakeholder Theory	- Explanatory theory that maps the interplay of markets and resources - Explains sustainable behavior as a consequence of stakeholder pressures	- Provides no explanations for incentive mechanism design - Applies overlapping theoretical constructs with institutional theory	
Strategic Choice Theory	Insights into the development of interorganizational sustainability strategies	- Dominance of strategic decisions - Provides no explanations for incentive mechanism design	
Transaction Cost Economics	Concerns internal and external costs that result from the sustainable behavior of LSPs	- Dominance of transaction costs (difficulties in translating sustainable actions into monetary value) - Provides no explanations for incentive mechanism design	
Legend: High Suitability ; Low Suitability			

Table 7: Selection of Theoretical Lenses Regarding the Research Problem

are inherent in interorganizational relationships of shippers and LSPs. Furthermore, it benefits from clear suggestions regarding how these issues can be solved by incentive mechanisms. Nonetheless, agency theory is criticized for its boundaries and neglectance of the institutional environment. Referring to the introduction of this chapter, agency theory follows efficiency objectives regarding incentive design.

Thereto, institutional theory has been selected as a complementary theory for the parts of the dissertation that involve the environment of dyadic relationships. Institutional theory centers legitimacy objectives of organizations and benefits from its clear structuration of institutional pressures, as well as the principles of isomorphism and conformity. Herewith, it presents an adequate counterpart to agency theory.

3.2.1 Agency Theory

Agency theory is chosen as the core organizational theoretic lens to this dissertation project that is present in all three research papers. The following section introduces the key theoretical constructs²² in order to provide anchors for the heuristic research framework.

The agency perspective deepens the understanding of organization behavior in shipper-LSP relationships and provides a theoretical background on the factors influencing incentive design. Agency theory centers the contractual relationship of a principal company, who delegates a task to an agent who then executes that work (*Eisenhardt 1989a*). Due to the underlying efficiency rationale of agency theory, both principals and agents are assumed to be self-interested and risk averse. Beyond this, the principal is assumed to be unable to monitor agents' actions and behavior perfectly and free of charge (*Pratt and Zeckhauser 1985*). However, the principal can limit undesired behavior by the implementation of appropriate incentives and monitoring systems (*Jensen and Meckling 1976*).

According to agency theory, appropriate incentive design depends on distinct types of underlying information asymmetries and agency problems that are summarized by Table 8.

The adverse selection problem occurs prior to contract and refers to information asymmetries of hidden characteristics and hidden information. The principal is not able or it is too costly to explore characteristics or to validate and understand the information provided by an agent. Moral hazard is related to information asymmetries of hidden actions and hidden information as well. Principals are worried about the invisible opportunistic behavior of agents or again are unable to validate and understand the information provided by an agent (*Alparslan 2006; Shapiro 2005*).

²² The section includes parts of the theory reviews provided within paper B and C.

Adverse selection and moral hazard problems can be solved by adequate monitoring systems that allow for the evaluation and selection of proper agents, as well as further contract-based incentives to prevent inappropriate agent behavior (*Eisenhardt* 1988; *Eisenhardt* 1989a; *Fama* 1980; *Logan* 2000; *Picot et al.* 2005). In her assessment and review, *Eisenhardt* (1989a) uses the phrase ‘contract design’ instead of ‘incentives’. Based on the framework of organizational control mechanisms, she proposes contracts be designed as either behavior or outcome-based (*Eisenhardt* 1989a; *Ouchi* 1979). Against this background, she highlights two major influencing variables: behavior measurability and outcome measurability. Thus, incentives may be behavior-based or outcome-based. Behavior-based incentives evaluate behavior and allow for selection mechanisms prior to contract, whereas outcome-based incentives reward or penalize agent behavior within a contractual relationship (*Laffont and Martimort* 2002; *Lim* 2000; *Picot et al.* 2005; *Solomon and Lewis* 2002; *Stölzle* 1999). Beyond these influential factors, *Eisenhardt* (1989a) also adds the risk aversion of principals and agents as a further moderator of contract design. She assumes that "if there is no goal conflict the agent will behave as the principal would like, regardless of whether his or her behavior is monitored" (p. 61). In contrast, high goal conflict should be addressed by outcome-based contracts. Thereby, three influential factors are introduced that refer to the task characteristics of organization behavior.

Agency Problems	Adverse Selection		Moral Hazard
Information Asymmetries	Hidden characteristics	Hidden information	Hidden action
Point of Time	Ex ante contract signing	Ex post contract signing	Ex post contract signing
Origin	Ex ante unknown qualities of agent	Lack of information to understand or verify behavior of agent	Unobservable behavior of agent
Problem	Evaluation of agent characteristics, Incentive design for differentiation of agent types	Evaluation of information by agent, Incentive design for appropriate reporting	Evaluation of agent characteristics, Incentive design for increasing performance level
Variability of Behavior	given	given	given
Solution Type	Signaling, screening, self selection	Incentive and control system	Incentive and control systems

Table 8: Characteristics of Agency Problems
(Adapted from *Roiger* 2007, p.13 and *Mathissen* 2009, p. 22)

3.2.2 Institutional Theory

Institutional theory is chosen as a complementary theory within one of the research papers (see appendix B)²³, which takes a broader view on sustainable behavior in dyadic relationships of logistics services.

Institutional theory explains the coherence of institutional pressures and the behavior of organizations as illustrated by Figure 9.

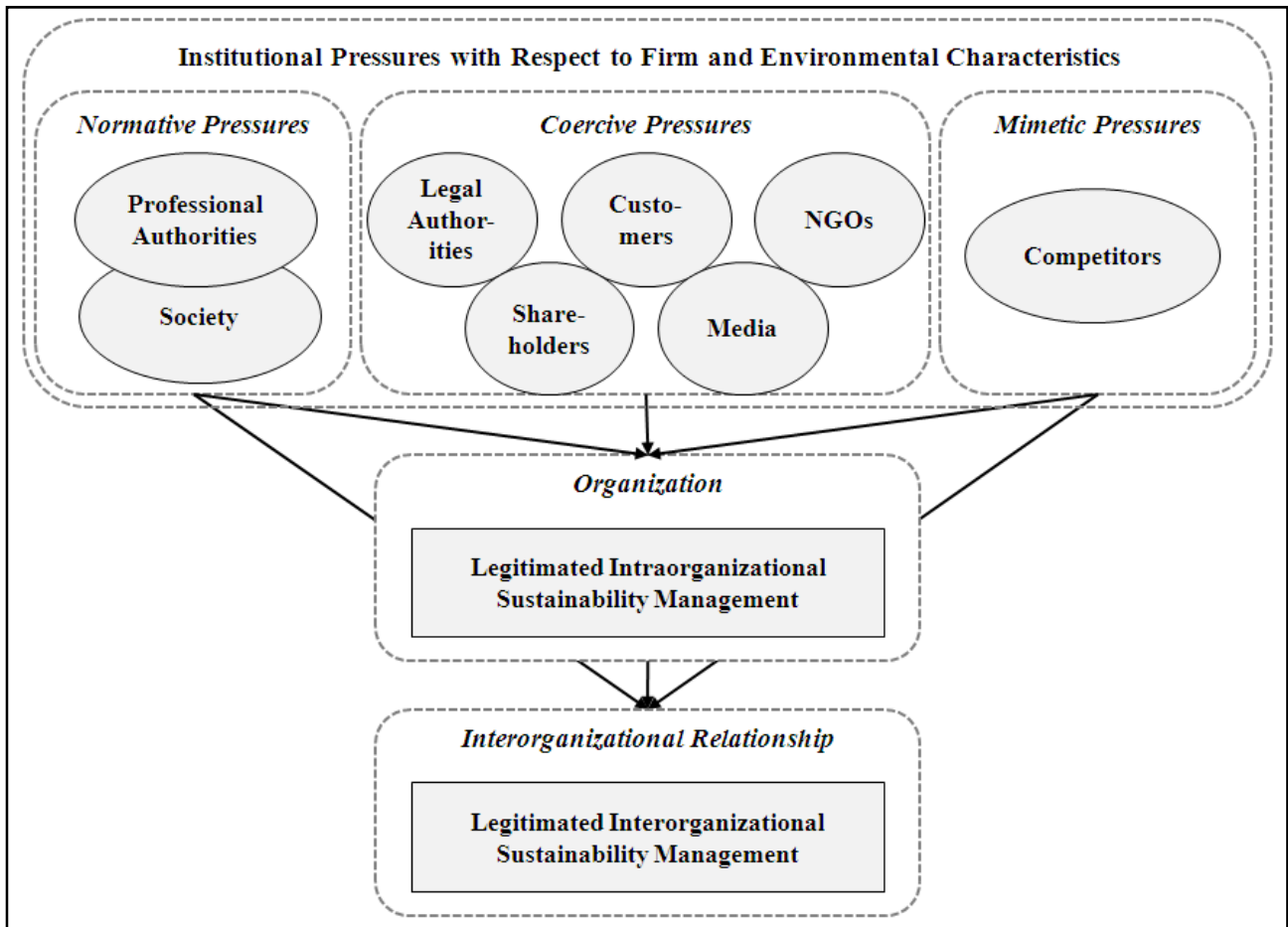


Figure 9: Institutional Pressures Regarding Sustainable Behavior of Organizations
(Adapted from *Williams et al.* 2009, p. 610)

Eisenhardt (1988) proposes that "the key idea behind institutionalization is that much organizational action reflects a pattern of doing things that evolves over time becomes legitimated within an organization and an environment" (p. 492). Legitimacy is defined as the perceived acceptance of an organization's actions as desirable and adequate to successfully sustain itself in its environment (*Kostova and Zaheer* 1999; *Suchman* 1995). As drivers for legitimacy needs, institutional theorists distinguish normative, mimetic and coercive pressures. These pressures reflect internal pressures, relating to firm or organizational characteristics, and external pressures, relating to environmental

²³ The section includes parts of the theory review provided within paper B.

characteristics (*Zucker 1987*). Normative pressures are proposed to stem from educational or professional authorities and are defined as "(...) a collective struggle of members of an occupation to define the conditions and methods of their work (...) to establish a cognitive base and legitimation of their occupational autonomy" (*DiMaggio and Powell 1983*, p. 152). Therewith, normative pressures rather reflect the internal perspective. Coercive and mimetic pressures, on the other hand, relate more to environmental characteristics. Coercive pressures include formal or informal norms, rules, expectations and laws actuated in an organization by other institutions (*DiMaggio and Powell 1983; Scott 1987*). Finally, mimetic pressures describe the competition within the environment of an organization. Thereto, institutional theory proposes that firms imitate peer companies and "best practices" in order to achieve competitive advantages (*Bansal 2005; Zhu and Sarkis 2007*).

On an interorganizational level, legitimacy needs are stated to be a mutual acknowledgement that involves expectations and the actual proper behavior and actions of partnering firms (*Kumar and Das 2007*). Thereto, institutional theory proposes that the height of legitimacy needs determines the selection process and the contractual relation, implying the choice of a partnering firm as well as the governance structure (*Dacin et al. 2007*). Against the background of sustainability, institutional theory supports the isomorphic understanding of similar development and the diffusion of sustainable actions throughout organizations (*Jennings and Zandbergen 1995; Oliver 1991*). Sustainability is therefore argued to be one type of legitimacy need (*Dacin et al. 2007*).

4 Research Framework

The subsequent chapter aims to integrate the conceptual and theoretical background in order to develop a research framework. Hereby, the research framework does not serve as a system of hypotheses in terms of logical consistency and viability but rather as a provisional and simplified orientation model. The objective is to summarize the existing theoretical knowledge and conceptual elements of the research context in order to illustrate their ties (*Kubicek 1977*). Thereby, it aims to channel and guide the progress of the research.

4.1 Definition of the Research Framework

Based on the stated research problem and its conceptual background, the research centers the constructs of sustainability management, third-party logistics services and incentive mechanisms implemented by shipping companies to actuate the sustainable behavior of LSPs.

Therefore, the conceptual elements refer to the tripartite understanding of sustainability that is reflected on an intraorganizational level implemented by shippers and LSPs, as well as on an interorganizational level implemented by shippers. Subject to the interorganizational level of sustainability (which is described by incentive mechanisms of supplier evaluation, selection and development), are logistics services, which encompass transport, warehousing, handling and administrative tasks. In addition, the research at hand covers the responses of LSPs towards incentives by means of performed sustainability activities.

Based on the theoretical background, the research framework elucidates a principal-agent relationship that is subject to underlying information asymmetries and agency problems regarding the mandated task of logistics services. Furthermore, the agency theory lens assumes opportunistic, self-interested behavior by shippers and LSPs, which influences the design of incentive mechanisms and the following of efficiency targets. Beyond this, agency theory provides propositions for how task characteristics (in the case of this dissertation related to sustainable logistics services) determine adequate incentive design. Since, the agency perspective is limited by its static view on the principal-agent dyad and neglects influences outside the dyad, agency theory provides no specific insights regarding recurrent shipper-LSP relationships, previous experiences or trustful long-term relationships.

Therefore, institutional theoretical constructs are integrated within the research framework in order to balance the stated limitations of agency theory and to derive more adequate and generalizable findings. Institutional theory provides the constructs of normative, mimetic and coercive pressures that are summarized by environmental and firm characteristics.

Thereby, institutional theory explains the sustainable behavior of organizations that follows legitimacy objectives by referring to underlying conformity and isomorphism principles.

Figure 10 illustrates the research framework that merges the outlined conceptual and theoretical constructs.

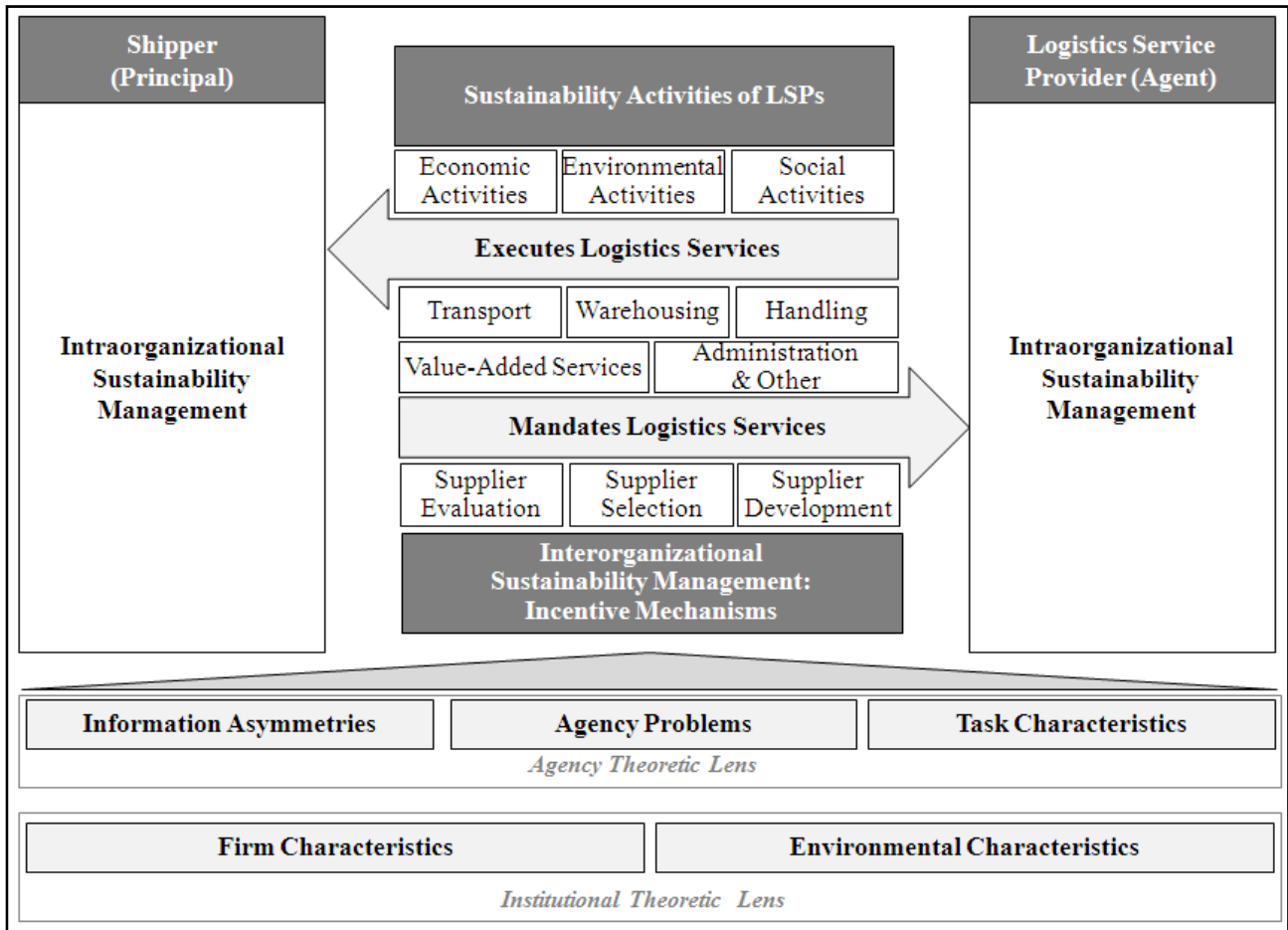


Figure 10: Research Framework

The scopes of the three research papers are schematically illustrated in Figure 11. The theoretical and conceptual constructs in focus are indicated by the shaded areas.

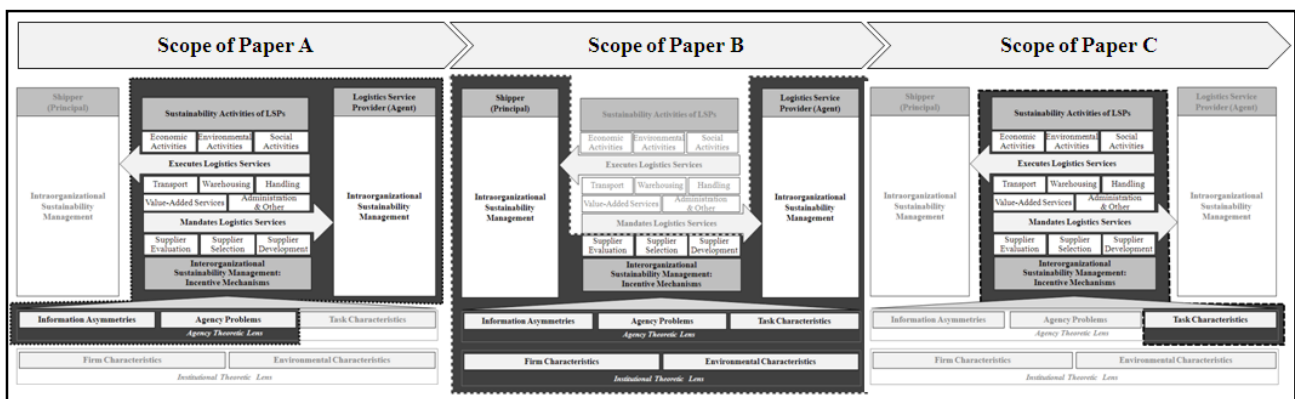


Figure 11: Scopes of Papers within the Research Framework

In order to present the three research designs and interplays of the papers within this cumulative dissertation in more detail, the following sections give a brief account. Figure 12 summarizes the research objectives, methodologies, empirical groundings and theoretical lenses of the papers and provides an introductory overview.

	Paper A	Paper B	Paper C
Research Objective	Exploring the Current State of Incentive Mechanisms for Sustainable Logistics Services and the Responding Sustainability Activities of LSPs	Explaining Determinants of the Conferment of Intraorganizational Sustainability Management to an Interorganizational Level	Derivation of Recommendations for the Design of Incentive Mechanisms with Respect to Characteristics of Sustainable Logistics Services
Methodology / Data Collection Procedure	▪ Literature Review ▪ Interviews ▪ Short Reports and Documentation of LSPs	▪ Literature Review on Theoretical Lenses ▪ Interviews ▪ Archival Data / Further Documentation on Sustainability	▪ Literature Review ▪ Two Interview Rounds (Single Interviews / Nominal Group Interviews)
Empirical Dataset	Case Studies of Eight Logistics Service Providers	Case Studies of Four Dyadic Relationships (Shippers and LSPs)	Case Studies of Four Dyadic Relationships (Shippers and LSPs)
Theoretical Lens	Agency Theory Supported by the Behavioral-Scientific S-O-R Model	Integrated Agency-Institutional Theoretic Approach	Agency Theory

Figure 12: Summarized Research Designs of the Papers

4.2 Research Design: Paper A

Paper A serves as an introduction to the research on sustainability in shipper-LSP relationships. It investigates the current state of the implementation of sustainability incentive mechanisms set by shippers and sustainability activities conducted by LSPs. An agency theoretic and stimulus-organism-response framework is applied as the theoretical foundation for the explorative case study analysis of five small-sized and three large-sized European LSPs. The behavioral-scientific stimulus-organism-response (S-O-R) model complements agency theory through its explorative character regarding cause-effect relationships. Therewith, S-O-R is applied as the explorative model, while agency theory is utilized to explain, discuss and resolve the findings.

The research design encompasses a literature review on sustainable purchasing and sustainable logistics services. Based on the early stage of interorganizational sustainability management and the research objective to identify patterns within rich, real-world datasets, the paper applies a multiple case study analysis that is grounded by the theoretical sampling method (*Eisenhardt and Graebner 2007*). The empirical datasets contain triangulated data

in written and oral formats based on interviews and documentation provided by the companies under study. The data analysis concludes by presenting a tentative taxonomy that contrasts the incentive mechanisms by shippers and the responding sustainability activities of LSPs. Thereby, a set of four response types is developed and discussed from an agency theoretic viewpoint regarding inherent information asymmetries and agency problems.

4.3 Research Design: Paper B

Paper B is based on the findings of the first paper, which point out that organization behavior with respect to sustainability differs significantly. In contrast to the first paper, the second paper analyzes dyadic relationships of shippers and LSPs from both perspectives. Thereby, it aims to explain the differing behavior and derive determinants that explain the conferment of sustainability management to an interorganizational level. The study is anchored by an integrated institutional and agency theoretic approach and analyzes the empirical datasets of four shipper-LSP relationships.

The empirical datasets contain 18 interviews regarding sustainability management and sustainable logistics services. The selected interviewees were board members, sustainability managers, purchasers of logistics services and key account managers. Beyond this, archival data on intraorganizational sustainability management structures and actions are taken into account to ensure a comprehensive and rich dataset. The data analysis contemplates the sophistication of intraorganizational sustainability management of shippers and LSPs and the sophistication of interorganizational sustainability management regarding sustainable logistics services. The empirical findings illustrate the determinants of agency and institutional theoretic backgrounds that influence the design of incentive mechanisms for sustainability.

4.4 Research Design: Paper C

Paper C analyzes the design of interorganizational incentive mechanisms for sustainable logistics services from an agency theoretic viewpoint. Based on four case studies of shipper-logistics service provider dyads, sustainable logistics performance criteria and corresponding incentive mechanisms are identified.

The data collection follows the two research questions on the definition of sustainable logistics services and the determination of interorganizational incentives for sustainable logistics services regarding the influential factors of behavior measurability, outcome uncertainty and goal conflict. Thereto, triangulated data from the literature and single

interviews, as well as nominal group interviews, is used. The nominal groups of experts from the shipping companies and the LSPs are employed to find a consensus on the assessment of influential factors and the assigned incentive mechanisms for each case. The analysis of the empirical data is conducted in three phases. First, the findings from the first interview round (individual interviews) are analyzed for relevant sustainability performance criteria for logistics services. Thereby, a list is developed, which serves as a basis for the nominal group interviews. The second step of data analysis deals with the assessment of the three influential factors regarding the sustainable logistics performance criteria. Third, an analysis of the selected incentive mechanisms for each composition and/or performance criterion is conducted. This step leads to an agency theoretic discussion of incentive mechanisms for extreme compositions of influential factors, which is concluded with a derivation of managerial and scientific recommendations for the design of incentive mechanisms for sustainable logistics services.

5 Summary of Key Findings and Contributions

According to the outlined research designs of the three scientific papers of this cumulative dissertation, the following chapter provides summaries of the key findings and contributions of each of the conducted studies.

5.1 Key Findings and Contributions: Paper A

Paper A analyzed sustainability in eight dyadic shipper-LSP relationships from an LSP perspective. The study is the first to apply a combined approach based on agency theory and the S-O-R model to observe shippers' stimuli, as well as LSP response activities, and develop a tentative taxonomy of response types. It therefore contributes to theory building and research on interorganizational sustainability management and indicates various future research topics.

Key Findings and Scientific Contributions:

- Development of a tentative taxonomy of response types of LSPs. The taxonomy contrasts the stimuli of shippers and the responding sustainability activities of LSPs. It elucidates four types of LSPs (Responsive Low and High Performers; Proactive Low and High Performers) that are discussed from an agency theoretic viewpoint. Hereby, underlying agency problems and information asymmetries are identified.
- Shippers' incentive mechanisms for sustainability are at an early stage and demand research into their design, effects and implementation (even proactive buyers barely yet integrate logistics services into their sustainability management).
- Sustainability activities of LSPs hold a strong environmental focus, which elucidates an imbalanced operationalization of the tripartite sustainability concept.
- The case sample elucidates higher proactiveness of SMEs in contrast to large companies. This finding is claimed to be a direction for future research into the specifics of drivers and motivations for SMEs.
- Methodologies and standards for the evaluation and assessment of the sustainability performance of LSPs are still lacking and thus provide an opportunity for future research.
- The identified significant differences regarding the proactiveness of SMEs in contrast to large-sized companies induce future research opportunities regarding comparative studies that take firm size and sustainability into account.

Key Managerial Contributions:

- Purchasers of logistics services may find the presented taxonomy useful to categorize their LSPs with respect to sustainable behavior.
- LSPs may find the detailed presentation of economic, environmental and social activities helpful to enhance their sustainability management concepts and prepare for the future demands of shippers.

5.2 Key Findings and Contributions: Paper B

Paper B investigates the determinants of interorganizational sustainability management in the dyadic relationships of logistics services from an agency and institutional perspective. Based on four case studies of shipping companies and logistics service providers, it is identified that shipping companies do not necessarily confer sustainability to an interorganizational level and thus implement incentive mechanisms. The study identifies determinants that influence the conferment of sustainability and relates them to institutional and agency theory.

Key Findings and Scientific Contributions:

- Based on the empirical results of four shipper-LSP relationships, six determinants were identified for why organizations hesitate or struggle with the conferment of sustainability. These determinants reflect the characteristics of the organization and its environment (lack of market liberalization and customer demands; decoupling of units or subsidiaries on the shipper's side), the characteristics of sustainable logistics services/sustainable behavior (measurability difficulties; uncertain added value; goal conflicts) and the characteristics of the dyadic relationship (trust).
- The sustainable behavior of LSPs is not solely dependent on principals' interorganizational sustainability management. Institutional pressures outside the dyad and affiliations to multiple supply chains should be taken into consideration when designing efficient and effective incentive mechanisms.
- The nature of sustainability lies between efficiency and legitimacy objectives. The empirical findings indicate that the conferment of sustainability to interorganizational incentive mechanisms for logistics services is determined by efficiency rather than legitimacy objectives nowadays.

Key Managerial Contributions:

- Market barriers, as well as customer requirements, have a strong influence on whether shipping companies confer or do not confer sustainability to an interorganizational level.
- The diffusion of corporate sustainability towards business functions plays a decisive role in the design of incentive mechanisms regarding logistics services.
- Long-term trustful relationships may tend to abstain from the development of interorganizational incentive mechanisms. Managers may consider to revisit trust that has developed through routines regarding traditional logistics services and trust that has evolved by the development of new sustainable routines.

5.3 Key Findings and Contributions: Paper C

Paper C analyzed four dyadic relationships of shippers and LSPs. It investigated rewardable sustainable logistics behavior and adequate interorganizational incentive design regarding the characteristics of sustainable behavior. The characteristics are given by the agency theoretic lens, as well as the findings of Paper B (behavior measurability, goal conflict and outcome uncertainty). The empirical findings lead to managerial and scientific recommendations regarding incentive mechanisms and the role of characteristics in sustainable logistics services.

Key Findings and Scientific Contributions:

- Provision of a set of 45 sustainable logistics performance criteria that are relevant as targets of incentive mechanisms. Seventeen of these performance criteria have been identified as relevant by all cases within the sample.
- According to the empirical findings, the sustainable behavior of LSPs is characterized by medium to high behavior measurability, low to medium goal conflict and medium to high outcome uncertainty. These findings underline the efficiency rationales of shippers and may explain why shipping companies hesitate to develop incentive mechanisms.
- Identification of behavior-based and outcome-based incentive mechanisms for sustainable logistics services.
- Presentation of a starting point for critical reflection on ambiguous agency theoretic suggestions regarding incentive design.
- Empirically derived recommendations for designing incentives under the influence of low and high levels of behavior measurability, goal conflict and outcome uncertainty.

-
- Evaluation and selection of LSPs according to their sustainability performance is identified as the core incentive mechanism. Further incentives that are related to supplier development (extended contract duration, contract contents or collaboration) are applied scarcely and are related to the behavior characteristics of high goal conflict and low outcome uncertainty.

Key Managerial Contributions:

- Purchasers of logistics services may find the results on relevant sustainable logistics performance criteria helpful to develop evaluation and selection schemes for LSPs. Likewise, LSPs may apply these criteria as starting points for their sustainable development.
- Practitioners may rely on the identified incentive mechanisms and derived recommendations in order to further develop their interorganizational sustainability management.

6 Conclusion

The final chapter of this dissertation concludes the key findings and contributions of the three research papers. It discusses the overall scientific and managerial contributions. Beyond this, it critically discusses the limitations of the research and derives recommendations for future research.

6.1 Scientific Contributions

The dissertation at hand explores the field of incentive mechanisms within interorganizational sustainability management for logistics services. Therewith, it contributes to a field of steadily increasing scholarly relevance but also a vastly unexplored research arena. As outlined in the conceptual background of this thesis (see Section 2.3.1 in particular), interorganizational sustainability research faces five major research arenas, which demand thorough contributions. In the following paragraphs, the scientific contributions of the thesis are related to the identified gaps in the research on interorganizational sustainability management.

First, the dissertation contributes to the further convergence of sustainability and SCM concepts. It outlines the ties between intraorganizational and interorganizational sustainability management through the derived conceptual frameworks, the tentative taxonomy and its focus on incentive mechanisms as a core element to gain information and control sustainable behavior, as well as to consequently adopt penalty and reward structures.

Second, the dissertation outlines the feasibility to operationalize sustainability for relevant business functions such as logistics services. It provides detailed insights into how to break down the often criticized abstractness of the Brundlandt definition for the sustainable development of logistics services with respect to all three dimensions of sustainability. Thereby, it highlights the role of a comprehensive diffusion of corporate sustainability management to business units and functions in order to develop resilient sustainability management concepts.

Third, the research at hand contributes to the measurement of sustainability performance for logistics services. It provides sets of empirically derived performance criteria that may be utilized for the further development of scientific sustainability performance evaluation schemes.

Fourth, the thesis provides detailed insights into the efficient and effective design of incentive mechanisms. Thoughts have been given to an exploration of the current state of incentives and determinants that influence the design. These determinants stem from the

characteristics of sustainable behavior, characteristics of interorganizational relationships and the characteristics of organizations and their institutional environments.

Fifth, the dissertation contributes to academic debates regarding organization trade-offs in terms of sustainability (*Hahn et al.* 2010). Despite the fact that sustainable behavior is often reasoned by legitimacy objectives (e.g. *Campbell* 2007), interorganizational sustainability management (in its current state) is often rather efficiency-driven.

Finally, the dissertation at hand contributes to organizational theoretic research regarding agency theory and the integrated usage of agency and institutional theory. It points out the applicability of agency theory to interorganizational sustainability management research. However, it outlines its boundaries and ambiguities regarding the design of incentive mechanisms. In addition, the research exemplifies how institutional and agency theory complement each other on research issues that lie between efficiency and legitimacy rationales.

6.2 Managerial Contributions

The managerial contributions of the dissertation refer to the development of a more detailed understanding of sustainability within and across organizations.

First, the dissertation provides a detailed understanding of sustainability for logistics services. It outlines the relevance of the sustainable development of logistics services for both shippers and LSPs. It presents an empirically validated structure and performance criteria to assess the sustainability performance of logistics services. Thereto, it integrates the economic, environmental and social dimensions with logistics services of transportation, warehousing, handling, value-added services and administrative tasks.

Second, the research indicates determinants of relevance when developing interorganizational sustainability management structures. Practitioners may consider these characteristics of sustainable behavior, the organization, the organization's environment and relationship characteristics when designing incentive mechanisms.

Third, the thesis outlines empirically derived recommendations for incentive design. These recommendations include the knowledge of board members, corporate sustainability managers and purchasers of logistics services from shipping organizations, as well as their counterparts on the side of logistics service providers. Hence, these recommendations aim to support the implementation of incentive mechanisms for sustainable logistics services in practice. It has been shown that sustainability supplier evaluation and selection schemes in particular are of high interest and relevance to practitioners. Further collaborative

development of certain sustainable behaviors of LSPs is scarcely applied with respect to the characteristics of high added values and high goal conflict. However, direct monetary incentives (e.g. price level increases or direct bonus payments) have been identified as not in the scope of intended incentive mechanisms at the current stage of interorganizational sustainability management²⁴.

6.3 Limitations and Future Research

The limitations of this dissertation may be related to the scope of the research, the applied methodologies and the organizational theoretic viewpoints chosen. Hence, these limitations also provide avenues for future research.

Due to the explorative design of the research, the dissertation predominantly focuses on logistics services that involve road transports. Further delimitations that refer to the segmentation of logistics (see Section 2.2.1), such as the type of goods or the comprehensiveness of service, were not taken into account. This broadness allows for a wider picture of sustainable logistics services but delimits the generalizability of the findings for specific industries or services. The focus on road transports also delimits the findings on sustainability performance criteria regarding warehousing, handling and value-added services, and certainly regarding all other modes of transport. Future research thus may take further delimitations into account or center other transport modes. Moreover, the empirical findings are limited by the geographical location of the organizations in scope. The data was collected from shipping organizations and LSPs located in Germany and Switzerland. Since governmental regulations play a significant role in sustainable development and mark the minimum requirements of sustainable activities, the transferability of the findings to other legal environments is limited. Hence, future research may compare the results to other geographical regions and legal backgrounds. A final limitation of the findings can be found in the approach to analyzing dyadic relationships of logistics services. LSPs are usually affiliated with multiple relationships and supply chains. Moreover, they may use subcontractors within their networks. Likewise, shipping organizations employ multiple LSPs. Therewith, the research presents an extract of the real world that for simplicity and generalizability reasons. Future research may extend this perspective and analyze these networks from both a shipper and an LSP perspective.

The second body of limitations refers to the applied methodology. The explorative character of the thesis, which was determined by the early stage of interorganizational sustainability

²⁴ An application of the identified incentive mechanisms of Paper C is planned by two of the shipping organizations under study by the end of 2011.

management regarding logistics services, led to the suitability of a predominantly qualitative case study approach. Hereby, the aim for rich datasets of selected cases limited the number of analyzed organizations. Hence, the generalizability is limited by the chosen methodology. In terms of future research, large-scale testing of the derived implications is suggested. Furthermore, researchers may take longitudinal studies into account that map the development of incentive mechanisms. Beyond this, future research may investigate the effects of incentives on the sustainable development of LSPs.

The third aspect of limitations reflects the choice of the core organizational theoretic lens. As agency theory presents a restricted view on static dyadic relationships, recurrent contracts, experiences and especially long-term trustful relationships, this shows its explanatory boundaries. Agency theory lacks the capability to explain multiple affiliations of the actors in scope, as well as their institutional environments. Therefore, critical assessments of agency theory and the application of other (e.g. transaction costs economics) or multiple theoretical lenses are suggested to further develop research within the field.

Appendix

Paper A: Sustainability in Shipper-Logistics Service Provider Relationships:
A Tentative Taxonomy Based on Agency Theory and Stimulus-Response-
Analysis

*Accepted and presented in a former version at the 73th VHB Annual
Congress, Kaiserslautern, June 16-18 2011*

*Accepted at the Journal of Purchasing and Supply Management, 2012,
in press*

Paper B: Determinants of Interorganizational Sustainability Management in Dyadic
Relationships: An Agency- and Institutional-Theoretic Approach

*Accepted at the Academy of Management 2012 Annual Meeting, Boston,
August 03-07 2012*

Paper C: Designing Interorganizational Incentive Mechanisms for Sustainable Logistics
Services: An Agency-Theoretic Analysis of Influential Factors

A Sustainability in Shipper-Logistics Service Provider Relationships: A Tentative Taxonomy Based on Agency Theory and Stimulus-Response Analysis

Nicole Kudla* and Thorsten Klaas-Wissing*

*Chair of Logistics Management, University of St.Gallen

A.1 Abstract

The paper contributes to research on sustainability in dyadic buyer-supplier relationships of logistics services. It presents deeper knowledge on why and how suppliers choose to behave sustainably. The research analyzes how shippers stimulate their LSPs and how LSPs respond by conducting sustainability activities. Agency theory and the stimulus-organism-response model are applied as the theoretical foundations for an explorative case study analysis of three large and five small and medium-sized European logistics service providers (LSPs) active in road transport services. Significant differences are found between the sustainability efforts of SMEs and large LSPs and a tentative taxonomy of the sustainability response types of LSPs is derived. The taxonomy contributes to theory-guided research in sustainable supply chain management and procurement. Thereby, mismatches of stimuli and responses are identified and related agency problems in dyadic relationships in terms of sustainability are discussed. From a managerial point of view, the findings may serve as a starting point for purchasers of logistics services to develop adequate sustainability selection criteria and incentives.

Keywords: Sustainability; Logistics; Incentives

A.2 Introduction

Contemporary academic and practitioner journals reflect the increasing relevance of sustainability in purchasing and supply chain management. Publications on topics like corporate social responsibility, environmental responsibility, philanthropy and business ethics (interchangeable names for sustainability) (*Bansal and Roth 2000; Lockett et al. 2006; McWilliams et al. 2006*) have increased significantly within the past decade (*Carter and Easton 2011; Seuring and Müller 2008b*). However, in times of global value creation networks and growing outsourcing, sustainability management clearly surpasses corporate borders and demands linkages with supply chain management (SCM) (*Carter and Rogers 2008; Pagell and Wu 2009; Svensson 2007*).

The evolving interorganizational supply chain perspective of sustainability brings up the questions of if and how suppliers' sustainable behavior is required and actuated by buyers (*Seuring and Müller 2008a*), as well as how suppliers react to the new sustainability demands of their customers. These questions play a prominent role in research on sustainable procurement. Articles in the field deal with drivers and mediators for the integration of supplier levels (*Min and Galle 1997; Pagell et al. 2010; Simpson et al. 2007; Walton et al. 1998*) and their impact on firm performance (*Foerstl et al. 2010; Reuter et al. 2010*), the development of sustainability selection criteria and methodologies (*Bai and Sarkis 2010; Lu et al. 2007*), and the organizational changes required to implement sustainable supplier management practices (*Koplin et al. 2007*).

A closer look at relevant articles outlines four major research gaps and elucidates the relevancy and objectives of this paper. First, current research predominantly deals with conceptual frameworks on the constituents and mediators of sustainable purchasing principles from a buyer perspective (*Amaeshi et al. 2008; Carter 2004; Carter 2005; Carter and Jennings 2004; Salam 2009*). Although the supplier's view from a dyadic perspective may give deeper insights regarding the implementation of interorganizational sustainability management, this perspective has rarely been contemplated (*Simpson et al. 2007; Wolf and Seuring 2010*). Second, the majority of current publications neglect the tripartition of the sustainability concept by focusing on the environmental dimension only (*Carter and Dresner 2001; Kogg 2003; Lu et al. 2007; Min and Galle 1997; Vachon 2007; Walton et al. 1998*). Third, from the viewpoint of organization theory, institutional and stakeholder approaches are identified as being predominant in the field (*Amaeshi et al. 2008; Simpson et al. 2007*). According to *Sarkis et al. (2011)*, research into incentive mechanisms and their impact on the adoption of sustainable practices could especially benefit from the consideration of agency theory (*Kogg 2003*) and the behavioral sciences. Finally, it was found that the available research on sustainable procurement intensively focuses on international product suppliers and less on service suppliers such as logistics services providers (*Wolf and Seuring 2010*). However, in addition to their well-known economic role, logistics processes have a strong impact on the environment (e.g. transportation-induced greenhouse gas emissions, noise and land consumption) and social issues (e.g. transport safety and physically draining occupations). Thereby, the derivative character of logistics services (i.e. the dependency of the demand for logistics services on the production and sales volumes of shipping industries) promotes the importance for focal companies to integrate related services into their interorganizational sustainability management.

Against this background, this research aims to fill the identified gaps regarding interorganizational sustainability management in shipper-LSP relationships using the following research question:

RQ: How is sustainability stimulated by shippers and how do LSPs respond to these requirements?

The study contributes to research on the procurement of sustainable logistics services through the application of a combined theory approach that encompasses the agency theory of economics and the stimulus-organism-response model (S-O-R) of behavioral science. This combined approach provides a deeper conceptual understanding of the contractual relationship between shippers and LSPs in terms of sustainability and rational behavior. For empirical evidence, an exploratory case study analysis of eight European LSPs is applied from a dyadic but supplier-focused perspective. Based on the theoretical and empirical implications, a taxonomy of sustainability response types of LSPs is developed.

In a first step, relevant literature is analyzed with respect to findings and identified research gaps. Thereby, frameworks on the motivation for sustainability and sustainable supply chain management (SSCM) are considered, as well as sustainable logistics. Second, the underlying research framework and the combined theory approach are introduced. Third, the methodological steps of the case study analysis and taxonomy development are presented. Within the first part of the results section, the current status of stimuli or incentives in interorganizational sustainability management in the context of logistics services is analyzed. The second part deals with the responding sustainability activities. Finally, the results are contrasted and a tentative taxonomy of the response types of LSPs is developed. Thus, a categorization for sustainable logistics services is presented and the findings are discussed from an agency theory point of view.

A.3 Literature Review

Sustainability and green supply chain strategies are described as ranging from compliance with legislation to holistic sustainability concepts that involve employees, customers and suppliers (*Min and Galle 1997; Walton et al. 1998*) and, thus, reactive and proactive strategy types (*Srivastava 2007*). *Walton et al. (1998)*, as well as *Min and Galle (1997)*, find limited integration of suppliers in their samples. However, they underline the important influence of purchasers and supply chain managers on sustainability management and suggest increased effort to proactively manage sustainability or environmental issues.

This aspect is linked with research on motivations for sustainability, which predominantly focuses on the role of institutional pressures. Therewith, normative, coercive and mimetic

pressures are discussed as the key moderators for sustainable behavior (*Bansal and Roth* 2000; *Delmas and Toffel* 2004; *Jennings and Zandbergen* 1995; *Zhu and Sarkis* 2007). Against this background, *Campbell* (2007) proposes that economic conditions, such as weak financial performance and intensity of competition, as well as institutional conditions (e.g. industrial self-regulation), drive companies to behave more or less sustainably. *Zhu and Sarkis* (2007) go one step further and test the moderating effects of implementing green supply chain practices. They point out that "the existence of market (normative) and regulatory (coercive) pressures will influence organizations to have better environmental performance (...)" and that "there are situations (...) where it might be prudent for production managers and strategists to champion certain practices down their supply chain (market pressures) (...)" (p. 4352). Furthermore, they highlight the role of firm size as a future research topic and propose that "(...) whereas regulatory and market pressures may influence larger organizations, smaller organizations may be more influenced by competitive pressures" (p. 4353).

While the articles presented deal with institutional and stakeholder pressures, they focus predominantly on the company level of sustainability. However, three current contributions were found that derive interorganizational SSCM frameworks. *Carter and Rogers* (2008) base their framework on a comprehensive literature review and integrate strategy, organizational culture, transparency and risk management into the triple bottom line concept. *Seuring and Müller* (2008b) include triggers for SSCM and supplier management for risk and performance, as well as SCM for sustainable products, into their framework. *Pagell and Wu* (2009) apply case study research to develop a model of sustainable SCM practices, which centers managerial orientation on sustainability and transparency in the supply chain and aims to increase sustainability outcomes. These frameworks reveal major research gaps in SSCM research: the triggers or incentives of SSCM, transparency by using adequate sustainability performance indicators, stronger supply chain orientation by the integration of suppliers and, finally, managerial orientation or organizational culture towards sustainability on a firm level (*Kudla and Stölzle* 2011).

Since the discussed publications do not point out any specifics regarding service suppliers and logistics services in particular, two articles on sustainable or environmental logistics services are finally discussed. *Carter and Jennings* (2002) propose an integrative framework for socially responsible logistics services, based on 26 comprehensive interviews with logistics managers of medium and large-sized manufacturing companies. They develop an initial framework encompassing managerial antecedents, consequences and activities in the areas of diversity, environment, ethics, human rights/quality of life and safety. Since they do not consider outsourced logistics services, they suggest "(...) a confirmation by other supply

chain members" and an "(...) exploration of other functional areas within the firm, as well as suppliers, customers, small manufacturing concerns, service firms, including transportation and warehousing providers (...)" (p. 168). In contrast, *Wolf and Seuring* (2010) use a dyadic approach, analyzing how buyers of logistics services consider environmental issues. They present initial evidence and challenges on incentives and supplier management for logistics services. Due to the lack of deeper insight and theory building in their findings, they suggest "(...) more in-depth analysis on pressures and incentives for implementing environmental logistics" (p. 99).

To conclude, the literature review highlights diverse knowledge gaps that motivate the research. First, the majority of the articles solely discuss environmental and green supply chain issues in contrast to the triple bottom line understanding of sustainability, which encompasses economy, environment and society (*Elkington* 1997; *WCED* 1987). Second, various publications are of a theoretical or quantitative nature and lack deeper insights into types of pressures in buyer-supplier relationships and suppliers' responses. Third, the aspect of firm size is named crucial to the implementation of sustainability but also demands more in-depth analysis. Fourth, logistics services, as a predominant outsourcing function with significant environmental and social impacts, offer a relevant field for interorganizational sustainability research, yet it has rarely been the focus of current research.

A.4 Research Framework

According to *Seuring and Müller* (2008b), "(...) there is a deficit in the take-up of theoretical background, both from within supply chain management, as well as from a wider perspective, such as new institutional economics and strategic management" (p. 1706). Traditionally, sustainability issues are analyzed from theoretical perspectives, such as the resource-based view (*Bansal* 2005; *Barney* 1991; *Daily and Huang* 2001), institutional theory (*Jennings and Zandbergen* 1995; *Meisner Rosen et al.* 2002; *Peters et al.* 2011; *Ransom and Lober* 1999) or stakeholder theory (*Bremmers et al.* 2007; *Carroll* 1991; *Delmas and Toffel* 2004; *Jamali* 2008). Against this background, new institutional economics (and agency theory in particular) may provide new insights regarding sustainability phenomena in buyer-supplier relationships and supply chains, due to its "natural fit with SCM research" (*Sarkis, et al.* 2011, p. 11).

Agency theory centers the contractual (economic) relationship between an ordering party (principal) and a contractor (agent) under the constraints of information asymmetries, uncertainties and risk allocation (*Eisenhardt* 1989a; *Logan* 2000). In the present research case, the shipper mandates the LSP concerning transport, warehousing, handling and value-

added services. Sustainability of these services is assumed to be subject to traditional information asymmetries, such as hidden characteristics, hidden actions and hidden information. These information asymmetries are linked to the agency problems of adverse selections and moral hazards, which appear prior to contracts and within existing contractual relations. According to agency theory, the problems may be solved or balanced by means of adequate partner selection (signaling, screening and self-selection), as well as by incentive, information and control mechanisms (*Alparslan 2006; Ebers and Gotsch 2002; Picot et al. 2005; Roiger 2007*). To conclude, agency theory provides problem-oriented normative explanations and assumptions of human and firm behavior, which may be helpful to resolve major issues in dyadic relationships, such as goal conflicts and difficulties in behavior validation (i.e. information asymmetries), as well as the design of information, control and incentive mechanisms.

This is where agency theory and the behavioral stimulus-organism-response (S-O-R) model complement one another. The objective of the behavioral sciences is the exploration and design of cause-effect relationships. Although the origin of the S-O-R model is "influenced by the wealth of relevant findings adduced in social sciences, particularly psychology" (*Jacoby 2002*, p. 51), its explorative approach based on input-output models may be transferred to an economic context as well.

In economics, the behavioral sciences are often applied to understand and influence consumer behavior (*Jang and Namkung 2009; Lafuente and Salas 1989; Oh et al. 2008; Sherman et al. 1997; Slama 1987; Yi and Gong 2009*). For instance, *Sherman et al. (1997)* explore how store environments and emotional states influence purchasing behavior, whereas *Yi and Gong (2009)* analyze the coherence of perceived customer support and customer satisfaction in terms of repurchasing. The foundation of these analyses is the stimulus-organism-response (S-O-R) model, which maps the relation of three interrelated classes of variables: the stimulus "(...) as something that rouses or incites to action or increased action" (*Sherman et al. 1997*, p. 365), the organism "(...) represented by affective and cognitive intermediary states and processes that intervene the relationship between the stimulus and (...) responses" (*Eroglu et al. 2001*, p. 180), and the response as the final action or outcome, which implies either action or avoidance. Against this background, stimulus and response act as observable parameters within cause-effect relationships: this allows the deduction of behavioral patterns regarding the decision-making processes of the organism.

Due to its generic simplicity, the model is applicable to various relationships of principals and agents or buyers and suppliers. It is used in combination with agency theory for the present research on sustainability in shipper-LSP relationships. Thereby, the research

benefits from the complementing characteristics and strengths of both theories: S-O-R as the explorative model and agency theory to explain, discuss and resolve the findings.

Figure A-1 visualizes the developed research framework on the contractual relationship between the shipper and the LSP. The observations on the parameters of stimulus and response within the center of the framework will be presented in the results sections. These build the empirical basis for the derivation of response types of LSPs and thus the development of the tentative taxonomy. Finally, the tentative taxonomy and observations from an agency theory perspective are discussed in order to contribute to theory building on sustainability in dyadic relationships concerning logistics services.

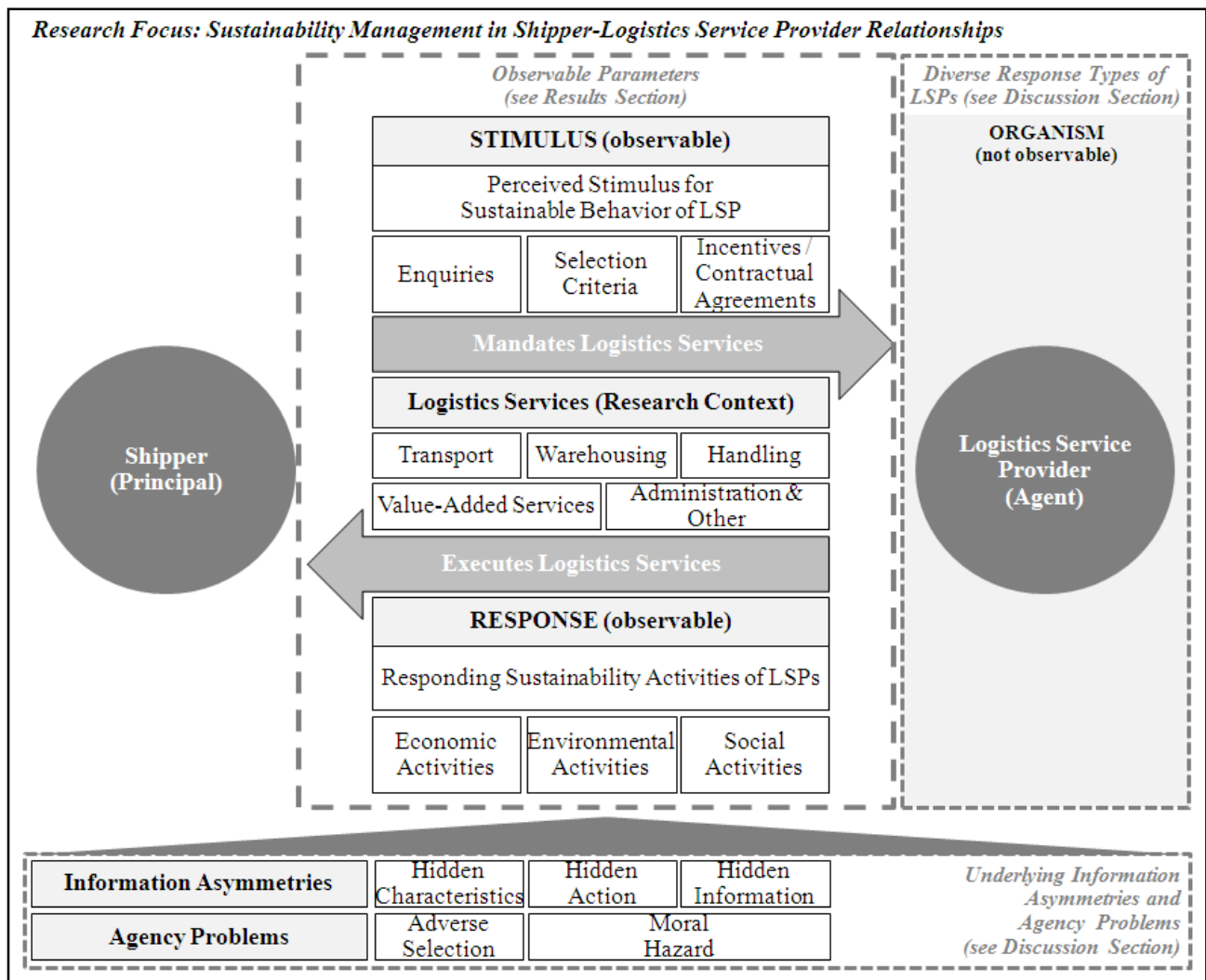


Figure A - 1: Research Framework Based on Agency Theory and the S-O-R Model

A.5 Methodology

In order to provide reconstructable and documented research, the main steps for case study work are followed: the definition of research questions, the unit of analysis, adequate case selection, data collection and data analysis procedures (*Eisenhardt 1989b; Yin 2003*).

The unit of analysis is distinguished by single cases and multiple cases, as well as holistic and embedded units. "But while single-case studies can richly describe the existence of a phenomenon, multiple-case studies typically provide a stronger base for theory building." (*Eisenhardt and Graebner 2007*, p. 27). Holistic cases contemplate outward influences to an organization or individual, whereas an embedded unit of analysis focuses on different subunits within an organization or individual (*Lamnek 2005*). Therefore, a holistic multiple-case design is chosen for the analysis of stimuli and an embedded multiple-case design is chosen for the response side.

A.5.1 Case Selection and Data Collection

Due to the objective to analyze sustainability stimuli and responses in dyadic relationships, the research aims to identify contrasting patterns in the data. Therefore, a theoretical sampling method is applied to explore polar types, implying sample extremes. According to *Eisenhardt and Graebner (2007)*, this sampling method allows for an empirically supported theory and a "(...) very clear pattern recognition of the central constructs, relationships and logic of the focal phenomenon" (p. 27).

The selected companies responded to a call for an assessment of sustainable logistics services in the European road transport industry. The selection process included the comparability of the cases in terms of the completeness of the requested datasets and the company size. Table A-1 gives an overview of the case sample, which includes the revenues, number of employees and fleet sizes of three large (cases I - V) and five small and medium-sized (cases VI - X) enterprises. Furthermore, the major market segments are named, which indicate the shippers' industries. Finally, the last row shows the permanently subcontracted fleet. The ratio is provided for two reasons: first, it shows the relevance of subcontracting within the logistics industry (cf. cases I, II and III); second, the ratio is given for the discussion of the role of sustainability management beyond corporate boundaries in terms of subcontracting.

	Case I	Case II	Case III	Case IV
Revenue	> €100 million	> €100 million	> €100 million	€2.5 million
Market segments - goods	▪ Building Mat. ▪ FMCG (Food) ▪ Textiles ▪ Machinery	▪ Textiles ▪ Furniture ▪ CEP ▪ FMCG (Food / Non-Food)	▪ Agric. Products ▪ Construction Mat. ▪ Chemicals ▪ FMCG (Food / Non-Food) ▪ Textiles ▪ Machinery ▪ Automotive	▪ Agric. Products ▪ Construction Mat. ▪ FMCG (Food) ▪ Machinery ▪ Automotive ▪ Packaging Mat.
Employees	4450	16500	3000	20
Fleet size	1200	1350	850	10
Permanent subcontracted fleet (%)	100%	90%	85%	0%
	Case V	Case VI	Case VII	Case VIII
Revenue	€25 million	€5-15 million	€30-50 million	€40 million
Market segments - goods	▪ Chemicals ▪ FMCG (Food / Non-Food) ▪ Textiles ▪ Machinery	▪ Construction Mat. ▪ FMCG (Food) ▪ Textiles ▪ Automotive	▪ Agric. Products ▪ Construction Mat. ▪ Chemicals ▪ FMCG (Food) ▪ Textiles ▪ Machinery ▪ Automotive	▪ Agric. Products ▪ Chemicals ▪ FMCG (Food) ▪ Textiles ▪ Machinery
Employees	120	90	370	110
Fleet size	50	40	110	160
Permanent subcontracted fleet (%)	12%	0%	11%	67%

Table A - 1: Case Sample

In general, empirical data collection techniques are interviews, participant observation, fieldwork or documentation (*Myers 2009*). The present research design used interviews and documentation. The first part of the research, stimuli in shipper-LSP relationships, demands insights into the perceived requests and support of shippers. Therefore, four major topics are analyzed:

- (1) Ratio of shippers stimulating sustainable logistics services (in terms of percentage of LSPs' revenues)
- (2) Shipping industries stimulating sustainable logistics services
- (3) Type and target of sustainability stimuli: enquiries, selection criteria and/or incentives to certain sustainability activities of LSPs
- (4) Opportunities, challenges and needs linked with sustainability in shipper-LSP relationships

These core issues were embedded in the semi-structured interview guidelines, which are adequate to understand themes of the lived daily world from the subject's own perspective (Kvale 2007). The interview guidelines were cross-checked by two further researchers with respect to the research objectives and clarity. Nonetheless, all the interviews were conducted by one of the two authors to ensure unitized transcription and interview procedures. The interview partners were the sustainability managers of the companies (cases I, II, III and IV) or managing directors (cases V, VI, VII and VIII) in the SMEs that did not have a dedicated sustainability manager. All the interview partners received the guidelines beforehand to allow for preparation. The interviews lasted between 45 and 75 minutes, depending on the experiences stated by the interviewees.

For the second part of the research, documents on the sustainability management concepts of the LSPs were collected. All companies handed in a ten page report describing their sustainability concept. The structure given was to comprehensively describe the motivation, objectives, measures, activities, resources applied and impacts. Furthermore, the companies filled out a questionnaire regarding all three dimensions of sustainability: economy, environment and society. Additional documentation screened for each case was the sustainability report if available (case III only) and company websites. All short reports and questionnaires were handed in by the sustainability managers and managing directors to ensure completeness.

A.5.2 Data Analysis

Due to the different kinds of datasets in both oral and written formats, the interviews and documents needed to be analyzed separately. The formats were used as a triangulation method: written formats were available beforehand so that the interview guidelines could be based on the documented sustainability concepts.

First, all eight interviews were audio-taped and transcribed into summarizing protocols directly after the interviews took place (Kvale 2007). The transcription followed the steps of summarizing content analysis: the definition of abstraction levels, selection process, reduction by summary, category building process and the iterative review of categories by analyzing the material (Mayring 2002, p. 94ff). The summarizing protocols were then transferred to a database for internal and cross-case analysis.

Second, comprehensive documentation analysis of the responding sustainability activities of LSPs was conducted. The documentation consisted of short reports, structured questionnaires and the sustainability sections of the company websites, as well as sustainability reports, if available. In order to follow a reconstructable research process, Mayring's model of structured content analysis was applied (Mayring 2002, p. 118ff).

The first step of structured content analysis is the sufficient definition of structuring dimensions by means of theory. Therefore, relevant dimensions are selected from sustainability as well as logistics literature. As first-level dimensions for sustainability, the triple bottom line concept and thus economy, environment and society are included within the analysis (*Elkington 1997*). For the second level, the basic logistics functions of transport, handling, warehousing, value-added services, administration and others are considered (*Klaus 2002*). Since a structure demands clear guidelines, a coding procedure and rules were defined for the classification of activities to first and second-level dimensions. First, activities were listed in one category only, so that cross-case analysis would not be limited by doubles. Second, all eco-efficient or socio-efficient activities were classified according to the environmental or social dimension only, instead of mentioning them in the economic dimension as well. Third, second-level dimensions classification rules were needed. While transport and handling are straightforward regarding their classification, warehousing activities, value-added services, administration and other activities may overlap. One example is facility-oriented activities, such as energy-saving lights. In order to list these activities once only, facility related activities were listed within the second-level dimension of warehousing, since it is a core competency of an LSP. Having these rules at hand, the material extraction of all cases was conducted sequentially and the results were transferred to the database.

A.5.3 Taxonomy Development

In this section, the definition of taxonomy and the methodology applied in its development in this research are introduced. A taxonomy classifies "(...) phenomena into mutually exclusive and exhaustive sets with a series of discrete decision rules" (*Doty and Glick 1994*, p. 232). According to *Rich (1992)*, a taxonomy is of an empirical nature and numerically defined. It is "(...) built of sets of similar groups (taxa) that are built into even larger and increasingly subsuming groups" (*Rich 1992*, p. 761). Expanding this, Rich defines three categories of typologies and taxonomies: traditional, theoretical and empirical. These categories are linked with process steps for the development of a taxonomy. Empirically driven but theory-based taxonomies, like the one this research aims to develop, encompass the definition of a classificatory theory, the definition of a universe of characters, the selection of characters of interest based on theory and, finally, the placement of organizations based on data analysis. Since "one source for the selection of the organizational variables upon which the classification will be built is the context of the study itself and the body of underlying theory" (*Rich 1992*, p. 767f), agency theory and S-O-R analysis are applied as the interlocking theoretical and empirical foundations of the research.

A.6 Results

A.6.1 Stimuli for Sustainability in Shipper-LSP Relationships

The data analysis follows the four major topics stated in section 4.1. Table A-2 gives an overview of the results of the interviews in reference to the first three topics.

Stimuli for Sustainability in Shipper-LSP Relationships		I	II	III	IV	V	VI	VII	VIII	Mean/ Sum
1.	Ratio of shippers stimulating sustainable logistics services (% of LSP's revenue)	10	50	20	14	30	30	1	15	21
2.	Shipping industries stimulating sustainable logistics: 1: Air Freight / 2: CEP / 3: Furniture / 4: Packaging / 5: FMCG (Food) / 6: FMCG (Non-Food) / 7: Automotive / 8: Chemicals	5/6	2/3 5/6	5/6	4	1/ 5/6	4/7	5	4/ 5/8	N/A
3.	Type and target of stimuli:									
	Fleet structure		1	1		1	1		1	5
	Sustainability report							1		1
	Training in eco-driving		1				1		1	3
	*Modal shift		1				1			2
	Sustain-ability enquiries and *sustain-able selection criteria									
	Alternative engines	1								1
	CO ₂ emission transparency	1	1	1	1					4
	ISO 14001 certification	1								1
	CO ₂ offsetting			1						1
	Overview of environmental activities	1	1			1				3
	Working safety standards		1				1		1	3
	Prohibition of child labor		1							1

Table A - 2: Stimuli for Sustainability in Shipper-LSP Relationships

The first row quantifies the stimuli for sustainable logistics. On average, 21% of revenues of LSPs are generated from shippers who stimulate sustainability engagement in their LSPs. Sustainability in large LSPs in the sample is actuated by, on average, 26.7% of their shippers, in contrast to SMEs with 18%. Our sample therefore suggests that larger LSPs are subject to more intensive buyer pressures in terms of sustainability.

In a second step, a closer look at the shipping industries stimulating sustainable behavior is taken. In sustainability literature, case studies are primarily conducted in the automotive industry (*Koplin et al. 2007; Tukker and Cohen 2004; Zhu et al. 2007*), the food sector (*Andersen 2002; Maloni and Brown 2006; Mintcheva 2005*), the chemical industry (*Reiskin et al. 1999*) and in the construction and foresting industry (*Irland 2007; Sharma and Henriques 2005*). These industries are also predominantly found among the analyzed dyadic relationships. The results indicate that end-consumer-oriented industries, such as fast-moving consumer goods (FMCG), furniture, automotive and reputation-sensitive sectors (such as air freight, packaging or chemicals), are particularly interested in the sustainability

activities of LSPs and thus attempt to proactively manage their supply chains in a sustainable way.

Due to the fact that small and medium-sized enterprises are often stated to not have the resources required for comprehensive sustainability management (*Ciliberti et al.* 2008a; *Côté et al.* 2008), the size categories of shippers is questioned as well. In cases III, IV and VII, 100% of the stimulating shippers are SMEs (so-called niche manufacturers) who differentiate themselves in terms of sustainability. Hence, there is no coherence between the company size of the shipper and their ambition to integrate their service suppliers in the case sample.

The third part of the table presents the types and targets of stimuli. Here, three types of stimuli are distinguished: sustainability enquiries, selection criteria and incentives or contractual agreements (cf. Figure A-1). The sustainability enquiry is a soft stimulus, implying enquired information that is not yet controlled or monitored. Sustainable selection criteria are essential to the contracting decision. Incentives and further contractual agreements refer to existing contractual relationships, detailed requirements and agreed consequences. Within the case sample, none of the third type of stimulus has yet been found. The largest group of stimuli in the dyadic relationships of the sample is the sustainability enquiry. Beyond this, it is found that modal shift (implying intermodal logistics services) is the only sustainable selection criterion, being relevant to two of the eight cases. Therefore, it is proposed that the shippers realize the information asymmetries regarding the sustainable behavior of LSPs prior to contract formation and within existing relationships but have not yet implemented adequate information, incentive and control mechanisms.

In the next step, the stimuli targets, i.e. the sustainability activities of LSPs, are contemplated. Economic targets, such as price and quality, are obviously standard selection criteria for shippers: they are thus omitted from the list. Beyond this, eight out of the eleven enquired activities concern environmental issues. Most relevant are CO₂ emissions, fleet structure and eco-driving training.

CO₂ emission standards have been discussed broadly in sustainability literature (*Andersen et al.* 2004; *Hammar and Jagers* 2007; *Hoffmann and Busch* 2008; *Meisterling et al.* 2009). However, measurability and comparability are still major issues for LSPs and shippers:

"Due to the variety of circumstances, benchmarking between actors in the transport sector is (...) difficult. Even if coordinated efforts could yield standard definitions of indicators, comparisons may not be fair due to differences in conditions outside the powers of the individual actor. However, the difficulty in

comparing performance and the unresolved problem of breaking down global ambitions to company targets in a fair way, does not reduce the potential for real developments" (*Roth and Kåberger* 2002, p. 369).

Hence, shippers seem to draw on comparable measures that influence the amount of CO₂ emissions: fleets and drivers.

Fleet structure refers to the emission standard of the vehicle. Thus, it directly influences the environmental impact and the variable vehicle costs due to European emission-oriented toll systems. Although fleet structure is measurable in terms of vehicle registration certificates, shippers tend to loosely enquire as to the highest standard and have not yet implemented control mechanisms.

Eco-driving is "perhaps the most overlooked action that could garner significant CO₂ savings (...). That is, a change from an "aggressive" driving style to a more refined style (...)" (*Barkenbus* 2010, p. 763). Especially in freight transport, the proposed reduction of fuel consumption by environmentally friendly driving is up to 10%. According to European guideline 2003/59/EG, eco-driving training will be compulsory for all truck drivers from 2014 onwards. In order to address the indicated potentials beforehand, shippers enquire about eco-driver training already. Further enquiries consider a general overview of environmental activities or the sustainability report, ISO 14001 certification, the usage of alternative engines or opportunities for CO₂ emission offsetting.

Social standards, such as working safety standards, are enquired about in cases II, VI and VIII, whereas prohibition of child labor was asked for by a shipper of company II only. In comparison to absolute enquiries on environmental issues, social standards seem to be of lower interorganizational interest within the case sample of European LSPs. The reason may be found in external stimuli, such as highly developed governmental regulations on working safety, social health and welfare systems. *Maignan and Ralston* (2002), for instance, compared the CSR positions of European and US companies and proposed coherence between the development of governmental social welfare systems and the engagement of companies within the countries.

The analysis of shipper stimuli reveals initial engagement and underlines the lack of implemented information, control and incentive mechanisms. Therefore, exemplary selected quotes of the interviewees regarding the opportunities, challenges and needs of interorganizational sustainability from an LSP perspective are presented in Table A-3. According to the explorative research approach utilized, all provided statements are presented but doubles are not listed.

Opportunities	Challenges	Needs
▪ "In order to tap the large potentials of sustainability management, we need to collaborate more with shippers and subcontractors" (case III). ▪ "Opportunities are conjoint actions for the reduction of CO₂ emissions by consolidation, so that fleet utilization can be increased" (case V). ▪ "The largest opportunity can be seen in strategic partnerships. Therewith, road transports can be shifted to rail on a long-term basis" (case VI).	▪ "Who pays for our sustainable engagement?" (case II). ▪ "Sustainability is hardly measurable or comparable. We demand standards" (case V). ▪ "Interorganizational sustainability management suffers from lacking organizational structures. We have no central communication. Enquiries arrive in sales and sustainability management has no information about it" (case I).	▪ "Firstly, LSPs demand incentives from shippers and the government. Secondly, LSPs need to change traditional thinking and thirdly societal and end-consumer decisions need to be sensitive to sustainability" (case III). ▪ "Transport policy is needed to create systems and infrastructure for attractive intermodal transport" (case VI).

Table A - 3: Opportunities, Challenges and Needs Linked with Sustainability in Shipper-LSP Relationships

All the companies think that sustainability will become a relevant decision criterion within the next five years. The largest opportunities are seen in partnerships between shippers, LSPs and even subcontractors, which conjointly reduce, compensate and report emissions. The major challenges are missing comparable performance indicators, willingness to pay and organizational structures. Large LSPs in particular have difficulties in reacting to sustainability enquiries, since communication paths between sales, marketing, sustainability managers and operations are not standardized yet. Whereas the majority of the interviewed companies demanded incentives and standards for stakeholders to increase their sustainability performance, a minority held that new thinking on the behalf of entrepreneurs is the only foundation for efficient sustainability management.

A.6.2 Responding Sustainability Activities of LSPs

A.6.2.1 Responding Sustainability Activities of LSPs in an Economic Context

Table A-4 shows the results on economic activities, which aim to improve process efficiency in terms of cost reduction, quality improvement and technological innovation. Since the case sample consists of LSPs working in road transport, the majority of activities deal either with transport operations or administrative functions.

1st Level: Economy (Process Efficiency / Quality / Costs)		Cases								
2nd Level: Function	Activities	I	II	III	IV	V	VI	VII	VIII	Sum
Transport	Telematics: Fleet management		1	1	1	1	1	1	1	7
	Telematics: Navigation		1	1	1	1	1	1	1	7
	Telematics: Order confirmation			1	1	1	1		1	5
	Freight exchange	1	1	1	1	1	1	1	1	8
	Cooperations / Consolidation			1	1	1	1		1	5
	Disposition tools		1	1	1	1	1	1	1	7
Administration and Other	Internal quality audits	1	1	1	1	1	1	1	1	8
	Certificate DIN EN ISO 9001 (QM)	1		1			1	1	1	5
	Tracking and tracing (online)	1	1	1	1	1		1	1	7
	Suggestion system	1		1	1					3
	Benchmarking among sites	1		1				1	1	4
	Customer surveys		1	1	1	1		1	1	6
		6	7	12	10	9	8	9	11	72

Table A - 4: Responding Sustainability Activities of LSPs in an Economic Context

A cross-case comparison of the applied activities shows a homogenous picture, which indicates high engagement in this field. However, the total number of economic activities is low compared to the listed environmental activities. One reason may be the diverse sustainability understandings of companies: economic activities are understood as fundamental entrepreneurial actions, so the participating companies may want to present a stronger environmental and social focus of their sustainability concepts.

Surprisingly, significant differences are found between large-sized companies and SMEs. In the sample, SMEs apply more sustainability-related economic activities than large companies. Furthermore, the SMEs show stronger focus on transport-related activities, whereas the large companies apply more administrative tasks on average. The justification for this phenomenon may be related to the high subcontractor rates of 85-100% of large companies (cf. Table A-1).

A.6.2.2 Responding Sustainability Activities of LSPs in an Environmental Context

Table A-5 presents all the activities that aim towards the reduction of negative environmental effects. The major logistics functions addressed by environmental activities are transport, warehousing and administration and others. Overall, there are significant differences among the LSPs: only 3 out of the 34 listed activities are conducted by all of the LSPs (ecological driving training, fleet modernization and tour optimization).

1st Level: Environment		Cases								
2nd Level: Function	Activities	I	II	III	IV	V	VI	VII	VIII	Sum
Transport	Training in eco-driving	1	1	1	1	1	1	1	1	8
	Modernization of fleet / fleet structure	1	1	1	1	1	1	1	1	8
	Alternative engines	1		1		1				3
	Alternative fuels or additives	1	1	1		1		1	1	6
	Alternative lubricants			1						1
	Ecological tuning					1		1	1	3
	Special containers							1	1	2
	Tire optimization				1		1		1	3
	Modal shift	1		1			1	1	1	5
	Exclusion of air transport	1								1
	Tour optimization	1	1	1	1	1	1	1	1	8
Handling	Alternative engines for material handling equipment			1	1	1		1	1	5
Warehousing	Green buildings (e.g. daylight usage, minergy standards, etc.)			1	1	1		1	1	5
	Low-energy lamps			1	1	1	1	1	1	6
	Alternative power supply				1	1			1	3
	Heating and climate systems			1	1	1	1	1	1	6
	Water reuse system	1		1		1		1		4
	Water usage reduction system				1	1				2
	Water protection (e.g. dangerous goods)			1				1		2
	Recycling program	1	1	1	1			1	1	6
	Waste reduction program	1		1	1			1	1	5
Value-Added Services	Environmentally friendly packaging							1	1	2
Administration and Other	Paperless administration			1	1		1	1		4
	Business travel standards			1						1
	Environmental standards for procurement			1				1	1	3
	Environmental management system and environmental certificates (ISO 14001)			1				1		2
	Density of branch offices		1							1
	Leasing opportunities / modernization of fleet of subcontractors		1							1
	Environmentally friendly cleaning of infrastructure			1				1		2
	Environmental responsibility training for all employees			1	1	1				3
	Environmental sponsoring			1						1
	Emission measurement			1		1				2
	Emission compensation program (forestry and energy)			1		1				2
	Support for employees buying cars with alternative engines					1				1
		10	7	24	14	17	8	20	17	117

Table A - 5: Responding Sustainability Activities of LSPs in an Environmental Context

Additionally, companies use alternative fuels and additives, such as biodiesel, AdBlue or liquefied petroleum gas (LPG). Beyond this, LSPs apply numerous green activities with regards to buildings, starting from efficient energy supply or water systems to waste management programs (*Ries et al.* 2006; *Von Paumgarten* 2003). Due to amortization times of up to 20 years, own alternative power supplies, as for instance in cases IV and V, are still exceptional. Nonetheless, companies working with tempered goods in particular have vast energy reduction potentials within their warehouses. Other comprehensive activities such as business travel standards, environmentally friendly cleaning utilities, environmental management systems and ISO 14001 certificates are still rarely found.

Again, differences between the SMEs and the larger LSPs are identified. The SMEs in the sample apply more environmental activities on average than large companies. Major differences in the sample appear in the warehousing function: SMEs put significant effort into green buildings and modernization of heating and climate control systems. This is a surprising finding, considering the fact that these modernizations are linked to high investments. It is assumed that this phenomenon may be related to a stronger altruistic motivation in SMEs and family-run companies, as per case III (*Jamali et al.* 2009).

A.6.2.3 Responding Sustainability Activities of LSPs in a Social Context

The social activities of the companies are summarized in Table A-6. The overall number of activities is significantly lower than in the environmental context. Moreover, the cases show high differences in the number of actions applied. According to the sample, the most important issues are employee satisfaction, employee health programs and ergonomic work places, as well as the offer of additional education and training. The SMEs apply more activities on average than large-sized companies. Considering the most relevant issues, it is proposed that SMEs may be more engaged in social aspects due to their stronger competition for skilled personnel. Alternatively, this phenomenon may be related to sample size and the selection process.

A.6.2.4 Overall Analysis of Responding Sustainability Activities of LSPs

In a final aggregate view of the response analysis, all the sustainability activities of each company case are compared by allocating them to the three sustainability dimensions and the two firm size clusters. The aggregate view in Figure A-2 thus indicates the sustainability performance of each company.

The comparison along the sustainability dimensions reveals that the environmental dimension involves the largest average body of activities; it also has the largest differences concerning the number of applied activities. In contrast, the economic context presents the most homogenous picture in terms of applied activities. As a conclusion, environmental

issues play the superior role in sustainability concepts of LSPs with a mean of 48%, whereas economic actions, as well as social issues, are represented to a significantly lesser extent. This heterogeneous allocation may be due to several reasons: low maturity of sustainability concepts, understanding of sustainable logistics as green logistics and understanding of the economic and social dimensions as standard entrepreneurial tasks or different strategies for the individual dimensions (e.g. reactive "compliance with legislation" for social issues).

The comparison of the two firm size clusters reveals that the sustainability performance of SMEs is higher on average than in large-sized LSPs. The SMEs in the sample show a higher application of sustainability activities and a more homogeneous picture in all three dimensions. In contrast, the large LSPs are the strongest and weakest performers in terms of the number of sustainability activities. The motives are, inter alia, named by the LSPs themselves (cf. Table A-3): lacking organizational structures (especially in large companies), unclear demands and the willingness of shippers to pay. SMEs, such as family-run companies, are the strongest performers in the sample (case III) and seem more likely to behave sustainably due to clear and flat hierarchies, direct top management support of sustainability activities and altruistic drivers.

1st Level: Social		Cases								
2nd Level: Function	Activities	I	II	III	IV	V	VI	VII	VIII	Sum
Transport	Fleet safety configuration				1	1		1		3
	Fleet comfort configuration					1				1
Administration and Other	Employee satisfaction surveys	1		1	1	1		1		5
	Team events (employee satisfaction)	1	1	1	1	1	1		1	7
	Employee health program			1	1	1		1	1	5
	Healthy nutrition (offers)							1		1
	Ergonomic work places			1	1	1		1	1	5
	Working time accounts			1						1
	Family programs			1				1	1	3
	Equity principle				1			1		2
	Further education and training (e.g. safety, dangerous goods, etc.)		1	1	1	1	1	1	1	7
	Sustainability education			1						1
	Integration of disabled employees							1		1
	Social sponsoring	1		1				1	1	4
	Donation program	1		1				1		3
	Scholarship program (child education)			1				1		2
		4	2	11	7	7	2	12	6	51

Table A - 6: Responding Sustainability Activities of LSPs in a Social Context

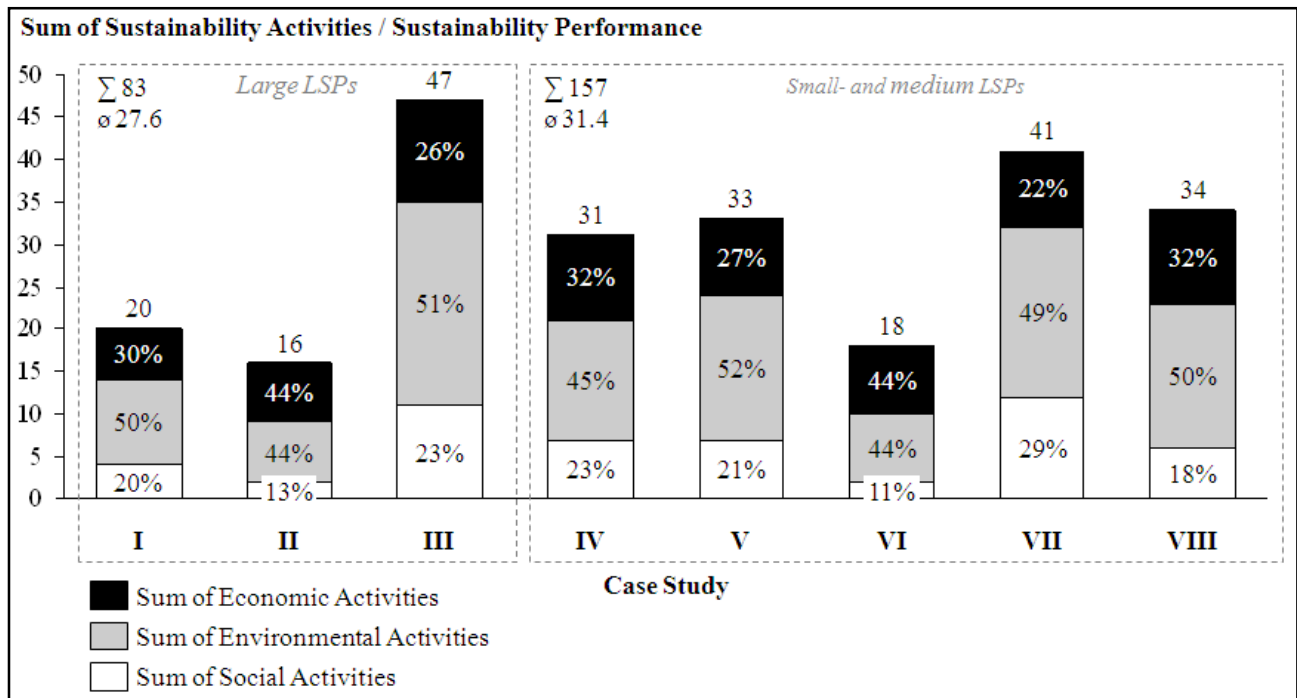


Figure A - 2: Overview of Responding Sustainability Activities / Sustainability Performance of LSPs

A.7 Discussion: Development of a Tentative Taxonomy

The final step of the research contrasts the results on stimuli (section 5.1) and response analysis (section 5.2). Thereby, the research question on the interdependency of shippers stimulating sustainable behavior and LSP responses is answered by the development of a tentative taxonomy of response type. Furthermore, insights into sustainability in dyadic relationships from an agency theory perspective are provided and behavioral patterns of the LSP organism are discussed.

In contrast to previous typologies on sustainability strategies, which consider the sum of institutional pressures (Aragon-Correa 1998; Aragon-Correa and Sharma 2003; Engau *et al.* 2008; Heikkurinen 2011; Sharma *et al.* 1999; Sharma and Vredenburg 1998; Walton *et al.* 1998; Winsemius and Guntram 1992), this typology focuses on dyadic pressures only. Nonetheless, this is based on prior research findings on the continuum of environmental and sustainability strategies, from responsiveness towards proactiveness:

"At one end of the continuum, a reactive posture is a response to changes in environmental regulations and stakeholder pressures (...). At the other end of the continuum, proactive postures involve anticipating future regulations and social trends and designing or altering operations, processes, and products to prevent (...) negative environmental impacts" (Aragon-Correa and Sharma 2003, p. 73).

The continuum approach provides non-numeric typologies, describing corporate response types by means of qualitative criteria (such as the degree of voluntariness) that encompass all stakeholder pressures, as well as environmental or sustainability performance (*Sharma et al. 1999; Winsemius and Guntram 1992*). However, previous research fails to separate the pressures and contemplate the strength of pressures, as well as derivative demands, for sustainable behavior as specifics at the supplier level. The initial taxonomy aims to contribute to the named paucities by applying an empirical quantified database on dyadic stimuli and responses.

Following the taxonomy development guidelines of *Rich (1992)*, the theoretically based and empirically derived core aspects of the study are applied as characters or variables in our taxonomy. With regards to the stimuli, the ratio of shippers actuating sustainability as a percentage of the LSP's total revenue is taken into account. For the response side, the sustainability performance is considered, namely the sum of sustainability activities (cf. Figure A-2). Both indicators are contrasted in Figure A-3, where the y-axis maps the stimuli and the x-axis maps the response side. Finally, the companies are positioned, with firm size being represented by the bubble size (cf. Table A-1).

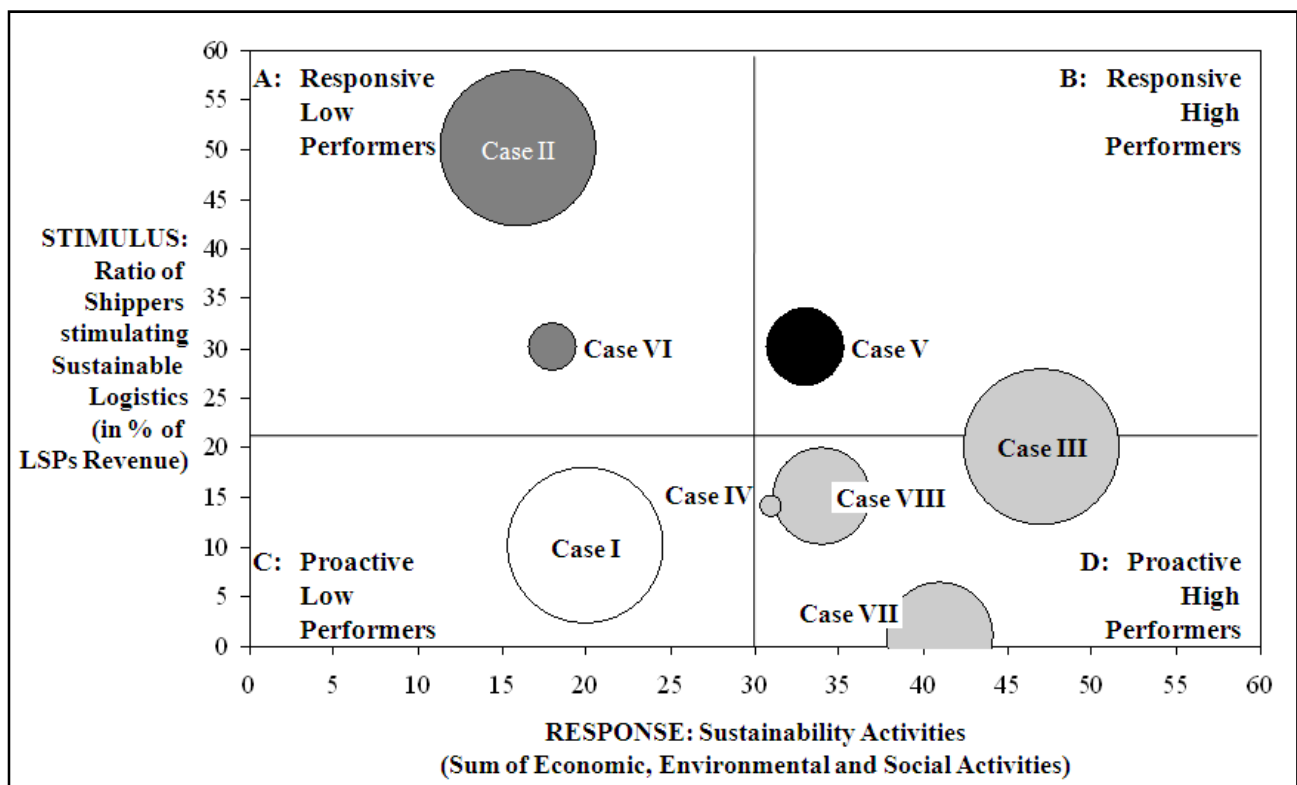


Figure A - 3: Tentative Taxonomy by Contrasting Sustainability Stimulus and Response in Shipper-LSP Relationships

Since the sample size is too low and too specific for numeric cluster analysis (*McKelvey 1982*), binary classification of the dimensions is initially conducted for reasons of generalizability. Hence, we distinguish low and high levels of sustainability performance

and the degree of voluntariness, namely responsive and proactive types (*Sharma et al.* 1999). The low and high levels of both dimensions are delimited by the arithmetic means of the sample, so that four taxa are derived. Therefore, the developed taxonomy is of a tentative nature and requires generalization in terms of theory building, as per the following discussion.

A.7.1 Responsive Low Performers (Quadrant A)

The responsive low performer is characterized by high revenue with sustainability stimulating shippers. Nonetheless, their sustainability performance (i.e. the number of sustainability activities) is low. Cases II and VI serve as examples of this type. Both LSPs focus on standard economic and environmental activities, whereas social issues are hardly considered. The sustainability activities of responsive low performers deal predominantly with the transport sector and can be summarized as easier to implement so-called "quick win" activities concerning vehicles and drivers. In comparison to the requests of purchasers named in Table A-2, both LSPs do not respond to all of the enquiries, fulfilling only three/four out of the seven requests. Since, cases II and VI are of small and large firm size, no firm size specifics are identified for responsive low performers.

From an agency theory perspective, the responsive low performer represents a clear mismatch for sustainability demanding shippers, due to high goal conflicts in terms of sustainability. Prior to contractual agreements, the adverse selection problem arises. Therefore, it is essential for proactive shippers to implement screening or signaling processes, implying adequate sustainable partner selection criteria and decision support to identify sustainably behaving LSPs (cf. high performers). In established contractual relationships, the information asymmetries of hidden actions and hidden information (moral hazard problem) may appear. This is especially relevant to logistics services, since the actions of LSPs and the sustainability of their behavior are not observable by the shipper. Furthermore, the shipper may not be able to understand or verify the information provided by the LSP (e.g. CO₂ emissions) due to a lack of knowledge or observability. Hence, shippers need to implement incentives, information and control mechanisms to improve the sustainable behavior of responsive low performers and fill information gaps.

A.7.2 Responsive High Performers (Quadrant B)

The sustainable behavior of responsive high performers is stimulated by a large amount of its shippers (in terms of percentage of the LSP's revenue). In contrast to the low performer, comprehensive sustainability engagement of the LSP can be identified. In the sample, case V (a medium-sized enterprise) exemplifies this type. Its shippers enquire about sustainable

engagement with regards to fleet structure and a comprehensive overview of environmental activities. The response side illustrates that the LSP (case V) has implemented a set of comprehensive sustainability activities along all three dimensions and adequately responds to information enquiries.

Ideally, the responsive high performer is chosen by a proactive shipper by means of adequate partner selection criteria. Alternatively, sustainable behavior can be developed by incentives within existing contractual relationships. Since this type presents a coherence of stimulus and response, these dyadic relationships are expected to have low goal conflicts in terms of sustainability. However, goal conflicts or information asymmetries may appear within the contractual relationships due to a mismatch of highly responsive sustainable behavior and shippers' pressures (moral hazards). Thus, proactive shippers also demand information and control mechanisms to validate sustainable behavior and provide information.

A.7.3 Proactive Low Performers (Quadrant C)

Quadrant C shows the type of a proactive low performers. This type is characterized by low stimulation from shippers and low sustainability performance. Therefore, this type also supports an interrelation between stimuli and responses. The characteristics of this type may indicate an early stage of proactiveness, when the company has clear motivation but does not yet have the capability to perform sustainably. Case I, a large-sized enterprise, is a typical example of this type: the company has started to improve its sustainable behavior but still suffers from implementation challenges, such as lacking organizational structure (cf. Table A-3).

Due to the low stimulus of shippers for sustainable behavior and the low performance of LSPs, this dyadic relationship is expected to have low goal conflicts and information asymmetries. Although the sample provided only one case of this type, the real world is expected to have a majority of proactive low performers for two reasons: numerous shippers have not yet integrated logistics services into their sustainability management and LSPs still hesitate to implement sustainability activities. Contemplating the dynamics of sustainability relevance, LSPs of this type are expected to be subject to the strongest changes within the near future.

A.7.4 Proactive High Performers (Quadrant D)

Finally, quadrant D represents the proactive high performers. This type is characterized by a high performance in all three dimensions and little stimulus from shippers. In the sample, companies III, IV, VII and VIII are typical examples. Cases III and VIII respond to all

enquiries of shippers. Cases IV and VII apply comprehensive sustainability activities but are not yet able to provide all enquired information. All companies of this type mentioned an intrinsic motivation and responsibility for the planet and people within the interviews, which is strongly linked with a proactive sustainability strategy type (*Hunt and Auster 1990*). Since proactive high performers are not subject to supplier pressures in terms of partner selection or incentives, dyadic relationships are expected to hold low information asymmetries and goal conflicts.

Finally, it is worth discussing the accumulation of SMEs within this cluster. According to the institutional approaches discussed in the literature review, smaller businesses are more likely to be influenced by competitive than by market or normative pressures (*Zhu and Sarkis 2007*). Considering the lower stimulus for SMEs in the sample, the present research's findings may underline this proposition. Beyond this, two further reasons are proposed for the accumulation within the developed taxonomy. First, proactive high performing companies are eager to communicate their engagement to their shippers and other stakeholders, so the stimulus of shippers may have been substituted by proactive information. Second, the case sample is drawn from a call on sustainability management concepts of LSPs, which may have encouraged especially proactive companies to present their engagement.

A.7.5 Agency Problems of Sustainability in Shipper-LSP Relationships

Table A-7 summarizes the findings by giving a comprehensive overview on the resulting agency problems of sustainability in dyadic shipper-LSP relationships. The overview highlights that an increased demand for sustainable behavior leads to agency problems of adverse selection and moral hazards in dyadic relationships. The identified adverse selection problem regarding responsive low performers indicates a demand for adequate partner selection criteria. Furthermore, the findings underline the necessity of incentive, information and control mechanisms with respect to moral hazard problems in relationships with responsive low and high performers. These mechanisms require comparable and measurable performance indicators for logistics services as a first step.

Finally, the identified demands for selection criteria and incentives reveal the basic conflict of agency theory: agency costs. These are defined as the principal efforts in limiting divergences of expected behavior: the agents' costs of not conducting certain actions as well as residual losses (implying agents' decisions) that do not maximize the principal's welfare (*Jensen and Meckling 1976*). Consequently, the design and implementation of information, control and incentive mechanisms demand consideration of the financial impact of

sustainable behavior and the business case of sustainability for logistics services in particular (*Carroll and Shabana 2010; Dyllick and Hockerts 2002*).

Stimulus / Response	Response: Low Sustainability Performance	Response: High Sustainability Performance
	Responsive Low Performers (Quadrant A)	Responsive High Performers (Quadrant B)
Stimulus: High	▪ High goal conflicts between shippers and LSPs in terms of sustainability ▪ Inadequate partner selection criteria/supplier evaluation and/or development of LSP by means of incentive, information and control mechanisms ▪ Possible information asymmetries: Hidden characteristics / actions / information ▪ Possible agency problems: Adverse selection / moral hazards	▪ Low or medium goal conflicts between shippers and LSPs in terms of sustainability (eventually information asymmetries within relationship / mismatching response) ▪ Selection of LSPs with a high sustainability performance / supplier evaluation or development of LSP by means of incentive, information and control mechanisms ▪ Possible information asymmetries: Hidden actions / information ▪ Possible agency problems: Moral hazards
Stimulus: Low	Proactive Low Performers (Quadrant C) ▪ Low goal conflicts between shippers and LSPs in terms of sustainability ▪ No partner selection criteria or incentive, information and control mechanisms in place ▪ Possible information asymmetries: None ▪ Possible agency problems: None	Proactive High Performers (Quadrant D) ▪ Low goal conflicts between shippers and LSPs in terms of sustainability ▪ No partner selection criteria or incentive, information and control mechanisms in place ▪ Possible information asymmetries: None ▪ Possible agency problems : None

Table A - 7: Overview of Agency Problems of Sustainability in Shipper-LSP Relationships

A.7.6 Limitations

The research has limitations. All the conclusions were drawn exclusively on the basis of LSP information, i.e. no shipper information has been part of the analysis. Thus, only conscious stimuli have been considered and further validation by changing perspectives needs to be taken into account in future research. Furthermore, the results indicate a high number of proactive companies within our sample. This imbalance within the case sample is rooted in the explicit call for sustainability concepts, which obviously addresses concerned companies. The advantage of this procedure is a broad exploratory insight into sustainability

concepts in logistics services. However, the results show a euphemistic picture of practice, which need to be relativized if looking for generalization of the findings.

Furthermore, the methodology applied has limitations as well. The interviews were conducted with one interviewee: either a managing director or a sustainability manager of each company. This procedure assured the selection of interviewees with the highest responsibility and knowledge on sustainability issues for each company. However, personal interpretation or lack of knowledge may have affected the interview results. The documentation analysis also has its limitations, since the reports were written by the companies themselves. Therefore, they do not necessarily contain all the company's sustainability activities, since the content and perspective are subject to the author's interpretation. Finally, the taxonomy scales are based on initial indicators of stimuli and responses. The ratio of sustainability enquiring shippers, as well as the sums of sustainability activities, may only indicate the pressures of shippers and sustainability performance, respectively. Further impacts were not taken into account or weighted. The presented taxonomy is limited by the applied sample size and the initial case study based quantification of the stimulus and response variables. A large-scale cluster analysis would thus facilitate further theory building.

A.8 Implications for Future Research and Conclusion

In this paper, sustainability in dyadic shipper-LSP relationships is analyzed from an LSP perspective. This study is the first to apply a combined theory approach based on agency theory and the S-O-R model to observe shippers' stimuli, as well as LSP response activities, and develop a tentative taxonomy of response types. It therefore contributes to theory building and research in sustainability procurement and supply chain management and indicates various future research topics.

First, it is found that shippers' stimuli for sustainability (i.e. selection criteria and incentives) are at an early stage and demand research into their design, effects and implementation. Against this background, agency theory may support research into the traditional problem types (adverse selection and moral hazard problems) of sustainability in dyadic relationships. However, the findings on the stimulus side also raise the question: why have even proactive buyers barely yet integrated logistics services within their sustainability management? Second, it is found that the sustainability activities of LSPs hold a strong environmental focus. Therefore, further research is proposed into the reasons for the operationalization imbalance of the tripartite sustainability concept. Third, further research effort into the methodologies and standards used to evaluate and assess the sustainability

performance of logistics companies is suggested. Fourth, the case sample presented significant differences regarding the proactiveness of SMEs and large companies. Hence, deeper analysis into the drivers and impacts of separate institutional pressures for the sustainable behavior of SMEs is encouraged. Fifth, research into sustainability in dyadic or supply chain relationships demands different point of views and datasets, such as from the focal firm or from a network perspective. Finally, quantitative research is suggested to validate and extend the presented taxonomy and research on sustainability strategies.

From a managerial point of view, this study makes recommendations for purchasing shippers, LSPs and policymakers. Purchasers of logistics services may find the presented taxonomy useful to categorize their LSPs with respect to their sustainable behavior and the resulting agency problems in order to establish suitable contractual arrangements. Furthermore, the extended relevance of the presented ideas to the design of selection criteria and incentive mechanisms is underlined. LSPs may find the detailed presentation of activities helpful to enhance their concepts and prepare them for future sustainability demands. In addition, the conjoint action of shippers and LSPs with respect to incentive design is recommended. Finally, policymakers can support the development of sustainability incentives in dyadic relationships by assisting cooperation, shippers and LSPs and by creating end-consumer sustainability awareness.

B Determinants of Interorganizational Sustainability Management in Dyadic Relationships: An Agency- and Institutional-Theoretic Analysis

Nicole Kudla* and Timo Busch⁺

*Chair of Logistics Management, University of St.Gallen

⁺Chair of Sustainability and Technology, ETH Zurich

B.1 Abstract

This study investigates the determinants of interorganizational sustainability management in the dyadic relationships of logistics services from an agency and institutional perspective. Based on four case studies of shipping companies and logistics service providers, we outline that shipping companies do not necessarily confer their sustainability legitimacy needs to their providers. In relation to institutional theory, we identify determinants regarding both firm and environmental characteristics that evoke the non-conferment of intraorganizational sustainability management to the interorganizational level. Based on agency theory, we discover that this non-conferment can be related to measurability difficulties, uncertain added value and goal conflicts regarding the sustainable behavior of firms. Furthermore, we highlight the role of trust within dyadic relationships as an important determinant of interorganizational sustainability management. We connect these determinants in an agency-institutional framework that facilitates the explanation of sustainability management and its trade-offs in interorganizational relationships.

Keywords: Agency Theory, Legitimacy, Efficiency, Dyadic Relationships, Institutional Theory, Logistics, Sustainability, Supply Chains

B.2 Introduction

Sustainability management, implying the tripartite reflection of economic, environmental and social issues, is of increasing relevance for organizations striving for success and researchers seeking to analyze corporate behavior. In times of global value creation networks and the high outsourcing degrees of focal companies, sustainability management should not be limited to gate-to-gate considerations but manage environmental and social impacts along the value chain. Therewith, organizations face the challenge of extending intraorganizational sustainability management to an interorganizational level (*Carter and Easton 2011; Carter and Rogers 2008; Gold et al. 2010; Seuring and Müller 2008a; Seuring and Müller 2008b; Svensson 2007*). In practice, this extension seems to face some obstacles:

researchers on sustainability and green supply chain management identify that focal companies rarely integrate the interorganizational perspective and thus do not yet integrate their suppliers in sustainability management (Min and Galle 1997; Walton et al. 1998). In a recent study, Wolf and Seuring (2010) contemplated environmental buying criteria for logistics services and identify that "(...) even at focal companies who postulate an environmental orientation during the procurement process; this orientation somehow turns into blurry and contradictory demands (...), if it is addressed at all" (p. 97). This paper contributes to this debate by explaining reasons why companies do not necessarily transfer sustainability to an interorganizational level.

From an organizational theoretic point of view, researchers are calling for the bridging of knowledge of organizational viewpoints in order to further understand efforts towards sustainable supply chain management (SSCM) (Ketchen and Hult 2007; Sarkis et al. 2011). We base our arguments on institutional theory in order to explain how external pressures influence organizational actions to reduce negative impacts and increase positive ones (Jamali 2008; Zhu and Sarkis 2007). On the one hand, institutional theory clearly explains the coherence of pressures and isomorphic organizational behavior and thus why companies behave sustainably and why they transfer sustainability to an interorganizational level. On the other hand, it is less clear why in some cases firms heterogeneously respond to institutional pressures (Reuter et al. 2010). Thereto, agency theory is suggested as a promising but underrepresented approach to interorganizational sustainability management (Kogg 2003). Its clear lens on information asymmetries and problems in dyadic contractual relationships might provide new insights and help explain phenomena where interorganizational sustainability management struggles. Eisenhardt (1988), as well as Berrone and Gomez-Mejia (2009), show how institutional and agency theory complement each other in explaining the differing behavior of organizations. Therewith, we take up their integrated approach in order to answer the following research question: what determines the conferment of interorganizational sustainability management in dyadic relationships?

The contribution of our research lies in providing a more detailed understanding of determinants that explain the differing behavior of organizations regarding SSCM. Based on this agency-institutional analysis, we provide insights into how to explain (a lack of) sustainable behavior in dyadic relationships. We examine four dyadic relationships of large companies from the food, packaging, chemical and construction industries and their logistics service providers (LSPs). We focus on dyadic relationships with LSPs for three reasons. First, the extant literature on interorganizational sustainability management research predominantly concentrates on manufacturing suppliers (Seuring 2008; Wolf and Seuring 2010). Second, logistics services are a core outsourcing function (Logan 2000) and

thus have major effects on the interorganizational sustainability efforts of focal companies (*Reuter et al.* 2010). Third, LSPs are responsible for significant environmental and social impacts within value chains due to the amount of external effects caused by transportation (*Himanen et al.* 2005; *Verhoef* 1994).

The remainder of this paper is organized as follows: as the first lens for our case study analysis, we lay out the theoretical background on institutional and agency theory in order to build an initial research framework. We then introduce the applied methodological steps from case selection to data analysis. Next, the findings on the intraorganizational and interorganizational sustainability management of shipping companies and their LSPs are presented. Finally, drawing on our institutional and agency theoretic background, we discuss our findings, derive propositions and present a framework regarding determinants for interorganizational sustainability management.

B.3 Institutional Perspective on Interorganizational Sustainability

We build on institutional theory due to its ability to explain the coherence of institutional pressures and the behavior of organizations. *Eisenhardt* (1988) proposes that "the key idea behind institutionalization is that much organizational action reflects a pattern of doing things that evolves over time becomes legitimated within an organization and an environment" (p. 492). Legitimacy is defined as the perceived acceptance of an organization's actions as desirable and adequate to successfully sustain itself in its environment (*Kostova and Zaheer* 1999; *Suchman* 1995). As drivers for legitimacy needs, institutional theorists distinguish normative, mimetic and coercive pressures. These pressures reflect internal pressures, relating to firm or organizational characteristics, and external pressures, relating to environmental characteristics (*Zucker* 1987). Normative pressures are proposed to stem from educational or professional authorities and are defined as "(...) a collective struggle of members of an occupation to define the conditions and methods of their work (...) to establish a cognitive base and legitimation of their occupational autonomy" (*DiMaggio and Powell* 1983, p. 152). Therewith, normative pressures rather reflect the internal perspective. Coercive and mimetic pressures, on the other hand, relate more to environmental characteristics. Coercive pressures include formal or informal norms, rules, expectations and laws actuated in an organization by other institutions (*DiMaggio and Powell* 1983; *Scott* 1987). Finally, mimetic pressures describe the competition within the environment of an organization. Thereto, institutional theory proposes that firms imitate peer companies and "best practices" in order to achieve competitive advantages (*Bansal* 2005; *Zhu and Sarkis* 2007).

On an interorganizational level, legitimacy needs are stated to be a mutual acknowledgement that involves expectations and the actual proper behavior and actions of partnering firms (*Kumar and Das 2007*). Thereto, institutional theory proposes that the height of legitimacy needs determines the selection process and the contractual relation, implying the choice of a partnering firm as well as the governance structure (*Dacin et al. 2007*).

Against the background of sustainability, institutional theory supports the isomorphic understanding of similar development and the diffusion of sustainable actions throughout organizations (*Jennings and Zandbergen 1995; Oliver 1991*). Sustainability is therefore argued to be one type of legitimacy need (*Dacin et al. 2007*). The extant literature identifies numerous external and internal stakeholder pressures that induce sustainable strategies and actions in firms (*Barnett 2007; Christmann 2004; Delmas and Toffel 2004; Fineman and Clarke 1996; Jamali 2008; Kolk and Pinkse 2007; Park-Poaps and Rees 2010; Sharma and Henriques 2005*). These normative, mimetic and coercive pressures are of significant relevance for visible and large organizations in particular (*Bansal and Roth 2000; Sharma and Vredenburg 1998*). Normative pressures are traced back to an increasing relevance of sustainability within the business management education of professionals. Whereas mimetic pressures relate to a diffusion of certain actions within an industry, for instance standardized sustainability reporting (*Etzion and Ferraro 2010*) or environmental management certification according to ISO 14001 (*Castka and Balzarova 2008; Nawrocka et al. 2009*), coercive pressures regarding sustainability are evoked by "(...) a rush of governmental strategies and initiatives fostering its spread (...)" (*Matten and Moon 2008*, p. 411). However, pressures stemming from supply chain partners in interorganizational relationships are still underrepresented in institutional literature (*Lin and Darnall 2010*).

B.4 Agency Perspective on Interorganizational Sustainability

The agency perspective deepens our understanding of organizational behavior within contractual relationships. It centers the relationship of a principal company, who delegates a task to an agent who then executes that work (*Eisenhardt 1989a*). "The challenge in the agency relationship arises whenever – which is almost always – the principal cannot perfectly and costlessly monitor the agent's actions and information" (*Pratt and Zeckhauser 1985*, p. 2f). The basic assumption behind this is that principals and agents are self-interested risk-averse individuals or organizations that aim to fulfill efficiency objectives (*Eisenhardt 1989a*). Agency theorists distinguish between problems that arise before and within contractual agreements, namely adverse selection and moral hazard problems

(Laffont and Martimort 2002; Shapiro 2005). First, adverse selection problems usually arise before contract. This is traditionally exemplified by the "lemons" market: Akerlof (1970) illustrates the problem with the analogy of the used car market, where the buyer needs to differentiate between good cars and bad cars, so-called "lemons". The problem lies in the identification and selection of a proper agent with characteristics that fulfill the requirements and needs of the principal. This problem is linked to information asymmetries of hidden characteristics and hidden information, where the principal is not able or it is too costly to explore the characteristics of the agent and to validate or understand the information they provide. Second, moral hazard refers to information asymmetries within existing relationships, which occur when principals are not able to assess actions or again validate or understand the information provided by an agent.

On an interorganizational level, the use of agency theory is helpful since it provides explanations to adverse selection and moral hazard problems between organizations and suggests solutions to balance information asymmetries by means of selection processes and the adequate design of contracts, implying governance structures (Eisenhardt 1988; Eisenhardt 1989a; Fama 1980; Jensen and Meckling 1976; Logan 2000; Picot et al. 2005). These agency theory-based solutions or control mechanisms are again proposed to be influenced by task programmability or behavior measurability, outcome measurability and goal conflicts, implying the risk aversion of either or both of the contractual partners (Eisenhardt 1985; Ouchi 1979).

When transferring the agency perspective to our research context on interorganizational sustainability within contractual relationships between shipping companies and logistics service providers, we find a principal-agent dyad that centers the governance structure and selection criteria as control mechanisms. Logistics services (and their sustainability efforts in particular) encompass actions and behavior that are not directly visible to contracting companies, which thus may imply information asymmetries and traditional agency problems. Supplier selection, as well as monitoring and compliance issues, have been identified in the extant sustainable purchasing literature (Bai and Sarkis 2010; Chatterji et al. 2009; Chatterji and Toffel 2010; Foerstl et al. 2010; Handfield et al. 2005; Handfield et al. 2002; Humphreys et al. 2003; Min and Galle 1997; Reuter et al. 2010; Walton et al. 1998; Wolf and Seuring 2010). However, only a few attempts have related the issue of the conferment of interorganizational sustainability management to agency theory (Kogg 2003; Pedersen and Andersen 2006).

B.5 Research Framework on Interorganizational Sustainability

Based on this institutional and agency theoretic background, we propose an initial research framework that facilitates developing a foundation for our empirical analysis and finally answering our research question. Thereto, Table B-1 highlights the general characteristics and boundaries of the two theories that appear to be relevant in the context of interorganizational sustainability.

	Institutional Theory	Agency Theory
Key Idea	Organizational practices arise from coercive, mimetic and normative forces, i.e. firm and environmental characteristics	Organizational practices arise from the efficient organization of information and risk-bearing costs
Basic Assumptions	Conformity to institutional pressures (Isomorphism)	Self-interest and risk aversion of principals and agents
Objective	Legitimacy	Efficiency
Boundaries	Conscious and unconscious mechanisms in order to conform to explicit pressures and adopt implicit pressures	Control mechanisms within outsourcing agreements

Table B - 1: General Reflection of Institutional and Agency Characteristics
(Based on *Eisenhardt* 1988, p. 491 and *Santos and Eisenhardt* 2005, p. 494)

On the one hand, both institutional and agency theory provide complementary theoretical explanations (*Berrone and Gomez-Meija* 2009; *Eisenhardt* 1988). Based on institutional theory, it can be proposed that firm characteristics and environmental characteristics determine the sustainability legitimacy needs of companies and thus intraorganizational sustainability management actions. Beyond this, high sustainability legitimacy needs are suggested to be reflected within governance structures and selection criteria on an interorganizational level (e.g. *Dacin et al.* 2007). In this regard, agency theory can provide a consistent albeit more focused point of view to these control mechanisms for interorganizational sustainability management. Agency theory assumes self-interested and risk-averse principals and agents, which leads to inherent adverse selection and moral hazard problems (*Eisenhardt* 1989a). As a result, agency theory adds to the often criticized isomorphism and conformity principle of institutional theory (*Oliver* 1991). By contrast, agency theory is criticized for its solitary focus on the contractual relationship, neglecting its environment, so institutional theory expands the limited agency perspective (*Gomez-Meija* 2005). *Berrone and Gomez-Meija* (2009) underline the consistencies of both theories and elucidate that their study "(...) expands agency theory by including insights from institutional theory, examining how a key institutional factor (i.e. legitimacy) intervenes in

the agent-principal-relationship" (p. 118). They posit that high environmental performance induces benefits for firms and, thus, legitimacy drives efficiency. *Eisenhardt* (1988) juxtaposes agency and institutional theory and thereby provides a complementary explanation for organizational behavior.

On the other hand, both theories have distinct assumptions and propose different rationales. The most obvious difference can be seen in the objective function. While institutional theory states that organizations seek to establish a high level of legitimacy, agency theory proposes efficiency as the basic objective of an organization (*Eisenhardt* 1988). The two objectives do not necessarily have to be conflicting. For example, *Eisenhardt* (1988, p. 505) speculates that "on the one hand efficiency theories reveal that some ways of structuring are inefficient. (...) On the other hand, efficiency theories generally do not yield a best way to organize, but rather, several best ways. (...) Thus, the resulting relationship (...) is both efficient and institutionalized." This means that in some cases the efficiency objective is consistent with both theories, while in other cases it is not. Here, both theories have a diverging point of view regarding the objective function of an organization. These differences regarding efficiency and legitimacy may help to explain our empirical research phenomenon.

This theoretical background leads to our initial research framework on the determinants for interorganizational sustainability management, as shown in Figure B-1. Thereby, we take up the consistently supported theoretical constructs of both theories (i.e. governance structure and partner selection) on intraorganizational and interorganizational sustainability management and expand the principal-agent boundary of the institutional environment (*Gomez-Mejia et al.* 2005). Based on the complementary arguments and the diverging points of view regarding efficiency and legitimacy, we seek to explain the conferment and non-conferment of interorganizational sustainability management.

In the case of conferment, we expect that the consistencies between institutional and agency theory can help to explain how a high level of intraorganizational sustainability management of the principal is transferred to a high level of interorganizational sustainability management. In this case, the legitimacy needs of both organizations are congruent and agency theoretic problems of adverse selection and moral hazard are solved by adequate governance structures and partner selection criteria, so that both influence the level of intraorganizational sustainability management of the agent.

In the case of non-conferment, we expect that the diverging theoretical assumptions of both theories can help to identify potential reasons for this behavior. Non-conformity occurs in cases where a high level of intraorganizational sustainability management of the principal is not conferred to governance structure and partner selection. Alternatively, the level of

interorganizational sustainability management evoked by the principal is not in line with the agent's intraorganizational response. From an agency perspective, the reasons for this may be related to information asymmetries and unsolved agency problems within contractual relations. From an institutional perspective, the reasons may be related to newer institutional discussions contesting isomorphism and conformity, namely the decoupling of formal structures and operational practices (*Boxenbaum and Jonsson 2008*). These are "(...) situations where compliance with external expectations is merely symbolic rather than substantive, leaving the original relations with an organization largely unchanged" (*Fiss and Zajac 2006*, p. 1175).

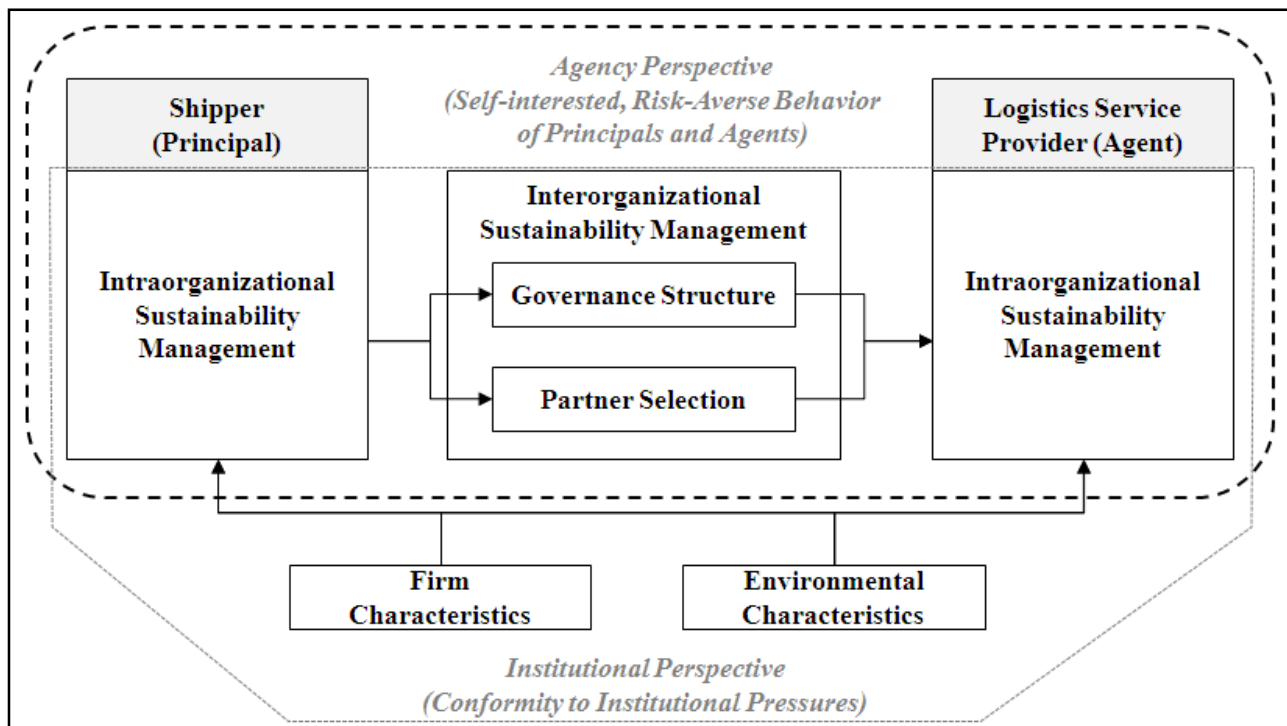


Figure B - 1: Research Framework

B.6 Methodology

The theoretical background frames our research on determinants for the conferment of sustainability in dyadic relationships within the context of existing theories, ensures internal validity and underlines the necessity of an inductive approach (*Eisenhardt and Graebner 2007*). Due to close interaction with practitioners, case studies are ideally suited to understand managerial environments and enrich existing theories. In order to build theoretical knowledge, benefit from rich qualitative datasets and follow rigorous methodological steps, we apply the framework of internal validity, construct validity, external validity and reliability in our case study design (*Cook and Campbell 1979; Eisenhardt 1989b; Eisenhardt and Graebner 2007; Gibbert et al. 2008; Yin 2003*).

B.6.1 Case Selection

To ensure the external validity and thus the generalizability of our approach, the rationale of the case selection is essential. Although multiple cases are suggested to provide a stronger base for theory building, theoretical sampling of multiple cases is more complex. In contrast to single cases, the selection depends more on the contribution to theory building of the whole sample than the uniqueness of each case. Hence, theoretical sampling of multiple cases leads to a sample of extremes that presents patterns and relationships to focal theoretical constructs and phenomena (*Eisenhardt and Graebner 2007*).

	Case A (Shipper)	Case B (Shipper)	Case C (Shipper)	Case D (Shipper)
Industry	Packaging	Food	Chemical	Construction and connecting materials
Type	Subsidiary of multinational enterprise	Large-sized national enterprise	Multinational enterprise	Subsidiary of multinational enterprise
Country	Switzerland	Switzerland	Germany	Switzerland
Revenue (2009)	MNE: >€10B Subs.: >50M CHF	>150M CHF	>€50B	MNE: >5B CHF Subs.: >€500M
Employees	MNE: >20,000 Subs.: >200	>200	>100,000	MNE: >50,000 Subs.: >1,000
	Case A (LSP)	Case B (LSP)	Case C (LSP)	Case D (LSP)
Type	Subsidiary of multinational enterprise	Large-sized national enterprise	Medium-sized enterprise	Multinational enterprise
Country	Switzerland	Switzerland	Germany	Germany
Revenue (2009)	MNE: >€1B Subs.: >200M CHF	>500M CHF	>€50M	>€10B
Employees	MNE: >20,000 Subs.: >500	>3,000	>200	>50,000

Table B - 2: Case Sample

Our theoretical institutional background proposes a causal relationship between firm and environmental characteristics and sustainability. Thereto, we applied those characteristics as selection criteria for our sample. Against this background, we chose four shipping companies of large firm sizes with industry sensitivity towards sustainability. By doing so,

we intended to improve the probability of identifying more sophisticated sustainability management concepts that are conferred to an interorganizational level. All shipping industries within this study, namely packaging (e.g. *Ciliberti et al.* 2008b; *Halme* 1995; *Min and Galle* 1997), food (e.g. *Andersen* 2002; *Maloni and Brown* 2006; *Mintcheva* 2005), chemical (e.g. *Foerstl et al.* 2010; *Reiskin et al.* 1999; *Taplin et al.* 2006) and construction (e.g. *Irland* 2007), have been shown in the literature to be extraordinarily sensitive to sustainable development. Beyond this, each shipping company selected a highly relevant or exemplary logistics service provider for the study. Our sample, presented in Table B-2, thus encompasses four dyadic relationships of shippers and logistics service providers.

B.6.2 Data Collection

In order to ensure the construct validity of our analysis, we follow *Gibbert et al.* (2008) by collecting and using a triangulation of archival data and interview data. Table B-3 gives an overview of the archival and interviewee data sources included.

Archival data was gathered to get a broad understanding of the intraorganizational sustainability management of the companies, as well as to validate and enrich our interview data. We collected all available archival datasets on sustainability issues from the companies, including sustainability reports, sustainability sections within annual reports, website content and further documentation, such as environmental brochures, documents on key performance indicators and internal strategy documents.

The interviews aimed to provide an overview of intraorganizational sustainability management and give in-depth information on interorganizational sustainability management for logistics services. We ensured we obtained this information by the use of two semi-structured interview guidelines dealing with sustainability management and the sustainability of logistics services. Semi-structured interviews were chosen due to their suitability to understand lived daily world issues from the subjects' own perspectives (*Kvale* 2007). According to the two interview guidelines and research objectives, we requested interview partners who were responsible for sustainability, implying board members or sustainability managers, and interview partners who were responsible for logistics services, i.e. purchasers of logistics services on the shipper's side and key account managers on the LSP's side.

In order to prepare for structured and focused data analysis (*George and Bennett* 2004), both sets of interview guidelines were oriented along differentiation criteria for the stages of sustainability management. These criteria, namely general mindset, organizational structure (top management involvement and resource commitment), performance objectives, reporting structures and the integration of manufacturing/production, were selected from

literature on classifying environmental management (*Hass 1996; Hunt and Auster 1990; Kolk and Mauser 2002*) and were transferred to the triple bottom line concept of sustainability (*Elkington 1997*). Furthermore, both sets of interview guidelines included a question on challenges for the conferment of sustainability to an interorganizational level.

The guidelines for the purchasers and key account managers of logistics services included further questions regarding their organization's governance structure and partner selection criteria. Finally, the interview guidelines were cross-checked by two further researchers in terms of the clarity of objectives and were sent to the interviewees beforehand to allow for preparation. All interviews took between 30 and 75 minutes, depending on the comprehensiveness of the statements provided.

Archival Data	Case A (Ship.)	Case A (LSP)	Case B (Ship.)	Case B (LSP)	Case C (Ship.)	Case C (LSP)	Case D (Ship.)	Case D (LSP)
Sustainability report	x				x			x
Annual report (sustainability section)					x	x	x	
Sustainability website	x	x	x	x	x	x	x	x
Further documentation (brochures, etc.)	x			x	x	x	x	
Interviewees	Case A (Ship.)	Case A (LSP)	Case B (Ship.)	Case B (LSP)	Case C (Ship.)	Case C (LSP)	Case D (Ship.)	Case D (LSP)
CEO / Board Member		x		x		x	x	
Sustainability Manager					x	x		x
Logistics / Production Manager (Purchaser of Logistics Services)	x (2)		x		x (2)		x (2)	
Key Account Managers of LSPs		x		x		x		x

Table B - 3: Data Sources (Archival Data and Interviewees)

B.6.3 Data Analysis

Reconstructable data analysis demands a reliable transcription and documentation process (*Gibbert et al. 2008*) in a first step. Therefore, we developed a comprehensive database

structured according to our research objectives and framework (cf. Figure B-1). In order to follow a unitized transcription and documentation process (as suggested by *George and Bennett* (2004) for comparative case studies), one researcher conducted these processes while being monitored, and corrected if necessary, by a further researcher. In a second step, the database was analyzed by two independent researchers to provide core results and evidence for our theoretical constructs.

The transcription and documentation process focused on written and oral data formats. First, archival data was screened according to the five criteria of intraorganizational sustainability management. Relevant passages were selected and transferred in their entirety to the database. Second, interview data was transcribed and transferred to the database as well. The interviews were audio-taped and transcribed into summarizing protocols directly after the interviews were taken between November 2010 and February 2011. The transcription followed the steps of summarizing content analysis: definition of the abstraction level, selection of statements of the same meaning, reduction by summarizing statements, transferring to core statements and, finally, an iterative review of the derived statements by analyzing the starting point of the material (*Mayring* 2002, p. 94ff). In a concluding step, we cross-checked the summarizing protocols with the interviewees to prevent misunderstandings.

The next step of data analysis included the necessary generalization of the comprehensive database. According to *Eisenhardt and Graebner* (2007), the presentation of comprehensive narratives is infeasible for multiple case studies. Therefore, we considered their suggestion to present summarizing tables that indicate the core phenomena and measures of our focal theoretical constructs. By this, we also increase the testability of our theoretical findings.

In order to identify the datasets best suited to present our focal theoretical constructs, two researchers independently reviewed and analyzed the database for relevant interview quotes, summarizing statements and datasets. Selecting the results on intraorganizational sustainability management of the first three aspects (general mindset, organizational structure and reporting structure) was straightforward due to sufficient information on the interview results, which were in line with archival data. By contrast, selecting performance objectives and the integration of manufacturing or production processes was challenging, since the archival data and the interview data complemented each other. For this step, we applied structured content analysis (*Mayring* 2002, p. 118ff) to identify relevant targets and measures. This analysis led to different results from the two researchers, so they agreed to present only clearly defined and quantifiable performance objectives, as well as only the most significant sustainable manufacturing or production processes. For interorganizational sustainability management data, structured content analysis was applied as well, since the

interviewee statements were comprehensive and demanded reduction in accordance with the core aspects stated. Figure B-2 maps the explained process steps from the development of the database to the presented results.

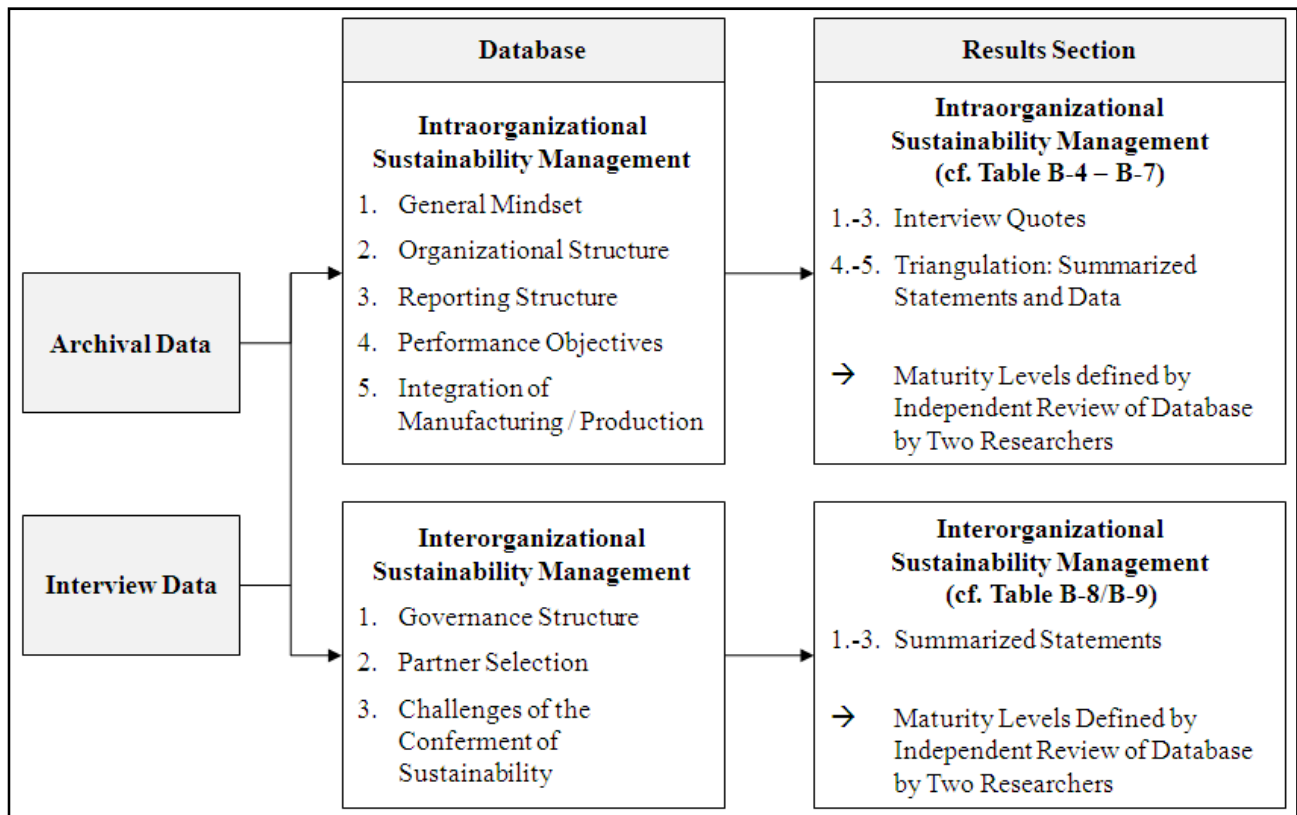


Figure B - 2: Process Steps of Data Analysis

Finally, the two researchers independently analyzed evidence for each theoretical construct and generalized them by maturity level. For the maturity level of intraorganizational sustainability management, the literature provides diverse classification approaches, for instance the five stages defined by *Hunt and Auster* (1990) ((1) beginner, (2) fire fighter, (3) concerned citizen, (4) pragmatist and (5) proactivist) or the six stages defined by *Walton et al.* (1998) ((1) resistant adaptation, (2) embracing without innovating, (3) reactive, (4) receptive, (5) constructive and (6) proactive). Nonetheless, these classifications lead to differentiation difficulties when contemplating a set of criteria (*Hass* 1996; *Kolk and Mauser* 2002). Therefore, we applied a binary classification of low and high levels according to the continuum of sustainability strategies from responsiveness to proactiveness (*Aragon-Correa and Sharma* 2003; *Sharma et al.* 1999) to support the generalizability of our findings. In order to ensure reliable and valid assessment, a third researcher was consulted in a final step to independently review the evidence and conclusions for each case, which was in line with the other two researchers. For the degree of conferment of sustainability within governance structures and partner selection, we defined the same

evaluation procedure. Due to the opposing findings on the interorganizational level, the assessment of these degrees by low and high levels turned out to be straightforward.

The last methodological step refers to the internal validity of our research, implying the causal relationship between the theoretical constructs and our results. This step encompasses drawing back on our research framework and pattern matching by means of within and cross-case analysis, as well as the application of different theoretical lenses to interpret our findings (*Gibbert et al.* 2008; *Yin* 2003). First, we summarized our findings on the theoretical constructs, i.e. the maturity of intraorganizational sustainability management and the degree of conferment of sustainability on an interorganizational level. Thereby, we outlined a support for our institutional theoretic expectations in two cases and two further phenomena.

In a second step, we applied Mill's method of comparative analysis, implying the method of difference and the method of agreement. Thereby, deviant cases are analyzed by their differences from theoretically expected cases and similarities to other cases (*George and Bennett* 2004; *Mill* 1843). Both researchers independently screened the archival and interview data again, aiming to identify determining factors that lead to the differences and similarities. In an iterative process, the two researchers marked exemplary quotes and related them to the literature on institutional and agency theory. Since the researchers worked independently, different wording was used and overlapping factors were identified. In a final step, the researchers compared their results and built a reduced list of adequately defined and non-overlapping determinants. The iterative process ended with the identification of six determinants for the conferment of interorganizational sustainability, which were transferred to propositions. Three determinants were related to agency theoretic constructs, two were related to institutional theory and one was related to both. Beyond this, we identified further support for the existence of institutional pressures, other than the principal company being decisive in cases of low interorganizational pressure.

B.7 Results

The results are presented in two steps. In the first paragraph, we introduce evidence on the maturity of intraorganizational sustainability management in the cases. The second paragraph deals with our findings on the interorganizational transfer of sustainability to governance structures and partner selection within the analyzed dyadic relationships.

B.7.1 Findings on Intraorganizational Sustainability Management

Tables B-4/B-5 and B-6/B-7 present evidence on intraorganizational sustainability management in the cases, following the differentiation criteria of general mindset, organizational structure (top management involvement and resource commitment), performance objectives, reporting structures and the integration of manufacturing/production. The final rows of the tables give a concluding evaluation of the maturity level of each company's sustainability management.

The shipper in case A is a subsidiary of a multinational enterprise in the packaging industry. Sustainability plays a prominent role in its product design and sourcing, as well as in its production processes. Its sustainability management comprises comprehensive organizational structures that underline top management commitment. The reduction of CO₂ emissions, for instance, is part of the personal evaluation of managers. Furthermore, the company provides an annual global reporting initiative (GRI) report following the highest standards with detailed information on comprehensive environmental and social activities. Therefore, we conclude a high degree of maturity of its intraorganizational sustainability management. Its LSP is a subsidiary of a multinational contract logistics service provider. In terms of sustainability, the LSP has predominantly implemented eco-efficiency measures by means of fleet modernization. A sustainability organizational structure has not yet been implemented. Moreover, no standardized reports on sustainability engagement were available at the time of data collection. Hence, we conclude a low maturity level.

The shipper in case B is a large Swiss enterprise in the food industry. The company's sustainability activities have a quality management background and concentrate on production processes, as well as the origin and cultivation of natural resources. Shipper B has not yet implemented sustainability organizational or reporting structures. Therefore, we assess a low sophistication of sustainability engagement. The logistics services in case B are outsourced to a large Swiss LSP with a focus on environmental sustainability. Core sustainable activities are fleet modernization and intermodal transports. The LSP provides an environmental brochure and details of CO₂ emissions for transport services on demand. Nonetheless, the provider has not yet implemented standardized organizational and

reporting structures. Therefore, we categorize the maturity of sustainability management of the LSP in case B as low.

The shipper-LSP relationship in case C is situated in the chemical industry. Both companies are active within a voluntary sustainability and safety initiative of the chemical industry, namely the 'Responsible Care Initiative'²⁵. Furthermore, they apply the 'safety and quality assessment system (SQAS)'²⁶ for logistics services, which includes diverse environmental and safety-related requirements. The multinational shipper has proactively and comprehensively developed sustainability organizational and reporting structures. All products are designed regarding to eco- and socio-efficiency analyses. Sustainability targets and activities are annually evaluated and reported following the GRI standard. Therefore, we categorize the maturity degree of shipper C as high. Its medium-size LSP is the only provider in the sample having a sustainability officer and reporting selected sustainability performance indicators on a regular basis. The LSP makes its sustainability engagement and objectives transparent in annual business reports and within brochures, so that we conclude a high maturity of sustainability management.

Shipper D is a multinational company trading with assembly and fastening material. Its sustainability management comprises code of conducts for international product suppliers and focuses on social issues. The company has not implemented sustainability organization or reporting structures yet. Although, they offer several environmental-friendly products, they have not defined sustainability performance objectives yet, which let us conclude a low sophistication of sustainability management. In contrast, the LSP of company D is a large-size multinational enterprise, which draws backs on comprehensive organizational and reporting structures to manage sustainability concerns. The LSP is the only provider within the sample, who publishes an annual sustainability report following the GRI standard and applies diverse environmental measures and programs. Hence, we assess a high level of sustainability efforts.

²⁵ "Responsible Care is the chemical industry's unique global initiative that drives continuous improvement in health, environmental and safety(HEC) performance, together with open and transparent communication with stakeholders." (Source: <http://www.icca-chem.org/en/Home/Responsible-care>)

²⁶ "SQAS (Safety & Quality Assessment System) is a system to evaluate the quality, safety, security and environmental performance of Logistics Service Providers and Chemical Distributors in a uniform manner by single standardised assessments carried out by independent assessors using a standard questionnaire." (Source: <http://www.sqas.org>)

Criteria to Assess Sustainability Management	Case A (Shipper)	Case B (Shipper)	Case C (Shipper)	Case D (Shipper)
General Mindset	"Sustainability is an integral part of our company's strategy."	"We have not specifically defined sustainability within our company policies. But sustainability issues are part of our quality policies (legal compliance, safety and environment)."	"For us, sustainable development means the combination of long-term oriented economic success with environmental protection and social responsibility."	"Sustainability for us means responsibility for our employees."
Organizational Structure				
■ Resource Commitment	"We have a sustainability officer within our top management as well as steering committees dealing with CSR and environmental issues."	"We have two employees working in personal union on quality and safety issues who report to the director of quality, safety and environment."	"We have created comprehensive structures to promote sustainable business (a sustainable council chaired by board members, a coordinating sustainability center, etc.)."	"We have no sustainability department yet, but deal with up-coming issues top-down."
■ Top Management Involvement				

Table B - 4: Findings on Intraorganizational Sustainability Management of Shippers I
(continued by Table B-5)

Criteria to Assess Sustainability Management	Case A (Shipper)	Case B (Shipper)	Case C (Shipper)	Case D (Shipper)
Reporting Structure	"Our objectives and activities are annually reported by a GRI report, which follows the A+ standard."	"Quality and safety issues are reported quarterly, whereas environmental issues are internally reported annually. We do not provide a sustainability report, but present selected activities on our webpage."	"We base our reporting on the up-to-date GRI standard."	"Our sustainability policies are presented in our annual financial report."
Performance Objectives (clearly defined and monitored objectives only)	▪ Reduction of CO₂ emissions ▪ Reduction of energy consumption ▪ Reduction of water consumption ▪ Increase of controlled sources of raw material	▪ Usage of local raw materials/ resources	▪ Reduction of greenhouse gas emissions ▪ Increase of energy efficiency of production processes ▪ Increase of transport safety ▪ Increase of product reliability ▪ Increase of workplace safety ▪ Increase of health protection	-
Integration of Manufacturing/ Production	▪ Lifecycle assessment of products	▪ Regional products and resources ▪ Offer of organic products	▪ Lifecycle assessment of products (eco-efficiency and socio-efficiency analysis)	▪ Environmentally friendly products
Maturity Level	High	Low	High	Low

Table B - 5: Findings on Intraorganizational Sustainability Management of Shippers II

Criteria to Assess Sustainability Management	Case A (LSP)	Case B (LSP)	Case C (LSP)	Case D (LSP)
General Mindset	"The focus of our sustainability management is on economic and environmental issues. But objectives are contradictory sometimes."	"Sustainability, implying economic and environmental thinking, is essential for staying in the market. Our employees build the basis thereto."	"For us, sustainability is environmental protection, investments in a modern fleet and technology, as well as social responsibility."	"Our sustainability management encompasses the three pillars: economy, environment and social management."
Organizational Structure				
▪ Resource Commitment	"We have no sustainability department, but a directorate for safety and environment with two responsible employees (part time). Top management is involved occasionally."	"We have no sustainability department, but cover upcoming sustainability issues within our quality management center."	"We have newly created the position of a sustainability officer, who directly reports to the CEO."	"We have a central organization dealing with green logistics and social management."
▪ Top Management Involvement				

Table B - 6: Findings on Intraorganizational Sustainability Management of LSPs I
(continued by Table B-7)

Criteria to Assess Sustainability Management	Case A (LSP)	Case B (LSP)	Case C (LSP)	Case D (LSP)
Reporting Structure	"Our environmental activities are reported internally. In Switzerland our reporting structures are still in a developing stage."	"We inform our customers by means of environmental brochures and provide details of our carbon footprint on demand."	"We report our sustainability activities within our annual report and company brochures. Beyond this, we provide sustainability KPIs to our customers on demand."	"We publish an annual sustainability report according to the GRI standard."
Performance Objectives (clearly defined and monitored objectives only)	▪ KPIs according to ISO 14001	▪ Reduction of energy consumption	▪ Reduction of empty trips ▪ Increase of ratio of intermodal transports (rail/road)	▪ Reduction of CO₂ emissions ▪ Reduction of energy consumption and increase of regenerative energy ▪ Noise reduction ▪ Improve health of employees
Integration of Manufacturing/ Production	▪ Fleet modernization ▪ Application of telematics / tracking and tracing (planned)	▪ Fleet modernization ▪ Application of telematics / tracking and tracing ▪ Tour optimization ▪ Intermodal transports ▪ Recycling, e.g. further usage of truck	▪ Responsible Care initiative requirements ▪ Fleet modernization ▪ Application of telematics ▪ Tour optimization ▪ Intermodal transports ▪ Eco-driving and safety training (behavior-based safety) ▪ Eco-driving and safety training (behavior-based safety) ▪ Dangerous goods training	▪ Fleet modernization ▪ Application of telematics ▪ Tour optimization ▪ Intermodal transports ▪ Eco-driving and safety training (behavior-based safety) ▪ CO₂ emissions calculation ▪ Green consulting to shipping companies ▪ Environmental program (business travel standards,
Maturity Level	Low	Low	High	High

Table B - 7: Findings on Intraorganizational Sustainability Management of LSPs II

B.7.2 Findings on Interorganizational Sustainability Management

Within this section, we present the results regarding if and to what extent sustainability is implemented within governance structures and partner selection. Table B-8 presents the details on the contractual relations of all the cases. The last column gives a first evaluation on the degree of interorganizational conferment of sustainability within the shipper-LSP relationship.

Case	Governance Structure	Partner Selection Criteria	Degree of Sustainability Conferment
Case A	Frame contract (price and transport volumes)	▪ Price and service level ▪ Trust/reputation ▪ Geographical proximity	Low
Case B	Frame contract (price, transport volumes and utilization)	▪ Price and service level ▪ Trust/reputation ▪ Geographical proximity	Low
Case C	Detailed contract (price, transport volumes, safety and environmental standards and infrastructure)	▪ Price and service level ▪ Safety quality assessment (SQAS) ▪ Supplier satisfaction evaluation	High
Case D	Verbal agreement (price, transport volumes and further specifics)	▪ Price and service level ▪ Trust/reputation	Low

Table B - 8: Findings on Interorganizational Sustainability Management

The shippers of cases A and B apply loose frame contracts that include the price and service level of the LSP. Sustainability is neither part of the contractual agreements nor the selection criteria. The manager of production and logistics of shipper A explained: "We have no sustainability requirements regarding our logistics services yet. At the time of contract signing this was not as relevant as nowadays". The partner selection is dependent on the required service level and the trust and reputation of the provider, since providers have access to shippers' warehousing facilities and IT infrastructure. The director of production and logistics of case B stated: "The reasons for the relationship with LSP B are their reliability and experiences of cooperation and trust. Their employees are somehow our employees." Beyond this, cases A and B require a certain geographical proximity of the provider due to national cabotage prohibition in Switzerland²⁷.

²⁷ National cabotage implies the transport of goods or passengers within the same country by a vehicle registered in a different country. National cabotage is prohibited by Article 14 of the agreement of the Swiss Federation and the European Community regarding goods and passenger road and railway transports (cf. AS 2002 1649; BBl 1999 6128).

The shipper of case D has also not implemented sustainability within its governance structure or partner selection: "We discuss transport volumes and quality standards annually, but do not fix them or any further specifics within a contract (...). The relationship to LSP D is historically grown and relies on trust and reliability. Beyond this, LSP D has a similar service and quality understanding as we have" (Logistics Purchaser, shipper D). Thus, the relationship with the LSP is based on verbal agreements regarding service level. These verbal agreements also underline the role of trust within the relationship.

In contrast, case C applies detailed contracts and partner selection criteria regarding safety, quality and environmental standards: "We select our logistics service providers according to price and service level, as well as according to their results to our safety, quality and environmental assessment, which consists of hundreds of prioritized questions. Requirements are included in a detailed contract. (...) Within the relationships, we assess our providers regularly and demand quality and sustainability KPIs" (Manager of Logistics, shipper C). Recurrent contracts also include supplier satisfaction evaluation based on the quality and reliability of the provided service within the last contract. Therefore, case C is the only shipper-LSP relationship in the sample that currently transfers sustainability to its governance structure and partner selection.

The findings on the degree of sustainability conferment within governance structures and partner selection in shipper-LSP relationships show that sustainability is only transferred in one case. Therefore, we present the shippers' challenges regarding the implementation of interorganizational sustainability management in Table B-9. The shippers in cases A and B pointed out their demand for logistics services within the Swiss market and thus their limited ability to select sustainable providers from a narrowed competitive market. Shipper A stated that "(...) the Swiss logistics market is a bit isolated", whereas shipper B told us that "(...) there is limited choice of providers within the market". Cases A, B and D further named a challenge regarding the concreteness of their customer demands. "Our customers ask for our sustainable engagement but do not specify requirements regarding logistics" (Director of Production and Logistics, shipper A). Therefore, the shippers struggle to decide which selection criteria or contract specifics are relevant for implementation. Beyond this, cases A, B and D underlined that they have concerns regarding the implementation of additional sustainability criteria within existing relationships, since sustainability was not as relevant at the time of contract signing.

All the shippers in the sample indicated a general lack of concrete sustainability performance indicators, and thus difficulties in measuring sustainability, as a major reason for not (or not to a larger extent, cf. case C) having conferred their sustainability needs to their contractual logistics partners. Shippers struggle with "(...) the definition of measures and the complexity of sustainability" (CEO, shipper D), as well as with "lacking standard

measures for logistics services" (Sustainability Officer, shipper C). Beyond this, the value added by sustainable logistics is underlined as a core challenge, since pay-offs are expected on a long-term basis or are uncertain in nature. As a consequence, the willingness to pay for exceptional sustainable engagement is still low. The CEO of shipper D told us that "cost efficiency and sustainable engagement are sometimes conflicting interests, especially for logistics". This issue was also underlined by the Manager of Production and Logistics of shipper A, who stated that "the implementation of sustainability is challenged by financial barriers". This leads to conflicts for shippers in terms of balancing the relevance of sustainability, price and service level. Since shipper C stated that measurability difficulties, uncertain added value and goal conflicts hinder the further development and extension of its interorganizational sustainability management, we listed these challenges in brackets for case C.

Challenges	Case A	Case B	Case C	Case D
▪ Lack of market liberalization	x	x	-	-
▪ Lack of concrete customer demands for sustainable logistics services	x	x	-	x
▪ Sustainability less relevant at contract signing / difficulty of implementing additional sustainability criteria within existing relationships	x	x	-	x
▪ Uncertain added value, high investments and lacking willingness to pay	x	x	(x)	x
▪ Difficulties in measuring and comparing sustainable logistics / lack of sustainability performance indicators	x	x	(x)	x
▪ Service level and/or price as predominant selection criteria	x	x	(x)	x

Table B - 9: Challenges Regarding Interorganizational Sustainability Management

B.8 Determinants of Interorganizational Sustainability Management

The case study findings indicate a heterogeneous picture of sustainability in dyadic relationships. Table B-10 presents an overview of our findings on intraorganizational maturity levels and the interorganizational conferment of sustainability.

	Maturity Level of Intraorganizational Sustainability Management (Shipper)	Degree of Sustainability Conferment within Governance Structure and Partner Selection	Maturity Level of Intraorganizational Sustainability Management (LSP)
Case A	High	Phenomenon 1 Low	Low
Case B	Low	Low	Low
Case C	High	High	High
Case D	Low	Low	Phenomenon 2 High

Table B - 10: Summary of Findings

Case C shows a consistent high level for intraorganizational and interorganizational sustainability within the dyadic relationship. Therewith, this case supports the institutional and agency theoretic expectation that a high level of intraorganizational sustainability management of the principal is transferred to a high level of interorganizational sustainability management (*Dacin et al. 2007*). Our findings on the challenges underline that case C solves adverse selection and moral hazard problems with respect to measurability, added value and goal conflicts to a certain extent by means of detailed contracts and comprehensive selection criteria, so both influence the level of intraorganizational sustainability management of the LSP. Therewith, we validate that institutional propositions that conferred legitimacy needs determine the behavior and performance of partners in dyadic relationships (e.g. *Dacin et al. 2007*; *Kumar and Das 2007*; *Lin and Darnall 2010*).

Case B, on the other hand, presents a consistent low level for intraorganizational and interorganizational sustainability management, which inversely supports our theoretical expectation. Therefore, we suppose that the firm and environmental characteristics in case B result in low sustainability legitimacy needs, leading to low intraorganizational and interorganizational sustainability management, and the LSP responds to these with a low sophistication of its sustainability management as well.

In contrast, cases A and D present two out of three realistic non-conformities. The first non-conformity is presented by the phenomenon observed in case A:

-
- (1) Why does the shipper in case A not confer the high maturity level of intraorganizational sustainability management to governance structure and partner selection?

The phenomenon is characterized by a high level of intraorganizational sustainability management that is not reflected on an interorganizational level. This type of non-conformity outlines factors determining diverging behavior in contrast to conforming behavior, which may be explained by institutional and agency theory. In a first step, we derive determinants by contrasting shipper A with shipper C, who has conferred sustainability. In a second step, we analyze the similarities between shipper A and shippers B and D, who have not transferred sustainability to an interorganizational level. This comparative case analysis leads to two determinants related to institutional theory, three determinants of agency theory and one determinant with explanations from both theoretical anchors. Contrasting cases A and C presents the following distinctions: shipper A is challenged by a lack of market liberalization and a lack of concrete customer demands for sustainable logistics. Beyond this, we identify a distinctive firm characteristic, since shipper A is a subsidiary of a multinational enterprise, whereas shipper C is a multinational enterprise. The analysis of the similarities between shippers A, B and D adds three further agency theoretic aspects determining interorganizational sustainability management related to information asymmetries and agency problems: measurability difficulties, uncertain added value and goal conflicts (cf. Tables B-8 and B-9). Finally, we identify a distinction between cases A and C related to the role of trust within the contractual relationships. These findings are used in the subsequent paragraphs in order to build propositions.

The second non-conformity is presented by the phenomenon of case D:

- (2) Why does the logistics service provider in case D have a high level of maturity with regards to intraorganizational sustainability management despite a lack of interorganizational pressure?

The phenomenon is characterized by the agent's high level of intraorganizational sustainability management despite a low level of interorganizational pressure by the principal. Despite a lack of pressure from the shipping company, the LSP in case D is the only one in the sample that shows a high level of maturity regarding sustainability management. When elucidating distinctions between the LSPs in cases A and B, we find that provider D has a significantly larger firm size in terms of revenue and employee numbers and is located in Germany just like provider C, who also showed high sustainability sophistication. Therewith, the second type of non-conformity indicates the superior role of institutional pressure outside the dyadic relationship related to firm characteristics.

The third non-conformity, which was not identified within our sample, would be a low level of intraorganizational sustainability management of an agent despite a high level of interorganizational pressure. Since this non-conformity outlines inadequate governance structures and selection criteria or mechanisms, which would not lead to desired effects on the agent's side, we suppose a close relationship to the determinants derived from the two prior phenomena. From an agency perspective, this non-conformity may be linked to inefficiencies in the design of the governance structure and the partner selection criteria, implying measurability difficulties, uncertain added value and even stronger goal conflicts between principals and agents. From an institutional perspective, weak sustainability performance may be explained by the lower diffusion of interorganizational actions related to decoupling (*Ansari et al.* 2010) or the superior role of low institutional pressures outside the dyad. Finally, trust may also have a significant role in undermining interorganizational control mechanisms within this third type of non-conformity.

The following paragraphs discuss the derived determinants from both phenomena in detail from an agency as well as an institutional theory perspective. We conclude each paragraph with a proposition regarding the influence of the determinant on interorganizational sustainability management.

B.8.1 Environmental Characteristics: Market Regulation and Customer Demands

From an institutional theory point of view, market regulation and customer demands can be summarized as environmental characteristics that constitute coercive pressures in our case study context. A common notion in the literature is that governmental pressures and regulations are able to positively influence the sustainable development of organizations (e.g. *Campbell* 2007; *Jennings and Zandbergen* 1995; *Zhu and Sarkis* 2007). We identify that market regulation that seeks to prevent market liberalization may also result in the opposite. This is based on our findings in the Swiss logistics market, where national cabotage is prohibited. Shippers in the Swiss market are thus confronted with a limited logistics market for national road transports, which seems to limit the opportunity for an extension of partner selection criteria or governance structures regarding sustainability. According to the interviewees, new sustainability criteria could only be fulfilled by a few or none of the LSPs in the market. Beyond this, LSP capacities in the Swiss market are well allocated among shipping companies on a long-term basis, so shippers hesitate to switch LSPs because of more or less sustainable behavior. Our finding on the influence of market liberalization supports the analysis of *Hitt et al.* (2004), who investigated differences between institutional pressures in China and Russia and their impact on partner selection. They found evidence that governmental regulations and barriers lead to a rather short-term

focus of partner selection in Russia, whereas the facilitation of business development in China leads to long-term alliances.

With respect to the concreteness of customer demands, we identify that customers of shipping companies are less interested in sustainable logistics services. Although shipper A receives general enquiries from customers with respect to intraorganizational sustainability efforts, the customers do not ask for sustainable logistics services. Therewith, we assume a lack of willingness to substantially contribute to more sustainable business practices, which in turn results in a lack of concrete demands within the supply chain and influences the conferment of sustainability management to an interorganizational level for logistics services (*Lieb and Lieb 2010; Wolf and Seuring 2010*). Hence, organizations focus on the sustainability of their core competences, products and manufacturing processes rather than on logistics services.

Proposition 1a (P1a): A lack of market liberalization decreases the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

Proposition 1b (P1b): A lack of concrete customer demands decreases the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.2 Firm Characteristics: Decoupling

Another institutional factor of importance is related to firm characteristics: case A is a subsidiary of an MNE. By contrast, in case C the shipper is an MNE headquarters. Shipper A explained that "(...) there are differences regarding sustainability management at the worldwide corporation and the subsidiary in terms of organization and actions." This determinant may be linked to institutional theoretic discussions on the decoupling of formal structures and actions (*Ansari et al. 2010; Boxenbaum and Jonsson 2008; Fiss and Zajac 2006*). Decoupling, opportunism or ceremonial conformity implies that organizations under institutional pressures may change their formal structures to signal conformity, while allowing internal units to operate independently (*Jamali 2010; Meyer and Rowan 1977; Scott 2008*). The ceremonial adoption of structures and actions by subsidiaries of multinationals was investigated by *Kostova and Roth (2002)*. They found evidence for significant challenges regarding the diffusion of practices at a corporate headquarters to subsidiaries and linked the diverging behavior of subsidiaries to decoupling. In our context, this could indicate that subsidiaries just implement symbolic sustainability efforts in order to fulfill the expectations of the headquarters. Alternatively, subsidiaries may be allowed to operate independently from the head organization. Both forms of decoupling impede the

implementation of substantial sustainability efforts. The finding in case A indicates the latter: the subsidiary operates independently or is decoupled from corporate structures and actions. Due to this independency, case A has not conferred the high level of its intraorganizational sustainability management to an interorganizational level. Therewith, we propose a relationship between decoupled structures and processes at subsidiaries of MNEs and the conferment of sustainability.

Proposition 2 (P2): Decoupled structures and processes at subsidiaries of MNEs decrease the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.3 Measurability Difficulties

Within the first phenomenon (see Table B-10), we identify measurability difficulties regarding sustainability issues. These difficulties may be related to information asymmetries and agency problems. According to the interviewees, a lack of measuring standards, key performance indicators and knowledge of sustainable logistics services hinder the adequate design of interorganizational sustainability control mechanisms. The relevance of these information issues is reflected by current debates on the general scope and definition of economic, environmental and social performance measures in SSCM research and practice (e.g. *Carter and Easton* 2011; *Kudla and Stölzle* 2011; *Seuring and Müller* 2008a). Although there have been attempts by scholars to define and structure sustainability performance measures, these attempts tend to either focus on the environmental (e.g. *Handfield et al.* 2002; *Humphreys et al.* 2003; *Hunt and Auster* 1990; *Kolk and Mauser* 2002; *Noci* 1997) or the social dimension (e.g. *Carter and Jennings* 2002; *Hutchins and Sutherland* 2008). Moreover, there are only a few rare approaches specific to logistics services that integrate all three dimensions (e.g. *Murphy and Poist* 2002; *Murphy and Poist* 2003).

In agency theory, measurability is a variable that influences contract design (*Eisenhardt* 1989a; *Logan* 2000; *Zsidisin and Ellram* 2003). "Agency theory predicts that the form of (...) contract will depend on the relative cost of curbing agent opportunism, either through monitoring of agent behaviors or through structuring of incentives that pay off for outcomes desired by the principal" (*Lassar and Kerr* 1996, p. 615). The measurability of sustainable behavior thus refers to the programmability of such behavior, implying "(...) the degree to which appropriate behavior by the agent can be specified in advance" (*Eisenhardt* 1989a, p. 62). If this specification is easy, it is straightforward for the shipper to observe and evaluate the behavior of an LSP. In contrast, measurability difficulties lead to the costly development of monitoring systems (e.g. *Eisenhardt* 1989a; *Ouchi* 1979; *Shapiro* 2005). This fact results

in a decrease in the likelihood of a shipper to confer sustainability to partner selection and governance structures in practice. The shipper would rather avoid additional costs, if this is feasible.

Proposition 3 (P3): The perceived measurability difficulties of sustainable behavior decrease the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.4 Uncertain Added Value

Based on agency theory, the value added or the outcome of certain behavior is a further variable to the design of governance structures and selection criteria (*Clark and Wilson 1961; Jensen and Meckling 1976*). "The simple model assumes that outcomes are easily measured. However, some tasks require a long time to complete, involve joint or team effort, or produce soft outcomes" (*Eisenhardt 1989a*, p. 62). These characteristics apply to sustainable behavior and sustainable logistics in particular. Shipper A as well as the other shippers that present a low degree of interorganizational sustainability management, stated that they are struggling with the long-term nature and uncertainty of pay-offs regarding sustainable logistics. These concerns are related to academic discussions on the business case for sustainability (e.g. *Carroll and Shabana 2010; Dyllick and Hockerts 2002*) and the relationship between corporate social responsibility and financial performance (e.g. *Baron 2007; Carter 2005; McGuire et al. 1988; McWilliams and Siegel 2000; Schaefer 2007*). Uncertainty regarding the added value by sustainable behavior and the measurability difficulties discussed in the prior paragraph leave the principal with the challenge that they can neither use behavior nor output control mechanisms at reasonable costs and thus have "(...) no rational form of control" (*Ouchi 1979*, p. 844). Although shipper C elucidates that they have solved the uncertainties regarding sustainable behavior to a certain extent, we propose that uncertain added value decreases the likelihood for interorganizational sustainability efforts.

Proposition 4 (P4): The perceived uncertain added value of sustainable behavior decreases the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.5 Goal Conflicts

Beyond the prior agency theoretic determinants, we identify inherent goal conflicts within the first phenomenon. By this we mean conflicts of the shipping company to design

governance structures and selection criteria according to economic (i.e. price and service level), environmental and social objectives. Therefore, goal conflicts occur in close interrelation with the measurability and outcome uncertainties described above, but they also include the risk aversion of the agent. In our context, this means that the logistics service provider does not necessarily provide the required sustainable behavior without being monitored by the interorganizational sustainability management of the shipper. This leaves the shipping company with the core agency theoretic task of identifying "(...) the trade-off between (a) the cost of measuring behavior and (b) the cost of measuring outcomes and transferring risk to the agent." (*Eisenhardt* 1989a, p. 61)

In order to explain inherent goal conflicts in more detail, we refer to *Shah and Swaminathan* (2008), who analyze the role of relationship context as an influencing factor for partner selection. *Shah and Swaminathan* (2008) propose a typology that classifies relationship contexts regarding low and high levels of behavior measurability and outcome interpretability. According to these characteristics of a relationship context, either trust, commitment, complementarity or financial pay-off become determining influential factors for partner selection (e.g. *Beckman et al.* 2004; *Büyüközkan et al.* 2008; *Ellram* 1990; *Hitt et al.* 2004; *Huang et al.* 2008; *Meuleman et al.* 2010; *Möller* 2010; *Teng and Jaramillo* 2005). Transferring this typology to our research context, we find evidence of two distinct relationship contexts that imply conflicts of interest.

Logistics services are typically characterized by high behavior measurability and high outcome interpretability. According to the typology of *Shah and Swaminathan* (2008), these characteristics lead to financial payoff as the most influential factor. This underlines our findings, since the shipping companies in our case study predominantly apply price as the core selection criteria and contractual content.

Sustainable logistics services, on the other hand, provide a distinct relationship context. They suffer from measurability difficulties and uncertain added value (cf. Table B-9). According to the described typology, these characteristics lead to trust as the most influential factor for partner selection. Shippers thus need to trust LSPs to behave sustainably or implement adequate incentive and control mechanisms. Hence, logistics services and sustainable logistics services are distinct relationship contexts that result in goal conflicts for shipping organizations. Shippers are confronted with the task of aligning sustainable and purely economic objectives (*Hahn et al.* 2010) regarding partner selection and governance structure. At the current state of interorganizational sustainability management, these goal conflicts lead to curbing implementation.

Proposition 5 (P5): The perceived goal conflicts between sustainable and purely economic objectives decrease the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.6 Trust

Beyond these determinants, the first phenomenon indicated the significant role of trust. Shipper A stated that trust is an important selection criterion and essential within the contractual relationship with the LSP. Nevertheless, shipper A faces difficulties in implementing sustainability within the existing relationship, since this might becloud trustworthiness. In contrast, shipper C relies on control mechanisms regarding sustainability rather than trust (cf. Table B-8). In literature, trust is defined "(...) as the mutual confidence that no party to an exchange will exploit another's vulnerabilities, because opportunistic behaviour would violate values, principles and standards of behaviour that have been internalised by parties to an exchange. (...) Trust can be a substitute for formal control mechanisms, reduce transactions costs, facilitate dispute resolution, and allow more flexibility in an alliance" (*Bierly and Gallagher 2007*, p. 138). Therewith, trust is contradictory to agency theoretic assumptions of the opportunistic, self-interested behavior of principals and agents (*Beccerra and Gupta 1999*). As a result, agency theory supports our finding that trust decreases the conferment of interorganizational control mechanisms.

From an institutional point of view, interorganizational trust evolves by "(...) processes and routines jointly developed (...), which become codified and stable over time and create a set of common expectations (...)of what is considered appropriate and fair behavior" (*Zaheer et al. 1998*, p. 21). These interorganizational routines and trustworthiness are supposed to induce higher performance outcomes (*Sharfman et al. 2009; Zaheer et al. 1998a*). However, in the case of interorganizational sustainability, we find a negative relation to this institutional proposition due to the dependence of partners. Thereto, we refer to Bierly and Gallagher (2007), who propose that "(...) trust can also be used inappropriately during the decision-making process. Too much emphasis may be placed on the trustworthiness of a partner, to the extent that important issues concerning strategic fit are not properly analyzed" (p. 142). Hence, trust may impede the implementation of new criteria and governance structures for sustainable services, so the fit of sustainability levels of partners may be neglected.

Proposition 6 (P6): The perceived trust in dyadic relationships decreases the likelihood that principal companies confer intraorganizational sustainability management to an interorganizational level.

B.8.7 Institutional Pressures outside the Principal-Agent-Dyad

The second phenomenon (see Table B-10) observed among our cases deals with the LSP in case D, who shows high sustainability management sophistication despite lacking pressure from the principal company. We relate this finding to traditional institutional answers to the question as to why companies behave sustainably (*Aguilera et al. 2007; Bansal and Roth 2000; Beliveau et al. 1994; Campbell 2007; Delmas and Toffel 2004*). Thereto, Campbell argues that "(...) the relative health of corporations, the economy and the level of competition (...) affect the probability that corporations will act in socially responsible ways" (p. 962). Beyond this, institutional theory proposes coercive and normative pressures result in an increased need for the justification of the strategic actions and outputs of organizations (*Zhu and Sarkis 2007*). These aspects match with our finding on the LSP in case D, which is an MNE of a significantly larger firm size than the other LSPs in the sample. These firm and environmental characteristics lead us to assume that the provider executes logistics services for hundreds of further key accounts, so its legitimacy needs are aligned to multiple stakeholder requirements. This finding supports our preliminary assumption that if firm and environmental characteristics lead to high legitimacy needs in a company, then these are reflected by the intraorganizational sustainability management.

B.9 Discussion and Conclusion

B.9.1 Contributions

The purpose of our research was to identify determinants that explain the diverging behavior of organizations in principal-agent dyads in terms of sustainability. Our theoretical anchors for developing propositions on these determinants were given by institutional and agency theory. Based on our empirical results, we discussed the identified determinants and underlined their role in influencing interorganizational sustainability management, as illustrated by the framework in Figure B-3. As a conclusion, we derived implications for the integrated usage of institutional and agency theory.

Our case study findings indicate that a high level of intraorganizational sustainability management does not necessarily lead to its conferment to interorganizational sustainability management. We identified six determinants of why organizations hesitate or struggle with the conferment of sustainability: lack of market liberalization and customer demands, decoupling, measurability difficulties, uncertain added value, goal conflicts and trust.

Market regulation and customer demands refer to core institutional pressures within an organization's environment. In an extension to previous studies that propose the positive effect of coercive pressures on sustainable behavior (*Delmas and Toffel 2004; Zhu and*

Sarkis 2007), our findings identify hindering facets (*lack of market liberalization and customer demands*) to the interorganizational diffusion of own (intraorganizational) behavior. In addition, we found evidence that firm characteristics indicating a *decoupling* of units or subsidiaries allow for efficiency-driven rather than legitimacy-driven operations in terms of interorganizational sustainability management (Kostova and Roth 2002), which also supports agency theory objectives. Hence, decoupling delimits the comprehensive diffusion of sustainability across organizational boundaries.

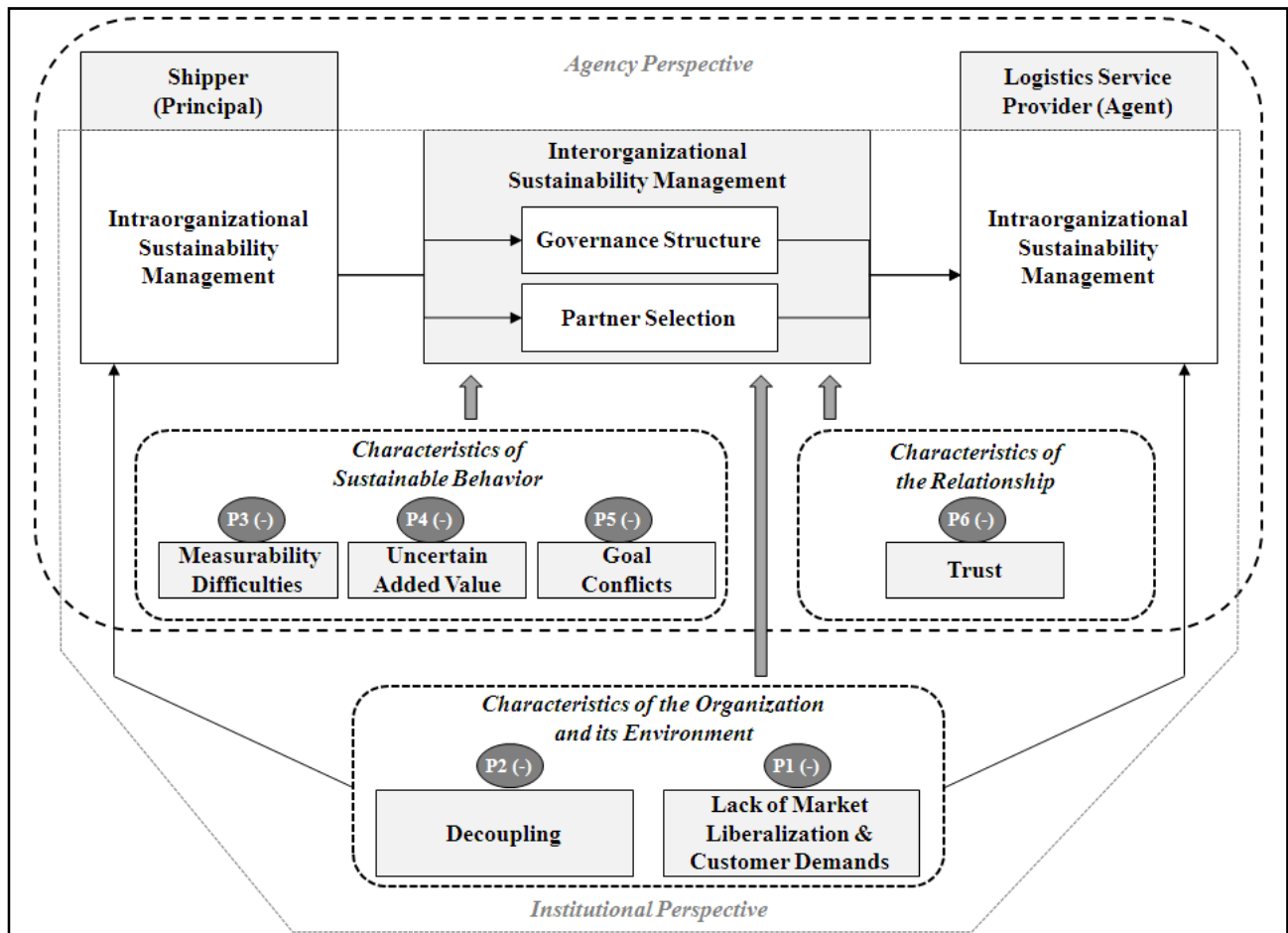


Figure B - 3: Framework of Determinants for Interorganizational Sustainability Management

Moreover, we identified three determinants regarding the characteristics of sustainable behavior that stem from agency theory, namely *measurability difficulties*, *uncertain value* and *goal conflicts* (Eisenhardt 1989a; Lassar and Kerr 1996; Shapiro 2005). The current scope of sustainability management across organizations reveals the rather early state of such activities and the fact that contract and incentive design still lack adequate measures for sustainable behavior and economic performance. Principal companies thus face the challenge of aligning efficiency and legitimacy objectives, translating them to an interorganizational level and adjusting risk-averse agents.

Beyond these determinants, we illustrated the role of *trust* as a further characteristic of dyadic relationships that determines the conferment of sustainability. Institutional theory assumes that trust is developed by routines and processes becoming stable and acknowledged over time in dyadic relationships, resulting in higher performance outcomes (Zaheer *et al.* 1998a). Agency theory, on the other hand, assumes a mutual absence of trust, due to its focus on control mechanisms (Beccerra and Gupta 1999). Our findings indicate that relational trust, implying the co-dependence of principal and agent, may supersede control mechanisms, which may therefore lead to the negligence of sustainability (Bierly and Gallagher 2007; Rousseau *et al.* 1998). Therewith, interorganizational sustainability management either demands collaborative sustainable engagement of the principal and agent (in cases of trustful relationships) or for the consideration of sustainable behavior as a new routine that demands the development of trust (and thus the minor role of past experiences and routines) when defining partner selection criteria and governance structures. The empirical findings and derived determinants present a relation to both the agency and the institutional anchors of the study. Nonetheless, neither of the theories explains the entire set of derived determinants, which leads to support for the integrated use of agency and institutional theory.

Finally, we identified that the sustainable behavior of agents is not solely dependent on principals' interorganizational sustainability management. We identified that institutional pressures outside the dyad should be taken into consideration as well. This is particularly interesting from a supply chain perspective, since organizations are incorporated within diverse relationships and environments. Institutional pressures may vary in strength, constituent multiplicity and regarding the dependence of an organization on the sources of institutional pressures, thus "the collective normative order of the environment is not necessarily unitary or coherent" (Oliver 1991, p. 162). Principal organizations that develop interorganizational sustainability management structures and actions should therefore take the institutional environments and related pressures of their agents into account. This is particularly relevant for sustainable logistics services since providers act in diverse legal and organizational environments, which plays a decisive role in the adequate design of interorganizational sustainability management. Thereby, we validated the criticism of agency theory regarding its limited dyadic perspective (Gomez-Mejia *et al.* 2005; Shapiro 2005; Worsham *et al.* 1997) and thus supported the further integration of institutional and agency theory.

The discussion above displays moderating factors that explain the non-conformities of intraorganizational and interorganizational sustainability management. These moderators stem from distinct but complementary institutional and agency theoretic viewpoints. Previous research combining agency and institutional theory elucidates how the theories

provide a consistent view when juxtaposed, albeit acknowledging that legitimacy and efficiency objectives have a trade-off relationship (*Eisenhardt* 1988). *Berrone and Gomez-Meija* (2009) demonstrate how institutional theory broadens the horizon of agency theory at often criticized boundaries and identify that efficiency may induce legitimacy. In a similar manner, our study integrated the perspectives and demonstrated how institutional and agency theory add to each other in a bidirectional manner to explain heterogeneous organizational behavior. This complementarity is caused by the different underlying objectives and assumptions between the self-interested, risk-averse behavior of principals and agents aiming towards efficiency and conforming behavior and the coercive, normative and mimetic pressures aiming towards the legitimacy of an organization, dyads or supply chains.

As key result, we propose that the nature of interorganizational sustainability lies between efficiency and legitimacy objectives. This finding is also displayed by the tripartite concept of balanced economic, environmental and social targets (*Carter and Rogers* 2008; *Dyllick and Hockerts* 2002; *Elkington* 1997). Thereby, companies face underlying trade-offs in addressing these different targets (*Hahn et al.* 2010). Our study illustrates that the conferment of intraorganizational sustainability management to an interorganizational level seems to be determined by efficiency objectives rather than legitimacy objectives. Our empirical findings indicate determinants that are linked to the trade-offs that organizations need to consider when conferring sustainability. Hereto, this paper contributes to the literature by providing theoretical anchors that are relevant to explaining diverging organizational behavior with respect to sustainability and gives leeway for the further derivation of managerial advice and sustainability research.

B.9.2 Limitations and Future Research

The limitations of our study provide opportunities for future research. First, the sample selection may have influenced our results. While we did not focus on one industry sector of shipping companies in order to have a cross-sectional database, we only selected large-sized companies from two countries, namely Switzerland and Germany. We assumed that larger companies would provide richer information on interorganizational sustainability issues. Therewith, future research could also investigate smaller shipping companies and vary the geographical origin of organizations. Beyond this, it would be an interesting but challenging task to take more than one logistics service provider of a shipping company into account. Second, our findings outline the relevance of research on the impact of governance structures and partner selection criteria on the intraorganizational sustainability management of suppliers and the role of trade-offs when implementing a sustainability strategy. Our case sample did not provide a case with a high level of conferred sustainability and a low level of

LSP sustainability management, which might be observed by future research into the effects of interorganizational incentive mechanisms on supplier sustainability management. Finally, as inductive research is limited in its generalizability, future research could test the theoretical constructs on a large-scale quantitative basis.

B.9.3 Managerial Implications

The derived propositions and framework on determinants for interorganizational sustainability management may help practitioners to understand influencing factors to consider for adequate contract and incentive design regarding sustainability issues. First, our framework points out the major role of governmental regulations and barriers in the sophistication of intraorganizational and interorganizational sustainability. Hence, market barriers, in our case transport policies, need to be contemplated in terms of their role in fostering and enabling the sustainable development of organizations. Second, the concreteness of customer demands plays a decisive role in enhancing the relevance of logistics services for interorganizational sustainability management. Therefore, customers of focal organizations should consider the inclusion of sustainable logistics into their general enquiries for sustainable engagement. Third, we identify that corporate sustainability structures and actions demand stronger diffusion among operational units and subsidiaries in order to develop comprehensive interorganizational sustainability management. Hence, executives and sustainability managers should consider how corporate sustainability strategies and activities may be operationalized across business functions and units. Fourth, managers may wish to revisit how interorganizational sustainability management can be implemented within long-term trustful relationships through collaborative actions or incentive mechanisms. Therefore, managers may consider that trust has developed by routines and standardized processes regarding traditional logistics services, whereas sustainable behavior presents itself as a new routine that demands specific acknowledgement and the development of trust in the first instance. Finally, we elucidate the necessity to cope with the characteristics of sustainable behavior. Thereto, interorganizational sustainability management demands measures and standards to define sustainable behavior and to assess financial outcomes in order to adequately solve goal conflicts.

C **Designing Interorganizational Incentive Mechanisms for Sustainable Logistics Services: An Agency-Theoretic Analysis of Influential Factors**

Nicole Kudla*

*Chair of Logistics Management, University of St.Gallen

C.1 Abstract

This study analyzes interorganizational incentives for sustainable logistics services from an agency theoretic viewpoint. Based on four case studies of shipper-logistics service provider dyads, we find sustainable logistics performance criteria and corresponding incentive mechanisms. Furthermore, we validate agency theoretic propositions on incentive design regarding the influence of behavior measurability, goal conflict and outcome uncertainty for sustainability issues and discuss theoretically expected ambiguities. We identify how characteristics of sustainable logistics services lead to partner selection as the most adequate incentive. Further incentives, such as bonus payment or extended cooperation, contract duration and content, are scarcely planned and correspond to high goal conflict and low outcome uncertainty. Our findings contribute to sustainability supply chain management as well as agency theory research and provide relevant insights to practitioners implementing interorganizational sustainability management.

Keywords: Agency Theory; Incentives; Logistics; Supply Chain; Sustainability

C.2 Introduction

Nowadays, organizations face rethinking regarding the role of sustainability in business practices (*Hart 1997; Scherer and Palazzo 2011*). Concurrent to the significance of global value creation networks and increasing outsourcing degrees, the demand of stakeholders for the reduction and avoidance of environmental and social impacts has increased noticeably. These demands have led to a convergence of sustainability and supply chain management concepts. Sustainable supply chain management (SSCM) thus seeks to integrate sustainability management and supplier evaluation, selection and development mechanisms (*Carter and Easton 2011; Gold et al. 2010; Pagell and Wu 2009; Seuring and Müller 2008b*). Nonetheless, researchers identify that focal companies still hesitate to integrate their suppliers (*Min and Galle 1997; Walton et al. 1998; Wolf and Seuring 2010*). One of the core issues is related to designing adequate interorganizational sustainability control and incentive mechanisms (*Seuring and Müller 2008a*). In line with this, *Reuter et al. (2010)*

point out the decisive role of purchasing departments and top management in ensuring supplier compliance with corporate sustainability agendas, but they also identify that "(...) knowledge as to how buying firms can design and structure such processes to assure sustainable supplier operations is limited" (p. 46). Thereto, our research seeks to help in the designing of incentive mechanisms such as supplier selection and development processes for sustainable logistics services.

Logistics services are a core outsourcing function of focal manufacturing organizations in supply chains (*Bask 2001; Logan 2000; Osman et al. 2003; Skjoett-Larsen 2000b*) that causes significant external, environmental and social effects (*Carter and Easton 2011; Carter and Jennings 2002; Lieb and Lieb 2010; Verhoef 1994*). Therewith, logistics is a function of major importance to the interorganizational sustainability efforts of sustainable purchasing departments (*Reuter et al. 2010*). Nonetheless, *Seuring (2008)* finds that SSCM research predominantly deals with manufacturing suppliers instead of service providers, which thereby underlines the relevancy of our research.

According to a recent organizational theoretic literature review of *Sarkis, Zhu and Lai (2011)*, agency theory belongs to a set of rather seldom applied theoretical lenses that show promise in contributing to the investigation of interorganizational incentive and reward structures. Since agency theory centers the contractual relation of principals and agents and provides propositions on incentives to solve inherent information asymmetries and agency problems (*Clark and Wilson 1961; Eisenhardt 1989a; Kaplan and Henderson 2005*), we take up the suggestions of *Sarkis, Zhu and Lai (2011)* and *Ketchen and Hult (2007)* to use the natural fit of supply chain management and agency theory for our research.

"The basic agency problem is characterized in terms of structuring monitoring (...) systems so that they will induce self-interested, utility-maximizing, risk-and-effort-averse agents to act on behalf of principals (...) who want to increase the value and performance of their firms" (*Bloom and Milkovich 1998, p. 283*). This definition is based on traditional agency theoretic works (*Eisenhardt 1989a; Fama 1980; Jensen and Meckling 1976*) and summarizes the key characteristics determining incentive design: behavior measurability, goal conflict, implying the risk aversion of agents and the uncertainty of the outcome of targeted behavior. Within this research, we want to transfer the efficiency rationales of incentive design to the legitimacy-driven sustainability context (*Campbell 2007*) in order to evaluate applicability. We aim to provide an understanding of the specifics of sustainable logistics services by following the call of *Kaplan and Henderson (2005)* to identify "what should be rewarded" in order to design "what should be done". Hence, our research questions are twofold:

-
- (1) What sustainable logistics performance criteria are relevant as targets for interorganizational incentives?
 - (2) How can interorganizational incentives for sustainable logistics services be designed regarding the characteristics of behavior measurability, goal conflict and outcome uncertainty?

The contribution of our research lies in providing a more detailed understanding of interorganizational incentives for sustainability from an agency theoretic perspective. Thereby, we provide insights into sustainable logistics performance criteria, as well as into its characteristics of behavior measurability, goal conflict and outcome uncertainty. In our analysis, we examine the incentive design intentions of four large focal companies from sustainability-sensitive industries, namely food, packaging, chemical and construction industries. The incentive design intentions are a result of assessments by nominal groups of experts from focal organizations and their LSPs.

The remainder of this paper contemplates the extant literature on sustainability incentives, as well as the theoretical background on agency theoretic assumptions, building a research framework. We then introduce the applied methodological steps from case selection to data analysis before we present our findings on sustainable logistics performance criteria and corresponding incentive mechanisms. Finally, we discuss our results and derive recommendations by drawing on our agency theoretic background.

C.3 Literature Review

In SSCM literature, the triple bottom line concept of sustainability, encompassing the economic, environmental and social performance of organizations (*Carter and Rogers 2008; Elkington 1997; Pagell and Wu 2009*), is transferred to the interorganizational supply chain perspective by means of traditional supplier management elements: supplier evaluation, selection and development (*Ellram 1990; Green et al. 1996; Maignan et al. 2002; Reuter et al. 2010; Zsidisin and Ellram 2001*). Throughout this paper, we refer to these supplier management elements as interorganizational incentives, since they actuate suppliers to behave as required by the buying company (*Baden et al. 2009; Delmas and Montiel 2009; Koplin et al. 2007; Roiger 2007*).

Contemplating the state of the research on sustainability incentives, an imbalance between the dimensions of sustainability with respect to environmental issues can be noticed (*Carter and Easton 2011; Gold et al. 2010; Kudla and Stölzle 2011; Seuring and Müller 2008b*). Environmental performance criteria and their applicability to supplier evaluation and selection have received vast attention in the past decade (e.g. *Darnall et al. 2008; Handfield et al. 2005; Handfield et al. 2002; Hervani et al. 2005; Humphreys et al. 2003; Kolk and*

Mauser 2002; Min and Galle 1997; Noci 1997; Noci 2000; Sarkis 2003; Schaefer 2007; Walton et al. 1998; Zendehdel et al. 2008; Zhu et al. 2008). Thereto, *Humphreys et al. (2003)* illustrated a comprehensive framework of qualitative and quantitative environmental performance measures, ranging from superordinate managerial competencies and green reputation aspects to product design and the control and monitoring of environmental effects, as well as improvement measures such as applied technologies, programs and use of environmentally friendly materials. As a solution to the selection issue, they suggest an analytic hierarchy process (AHP) as the most suitable method. *Handfield et al. (2002)* applied the AHP model within three piloting studies on environmental performance and allowed a Delphi group to assess the relevancy and availability of common environmental indicators. They identify the most relevant and easily assessed indicators but outline that there is still a gap in the measurability as well as on the economic and environmental effects of supplier evaluation and selection.

In contrast, social performance indicators, as well as comprehensive approaches integrating economic, environmental and social impacts, receive far less attention within the debates (*Jiang 2009; Keeble et al. 2003; Labuschagne et al. 2005; Pullman et al. 2009*). *Hutchins and Sutherland (2008)* base their notable definition of social indicators on the framework of the United Nations Division of Sustainable Development and derived four categories: labor equity, healthcare, safety and philanthropy. An integrated perspective of all three sustainability dimensions in supplier evaluation and selection is contemplated in a recent article by *Bai and Sarkis (2010)*. The authors introduce a conceptual example for sustainable partner selection but highlight that practical applicability may be limited by measurability and information issues. Above these supplier selection issues, incentive research traditionally also takes the opportunistic behavior of supply chain partners into account. Thereto, *Pedersen and Andersen (2006)* contemplate agency problems in supply chains regarding code of conduct management and suggest that the design of codes of conduct and incentive mechanisms demand a deeper understanding of supplier abilities in order to adopt the necessary practices.

Considering sustainable logistics services, comprising transport, handling, warehousing and value-added services (*Gunasekaran and Kobu 2007; Razzaque and Sheng 1997*), we again identify a strong focus on environmental issues in literature (e.g. *Abukhader and Jönson 2004; Goldsby and Stank 2000; Lieb and Lieb 2010; Murphy and Poist 2000a; Murphy and Poist 2003; Murphy et al. 1995; Murphy et al. 1996; Wolf and Seuring 2010*), whereas the social dimension is rather underrepresented (*Carter and Jennings 2002*). Beyond this, incentives for sustainable logistics services have thus far been investigated rather from an as-is perspective than a design perspective. *Wolf and Seuring (2010)* and *Lieb and Lieb (2010)* underline that in terms of sustainable supplier evaluation and selection, traditional

selection criteria such as "(...) cost, quality, lead time, features, aesthetics, reliability, trust-level, brand equity, service level, product variety offered, customization, additional services provided, etc. (...)" (*Wolf and Seuring* 2010, p. 95) still supersede environmental or sustainable criteria, due to measurability and comparability issues.

In conclusion, our brief literature review elucidates a gap in interorganizational incentive research for sustainable logistics services but provides starting points on sustainability performance measurement as well. Our research thus seeks to contribute to the further integration and application of all three sustainability dimensions. Furthermore, we aim to answer the question of how behavior measurability difficulties, outcome measurability certainties and goal incongruence of buyers and suppliers influence the design of incentives and, subsequently, sustainable logistics service provider evaluation, selection and development.

C.4 Theoretical Background and Research Framework

The agency perspective deepens our understanding of organization behavior in buyer-supplier or shipper-LSP relationships and provides a theoretical background on the factors influencing incentive design. Agency theory centers the contractual relationship of a principal company, who delegates a task to an agent who then executes that work (*Eisenhardt* 1989a). Due to the underlying efficiency rationale of agency theory, both principals and agents are assumed to be self-interested and risk averse. Beyond this, the principal is assumed to be unable to monitor agents' actions and behavior perfectly and free of charge (*Pratt and Zeckhauser* 1985). However, the principal can limit undesired behavior by the implementation of appropriate incentives and monitoring systems (*Jensen and Meckling* 1976).

According to agency theory, appropriate incentive design depends on distinct types of underlying information asymmetries and agency problems. The adverse selection problem occurs prior to contract and refers to information asymmetries of hidden characteristics and hidden information. The principal is not able or it is too costly to explore characteristics or to validate and understand the information provided by an agent. Moral hazard is related to information asymmetries of hidden actions and hidden information as well. Principals are worried about the invisible opportunistic behavior of agents or are again unable to validate and understand the information provided by an agent (*Alparslan* 2006; *Shapiro* 2005).

Adverse selection and moral hazard problems can be solved by adequate monitoring systems that allow for the evaluation and selection of proper agents, as well as further contract-based incentives to prevent inappropriate agent behavior (*Eisenhardt* 1988; *Eisenhardt* 1989a; *Fama* 1980; *Logan* 2000; *Picot et al.* 2005). In her assessment and

review, *Eisenhardt* (1989a) uses the phrase ‘contract design’ instead of ‘incentives’. Based on Ouchi's framework of organizational control mechanisms, she proposes contracts be designed as either behavior or outcome-based (*Ouchi* 1979). Against this background, she highlights two major influencing variables: behavior measurability and outcome measurability. High behavior measurability reveals the agent’s behavior easily and reflects a complete information case. Thereto, she suggests applying a behavior-based contract, which pays hourly or monthly wages or completing prices for mandated services. For cases of low task programmability and thus incomplete information, *Eisenhardt* (1985) proposes that the principal can either purchase "(...) surveillance mechanisms such as cost accounting measures, budgeting systems, or additional layers of management" (p. 136) or reward the agent based on financial outcomes surrogating behavior measures. Outcome-based contracts thus penalize or reward the agents by means of commission, bonus-malus agreements, stock ownership, etc. Beyond these influential factors, *Eisenhardt* (1989a) also adds the risk aversion of principals and agents as a further moderator of contract design. She assumes that "if there is no goal conflict the agent will behave as the principal would like, regardless of whether his or her behavior is monitored" (p. 61). In contrast, high goal conflict should be addressed by outcome-based contracts. As illustrated in Table C-1, agency theory hereby provides propositions for how task characteristics, such as behavior measurability, outcome uncertainty and goal conflict, influence incentive design. However, certain task characteristics may induce ambiguous propositions for incentive design, which shall be contemplated in this study

	Behavior Measurability	Goal Conflict	Outcome Uncertainty
Low	Outcome-Based	Behavior-Based	Outcome-Based
High	Behavior-Based	Outcome-Based	Behavior-Based

Table C - 1: Agency-Theoretic Propositions on the Influence of Task Characteristics on Incentive Design
(Adapted from *Eisenhardt* 1989a)

To conclude, incentives may be behavior-based or outcome-based. Behavior-based incentives evaluate behavior and allow for selection mechanisms prior to contract, whereas outcome-based incentives reward or penalize agent behavior within a contractual relationship (*Laffont and Martimort* 2002; *Lim* 2000; *Picot et al.* 2005; *Solomon and Lewis* 2002; *Stölzle* 1999). Thereby, incentives follow the following premises: (1) incentives are scarce by definition; (2) an organization’s incentive output must not exceed its available incentive resources; (3) the function of the organization is to obtain a net surplus of incentives; and (4) incentives are either tangible or intangible and, thus, material, solidary or purposive (*Clark and Wilson* 1961, pp. 132-134).

Transferring the agency theoretic background to interorganizational incentives for sustainable logistics services, we find a principal-agent dyad. Mandated logistics services and their sustainability in particular encompass actions that are not directly visible to the principal and, thus, may be subject to information asymmetries and traditional agency problems. Both problem types, namely adverse selection and moral hazard, have been identified in SSCM literature but have not been related to agency theory (*Bai and Sarkis 2010; Chatterji et al. 2009; Chatterji and Toffel 2010; Foerstl et al. 2010; Handfield et al. 2005; Handfield et al. 2002; Humphreys et al. 2003; Min and Galle 1997; Reuter et al. 2010; Walton et al. 1998; Wolf and Seuring 2010*). Despite the fact that an agency theoretic design of incentive mechanisms has been suggested by scholars, deeper investigations have not yet taken place (*Kogg 2003; Pedersen and Andersen 2006*). Thereto, we aim to investigate the specific characteristics of the sustainable behavior of logistics services according to the described influencing factors of behavior measurability, outcome uncertainty and goal conflict and their influence on incentive mechanisms. We hypothesize that certain sustainable behaviors of LSPs will lead to ambiguous theoretical propositions on behavior or outcome-based incentive design. Hence, we may provide new insights into how agency problems can be solved and how incentive mechanisms can be designed under certain conditions.

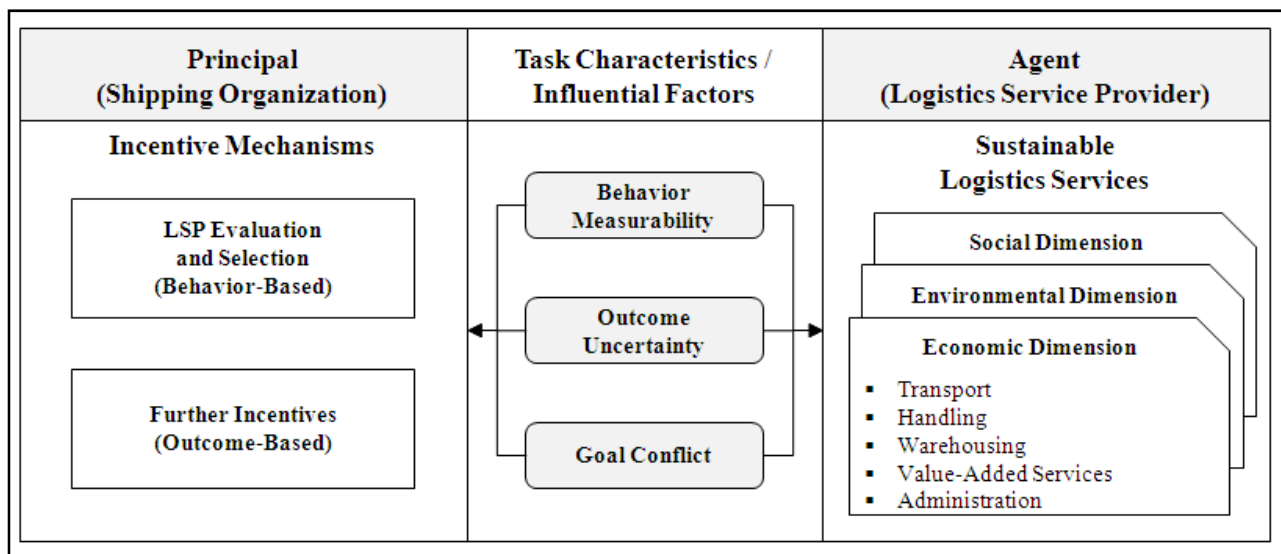


Figure C - 1: Research Framework

The research framework in Figure C-1 summarizes our literature review base and theoretical background. It maps the outlined contractual relation, the presumed influencing factors and the coherence of what should be rewarded, implying sustainable behavior as the incentive target, and what should be done as the resulting incentive mechanism. Therefore, sustainable behavior is determined regarding the dimensions of sustainability as well as traditional logistics functions. The incentive mechanisms, on the other hand, are split into the evaluation and selection of providers as a behavior-based contract form and further

outcome-based incentives that may occur within an existent contractual relation in order to develop the LSP's sustainable behavior.

C.5 Methodology

In order to ensure a rigorous inductive and thus explorative approach to the design of interorganizational incentives for sustainable logistics services, we apply multiple case studies. Thereto, we follow the case study investigation framework of *Cook and Campbell* (1979), which calls for internal validity, construct validity, external validity and reliability (*Eisenhardt* 1989b; *Eisenhardt and Graebner* 2007; *Gibbert et al.* 2008; *Yin* 2003). Our research framework provides the first step of an internally valid research design, embedding conceptual and theoretical literature. The case selection refers to the external validity. It elucidates the rationales of theoretical sampling and provides insights into selected case industries and characteristics. Construct validity is ensured by triangulated data collection, analysis and transcription into databases, which also underlines the reliability of our research design.

C.5.1 Case Selection

Multiple cases are proposed to provide a stronger base for theory building due to their rich insights into a sample, instead of a unique identified phenomenon in a single case. However, theoretical sampling of multiple cases is more complex due to the objective to present extreme cases that illustrate patterns and coherences of theoretical constructs (*Eisenhardt and Graebner* 2007).

According to our agency theoretic background, we selected principal-agent dyads of shipping companies and their LSPs to gain the best suitable insights on sustainability incentives. The shipping companies were selected according to their sensitivity towards sustainability and a particular interest in the development of incentive mechanisms. The industries of the four chosen shipping companies have been identified in literature as being sensitive to sustainable development, namely chemical (e.g. *Foerstl et al.* 2010; *Reiskin et al.* 1999; *Taplin et al.* 2006), food (e.g. *Andersen* 2002; *Maloni and Brown* 2006; *Mintcheva* 2005) construction (e.g. *Irland* 2007) and packaging (e.g. *Ciliberti et al.* 2008; *Halme* 1995; *Min and Galle* 1997). However, the selected shipping companies hold different starting points regarding their sophistication of sustainability management. Cases A and D present highly developed sustainability management structures. Case A even applies standardized environment, quality and safety questionnaires and assessments to their LSPs already. We selected these cases to gain information on incentive mechanism design from a higher

sustainability management sophistication perspective, in contrast to the lower maturities of sustainability management for cases B and C.

Since recent articles on sustainable logistics services identify a knowledge gap on the buyers' side to determine relevant and applicable sustainable behavior of logistics service providers (*Lieb and Lieb 2010; Wolf and Seuring 2010*), we asked the shipping companies to select one or more highly relevant or exemplary providers to extend expert knowledge on the design of sustainability incentives. All shipping companies selected one LSP with a focus on road transports, so our sample illustrated in Table C-2 encompasses four shipper-LSP dyads.

	Case A (Ship.)	Case B (Ship.)	Case C (Ship.)	Case D (Ship.)
Industry	Chemical	Food	Construction and connecting materials	Packaging
Revenue (2009)	> €50B	> €150M	>€5B	>€10B
Employees	>100.000	>300	>50.000	>20.000
	Case A (LSP)	Case B (LSP)	Case C (LSP)	Case D (LSP)
Revenue (2009)	>€50M	>€500M	>€10B	>€1B
Employees	>200	>3000	>50.000	>20.000

Table C - 2: Case Sample

C.5.2 Data Collection

The data collection followed our research questions on the definition of sustainable logistics services and the determination of interorganizational incentives for sustainable logistics services regarding the influential factors of behavior measurability, outcome uncertainty and goal conflict. Thereto, we used triangulated data from literature and single interviews, as well as nominal group interviews, to find a consensus on the assessment of influential factors and the assigned incentive mechanisms for each case (*Gibbert et al. 2008*).

As illustrated in Figure C-2, we firstly conducted semi-structured single interviews on the definition of sustainable logistics behavior and the definition of incentive mechanisms. According to these objectives, we selected interview partners who were responsible for sustainability, implying board members and/or sustainability managers, and interview partners from logistics departments, i.e. purchasers of logistics services from shipping companies and the key account managers of logistics service providers (cf. Table C-3). The first part of the semi-structured interview guidelines dealt with sustainable logistics services

and was developed on the basis of the economic, environmental and social performance indicators outlined in our literature review (e.g. *Carter and Jennings 2002; Gunasekaran and Kobu 2007; Humphreys et al. 2003; Hutchins and Sutherland 2008; Murphy and Poist 2002; Noci 1997*). Furthermore, we took the global reporting initiative standard and its extension for logistics and transportation companies into account (*GRI 2011*). We thereby developed a list of 68 sustainability performance criteria and questioned interviewees of both shipping companies and LSPs if the criteria were relevant as incentive targets and if further criteria needed to be considered. Within the second part of the interview guidelines, the interviewees were asked for possible incentive mechanisms for the sustainable behavior of LSPs.

1 st Round: Semi-structured Single Interviews	Preparation 2 nd Round based on 1 st Round Results	Preparation 2 nd Round by Experts	2 nd Round: Structured Nominal Group Interviews
Objectives: ▪ Exploration and definition of sustainable logistics performance criteria ▪ Exploration and definition of incentive mechanisms for sustainable logistics services	▪ Development of a structured questionnaire that encompasses: ▪ Sustainable logistics performance criteria ▪ Influential factors (behavior measurability; goal conflict; outcome uncertainty) ▪ Incentive mechanisms	▪ Assessment and preparation of the structured questionnaire by each expert prior nominal group interview	Objectives: ▪ Consensus per case on... ▪ ...the assessment of each sustainable logistics performance criterion ▪ ...intended incentive mechanisms for each performance indicator per case

Figure C - 2: Data Collection Process

Based on our findings from the first round of interviews, we developed a list of 45 sustainability performance criteria for logistics services, which included all criteria being identified as relevant by one or more of the interview partners. This list was prepared as a structured questionnaire with an extension by the theoretically derived influential factors of behavior measurability, goal conflict and outcome uncertainty. The participants were asked to assess the three influential factors on a three-point Likert scale (low, medium and high). The three-point Likert scale was chosen due to its generalizability and validity for a qualitative approach based on four case studies (*Jacoby and Matell 1971*). Behavior measurability, hereby, indicated the task programmability and controllability of the sustainable behavior by the shipping organization. Outcome uncertainty implied the level of insecure sustainable added value of a criterion. Hereby, the interviewees were asked to consider the overall economic, environmental and/or social outcome if the LSP fulfilled the requirement. Thereto, the participants needed to assess the height and certainty of added value by sustainable behavior since some tasks may "(...) require a long time to complete,

involve joint or team effort, or produce soft outcomes" (*Eisenhardt* 1989a, p. 62). The goal conflict implied the risk aversion of the logistics service provider regarding sustainable behavior. As stated before, a low goal conflict is related to a behavior in the interest of a logistics service provider, whereas a high goal conflict may occur if a certain task demands high investment on the LSP's side. Finally, the questionnaire asked the respondents to assign each criterion with a suitable incentive mechanism that resulted from the first interview round.

The design of incentive mechanisms for sustainable logistics services is a multivariate problem-solving and decision-making process for every organization. Therefore, efficient and adequate solutions demand a consensus from experts from different backgrounds and perspectives. Previous articles on green supplier evaluation and selection have also applied nominal groups of experts or the Delphi method (*Handfield et al.* 2002; *Lin and Juang* 2008). With regards to methods for group decision making, the extant literature distinguishes interactive groups, nominal groups and Delphi processes (*Delbecq et al.* 1975; *Häder* 2009). Due to the structured procedures, the use of both nominal groups and Delphi processes is suggested to be most efficient (*Van De Ven and Delbecq* 1974). However, a nominal group of experts is particularly appropriate for a consensus of a manageable size of experts that are able to participate in a joint meeting (*Okoli and Pawlowski* 2004; *Souder* 1977; *Van De Ven and Delbecq* 1974).

We adapted the nominal group meeting and interview structure from the steps outlined by *Van de Ven and Delbecq* (1974). First, we sent the previously described structured questionnaires to all nominal group members and asked them to assess the influential factors and preferred incentive mechanisms for each sustainable logistics performance indicator on their own. Second, we arranged a nominal group meeting with all the experts from each case. The 4-6 hour group interview followed the structured questionnaire as the basic stimulus for the group discussion (*Mayring* 2002). Each expert presented his or her assessment of a sustainability performance indicator in the first instance. Next, the nominal group was asked to find a consensus assessment. If the experts disagreed on an assessment, the shipper experts tipped the scale, since they are supposed to drive the incentives in the near future. Two researchers observed and transcribed the group discussions from a neutral and, if necessary, facilitating perspective (*Atteslander* 2006). As a result, we derived case specific lists of sustainability performance criteria with an evaluation of influential factors and assigned incentive mechanisms.

Interviewees / Experts	Case A (Ship.)	Case B (Ship.)	Case C (Ship.)	Case D (Ship.)
CEO / Board Member				x
Sustainability Manager	x		x	
Director / Manager of Logistics and Production (Purchaser of Logistics Services)	x (2)	x	x (2)	x (2)
Interviewees / Experts	Case A (LSP)	Case B (LSP)	Case C (LSP)	Case D (LSP)
CEO / Board Member	x	x		x
Sustainability Manager	x		x	
Key Account Manager of LSPs	x	x	x	x

Table C - 3: Interviewees / Experts of the Case Sample

C.5.3 Data Analysis

In order to conduct a comparative analysis of our cases and theoretical constructs (*George and Bennett 2004*), we developed a comprehensive database structured according to the objectives of the interview rounds. Thereto, a unitized transcription and documentation process was conducted by one researcher and monitored and corrected by a further researcher.

The first interview round was based on semi-structured audio-taped interviews. These interviews were transcribed into summarizing protocols, presenting the relevant sustainability performance criteria and incentive mechanisms for each interviewee (*Kvale 2007; Mayring 2002*). In a concluding step, we cross-checked the summarizing protocols with the interviewees to prevent misunderstandings and transferred the results to our database. We then developed a structured questionnaire based on all the interview results as a basis for the second interview round. The results from the second interview round (the assessment of sustainable logistics performance criteria and the allocation of incentive mechanisms) were again transcribed into summarizing protocols of the group interviews. These were sent to the experts of each group for validation and were then transferred to our database as well.

The analysis of the database is conducted in three phases and will be presented in the results section. First, we collate our findings from the first interview round on relevant sustainability performance criteria for logistics services. The list, which serves as a basis for the nominal group interviews, is analyzed to identify internal and cross-case specifics. We hereby identify significant differences regarding the amount and the content of the selected

performance criteria of each case. The second step of data analysis deals with the three influential factors. Due to the assessment of the factors on a three-point Likert scale, we theoretically derive 27 different compositions of influential factors. In order to analyze these characteristics of sustainable logistics behavior, we assign the corresponding performance criteria to each composition. We then conduct a comparative quantitative analysis in order to identify patterns across cases. Finally, we analyze the incentive mechanisms selected for each composition and/or performance criterion and derive recommendations for incentive mechanisms for extreme compositions of influential factors. Therewith, we draw on our agency theoretic background and evaluate the characteristics of sustainable behavior as preconditions to corresponding incentive types.

C.6 Results

C.6.1 Findings on Sustainable Logistics Performance Criteria

The first interview round lead to a list of 45 sustainable logistics performance criteria that were identified as relevant by one or more of the interviewees of the case sample. The list in Table C-4 comprises comprehensive sustainability management criteria, as well as economic, environmental and social criteria, which are subdivided by their focus on transport or other logistics functions (such as warehousing, handling, value-added services and administration). According to our case sample, which focused on road transports primarily, the majority of the sustainable logistics performance criteria deal with road transport services indicated by the subdivisions in the list. By performing a cross-case comparison, we identify 17 performance criteria that are relevant within all cases. Five of these criteria are related to the corporate sustainability management tasks of the logistics service providers. Beyond this, we identify significant differences among the dimensions of sustainability. The economic dimension contains six criteria, whereas the environmental and social dimensions include 20 and 12 criteria, respectively. This imbalance may be explained by the understanding of sustainability of the focal companies and their LSPs.

Economic actions are understood as a core competence that should not be subject to incentives for sustainable behavior. Therewith, economic criteria refer to technology applications and quality management tasks, which are desirable from a shipper's point of view. The environmental dimension presents a more heterogeneous picture, since the criteria range from transport-specific environmentally friendly technologies to comprehensive corporate environmental actions regarding energy and water consumption, as well as waste reduction and recycling programs. The social dimension includes workplace safety issues and improvements to working conditions at the LSP's sites.

Logistics Function	Sustainability Dimension	Relevance per case			
	Comprehensive Sustainability Management	A	B	C	D
	1. Sustainability organization / Sustainability officer	x	x	x	x
	2. Sustainability report following GRI standards	x	x	x	x
	3. Sustainability brochures or other documentation	x	x	x	x
	4. Negative reputation or media on sustainability concerns	x	x	x	x
	5. Code of conduct for subcontractors regarding to sustainability	x	x	x	x
	Economic Dimension				
Transport	6. Measures and actions for dispatching, tour and route optimization	x	x	-	x
	7. Application of tracking & tracing systems	x	x	x	x
	8. Electronic data exchange	x	x	x	-
	9. Gathering and provision of quality KPIs (punctuality, delivery times, damage events, utilization, etc.)	x	-	x	x
Other*	10.Certification according to ISO 9001 or quality management system	x	x	x	x
	11.Certification according to common industry standards (e.g. SQAS and BRC)	x	x	x	x
	Environmental Dimension				
Transport	12.Fleet modernization according to highest emission standard	x	x	x	x
	13.Alternative engines (e.g. EEV, Hybrid and LPG)	x	x	x	x
	14.Alternative fuels or additives (e.g. Biodiesel and AdBlue)	-	-	-	x
	15.Aerodynamic and roll resistance tuning of fleet	x	x	-	x
	16.Analysis of fuel consumption and optimization measures	x	x	x	x
	17.Actions for environmental friendly driving beyond governmental regulation (e.g. trainings, bonus systems and driving assistance)	x	x	x	x
	18.Offer of intermodal transports / modal shift	x	-	-	-
	19.CO ₂ -emissions per transport transparency	x	-	-	x
Other*	20.Alternative engines or power supplies for material handling equipment	-	-	x	x
	21.Certification according to ISO 14001 or adequate environmental management system	x	x	x	x
	22.Corporate carbon footprint	-	x	x	-
	23.Compensation/Offsetting program for carbon footprint	-	-	-	x
	24.Comprehensive reusable packaging management	-	x	-	-
	25.Consideration of land consumption and environmental protection for new building constructions	x	-	-	-
	26.Programs to reduce energy consumption	-	-	x	x
	27.Alternative energy supplies (e.g. photovoltaics)	-	-	x	x
	28.Programs to reduce or reprocess consumed water	-	-	x	x
	29.Programs to reduce or recycle waste	-	-	x	x
	30.Employee training regarding to environmental responsibility	x	-	x	x
	31.Engagement within local, national or international environmental programs or actions	x	-	x	x
	32.Environmental regulations for business travel	-	-	x	x

* ‘Other’ refers to warehousing, handling, value-added services or administrative actions

* 'Other' refers to warehousing, handling, value-added services or administrative actions

(Table continued on next page)

Logistics Function	Sustainability Dimension	Relevance per Case			
		A	B	C	D
	Social Dimension				
Transport	33. Safety equipment of fleet beyond governmental regulations	x	-	x	x
	34. Ergonomic or healthy equipment of fleet beyond governmental regulations	x	-	-	x
	35. Language classification of drivers (in order to ensure understanding of safety guidelines)	x	x	x	x
	36. Application of noise protective technologies in transport	x	-	-	-
Other*	37. Care and reintegration program for employees after work accidents	x	x	x	x
	38. Programs or actions for employee satisfaction improvement	x	x	x	x
	39. Safety trainings beyond governmental regulations	-	-	x	x
	40. Accredited company offering apprenticeships	x	x	x	x
	41. Further education programs for employees	-	x	x	-
	42. Programs to align family and employment	-	-	x	x
	43. Programs to integrate disabled employees	-	-	x	x
	44. Programs or actions for employee health	x	-	x	x
	45. Engagement within local, national or international social programs or actions	x	-	x	x
Sum of relevant sustainable logistics performance criteria		31	23	35	38
* ‘Other’ refers to warehousing, handling, value-added services or administrative actions					

Table C - 4: List of Sustainable Logistics Performance Criteria

In conclusion, we discover that the sustainable behavior of LSPs comprises significantly different numbers of performance criteria. Whereas cases A, C and D assigned between 31 and 38 criteria as relevant, case B stated 23. In line with our findings on the 17 overall relevant criteria, we outline a high case specificity of sustainable behavior in logistics. The differences may be explained by distinct sustainability understandings and strategies at the interviewed organizations. These standpoints are described by the continuum of sustainability strategies, ranging from reactive to proactive strategy types. Whereas reactive strategies are based on compliance to governmental regulations and concrete stakeholder demands, proactive strategies imply first-movers in the sustainability arena that go beyond traditional purely economic objectives (*Aragon-Correa 1998; Aragon-Correa and Sharma 2003; Hunt and Auster 1990; Kolk and Mauser 2002; Walton et al. 1998*). Comparing these strategy types with our findings and the presumed sustainability strategies of the sample, the high number of relevant performance criteria identified by cases A and D seem to be in line with their rather proactive sustainability strategies. Thereto, the low number of relevant criteria indicated by case B also seems to be in line with the lower sophistication of the shipper's sustainability management. In contrast, case C also stated a large number of relevant sustainability criteria, despite a lower sophistication of the shipper's sustainability management. Therewith, the shipper in case C seems to be in a strongly developing phase regarding its sustainability strategy.

C.6.2 Assessment of Sustainable Logistics Performance Criteria Regarding Influential Factors

In the second interview round, the nominal groups assessed the relevant performance criteria of each case regarding their behavior measurability, inherent goal conflicts between the shipping companies and their LSP and the outcome uncertainty of the sustainable behavior of the shipper on a three-point Likert scale, giving a low, medium or high classification. The three agency theoretic characteristics and the three-point Likert scale induce 27 distinct compositions. Table C-5 presents the assessed performance criteria to provide deeper understanding of the characteristics of sustainable logistics services.

Behav. Measur.	Goal Conflict	Outcome Uncert.	Case A	Case B	Case C	Case D
Low	Low	High	35	-	26; 29	26; 29; 38
Low	Low	Medium	-	-	-	-
Low	Low	Low	25	-	-	-
Low	Medium	High	-	-	28; 32; 37	28; 32
Low	Medium	Medium	-	-	-	-
Low	Medium	Low	-	-	-	-
Low	High	High	18	4	22	19; 23
Low	High	Medium	-	-	-	-
Low	High	Low	-	-	-	-
Medium	Low	High	38	6; 10; 41	16; 35; 40; 41	40
Medium	Low	Medium	3; 37; 44	3; 11; 31	3; 8; 38	3
Medium	Low	Low	16; 34	14	-	6; 16
Medium	Medium	High	-	-	20; 30; 31; 33; 39; 35; 42; 43; 44; 45	7; 20; 27; 30; 31; 37; 39; 42; 43; 44; 45
Medium	Medium	Medium	30; 33; 45	5; 37	5; 27	5
Medium	Medium	Low	12; 15; 17; 31	15; 17	12; 17	12; 15; 17
Medium	High	High	.-	22	-	-
Medium	High	Medium	-	-	-	-
Medium	High	Low	-	-	4	4
High	Low	High	9; 10; 11	11; 13; 35	11	10; 11; 35
High	Low	Medium	6; 7; 8; 40	8; 40	9; 13	-
High	Low	Low	5	-	-	-
High	Medium	High	-	1; 7; 21	1	9; 21; 33; 34
High	Medium	Medium	1	24	21	1
High	Medium	Low	19	-	10	-
High	High	High	21	-	-	-
High	High	Medium	2; 36	2	2; 7	2; 13; 14
High	High	Low	4; 13	-	-	-

Table C - 5: Assessment of Sustainable Logistics Performance Criteria Regarding Influential Factors

In Table C-6, we summarize the assessments quantitatively and conduct a cross-case comparison for the assessed sustainability performance criteria of each case.

	Behavior Measurability				Goal Conflict				Outcome Uncertainty			
	A	B	C	D	A	B	C	D	A	B	C	D
High (%)	48.4	42.5	61.1	29.0	19.4	13.0	11.1	15.8	22.6	47.8	61.1	68.4
Medium (%)	41.9	52.2	22.2	52.6	29.0	34.8	55.6	57.9	41.9	39.1	27.8	15.8
Low (%)	9.7	4.4	16.7	18.4	51.6	52.2	33.3	26.3	34.5	13.0	11.1	15.8

100% of sustainable logistics performance criteria of each case, deviations from 100% are attributed to rounding

Table C - 6: Ratios of Sustainable Logistics Performance Criteria Assigned to Influential Factor Levels

The overall sustainable behavior of LSPs is characterized by medium to high behavior measurability. On average, 45% and 42% of the criteria were classified by high and medium behavior measurability, respectively. The high and medium classification of measurability stands in contrast to previous findings that measurability difficulties are a core issue for sustainability management in supply chains (*Carter and Easton 2011; Seuring and Müller 2008a*). We explain this finding by the knowledge increase of our case sample throughout our study, which lead to a decrease in measurability difficulties as a perceived obstacle.

The second influential factor, goal conflict between shippers and LSPs, is characterized as low or medium for an average of 85% of the sustainability performance criteria. A low goal conflict indicates that a certain behavior is in the interest of the logistics service provider and demands no or minor effort on behalf of the shipping company to control or actuate the behavior. Therewith, this finding raises the issue of the relevance of interorganizational incentives if goal conflicts are perceived as low. However, it stands out that 44.3% on average are classified by medium goal conflict. The large amount elucidates a certain indecisiveness of the experts of all cases. They stated that low goal conflict does not imply that the LSP is actually already active within the desired field.

The third finding of our cross-case comparison underlines a further severe issue regarding sustainable behavior in principal-agent dyads and supply chains: outcome uncertainty is perceived predominantly as high or medium, with amounts of 50% and 31% on average. This finding underlines the debates in sustainability literature on the business case for sustainability (*Carroll and Shabana 2010; Dyllick and Hockerts 2002*). Although researchers have identified a link between high sustainability performance and high

financial performance (*Berrone and Gomez-Mejia 2009; McGuire et al. 1988*), the financial outcome may occur in the long term and has thus far rarely been investigated on a supply chain level (*Carter 2005*). Thus, the nominal groups perceived the sustainable outcome as uncertain for the shipping company, which may lead to challenges for interorganizational incentive design.

C.6.3 Assessment of Incentive Mechanisms Regarding Influential Factors

In a final step, the nominal groups assigned each sustainable logistics performance criterion to an intended incentive mechanism. These incentives are derived from the first interview round and are presented in Table C-7. The interviewees stated two behavior-based incentives: partner selection according to the overall sustainability performance of an LSP and an annual assessment of the sustainability performance. Hereby, the shipping companies use contract awards and future contract awards as incentives. Furthermore, the experts named two further outcome-based alternatives applicable within the contractual relationship. First, they named extended cooperation, relationship duration or content in order to develop certain sustainable behaviors in the LSP. Second, higher prices or adequate bonus payments were stated as incentives used in order to actuate certain sustainable practices.

a)	Behavior-Based: Partner Selection (Prior to Contract; Incentive: Contract Award)
b)	Behavior-Based: Annual Assessment (Within Contractual Relation; Incentive: Future Contract Award)
c)	Outcome-Based: Extended Cooperation/Contract Duration/Contract Content (e.g. Transport Volume)
d)	Outcome-Based: Higher Prices/Bonus Payments

Table C - 7: Intended Types of Interorganizational Incentives for Sustainable Logistics Services

Table C-8 presents the assignment of incentive types to the compositions of investigated influential factors.

Case A intends to apply partner selection as a behavior-based incentive to all sustainable logistics performance criteria. Furthermore, the shipper plans to actuate LSPs to use alternative engines within their fleets by offering higher transport volumes or extended relationship durations. The usage of alternative engines is characterized by high measurability, goal conflict and outcome certainty. Due to these specifics, this criterion is the only one in the list providing a valuable target for outcome-based incentives from the shipper's point of view. Higher prices or bonus payments do not belong to the types of incentives preferred by the shipping organizations. However, case A stated that a monetary incentive is conceivable for LSPs that are leaders in sustainability.

Behav. Measur.	Goal Conflict	Outcome Uncert.	Case A	Case B	Case C	Case D
Low	Low	High	a	-	a	a
Low	Low	Low	a	-	-	-
Low	Medium	High	-	-	a	a
Low	High	High	a	-	a	a; (c)
Medium	Low	High	a	a; b	a	a
Medium	Low	Medium	a	a; b	a	a
Medium	Low	Low	a	a; b	-	a
Medium	Medium	High	-	-	a	a
Medium	Medium	Medium	a	a; b	a	a
Medium	Medium	Low	a	a; b	a; b	a
Medium	High	High	.-	a; b	-	-
Medium	High	Low	-	-	a; b	a
High	Low	High	a	a; b	a	a
High	Low	Medium	a	a; b	a	-
High	Low	Low	a	-	-	-
High	Medium	High	-	a; b	a	a
High	Medium	Medium	a	-	a	a
High	Medium	Low	-	-	a; b	-
High	High	High	a	-	-	-
High	High	Medium	a	a; b	a	a; (c)
High	High	Low	a; (c)	-	-	-
			(c); (d): in case of sustainability performance leadership			

Table C - 8: Assesment of Intended Types of Interorganizational Incentives Regarding Influential Factors

Case B intends to use behavior-based partner selection as well. Moreover, the shipping company plans to assess the sustainability performance of their LSPs annually in order to develop their logistics partner. In case of deficient development and non-sustainable performance, the award of the future contract may be at stake.

The incentive mechanisms intended by case C are in line with case B, but they only contemplate criteria with low outcome uncertainty for annual assessment and situative development.

Similarly to case A, case D aims to actuate sustainable logistics by means of partner selection according to the identified criteria. Beyond this, two criteria are planned as targets for further incentives within contractual relationships. First, case D aims to support alternative engine fleets at their LSP by means of extended relationships. Second, case D selected CO₂ emission transparency as an incentive target. Due to the lack of standardized CO₂ emission reporting for transports, the nominal group assessed the measurability as low. Furthermore, the group assigned the financial and environmental outcome by reporting itself as low, but they perceive the criterion as a valuable regularly assessable indicator for sustainable development. However, the development of CO₂ reporting is linked to high and uncertain investments by the LSP. These are related to high goal conflicts, so the shipper plans to cooperate with one or more selected LSPs over an extended relationship duration to develop a standardized method for CO₂ emission reporting.

C.7 Incentive Mechanisms for Sustainable Logistics Services

Our case study results give a picture of perceived rewardable sustainable behavior by 45 identified performance criteria for logistics services. Seventeen of these performance criteria were selected as relevant by all four cases. This finding outlines a high specification of sustainability performance criteria for logistics services, which may be related to the distinct sustainability strategies of shipping companies and reflects distinct desirable service specifics. The assessment of performance criteria regarding the agency theoretic influential factors of behavior measurability, goal conflict and outcome uncertainty presents characteristics of sustainable logistics services. Most frequently the of performance criteria were assigned medium to high behavior measurability, low to medium goal conflict and high to medium outcome uncertainty. The large amounts of medium assessments elucidate the early state of interorganizational incentive design. Organizations seem uncertain and indecisive regarding the characterization of sustainable behavior. Furthermore, our findings point out core issues for interorganizational sustainability management. While it is often stated that measurability difficulties present themselves as rather solvable issues (*Carter and Easton 2011; Seuring and Müller 2008a; Seuring and Müller 2008b*), perceived low goal conflict and high outcome uncertainty seem to be larger challenges. Thereto, we investigated under what circumstances companies consider behavior and outcome-based incentives for sustainable logistics services. The cases of our sample intend to predominantly use behavior-based incentives by means of partner selection. Furthermore,

companies choose other behavior-based and outcome-based incentive mechanisms for sustainable behavior that possesses specific characteristics. Case B, for instance, considers performance criteria of low outcome uncertainty or high added value for an annual assessment and situative development. Cases A and D plan to actuate the usage of alternative engines and the reporting of CO₂ emissions for each transport by means of extended cooperation, relationship duration or content. Case A also plans a bonus or higher price if a LSP shows leadership in sustainable behavior in comparison to competitors contracted by the shipping organization.

Influential Factor Levels			Theoretically Proposed Incentive Type for Influential Factor Levels (Adapted from <i>Eisenhardt</i> 1989a)			Incentive Type Intended by Case			
Behav. Measur.	Goal Conflict	Outcome Uncert.	Behav. Measur.	Goal Conflict	Outcome Uncert.	A	B	C	D
Low	Low	High	O-B	B-B	B-B	B-B	-	B-B	B-B
Low	Low	Low	O-B	B-B	O-B	B-B	-	-	-
Low	High	High	O-B	O-B	B-B	B-B	-	B-B	B-B O-B
Low	High	Low	O-B	O-B	O-B	-	-	-	-
High	Low	High	B-B	B-B	B-B	B-B	B-B	B-B	B-B
High	Low	Low	B-B	B-B	O-B	B-B	-	-	-
High	High	High	B-B	O-B	B-B	B-B	-	-	-
High	High	Low	B-B	O-B	O-B	B-B O-B	-	-	-

Legend: B-B: Behavior-Based Incentive; O-B: Outcome-Based Incentive

Table C - 9: Contrast of Theoretically Proposed Incentives and Intended Incentives by Case

Within the following paragraphs, we aim to summarize and generalize our findings in order to derive recommendations for interorganizational incentive design for sustainable logistics services. Thereto, we draw on our agency theoretic background. First, we contemplate the theoretically proposed incentive designs for eight extreme cases of behavior measurability, goal conflict and outcome uncertainty. Hereby, we neglect the medium assessments for simplicity reasons. As illustrated by Table C-9, theoretically proposed incentive types are ambiguous for various compositions of influential factor levels. Hence, we aim to discuss ambiguous propositions and alternatives for incentive mechanisms. Second, we contrast the theoretical propositions with our empirical findings from the case sample. Thereby, we aim to provide a starting point for scholarly discussion on ambiguous incentive design suggestions, as well as managerial recommendations for the design of interorganizational incentive mechanisms for sustainable logistics services.

C.7.1 Incentives under Low Behavior Measurability, Low Goal Conflict and High Outcome Uncertainty

From an agency theoretic point of view, low behavior measurability and high outcome uncertainty leave the principal with "(...) no rational form of control" (*Ouchi* 1979, p. 844). This is underlined by the ambiguous propositions of *Eisenhardt* (1989) to apply outcome and/or behavior-based incentives. Thereto, *Ouchi* (1979) suggests that organizations should rely on ceremonial forms of control by means of careful partner selection and development of desired behaviors. *Shah and Swaminathan* (2008) complement this suggestion by their analysis of influential factors of task characteristics for partner selection. Thereby, they propose that low behavior and outcome measurability lead to trust as the most critical criterion for partner selection. This suggestion is in line with the underlying assumption of low goal conflict. If a behavior is characterized by low goal conflict, monitoring is not necessarily essential. Therewith, agency theory proposes either a behavior-based incentive design or trust as a substitute for control (*Bierly and Gallagher* 2007). The decision depends on the willingness of the principal to invest in monitoring systems (*Lassar and Kerr* 1996).

Within our case sample, we identified that cases A, B and D all apply behavior-based incentive design for performance criteria falling within this first composition of influential factors. The sustainable logistics performance criteria of this composition are mostly concerned with environmental or social activities at the headquarters of the LSPs. The criteria, for instance, refer to programs to reduce energy consumption or waste. The shippers intend to include these performance criteria within their assessment of LSPs prior to contract and apply partner selection as an incentive. Thereby, they aim to gain further information on the comprehensiveness of the LSPs' corporate sustainability management and aim to stimulate LSPs that have not yet implemented the desired sustainable activities.

We argue that performance criteria that are characterized by low behavior measurability, low goal conflict and high outcome uncertainty certainly do not have the highest priority among interorganizational incentive targets. However, according to the initial phase of incentive mechanism design within interorganizational sustainability management, we underscore the decision of participating companies to invest in monitoring systems that include performance criteria of this first composition of influential factors. Thereby, shipping organizations may get an impression of the actual spread and relevance of certain sustainable behavior. From a managerial point of view, initial testing may either lead to an exclusion of performance criteria in the future or the further development of behavior or outcome measures.

C.7.2 Incentives under Low Behavior Measurability, Low Goal Conflict and Low Outcome Uncertainty

When contemplating the proposed incentive types for low measurability and low outcome uncertainty, agency theorists suggest outcome-based incentive design. However, low goal conflict is related to behavior-based incentives. According to *Perrow* (1986), the assumption of bounded rationality and opportunism may be relaxed under certain circumstances. Consequently, an agent may act on behalf of the principal's interests without being actuated by behavior or outcome-based incentives. Therewith, agency theory gives ambiguous suggestions for adequate incentive design for this composition of influential factors.

Our empirical findings illustrate that shipper A intends to apply behavior-based incentive design. The shipper, thereby, aims to evaluate the LSP's land consumption and environmental protection programs for new building construction. These performance criteria are especially relevant for the chemical industry and are also included in governmental regulations. Therefore, the shipper is required to verify the sustainable behavior in accordance with legislative authority requirements. Behavior-based incentive design is thus chosen by the shipper for two major reasons. First, behavior-based incentives are less cost-intensive in contrast to outcome-based incentives in this context. Second, it is a legal requirement to ensure compliance with the selected performance criteria.

In conclusion, sustainable logistics performance criteria that are characterized by low outcome uncertainty are naturally of higher relevance to shipping companies. Nonetheless, low behavior measurability and low goal conflict narrow the overall priority and suitability of outcome-based incentives. We argue that shipping organizations that are willing to invest in monitoring systems should integrate criteria of these characteristics for explorative purposes at the initial stages of sustainability evaluation and selection schemes.

C.7.3 Incentives under Low Behavior Measurability, High Goal Conflict and High Outcome Uncertainty

As outlined for the first composition of influential factors, low behavior measurability and high outcome uncertainty lead to ambiguous agency theoretic propositions regarding incentive design. Both behavior and outcome-based incentive designs are feasible, but so is a non-rational form of control. In contrast to the first case, we are now facing high goal conflict. Thereto, agency theory indicates the need for outcome-based incentive design.

Within our sample, we identified sustainable logistics performance criteria of low behavior measurability, high goal conflict and high outcome certainty within cases A, C and D. All the cases intend to apply behavior-based incentives in the first line, whereas case D also plans to use outcome-based incentives for one criterion in particular. The criteria classified

under this third composition encompass CO₂ emission reporting for transports, corporate carbon footprints or CO₂ compensation programs. Due to a perceived lack of standards regarding CO₂ emission measurement and difficulties for shipping companies in validating and comparing the information of LSPs, these performance criteria were classified by low behavior measurability. Furthermore, the nominal groups assessed that solitary reporting does not yield any financial, environmental or social outcomes for the shipping companies. In addition, shipping organizations presume high goal conflict regarding these criteria due to the high investments and managerial efforts required to develop standardized CO₂ measurement at the LSP's sites. Case D, therefore, plans to actuate CO₂ emission reporting for transports by outcome-based incentives. The shipper aims to overcome the high goal conflict by an extended cooperation and contractual relation with the LSP. In this case, the shipper assumes that the value added by CO₂ reporting will change in the near future. As a first step, the shipping company has integrated CO₂ emission reduction in the personal evaluation scheme of its managers. Hence, purchasing managers of shipper D plan to develop appropriate CO₂ measuring standards for transports in cooperation with selected LSPs in order to align interests and prepare for higher measurability and outcome certainties.

Against the background of the empirical and theoretical findings, sustainable logistics performance criteria of low behavior measurability, high goal conflict and high outcome uncertainty present challenging incentive targets for shippers from an efficiency rationale point of view. Both low behavior measurability and the expected low value added lead to lower priority as an incentive target. Therefore, performance criteria falling into this third composition of influential factors may be considered as part of the partner evaluation and selection criteria at the initial stages of interorganizational sustainability management. However, if shippers expect that outcome uncertainties or behavior measurability difficulties may be subject to change or may be overcome by reasonable efforts, the high goal conflict is decisive for outcome-based incentive design. Under these circumstances, outcome-based incentives may be implemented in addition to partner evaluation and selection schemes to ensure compliance and development.

C.7.4 Incentives under Low Behavior Measurability, High Goal Conflict and Low Outcome Uncertainty

From an agency theoretic viewpoint, tasks that are characterized by low behavior measurability, high outcome certainty and goal conflict are mutually exclusive and are proposed to be actuated by outcome-based incentives (*Eisenhardt* 1989a).

Our empirical datasets did not include sustainable logistics performance criteria of this fourth characterization. However, we identified one performance criterion of medium

behavior measurability, high goal conflict and low outcome uncertainty: negative reputation and media regarding sustainability concerns. The shippers in cases C and D stated that if negative media publications on sustainability issues are observed regarding an LSP prior to contract, this will lead to direct disqualification of the LSP from the tendering process. This underlines the high relevance of sustainability to the shippers. In contrast to the agency theoretic proposition, both shippers intend to apply behavior-based incentive design. The choice is related to the specificity of the outlined performance criterion. Thus, outcome-based incentives are inadequate to deal with negative reputation issues.

As a conclusion, sustainable logistics performance criteria that are characterized by low behavior measurability, high goal conflict and high outcome certainty are naturally highly relevant within interorganizational sustainability management. Due to an expected high added value in combination with high goal conflict, outcome-based incentive design seems most suitable to align the behavior of LSPs. However, prior to supplier development, shippers may implement these criteria within evaluation and selection schemes. Based on our empirical findings, we suppose that in cases where the desired sustainable behavior may not be achieved by the LSP within an adequate time or by means of justifiable efforts of the shipper, behavior-based incentive design is suitable.

C.7.5 Incentives under High Behavior Measurability, Low Goal Conflict and High Outcome Uncertainty

With respect to high behavior measurability, low goal conflict and high outcome uncertainty, agency theory uniquely proposes behavior-based incentive design (*Eisenhardt 1985; Eisenhardt 1989a; Ouchi 1979*).

Therewith, our empirical findings are in line with agency theoretical suggestions. Cases A, B, C and D all apply behavior-based incentives. Our nominal group assessment of sustainable logistics performance criteria illustrates that quality targets especially are characterized by high behavior measurability, low goal conflict and low overall outcome certainty. The high behavior measurability is self-explanatory: the quality of services is measurable and easily observable by the principal. The reasons for the low classification of outcome certainty and goal conflict may be related to the understanding of sustainability by the companies. The nominal groups understood quality targets as self-evident performance criteria, since they refer to the core competences of LSPs. Therewith, shipping companies presume medium to low additional economic outcome and minor or no environmental or social effects. Due to the low goal conflict and high outcome uncertainty, they decided to rely on partner evaluation and selection.

From a managerial perspective, it seems contradictory to monitor behavior that is characterized by low goal conflict and high outcome uncertainty. Therefore, we suppose

that our findings elucidate the early initial phase of interorganizational incentive design. Organizations tend to start with a wide range of evaluation and selection criteria in order to gain comprehensive information on sustainable logistics services. Thereby, they validate their initial assessments made within our study and might exclude low goal conflict and high outcome uncertainty criteria in the long run.

C.7.6 Incentives under High Behavior Measurability, Low Goal Conflict and Low Outcome Uncertainty

In the case of high behavior measurability and low outcome uncertainty, agency theorists suggest that both behavior and outcome-based incentive mechanisms are suitable but that the low cost alternative will be chosen (*Ouchi 1979*). The choice is dependent on the trade-off between monitoring and failure costs. The low goal conflict would thus underline the choice of behavior-based incentive design.

Our findings in case A support our theoretical expectation. The sustainable logistics performance criterion that is characterized by this sixth composition of influential factors deals with the development and application of codes of conduct for sustainable logistics services of the subcontractors of LSPs. The shipper perceives the measurability and controllability of a code of conduct as easy and expects low goal conflict and outcome uncertainty. In order to evaluate whether LSPs apply a code of conduct to their subcontractors, the shipper intends to apply a sustainability performance assessment prior to contract.

Against this background, we argue that low outcome uncertainty is naturally related to the higher relevance of a performance criterion within evaluation and selection schemes. Due to the low goal conflict, behavior-based incentive design presents the most suitable and cost-efficient alternative in this instance.

C.7.7 Incentives under High Behavior Measurability, High Goal Conflict and High Outcome Uncertainty

Based on agency theoretic expectations, both behavior measurability and high outcome uncertainty suggests a behavior-based incentive is appropriate (*Eisenhardt 1985; Eisenhardt 1989a; Ouchi 1979*). In contrast, high goal conflict is traditionally related to outcome-based incentives in order to align agent behavior. Therewith, agency theory presents ambiguous suggestions but predominantly indicates the appropriateness of behavior-based incentive design.

Case A provides an example of this composition of influential factors. They assess the ISO 14001 certification of environmental management as easily measurable and controllable. Nonetheless, ISO 14001 allows for self-determined goals and improvement processes by the

LSP (*Gonzalez et al. 2008; Nawrocka et al. 2009*), which results in high outcome uncertainty presumed by the shipping organization. Moreover, the nominal group in case A came to the conclusion that LSPs hesitate to certify their environmental management due to high organizational and monitoring costs. Therefore, they stated that the criterion reflects a "nice to have" behavior actuated most adequately by a comprehensive evaluation of sustainability performance.

In line with this empirical finding, we suggest the consideration of performance criteria of high behavior measurability and high goal conflict to be included in evaluation and selection schemes. Furthermore, these criteria should be reflected in further LSP development, in case outcome uncertainty is subject to change within the near future.

C.7.8 Incentives under High Behavior Measurability, High Goal Conflict and Low Outcome Uncertainty

Finally, we contemplate the previous case but with low outcome uncertainty. Therewith, agency theory proposes outcome-based incentive design for both outcome certainty and goal conflicts, whereas high behavior measurability allows for behavior-based incentive design.

Case A intends to actuate the application of alternative engines within the LSP's fleet by means of extended cooperation, contract duration and higher transport volumes. Thereby, shipper A intends to overcome goal conflicts and the risk aversion of LSPs with respect to the high investments required for alternative engines. However, case A applies a behavior-based incentive in the first instance. The explanation of the twofold incentive application is related to agency costs (*Jensen and Meckling 1976*). Behavior-based incentives seem to be less cost-intensive compared to outcome-based incentives. Therefore, shippers prefer to apply behavior-based incentives prior to contract. If the shipper's evaluation of the LSP's sustainable behavior leads to a negative result regarding the desired criteria prior to contract, outcome-based incentives are applied within the contractual relation in order to develop the LSP.

Our findings thus support a combined approach, applying behavior-based as well as outcome-based incentives. Within the evaluation and selection schemes of shippers' performance criteria, this eighth composition of influential factors is of high relevance and thus demands high priority. Thereby, shippers actuate the desired sustainable behavior prior to contract as well as within a contractual relationship.

C.8 Discussion and Conclusion

C.8.1 Contributions

The purpose of this study was to identify rewardable sustainable logistics behavior and adequate interorganizational incentive design regarding the characteristics of sustainable behavior. The characteristics were given by our agency theoretical lens, namely behavior measurability, goal conflict and outcome uncertainty. Our findings contribute to sustainability supply chain management research, as well as to agency theoretic research on sustainability issues.

First, we identified a set of 45 sustainability performance criteria regarding logistics services. These criteria encompass the economic, environmental and social dimensions and provided a comprehensive basis for the evaluation of sustainable behavior in logistics. We observed high specificity of performance criteria among the four analyzed dyadic relationships and outlined how distinct sustainability strategies and service specifics determine behavior requirements. Moreover, we provided a set of 17 criteria, which have been relevant across our case sample.

Second, we evaluated sustainability performance criteria from an agency theoretic viewpoint. We demonstrated that the overall sustainable behavior of LSPs is characterized by medium to high behavior measurability, low to medium goal conflict and medium to high outcome uncertainty. Thereby, we elucidated core issues for interorganizational incentive design. If sustainable behavior is perceived as solely being a self-interest of LSPs and adds only low value for shipping organizations, shippers may tend to disregard interorganizational incentives for sustainable logistics. This finding underlines prior empirical studies that demonstrate the reluctant behavior of buyers of logistics services (*Lieb and Lieb 2010; Wolf and Seuring 2010*). Furthermore, it raises the question whether the sustainability strategies of focal companies are following efficiency rather than legitimacy rationales (*Oliver 1991*). Recent articles on institutional theories have shaped the term of decoupling in relation to the diffusion of corporate sustainability management objectives and its effective actions (*Boxenbaum and Jonsson 2008; Fiss and Zajac 2006*). Hereto, our study presents insights into why sustainability management may end at corporate borders due to predominant efficiency rationales.

Third, we contribute to incentive design from an agency theoretic viewpoint. Agency theory proposes certain types of incentive design in conjunction with behavior measurability and outcome uncertainty. Furthermore, it provides assumptions for incentive design under high and relaxed goal conflict on a solitary basis (*Eisenhardt 1989a; Ouchi 1979; Shapiro 2005*). Therewith, agency theory leads to ambiguous recommendations for incentive design for numerous compositions of behavior measurability, goal conflict and outcome uncertainty.

Our study presents a starting point for a theoretical discussion on ambiguous agency theoretic suggestions. Furthermore, it presents empirically derived recommendations and examples, as outlined in Figure C-3, of how organizations solve these ambiguities for sustainability concerns. We hereby elucidated that incentive design is predominantly driven by goal conflicts and low outcome uncertainty. If shippers expect high added value from a certain sustainable behavior, they are willing to overcome goal conflicts with their LSPs by using outcome-based incentives. These outcome-based incentives are of indirect monetary nature since they merge contractual partners by means of extended cooperation and contract duration (*Clark and Wilson 1961*). Direct monetary incentives, on the other hand, are sparsely applied, which underlines the strong efficiency rationales of shippers and the high cost pressure of the logistics industry, even regarding sustainability issues. Thereto, it is not astonishing that behavior-based incentives, implying careful partner evaluation and selection according to sustainability performance, are assumed to be less cost-intensive and are predominantly intended to be implemented by the shipping companies. Against this background, we identified that perceived high added value and high goal conflict determine the priority of sustainable logistics performance criteria within evaluation and selection schemes.

Prior to our study, we expected conflicts regarding an agency theoretical lens on sustainability issues due to the strong assumption of opportunistic principals and agents. We anticipated the discovery of at least one case where a principal organization, following a proactive sustainability strategy, designs incentives from an altruistic standpoint. As we have shown, this was not observed within our sample. In contrast, we validated traditional agency theoretic assumptions in large parts of our study on sustainability research. Nonetheless, we outline that interorganizational incentive design by means of agency theory is delimited by the restricted consideration of the principal-agent dyad (*Berrone and Gomez-Mejia 2009; Eisenhardt 1988; Gomez-Mejia et al. 2005*). *Shapiro (2005)* and *Worsham et al. (1997)* argue that agents normally serve many masters and need to balance diverse conflicts of interest. This is especially true for LSPs, which are active in multiple supply chains and institutional environments. This increases the verisimilitude that certain sustainable behavior will be required by other stakeholders as well, or even more so. Hence, we argue that shippers should contemplate the institutional environment of agents when designing interorganizational incentive mechanisms (*Tate et al. 2011*). Future research, thus, should integrate institutional and agency theoretical assumptions in order to reveal conflicting or congruent incentives and pressures by various distinct stakeholder groups.

Characteristics of Sustainable Behavior				Concluding Findings and Recommendations for Incentive Mechanisms Regarding Characteristics of Sustainable Behavior
	Behav. Measur.	Goal Conflict	Outcome Uncert.	
(1)	Low	Low	High	- High outcome uncertainties lead to a low relevance of sustainable logistics performance criteria as an incentive target for shippers. - At initial stages of interorganizational sustainability management, behavior-based incentives by means of evaluation and partner selection are seen as suitable by shippers to explore the sustainable behavior of an LSP. - Shippers intend to assign sustainable logistics performance criteria of these characteristics a lower priority than criteria with a low outcome uncertainty within the evaluation and selection scheme.
(3)	Low	High	High	
(5)	High	Low	High	
(7)	High	High	High	
(2)	Low	Low	Low	- Low outcome uncertainties lead to a high relevance of sustainable logistics performance criteria as an incentive target for shippers. - Due to low goal conflicts, behavior-based incentives are preferred against outcome-based incentives. - Shippers intend to assign sustainable logistics performance criteria of these characteristics a higher priority than criteria with a high outcome uncertainty within the evaluation and selection scheme.
(6)	High	Low	Low	
(4)	Low	High	Low	- Low outcome uncertainties lead to a high relevance of sustainable logistics performance criteria as an incentive target for shippers. - Due to high goal conflicts, outcome-based incentives are applied in combination with behavior-based incentives. - Shippers intend to assign sustainable logistics performance criteria of these characteristics a higher priority than criteria with low outcome uncertainty and low goal conflicts within the evaluation and selection scheme.
(8)	High	High	Low	

Figure C - 3: Concluding Findings and Recommendations on Incentive Mechanisms Regarding Characteristics of Sustainable Behavior

C.8.2 Limitations and Future Research

The limitations of our study provide opportunities for future research. First, our study is limited by the number of cases considered. Our objective was to provide rich and comprehensive insights into interorganizational incentive design for sustainable logistics. Hence, it lacks a large quantitative basis that would allow for a quantitative analysis of relevant sustainable logistics performance criteria, as well as testing of derived propositions and theoretical constructs. The second limitation concerns the solitary application of an agency theoretic lens. As outlined within our findings, LSPs are subject to diverse pressures in their institutional environments; these should be integrated into future research to detect overlying or consistent incentives and pressures. Thereby, a more comprehensive picture of influential factors on incentive design may be derived. Third, our findings are limited by the initial stage of interorganizational sustainability management. We identified intended incentive mechanisms that will be implemented at the contemplated companies by the end of the year 2011. Therewith, future research may consider longitudinal studies comprising initial, intermediate and advanced phases of incentive application for sustainable logistics

services. Herewith, scholars may evaluate the impact of incentive mechanisms on the sustainable behavior of LSPs over time, as well as how focal organizations take other forms of incentives into account.

C.8.3 Managerial Implications

The managerial implications of our study are threefold. First, practitioners or policymakers may find our results on relevant sustainable logistics performance criteria helpful to develop supplier evaluation and selection schemes. As supposed by Noci (1997) and Handfield et al. (2002), supplier selection models may use the analytic hierarchy process to design efficient selection mechanisms. Hereto, our assessment of influential factors can serve as a basis for this. Behavior measurability, goal conflict and outcome uncertainty may be applied as influential factors to determine relative weightings of sustainable logistics performance criteria. Second, sustainability managers may benefit from our findings regarding the challenges of purchasing and logistics departments to operationalize and align corporate sustainability objectives. Our empirical findings demonstrate that the design of incentive mechanisms requires further cooperation of corporate sustainability departments, functional departments and LSPs to align conflicting objectives and integrate functional knowledge. Third, practitioners may build on our cross-industry approach and the identified incentive mechanisms to further develop incentives for sustainable behavior. We elucidated conditions and characteristics of sustainable behavior that allow for either behavior or outcome-based incentives. We have shown that the evaluation and selection of LSPs by sustainable behavior is seen as the core element of supplier management. Furthermore, outcome-based incentives are applied wherever goal conflicts are high and shippers expect high added value. Within this initial phase of interorganizational incentive design, shippers tend to actuate sustainable behavior by extended cooperation, contract duration and contract content. Hence the research at hand provides recommendations for incentive design by taking characteristics of sustainable behavior into account.

References

- Aberle, G.** (2009): "Transportwirtschaft: Einzelwirtschaftliche und gesamtwirtschaftliche Grundlagen". Oldenbourg, München.
- Abukhader, S.M. and Jönson, G.** (2004): "Logistics and the Environment: Is it an established Subject?". *International Journal of Logistics: Research & Applications*. 7 (2), p. 137-149.
- Aguilera, R.V., Rupp, D.E., Williams, C.A. and Ganapathi, J.** (2007): "Putting the S back in Corporate Social Responsibility: A multilevel Theory of social Change in Organizations". *Academy of Management Review*. 32 (3), p. 836-863.
- Albers, S.** (2005): "The Design of Alliance Governance Systems". Kölner Wissenschaftsverlag, Köln.
- Alparslan, A.** (2006): "Strukturalistische Prinzipal-Agent-Theorie. Eine Reformulierung der Hidden-Action-Modelle aus der Perspektive des Strukturalismus". Gabler Edition Wissenschaft, Wiesbaden.
- Amaeshi, K.M., Osuji, O.K. and Nnodim, P.** (2008): "Corporate Social Responsibility in Supply Chains of global Brands: A boundaryless Responsibility? Clarifications, Exceptions and Implications". *Journal of Business Ethics*. 81 (1), p. 223-234.
- Andersen, O.** (2002): "Transport of Fish from Norway: Energy Analysis using Industrial Ecology as the Framework". *Journal of Cleaner Production*. 10 (6), p. 581-588.
- Andersen, O., Lundli, H.-E., Holden, E. and Hoyer, K.G.** (2004): "Transport Scenarios in a Company Strategy". *Business Strategy and the Environment*. 13 (1), p. 43-61.
- Ansari, S.M., Fiss, P.C. and Zajac, E.J.** (2010): "Made to Fit: How Practices vary when they diffuse". *Academy of Management Journal*. 35 (1), p. 67-92.
- Aragon-Correa, J.A.** (1998): "Strategic Proactivity and Firm Approach to the Natural Environment". *The Academy of Management Journal*. 41 (5), p. 556-567.
- Aragon-Correa, J.A. and Sharma, S.** (2003): "A contingent Resource-Based View of proactive Corporate Environmental Strategy". *Academy of Management Review*. 28 (1), p. 71-88.
- Atteslander, P.** (2006): "Methoden der empirischen Sozialforschung". Erich Schmidt Verlag, Berlin.
- Bachmann, H.** (2008): "Post Merger Integration von Logistikunternehmen: Eine branchenspezifische theoriegeleitete und empirische Analyse". Gabler, Wiesbaden.
- Baden, D.A., Harwood, I.A. and Woodward, D.G.** (2009): "The Effect of Buyer Pressure on Suppliers in SMEs to demonstrate CSR Practices: An added Incentive or counter productive?". *European Management Journal*. 27 (6), p. 429-441.
- Bai, C. and Sarkis, J.** (2010): "Integrating Sustainability into Supplier Selection with Grey System and Rough Set Methodologies". *International Journal of Production Economics*. 124 (1), p. 252-264.
- Baker, G.P., Jensen, M.C. and Murphy, K.J.** (1988): "Compensation and Incentives: Practice vs. Theory". *The Journal of Finance*. 43 (3), p. 593-616.

-
- Bansal, P.** (2002): "The Corporate Challenges of Sustainable Development". *The Academy of Management Executive (1993-2005)*. 16 (2), p. 122-131.
- Bansal, P.** (2005): "Evolving Sustainably: A longitudinal Study of Corporate Sustainable Development". *Strategic Management Journal*. 26 (3), p. 197-218.
- Bansal, P. and McKnight, B.** (2009): "Looking forward, pushing back and peering sideways: Analyzing the Sustainability of industrial Symbiosis". *Journal of Supply Chain Management*. 45 (4), p. 26-38.
- Bansal, P. and Roth, K.** (2000): "Why Companies go green: A Model of ecological Responsiveness". *Academy of Management Journal*. 43 (4), p. 717-748.
- Barkenbus, J.N.** (2010): "Eco-driving: An overlooked Climate Change Initiative". *Energy Policy*. 38 (2), p. 762-769.
- Barnard, C.I.** (1938): "The Functions of the Executive". Harvard University Press, Cambridge (MA).
- Barnett, M.L.** (2007): "Stakeholder Influence Capacity and the Variability of financial Returns to Corporate Social Responsibility". *Academy of Management Review*. 32 (3), p. 794-816.
- Barney, J.** (1991): "Firm Resources and Sustained Competitive Advantage". *Journal of Management*. 17 (1), p. 99-120.
- Baron, D.P.** (2007): "Corporate Social Responsibility and Social Entrepreneurship". *Journal of Economics & Management Strategy*. 16 (3), p. 683-717.
- Bask, A.H.** (2001): "Relationships among TPL Providers and Members of Supply Chains - A strategic Perspective". *The Journal of Business & Industrial Marketing*. 16 (6/7), p. 470-487.
- Basu, K. and Palazzo, G.** (2008): "Corporate Social Responsibility: A Process Model of Sensemaking". *Academy of Management Review*. 33 (1), p. 122-136.
- Baumann, H., Boons, F. and Bragd, A.** (2002): "Mapping the green Product Development Field: Engineering, Policy and Business Perspectives". *Journal of Cleaner Production*. 10 (5), p. 409-426.
- Beccerra, M. and Gupta, A.K.** (1999): "Trust within the Organization: Integrating the Trust Literature with Agency Theory and Transaction Costs Economics". *Public Administration Quarterly*. 23 (2), p. 177-203.
- Bechtel, C. and Jayaram, J.** (1997): "Supply Chain Management: A strategic Perspective". *The International Journal of Logistics Management*. 8 (1), p. 15-34.
- Beckman, C.M., Haunschild, P.R. and Phillips, D.J.** (2004): "Friends or Strangers? Firm-specific Uncertainty, Market Uncertainty, and Network Partner Selection". *Organization Science*. 15 (3), p. 259-275.
- Beliveau, B., Cottrill, M. and O'Neill, H.M.** (1994): "Predicting Corporate Social Responsiveness: A Model Drawn from Three Perspectives". *Journal of Business Ethics*. 13 (9), p. 731-738.
- Berger, U. and Bernhard-Mehlich, I.** (2002): "Verhaltenswissenschaftliche Entscheidungstheorie". In: Kieser, A.: "Organisationstheorien". W. Kohlhammer, Stuttgart.
-

-
- Berrone, P. and Gomez-Mejia, L.R.** (2009): "Environmental Performance and Executive Compensation: An integrated Agency-Institutional Perspective". *Academy of Management Journal*. 52 (1), p. 103-126.
- Bierly, P.E. and Gallagher, S.** (2007): "Explaining Alliance Partner Selection: Fit, Trust and strategic Expediency". *Long Range Planning: International Journal of Strategic Management*. 40 (2), p. 134-153.
- Bloom, M. and Milkovich, G.T.** (1998): "Relationships among Risk, Incentive Pay, and Organizational Performance". *Academy of Management Journal*. 41 (3), p. 283-297.
- Bogetoft, P. and Olesen, H.B.** (2004): "Quality Incentives and Supply Chains: Managing Salmonella in Pork Production". *American Journal of Agricultural Economics*. 86 (3), p. 829-834.
- Boxenbaum, E. and Jonsson, S.** (2008): "Isomorphism, Diffusion and Decoupling". In: Greenwood, R., Suddaby, R., Oliver, C. and Sahlin-Anderson, K.: "Handbook of Organizational Institutionalism". Sage, New York.
- Bremmers, H., Omta, O., Kemp, R. and Haverkamp, D.-J.** (2007): "Do Stakeholder Groups influence environmental Management System Development in the Dutch Agri-food Sector?". *Business Strategy and the Environment*. 16 (3), p. 214-231.
- Brenck, A., Mitusch, K. and Winter, M.** (2007): "Die externen Kosten des Verkehrs". In: Schöller, O., Canzler, W. and Knie, A.: "Handbuch Verkehrspolitik". VS Verlage für Sozialwissenschaften, Wiesbaden.
- Bretzke, W.-R.** (2010): "Logistische Netzwerke". Springer, Heidelberg.
- Bretzke, W.-R.** (2011): "Sustainable Logistics: In Search of Solutions for a challenging new Problem". *Logistics Research*. 3 (4), p. 179-189.
- Bretzke, W.-R. and Barkawi, K.** (2010): "Nachhaltige Logistik. Antworten auf eine globale Herausforderung". Springer, Heidelberg.
- Brink, A.** (2009): "Corporate Philanthropy aus strategischer Perspektive". *Die Unternehmung (Swiss Journal of Business Research and Practice)*. 63 (1), p. 75-100.
- Bunge, M.** (1996): "Finding Philosophy in Social Science". Yale University Press, New Haven.
- Büyükoçkan, G., Feyzio-lu, O. and Nebol, E.** (2008): "Selection of the strategic Alliance Partner in Logistics Value Chain". *International Journal of Production Economics*. 113 (1), p. 148-158.
- Campbell, J.L.** (2007): "Why would Corporations behave in socially responsible Ways? An Institutional Theory of Corporate Social Responsibility". *Academy of Management Review*. 32 (3), p. 946-967.
- Carroll, A.B.** (1979): "A three-dimensional conceptual Model of Corporate Performance". *Academy of Management Review*. 4 (4), p. 497-505.
- Carroll, A.B.** (1991): "The Pyramid of Corporate Social Responsibility: Toward the moral Management of organizational Stakeholders". *Business Horizons*. 34 (4), p. 39-48.
- Carroll, A.B. and Shabana, K.M.** (2010): "The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice". *International Journal of Management Reviews*. 12 (1), p. 85-105.
-

-
- Carter, C.R.** (2004): "Purchasing and Social Responsibility: A Replication and Extension". *Journal of Supply Chain Management: A Global Review of Purchasing & Supply*. 40 (4), p. 4-16.
- Carter, C.R.** (2005): "Purchasing Social Responsibility and Firm Performance: The Key mediating Roles of organizational Learning and Supplier Performance". *International Journal of Physical Distribution & Logistics Management*. 35 (3/4), p. 177-195.
- Carter, C.R. and Dresner, M.** (2001): "Purchasing's Role in environmental Management: Cross-functional Development of Grounded Theory". *Journal of Supply Chain Management*. 37 (3), p. 12-26.
- Carter, C.R. and Easton, P.L.** (2011): "Sustainable Supply Chain Management: Evolution and Future Directions". *International Journal of Physical Distribution & Logistics Management*. 41 (1), p. 46.
- Carter, C.R. and Jennings, M.M.** (2002): "Logistics Social Responsibility: An integrative Framework". *Journal of Business Logistics*. 23 (1), p. 145-181.
- Carter, C.R. and Jennings, M.M.** (2004): "The Role of Purchasing in Corporate Social Responsibility: A structural Equation Analysis". *Journal of Business Logistics*. 25 (1), p. 145-187.
- Carter, C.R. and Rogers, D.S.** (2008): "A Framework of sustainable Supply Chain Management: Moving toward new Theory". *International Journal of Physical Distribution & Logistics Management*. 38 (5), p. 360-387.
- Casadesus-Masanell, R., Crooke, M., Reinhardt, F. and Vasishth, V.** (2009): "Households' Willingness to pay for "Green" Goods: Evidence from Patagonia's Introduction of organic Cotton Sportswear". *Journal of Economics & Management Strategy*. 18 (1), p. 203-233.
- Castka, P. and Balzarova, M.** (2008): "The Impact of ISO 9000 and ISO 14000 on Standardisation of Social Responsibility - An inside Perspective". *International Journal of Production Economics*. 113 (1), p. 74-87.
- Cerin, P. and Karlson, L.** (2002): "Business Incentives for Sustainability: A Property Rights Approach". *Ecological Economics*. 40 (1), p. 13-22.
- Chalmers, A.F.** (2007): "Wege der Wissenschaft. Einführung in die Wissenschaftstheorie". Springer, Heidelberg.
- Chan, S.Y.S.** (2009): "New green Tax Incentive in Hong Kong". *International Tax Journal*. 35 (6), p. 55-68.
- Chatterji, A.K., Levine, D.I. and Toffel, M.W.** (2009): "How well do social Ratings actually measure Corporate Social Responsibility?". *Journal of Economics & Management Strategy*. 18 (1), p. 125-169.
- Chatterji, A.K. and Toffel, M.W.** (2010): "How Firms respond to being rated". *Strategic Management Journal*. 31 (9), p. 917-945.
- Chen, C.** (2001): "Design for the Environment: A quality-based Model for green Product Development". *Management Science*. 47 (2), p. 250-264.
- Chen, K.-P.** (2005): "External Recruitment as an Incentive Device". *Journal of Labor Economics*. 23 (2), p. 259-277.
-

-
- Child, J.** (1972): "Organizational Structure, Environment and Performance: The Role of strategic Choice". *Sociology*. 6 (1), p. 1-22.
- Chmielewicz, K.** (1979): "Forschungskonzeptionen der Wirtschaftswissenschaften". Poeschel, Stuttgart.
- Choi, T.Y. and Krause, D.R.** (2006): "The Supply Base and its Complexity: Implications for Transactions Costs, Risks, Responsiveness and Innovation". *Journal of Operations Management*. 24 (5), p. 637-652.
- Christmann, P.** (2004): "Multinational Companies and the natural Environment: Determinants of global environmental Policy Standardization". *Academy of Management Journal*. 47 (5), p. 747-760.
- Ciliberti, F., Pontrandolfo, P. and Scozzi, B.** (2008a): "Investigating Corporate Social Responsibility in Supply Chains: A SME Perspective". *Journal of Cleaner Production*. 16 (15), p. 1579-1588.
- Ciliberti, F., Pontrandolfo, P. and Scozzi, B.** (2008b): "Logistics Social Responsibility: Standard Adoption and Practices in Italian Companies". *International Journal of Production Economics*. 113 (1), p. 88-106.
- Clark, P.B. and Wilson, J.Q.** (1961): "Incentive Systems: A Theory of Organizations". *Administrative Science Quarterly*. 6 (2), p. 129-166.
- Clemens, B.** (2006): "Economic Incentives and small Firms: Does it pay to be green?". *Journal of Business Research*. 59 (4), p. 492-500.
- Cohen, S.A., Kelp, S. and Randall, T.** (2007): "Motivating Supply Chain Behavior: The right Incentives can make all the Difference". *Supply Chain Management Review*. 11 (4), p. 18-24.
- Cook, T.D. and Campbell, D.T.** (1979): "Quasi-Experimentation: Design and Analysis Issues for Field Settings". Rand Mc Nally, Chicago.
- Cooper, M.C., Lambert, D.M. and Pagh, J.D.** (1997): "Supply Chain Management: More than a new Name for Logistics". *International Journal of Logistics Management*. 8 (1), p. 1-14.
- Côté, R.P., Lopez, J., Marche, S., Perron, G.M. and Wright, R.** (2008): "Influences, Practices and Opportunities for environmental Supply Chain Management in Nova Scotia SMEs". *Journal of Cleaner Production*. 16 (15), p. 1561-1570.
- Crouch, C.** (2006): "Modelling the Firm in its Market and organizational Environment: Methodologies for studying Corporate Social Responsibility". *Organization Studies*. 27 (10), p. 1533-1551.
- Cullinane, S. and Edwards, J.** (2010): "Assessing the environmental Impacts of Freight Transport". In: McKinnon, A.C., Cullinane, S., Browne, M. and Whiteing, A.: "Green Logistics. Improving the environmental Sustainability of Logistics". Kogan Page, London.
- Cuthbertson, R.** (2011): "The need for sustainable Supply Chain Management". In: Cetinkaya, B., Cuthbertson, R., Ewer, G., Klaas-Wissing, T., Piotrowicz, W. and Tyssen, C.: "Sustainable Supply Chain Management". Springer, Heidelberg.
- Dacin, M.T., Oliver, C. and Roy, J.-P.** (2007): "The Legitimacy of Strategic Alliances: An Institutional Perspective". *Strategic Management Journal*. 28 (2), p. 169-187.
-

-
- Daily, B.F. and Huang, S.-C.** (2001): "Achieving Sustainability through Attention to Human Resource Factors in environmental Management". *International Journal of Operations & Production Management*. 21 (12), p. 1539-1554.
- Darnall, N., Jolley, G. and Handfield, R.** (2008): "Environmental Management Systems and green Supply Chain Management: Complements for Sustainability?". *Business Strategy and the Environment*. 17 (1), p. 30-45.
- Das, T.K. and Teng, B.-S.** (2001): "A Risk Perception Model of Alliance Structuring". *Journal of International Management*. 7 (1), p. 1-29.
- Delbecq, A.L., Van de Ven, A.H. and Gustafson, D.H.** (1975): "Group Techniques for Program Planning: A Guide to Nominal Group and Delphi Processes". Scott, Foresman and Company, Glenview (IL).
- Delmas, M. and Montiel, I.** (2009): "Greening the Supply Chain: When Is Customer Pressure Effective?". *Journal of Economics & Management Strategy*. 18 (1), p. 171-201.
- Delmas, M. and Toffel, M.W.** (2004): "Stakeholders and environmental Management Practices: An Institutional Framework". *Business Strategy and the Environment*. 13 (4), p. 209-222.
- DiMaggio, P.J. and Powell, W.W.** (1983): "The Iron Cage revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields". *American Sociological Review*. 48 (2), p. 147-160.
- Donaldson, L. and Davis, J.** (1991): "Stewardship Theory or Agency Theory: CEO Governance and Shareholder Returns". *Australian Journal of Management*. 16 (1), p. 49-65.
- Doty, D.H. and Glick, W.H.** (1994): "Typologies as a unique Form of Theory Building: Toward improved Understanding and Modeling". *Academy of Management Review*. 19 (2), p. 230-251.
- Dyllick, T. and Hockerts, K.** (2002): "Beyond the Business Case for Corporate Sustainability". *Business Strategy and the Environment*. 11 (2), p. 130-141.
- Ebers, M. and Gotsch, W.** (2002): "Institutionenökonomische Theorien und Ansätze". In: Kieser, A.: "Organisationstheorien". W. Kohlhammer, Stuttgart.
- Eisenhardt, K.M.** (1985): "Control: Organizational and economic Approaches". *Management Science*. 31 (2), p. 134-149.
- Eisenhardt, K.M.** (1988): "Agency- and Institutional-Theory Explanations: The Case of Retail Sales Compensation". *Academy of Management Journal*. 31 (3), p. 488-544.
- Eisenhardt, K.M.** (1989a): "Agency Theory: An Assessment and Review". *Academy of Management Review*. 14 (1), p. 57-74.
- Eisenhardt, K.M.** (1989b): "Building Theories from Case Study Research". *Academy of Management Review*. 14 (4), p. 532-550.
- Eisenhardt, K.M. and Graebner, M.E.** (2007): "Theory Building from Cases: Opportunities and Challenges". *Academy of Management Journal*. 50 (1), p. 25-32.
- Elkington, J.** (1997): "Cannibals with Forks. The Triple Bottom Line of 21st Century Business". Capstone, Oxford.
-

-
- Ellram, L.M.** (1990): "The Supplier Selection Decision in strategic Partnerships". *International Journal of Purchasing and Materials Management*. 26 (4), p. 8-15.
- Endress, L.H., Roumasset, J.A. and Zhou, T.** (2005): "Sustainable Growth with environmental Spillovers". *Journal of Economic Behavior & Organization*. 58 (4), p. 527-547.
- Engau, C., Sprengel, D.C. and Hoffmann, V.** (2008): "Fasten your Seatbelts: European Airline Responses to Climate Change Turbulence". In: Sullivan, R.: "Corporate Responses to Climate Change". Greenleaf Publishing, Sheffield.
- Eroglu, S.A., Machleit, K.A. and Davis, L.M.** (2001): "Atmospheric Qualities of online Retailing: A conceptual Model and Implications". *Journal of Business Research*. 54 (2), p. 177-184.
- Etzion, D. and Ferraro, F.** (2010): "The Role of Analogy in the Institutionalization of Sustainability Reporting". *Organization Science*. 21 (5), p. 1092-1107.
- EU** (2009): "Mainstreaming Sustainable Development into EU Policies: 2009 Review of the European Union Strategy for Sustainable Development". Brussels.
- Fama, E.F.** (1980): "Agency Problems and the Theory of the Firm". *Journal of Political Economy*. 88 (2), p. 288-307.
- Faruk, A.C., Lamming, R.C., Cousins, P.D. and Bowen, F.E.** (2001): "Analyzing, mapping, and managing environmental Impacts along Supply Chains". *Journal of Industrial Ecology*. 5 (2), p. 13-36.
- Fineman, S. and Clarke, K.** (1996): "Green Stakeholders: Industry Interpretations and Response". *Journal of Management Studies*. 33 (6), p. 715-730.
- Fiss, P.C. and Zajac, E.J.** (2006): "The symbolic Management of strategic Change: Sensegiving via Framing and Decoupling". *Academy of Management Journal*. 49 (6), p. 1173 - 1193.
- Fleischmann, B.** (2008): "Grundlagen: Begriff der Logistik, logistische Systeme und Prozesse". In: Arnold, D., Kuhn, A., Furmanns, K., Isermann, H. and Tempelmeier, H.: "Handbuch Logistik". Springer, Heidelberg.
- Foerstl, K., Reuter, C., Hartmann, E. and Blome, C.** (2010): "Managing Supplier Sustainability Risks in a dynamically changing Environments: Sustainable Supplier Management in the Chemical Industry". *Journal of Purchasing & Supply Management*. 16 (2), p. 118-130.
- Freeman, R.E.** (1984): "Strategic Management: A Stakeholder Approach". Prentice-Hall, Englewood Cliffs (NJ).
- George, A.L. and Bennett, A.** (2004): "Case Studies and Theory Development in the Social Sciences". MIT Press, Cambridge (MA).
- Georgiadis, P. and Besiou, M.** (2008): "Sustainability in electrical and electronic Equipment closed-loop Supply Chains: A System Dynamics Approach". *Journal of Cleaner Production*. 16 (15), p. 1665-1678.
- Giannakis, M. and Croom, S.R.** (2004): "Toward the Development of a Supply Chain Management Paradigm: A Conceptual Framework". *Journal of Supply Chain Management*. 40 (2), p. 27-37.
-

-
- Gibbert, M., Ruigrok, W. and Wicki, B.** (2008): "What passes as a rigorous Case Study?". *Strategic Management Journal*. 29 (13), p. 1465-1474.
- Gibson, B.J., Mentzer, J.T. and Cook, R.L.** (2005): "Supply Chain Management: The Pursuit of a Consensus Definition". *Journal of Business Logistics*. 26 (2), p. 17-25.
- Giddens, A.** (1984): "The Constitution of Society: Outline of the Theory of Structuration". University of California Press, Berkeley and Los Angeles.
- Gladwin, T.N., Kennelly, J.J. and Krause, T.-S.** (1995): "Shifting Paradigms for sustainable Development: Implications for Management Theory and Research". *Academy of Management Review*. 20 (4), p. 874-908.
- Gold, S., Seuring, S. and Beske, P.** (2010): "Sustainable Supply Chain Management and inter-organizational Resources: A Literature Review". *Corporate Social Responsibility and Environmental Management*. 17 (4), p. 230-245.
- Goldsby, T.J. and Stank, T.P.** (2000): "World Class Logistics Performance and environmentally responsible Logistics Practices". *Journal of Business Logistics*. 21 (2), p. 187-209.
- Gomez-Mejia, L., Wiseman, R.M. and Dykes, B.J.** (2005): "Agency Problems in diverse Contexts: A global Perspective". *Journal of Management Studies*. 42 (7), p. 1507-1517.
- Gomez-Mejia, L.R. and Wiseman, R.M.** (2007): "Does Agency Theory have universal Relevance? A Reply to Lubatkin, Lane, Collin, and Very". *Journal of Organizational Behavior*. 28 (1), p. 81-88.
- Gonzalez, P., Sarkis, J. and Adenso-Diaz, B.** (2008): "Environmental Management System Certification and its Influence on Corporate Practices". *International Journal of Operations & Production Management*. 28 (11), p. 1021-1021-1041.
- Green, K., Morton, B. and New, S.** (1996): "Purchasing and Environmental Management: Interaction, Policies and Opportunities". *Business Strategy and the Environment*. 5 (3), p. 188-197.
- GRI** (2011): "Sustainability Reporting Guidelines". Global Reporting Initiative, Amsterdam.
- Groenewege, J.** (1996): "Transaction Cost Economics and beyond". Kluwer, Norwell (MA).
- Gudmundsson, H. and Höjer, M.** (1996): "Sustainable Development Principles and their Implications for Transport". *Ecological Economics*. 19 (3), p. 269-282.
- Gunasekaran, A. and Kobu, B.** (2007): "Performance Measures and Metrics in Logistics and Supply Chain Management: A Review of recent Literature (1995-2004) for Research and Applications". *International Journal of Production Research*. 45 (12), p. 2819-2840.
- Günther, E. and Greschner Farkavcová, V.** (2010): "Decision Making for Transportation Systems as a Support for Sustainable Stewardship". *Management Research Review*. 33 (4), p. 317-339.
- Häder, M.** (2009): "Delphi-Befragung: Ein Arbeitsbuch". VS Verlag für Sozialwissenschaften, Wiesbaden.
-

-
- Hahn, T., Figge, F., Pinkse, J. and Preuss, L.** (2010): "Trade-Offs in Corporate Sustainability: You can't have your Cake and eat it". *Business Strategy and the Environment*. 19 (4), p. 217-229.
- Halldorsson, A., Kotzab, H., Mikkola, J.H. and Skjoett-Larsen, T.** (2007): "Complementary Theories to Supply Chain Management". *Supply Chain Management: An International Journal*. 12 (4), p. 284-296.
- Halme, M.** (1995): "Environmental Issues in Product Development Processes: Paradigm Shift in a Finnish Packaging Company". *Business Ethics Quarterly*. 5 (4), p. 713-733.
- Hammar, H. and Jagers, S.C.** (2007): "What is a fair CO2 Tax Increase? On fair Emission Reductions in the Transport Sector". *Ecological Economics*. 61 (2/3), p. 377-387.
- Handfield, R.B., Sroufe, R. and Walton, S.V.** (2005): "Integrating environmental Management and Supply Chain Strategies". *Business Strategy and the Environment*. 14 (1), p. 1-19.
- Handfield, R.B., Walton, S.V., Sroufe, R. and Melnyk, S.A.** (2002): "Applying environmental Criteria to Supplier Assessment: A Study in the Application of the Analytical Hierarchy Process". *European Journal of Operational Research*. 141 (1), p. 70-87.
- Harland, C.M.** (1996): "Supply Chain Management: Relationships, Chains and Networks". *British Journal of Management*. 7 (1), p. 63-81.
- Hart, S.L.** (1997): "Beyond Greening: Strategies for a sustainable World". *Harvard Business Review*. 75 (1), p. 66-76.
- Hass, J.L.** (1996): "Environmental (green) Management Typologies: An Evaluation, Operationalization and empirical Development". *Business Strategy and the Environment*. 5 (2), p. 59-68.
- Heikkurinen, P.** (2011): "Environmental Strategy and Sustainability". In: Idowu, S.O. and Louche, C.: "Theory and Practice in Corporate Social Responsibility". Springer, London.
- Hellweg, S., Fischer, U., Hofstetter, T.B. and Hungerbühler, K.** (2005): "Site-dependent Fate Assessment in LCA: Transport of heavy Metals in Soil". *Journal of Cleaner Production*. 13 (4), p. 341-361.
- Henriques, I. and Sadorsky, P.** (1999): "The Relationship between environmental Commitment and managerial Perceptions of Stakeholder Importance". *Academy of Management Journal*. 42 (1), p. 87-99.
- Hervani, A.A., Helms, M.M. and Sarkis, J.** (2005): "Performance Measurement for green Supply Chain Management". *Benchmarking*. 12 (4), p. 330-353.
- Hezri, A.A. and Dovers, S.R.** (2006): "Sustainability Indicators, Policy and Governance: Issues for ecological Economics". *Ecological Economics*. 60 (1), p. 86-99.
- Hill, M.R.** (2001): "Sustainability, Greenhouse Gas Emissions and International Operations Management". *International Journal of Operations & Production Management*. 21 (12), p. 1503-1520.
- Himanen, V., Lee-Gosselin, M. and Perreels, A.** (2005): "Sustainability and the Interactions between external Effects of Transport". *Journal of Transport Geography*. 13 (1), p. 23-28.
-

-
- Hitt, M.A., Ahlstrom, D., Dacin, M.T., Levitas, E. and Svobodina, L.** (2004): "The Institutional Effects on Strategic Alliance Partner Selection in Transition Economies: China vs. Russia". *Organization Science*. 15 (2), p. 173-185.
- Hoffmann, A. and Resch, B.** (2010): "Eigenschaften von Güterverkehrsleistungen". In: Stölzle, W. and Fagagnini, H.-P.: "Güterverkehr kompakt". Oldenbourg, München.
- Hoffmann, V.H. and Busch, T.** (2008): "Corporate Carbon Performance Indicators: Carbon Intensity, Dependency, Exposure, and Risk". *Journal of Industrial Ecology*. 12 (4), p. 505-520.
- Hofmann, E., Hofmann, C. and Pfeiffer, T.** (2008): "Kontrollrechte und Anreize in Supply Chains". *Zeitschrift für betriebswirtschaftliche Forschung*. 59 (Sonderheft), p. 1-29.
- Hofmann, E. and Wessely, P.** (2010): "Verkehrsmärkte". In: Stölzle, W. and Fagagnini, H.-P.: "Güterverkehr kompakt". Oldenbourg, München.
- Holmstrom, B.** (1982): "Design of Incentive Schemes and the New Soviet Incentive Model". *European Economic Review*. 17 (2), p. 127-149.
- Huang, X., Gattiker, T. and Schwarz, J.** (2008): "Interpersonal Trust Formation during the Supplier Selection Process: The Role of the Communication Channel". *Journal of Supply Chain Management*. 44 (3), p. 53-75.
- Humphreys, P., McIvor, R. and Chan, F.** (2003): "Using Case-based Reasoning to evaluate Supplier Environmental Management Performance". *Expert Systems with Applications*. 25 (2), p. 141-153.
- Hunt, C.B. and Auster, E.R.** (1990): "Proactive Environmental Management: Avoiding the Toxic Trap". *Sloan Management Review*. 31 (2), p. 7-18.
- Husted, B.W. and Allen, D.B.** (2000): "Is it ethical to use Ethics as Strategy? ". *Journal of Business Ethics*. 27 (1-2), p. 21-31.
- Husted, B.W. and Allen, D.B.** (2006): "Corporate Social Responsibility in the multinational Enterprise: Strategic and institutional Approaches". *Journal of International Business Studies*. 37 (6), p. 838-849.
- Hutchins, M.J. and Sutherland, J.W.** (2008): "An Exploration of Measures of social Sustainability and their Application to Supply Chain Decisions". *Journal of Cleaner Production*. 16 (15), p. 1688-1698.
- Irland, L.C.** (2007): "Developing Markets for certified Wood Products: Greening the Supply Chain for Construction Materials". *Journal of Industrial Ecology*. 11 (1), p. 201-216.
- Jacoby, J.** (2002): "Stimulus-Organism-Response Reconsidered: An Evolutionary Step in Modeling (Consumer) Behavior". *Journal of Consumer Psychology*. 12 (1), p. 51-57.
- Jacoby, J. and Matell, M.S.** (1971): "Three-Point Likert Scales are good enough". *Journal of Marketing Research*. 8 (4), p. 495-500.
- Jamali, D.** (2008): "A Stakeholder Approach to Corporate Social Responsibility: A fresh Perspective into Theory and Practice". *Journal of Business Ethics*. 82 (1), p. 213-231.
-

-
- Jamali, D.** (2010): "MNCs and international Accountability Standards through an Institutional Lens: Evidence of symbolic Conformity or Decoupling". *Journal of Business Ethics*. 95 (4), p. 617-640.
- Jamali, D. and Mirshak, R.** (2007): "Corporate Social Responsibility (CSR): Theory and Practice in a Developing Country Context". *Journal of Business Ethics*. 72 (3), p. 243-262.
- Jamali, D., Zanhour, M. and Keshishian, T.** (2009): "Peculiar Strengths and Relational Attributes of SMEs in the Context of CSR". *Journal of Business Ethics*. 87 (3), p. 355-377.
- Jang, S. and Namkung, Y.** (2009): "Perceived Quality, Emotions, and Behavioral Intentions: Application of an extended Mehrabian-Russell Model to Restaurants". *Journal of Business Research*. 62 (4), p. 451-460.
- Jenkins Jr., G.D., Mitra, A., Gupta, N. and Shaw, J.D.** (1998): "Are financial Incentives related to Performance? A meta-analytic Review of Empirical Research". *Journal of Applied Psychology*. 83 (5), p. 777-787.
- Jennings, P.D. and Zandbergen, P.A.** (1995): "Ecologically sustainable Organizations: An Institutional Approach". *Academy of Management Review*. 20 (4), p. 1015-1053.
- Jensen, M.C. and Meckling, W.H.** (1976): "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure". *Journal of Financial Economics*. 3 (4), p. 305-360.
- Jiang, B.** (2009): "Implementing Supplier Codes of Conduct in global Supply Chains: Process Explanations from theoretic and empirical Perspectives". *Journal of Business Ethics*. 85 (1), p. 77-92.
- Kacperczyk, A.** (2009): "With greater Power comes greater Responsibility? Takeover Protection and Corporate Attention to Stakeholders". *Strategic Management Journal*. 30 (3), p. 261-285.
- Kaplan, S. and Henderson, R.** (2005): "Inertia and Incentives: Bridging Organizational Economics and Organizational Theory". *Organization Science*. 16 (5), p. 509-521.
- Keeble, J.J., Topiol, S. and Berkeley, S.** (2003): "Using Indicators to measure Sustainability Performance at a Corporate and Project Level". *Journal of Business Ethics*. 44 (2/3), p. 149-158.
- Kempainen, K. and Vepsalainen, A.P.J.** (2003): "Trends in industrial Supply Chains and Networks". *International Journal of Physical Distribution & Logistics Management*. 33 (8), p. 701-720.
- Kenny, K., E.** (2007): "Code or Contract: Whether Wal-Mart's Code of Conduct creates a contractual Obligation between Wal-Mart and the Employees of its foreign Suppliers". *Northwestern Journal of International Law & Business*. 27 (2), p. 453.
- Ketchen, D.J. and Hult, G.T.** (2007): "Bridging Organization Theory and Supply Chain Management: The Case of best Value Supply Chains". *Journal of Operations Management*. 25 (2), p. 573-580.
- Kim, J. and Mahoney, J.T.** (2005): "Property Rights Theory, Transaction Costs Theory and Agency Theory: An Organizational Economics Approach to Strategic Management". *Managerial and Decision Economics*. 26 (4), p. 223-242.
-

-
- Kim, J., Park, K., Hwang, Y. and Park, I.** (2010): "Sustainable Manufacturing: A Case Study of the Forklift painting Process". *International Journal of Production Research*. 48 (10), p. 3061-3078.
- King, A.A. and Shaver, J.M.** (2001): "Are Aliens green? Assessing foreign Establishments' environmental Conduct in the United States". *Strategic Management Journal*. 22 (11), p. 1069-1086.
- Klaus, P.** (2002): "Die dritte Bedeutung der Logistik: Beiträge zur Evolution logistischen Denkens". Deutscher Verkehrs-Verlag, Hamburg.
- Klaus, P. and Krieger, W.** (2008): "Gabler Lexikon Logistik. Management logistischer Netzwerke und Flüsse". Gabler, Wiesbaden.
- Kleine, A. and Von Hauff, M.** (2009): "Sustainability-driven Implementation of Corporate Social Responsibility: Application of the integrative Sustainability Triangle". *Journal of Business Ethics*. 85 (3), p. 517-533.
- Kogg, B.** (2003): "Power and Incentives in environmental Supply Chain Management". In: Seuring, S., Müller, M., Goldbach, M. and Schneidewind, U.: "Strategy and Organization in Supply Chains". Physica Heidelberg.
- Kolk, A. and Mauser, A.** (2002): "The Evolution of environmental Management: From Stage Models to Performance Evaluation". *Business Strategy and the Environment*. 11 (1), p. 14-31.
- Kolk, A. and Pinkse, J.** (2007): "Towards Strategic Stakeholder Management? Integrating Perspectives on Sustainability Challenges such as Corporate Responses to Climate Change". *Corporate Governance*. 7 (4), p. 370-378.
- Koplin, J., Seuring, S. and Mesterharm, M.** (2007): "Incorporating Sustainability into Supply Management in the Automotive Industry - The Case of the Volkswagen AG". *Journal of Cleaner Production*. 15 (11-12), p. 1053-1062.
- Kortelainen, K.** (2008): "Global Supply Chains and social Requirements: Case Studies of Labour Condition Auditing in the People's Republic of China". *Business Strategy and the Environment*. 17 (7), p. 431-443.
- Kostova, T. and Roth, K.** (2002): "Adoption of an Organizational Practice by Subsidiaries of multinational Corporations. Institutional and Relational Effects". *Academy of Management Journal*. 45 (1), p. 215-233.
- Kostova, T. and Zaheer, S.** (1999): "Organizational Legitimacy under Conditions of Complexity: The Case of multinational Enterprise". *Academy of Management Review*. 24 (1), p. 64-81.
- Kraaijenbrink, J., Spender, J.-C. and Groen, A.J.** (2010): "The Resource-Based View: A Review and Assessment of its Critiques ". *Journal of Management*. 36 (1), p. 349-372.
- Krause, D.R., Vachon, S. and Klassen, R.D.** (2009): "Special Topic Forum on sustainable Supply Chain Management: Introduction and Reflections on the Role of Purchasing Management". *Journal of Supply Chain Management: A Global Review of Purchasing & Supply*. 45 (4), p. 18-25.
- Kuchenbecker, M.** (1998): "Bedeutung und Entwicklung der Verkehrslogistik". In: Buchholz, J., Clausen, U. and Vastag, A.: "Handbuch der Verkehrslogistik". Springer, Heidelberg.
-

-
- Kudla, N.** (2010): "Nachhaltigkeitsmanagement". In: Stölzle, W. and Fagagnini, H.-P.: "Güterverkehr kompakt". Oldenbourg, München.
- Kudla, N. and Stölzle, W.** (2011): "Sustainability Supply Chain Management Research: A structured Literature Review". *Die Unternehmung (Swiss Journal of Business Research and Practice)*. 65 (3), p. 261-300.
- Kumar, R. and Das, T.K.** (2007): "Interpartner Legitimacy in the Alliance Development Process". *Journal of Management Studies*. 44 (8), p. 1425-1453.
- Kummer, S.** (2006): "Einführung in die Verkehrswirtschaft". WUV, Wien.
- Kvale, S.** (2007): "Doing Interviews". Sage, London.
- Labuschagne, C., Brent, A.C. and Van Erck, R.P.G.** (2005): "Assessing the Sustainability Performances of Industries". *Journal of Cleaner Production*. 13 (4), p. 373-385.
- Laffont, J.-J. and Martimort, D.** (2002): "The Theory of Incentives: The Principal-Agent-Model". Princeton University Press, Princeton.
- Lafuente, A. and Salas, V.** (1989): "Types of Entrepreneurs and Firms: The Case of new Spanish Firms". *Strategic Management Journal*. 10 (1), p. 17-30.
- Lamnek, S.** (2005): "Qualitative Sozialforschung". Beltz Verlag, Weinheim.
- Lassar, W.M. and Kerr, J.L.** (1996): "Strategy and Control in Supplier-Distributor Relationships: An Agency Perspective". *Strategic Management Journal*. 17 (8), p. 613-632.
- Lee, D., Dong, M. and Bian, W.** (2010): "The Design of sustainable Logistics Network under Uncertainty". *International Journal of Production Economics*. 128 (1), p. 159-166.
- Lélé, S.M.** (1991): "Sustainable Development: A critical Review". *World Development*. 19 (6), p. 607-621.
- Levitt, B. and March, J.G.** (1995): "Barnard and the Intelligence of Learning". In: Williamson, O.E.: "Organization Theory. From Chester Barnard to the Present and beyond". Oxford University Press, New York.
- Lieb, K.J. and Lieb, R.C.** (2010): "Environmental Sustainability in the Third-Party Logistics (3PL) Industry". *International Journal of Physical Distribution & Logistics Management*. 40 (7), p. 524-533.
- Lim, W.S.** (2000): "A Lemons Market? An Incentive Scheme to induce Truth-Telling in Third Party Logistics Providers". *European Journal of Operational Research*. 125 (3), p. 519.
- Lin, H. and Darnall, N.** (2010): "Strategic Alliances for environmental Protection". In: Sarkis, J., Cordeiro, J. and Vazquez Brust, D.A.: "Facilitating sustainable Innovation through Collaboration: A Multistakeholder Perspective". Springer, New York.
- Lin, N.** (2001): "Social Capital. A Theory of Social Structure and Action". Cambridge University Press, Cambridge.
- Lin, N., Cook, K. and Burt, R.S.** (2008): "Social Capital. Theory and Research". Transaction Publishers, New Brunswick (NJ).
-

-
- Lin, S.-S. and Juang, Y.-S.** (2008): "Selecting green Suppliers with Analytic Hierarchy Process for Biotechnology Industry". *Operations and Supply Chain Management*. 1 (2), p. 115-129.
- Lockett, A., Moon, J. and Visser, W.** (2006): "Corporate Social Responsibility in Management Research: Focus, Nature, Salience and Sources of Influence". *Journal of Management Studies*. 43 (1), p. 115-136.
- Logan, M.S.** (2000): "Using Agency Theory to design successful Outsourcing Relationships". *International Journal of Logistics Management*. 11 (2), p. 21-32.
- London, M. and Oldham, G.R.** (1977): "A Comparison of Group and Individual Incentive Plans". *Academy of Management Journal*. 20 (1), p. 34-41.
- Lu, L.Y.Y., Wu, C.H. and Kuo, T.C.** (2007): "Environmental Principles applicable to green Supplier Evaluation by using multi-objective Decision Analysis". *International Journal of Production Research*. 45 (18/19), p. 4317-4331.
- Maignan, I., Hillebrand, B. and McAlister, D.** (2002): "Managing Socially-Responsible Buying: How to integrate non-economic Criteria into the Purchasing Process". *European Management Journal*. 20 (6), p. 641-648.
- Maignan, I. and Ralston, D.A.** (2002): "Corporate Social Responsibility in Europe and the U.S.: Insights from Businesses' Self-presentations". *Journal of International Business Studies*. 33 (3), p. 497-514.
- Maloni, M.J. and Brown, M.E.** (2006): "Corporate Social Responsibility in the Supply Chain: An Application in the Food Industry". *Journal of Business Ethics*. 68 (1), p. 35-52.
- Maloni, M.J. and Carter, C.R.** (2006): "Opportunities for Research in Third-Party Logistics". *Transportation Journal*. 45 (2), p. 23-38.
- Mathissen, M.** (2009): "Die Principal-Agent Theorie: Positive und normative Aspekte für die Praxis". IGEL, Hamburg.
- Matten, D. and Moon, J.** (2008): "'Implicit' and 'explicit' CSR: A conceptual Framework for a comparative Understanding of Corporate Social Responsibility". *Academy of Management Review*. 33 (2), p. 404-424.
- Mayring, P.** (2002): "Einführung in die qualitative Sozialforschung". Beltz Verlag, Weinheim.
- McGuire, J.B., Sundgren, A. and Schneeweis, T.** (1988): "Corporate Social Responsibility and Firm financial Performance". *Academy of Management Journal*. 31 (4), p. 854-872.
- McIntyre, K., Smith, H.A., Henham, A. and Pretlove, J.** (1998): "Logistics Performance Measurement and Greening Supply Chains: Diverging Mindsets". *International Journal of Logistics Management*. 9 (1), p. 57-68.
- McKelvey, B.** (1982): "Organizational Systematics - Taxonomy, Evolution, Classification". University of California Press, Berkeley and Los Angeles.
- McKinnon, A.C.** (2010): "Environmental Sustainability: A new Priority for Logistics Managers". In: McKinnon, A.C., Cullinane, S., Browne, M. and Whiteing, A.: "Green Logistics. Improving the environmental Sustainability of Logistics". Kogan Page, London.
-

-
- McWilliams, A. and Siegel, D.S.** (2000): "Corporate Social Responsibility and financial Performance: Correlation or Misspecification?". *Strategic Management Journal*. 21 (5), p. 603-610.
- McWilliams, A. and Siegel, D.S.** (2001): "Corporate Social Responsibility: A Theory of the Firm Perspective". *Academy of Management Review*. 26 (1), p. 117-127.
- McWilliams, A., Siegel, D.S. and Wright, P.M.** (2006): "Corporate Social Responsibility: International Perspectives". *Journal of Business Strategies*. 23 (1), p. 1-12.
- Meisner Rosen, C., Beckman, S.L. and Bercovitz, J.** (2002): "The Role of voluntary Industry Standards in environmental Supply-Chain Management". *Journal of Industrial Ecology*. 6 (3-4), p. 103-123.
- Meisterling, K., Samaras, C. and Schweizer, V.** (2009): "Decisions to reduce Greenhouse Gases from Agriculture and Product Transport: LCA Case Study of organic and conventional Wheat". *Journal of Cleaner Production*. 17 (2), p. 222-230.
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G.** (2001): "Defining Supply Chain Management". *Journal of Business Logistics*. 22 (2), p. 1-26.
- Mentzer, J.T., Stank, T. and Esper, T.** (2008): "Supply Chain Management and its Relationship to Logistics, Marketing, Production, and Operations Management". *Journal of Business Logistics*. 29 (1), p. 31-48.
- Meredith, J.R., Raturi, A., Amoako-Gyampah, K. and Kaplan, B.** (1989): "Alternative Research Paradigms in Operations". *Journal of Operations Management*. 8 (4), p. 297-326.
- Meuleman, M., Lockett, A., Manigart, S. and Wright, M.** (2010): "Partner Selection Decisions in Interfirm Collaborations: The Paradox of Relational Embeddedness". *The Journal of Management Studies*. 47 (6), p. 995-1019.
- Meyer, J.W. and Rowan, B.** (1977): "Institutionalized Organizations: Formal Structure as Myth and Ceremony". *American Journal of Sociology*. 83 (2), p. 340-363.
- Miles, R.E. and Snow, C.C.** (2007): "Organization Theory and Supply Chain Management: An evolving Research Perspective". *Journal of Operations Management*. 25 (2), p. 459-463.
- Mill, J.S.** (1843): "A System of Logic. Ratiocinative and Inductive. Being a connected View of the Principles of Evidence and the Methods of Scientific Investigation". Longmans, Green & Co Ltd. , London.
- Min, H. and Galle, W.P.** (1997): "Green Purchasing Strategies: Trends and Implications". *International Journal of Purchasing and Materials Management*. 33 (3), p. 10-18.
- Miner, J.B.** (2007): "Organizational Behavior 4: From Theory to Practice". M.E. Sharpe, New York.
- Mintcheva, V.** (2005): "Indicators for environmental Policy Integration in the Food Supply Chain (The Case of the Tomato Ketchup Supply Chain and the integrated Product Policy)". *Journal of Cleaner Production*. 13 (7), p. 717-731.
- Möller, K.** (2010): "Partner Selection, Partner Behavior and Business Network Performance. An empirical Study on German Business Networks". *Journal of Accounting and Organizational Change*. 6 (1), p. 27-51.
-

-
- Murphy, J. and Gouldson, A.** (2000): "Environmental Policy and Industrial Innovation: Integrating Environment and Economy through Ecological Modernisation". *Geoforum*. 31 (1), p. 33-44.
- Murphy, P.R. and Poist, R.F.** (2000a): "Green Logistics Strategies: An Analysis of Usage Patterns". *Transportation Journal*. 40 (2), p. 5-17.
- Murphy, P.R. and Poist, R.F.** (2000b): "Third-Party Logistics: Some User versus Provider Perspectives". *Journal of Business Logistics*. 21 (1), p. 121-133.
- Murphy, P.R. and Poist, R.F.** (2002): "Socially Responsible Logistics: An Exploratory Study". *Transportation Journal*. 41 (4), p. 23.
- Murphy, P.R. and Poist, R.F.** (2003): "Green Perspectives and Practices: A "comparative Logistics" Study". *Supply Chain Management*. 8 (2), p. 122-132.
- Murphy, P.R., Poist, R.F. and Braunschweig, C.D.** (1995): "Role and Relevance of Logistics to Corporate Environmentalism - An empirical Assessment". *International Journal of Physical Distribution & Logistics Management*. 25 (2), p. 5-20.
- Murphy, P.R., Poist, R.F. and Braunschweig, C.D.** (1996): "Green Logistics: Comparative Views of environmental Progressives, Moderates, and Conservatives". *Journal of Business Logistics*. 17 (1), p. 191-212.
- Myers, M.D.** (2009): "Qualitative Research in Business and Management". Sage, London.
- Nawrocka, D., Brorson, T. and Lindhqvist, T.** (2009): "ISO 14001 in environmental Supply Chain Practices". *Journal of Cleaner Production*. 17 (16), p. 1435-1443.
- Nehm, A., Schwemmer, M. and Kübler, A.** (2011): "Nachhaltigkeitsindex für Logistikdienstleister: Orientierungshilfe in einem intransparenten Markt". Fraunhofer-Arbeitsgruppe für Supply Chain Services (SCS), Nürnberg.
- Noci, G.** (1997): "Designing "green" Vendor Rating Systems for the Assessment of a Supplier's Environmental Performance". *European Journal of Purchasing & Supply Management*. 3 (2), p. 103-114.
- Noci, G.** (2000): "Environmental Reporting in Italy: Current Practice and Future Developments". *Business Strategy and the Environment*. 9 (4), p. 211-223.
- North, D.C.** (1990): "Institutions, institutional Change and economic Performance". Cambridge University Press, Cambridge.
- Oh, J., Fiorito, S.S., Cho, H. and Hofacker, C.F.** (2008): "Effects of Design Factors on Store Image and Expectation of Merchandise Quality in web-based Stores". *Journal of Retailing & Consumer Services*. 15 (4), p. 237-249.
- Okoli, C. and Pawlowski, S.D.** (2004): "The Delphi Method as a Research Tool: An Example, Design Considerations and Applications". *Information & Management*. 42 (1), p. 15-29.
- Oliver, C.** (1991): "Strategic Responses to Institutional Processes". *Academy of Management Review*. 15 (1), p. 145-179.
- Oliver, C.** (1997): "Sustainable Competitive Advantage: Combining institutional and resource-based Views". *Strategic Management Journal*. 18 (9), p. 697-713.
-

-
- Oliver, C. and Holzinger, I.** (2008): "The Effectiveness of Strategic Political Management: A Dynamic Capabilities Framework ". *Academy of Management Review*. 33 (2), p. 496-520.
- Orsato, R.J.** (2009): "Sustainability Strategies: When does it Pay to be Green?". Palgrave Macmillan, London.
- Osman, A., Nesim, K.E. and Refik, G.** (2003): "Outsourcing Logistics: Designing Transportation Contracts between a Manufacturer and a Transporter". *Transportation Science*. 37 (1), p. 23.
- Ouchi, W.G.** (1979): "A conceptual Framework for the Design of organizational Control Mechanisms". *Management Science*. 25 (9), p. 833-848.
- Pagell, M., Krause, D. and Klassen, R.** (2008): "Sustainable Supply Chain Management: Theory and Practice". *Journal of Supply Chain Management*. 44 (1), p. 85-85.
- Pagell, M. and Wu, Z.** (2009): "Building a more complete Theory of sustainable Supply Chain Management using Case Studies of 10 Exemplars". *Journal of Supply Chain Management*. 45 (2), p. 37-56.
- Pagell, M., Wu, Z. and Wasserman, M.E.** (2010): "Thinking differently about Purchasing Portfolios: An Assessment of sustainable Sourcing". *Journal of Supply Chain Management*. 46 (1), p. 57-73.
- Palovita, A. and Luoma-Aho, V.** (2010): "Recognizing definitive Stakeholders in Corporate Environmental Management". *Management Research Review*. 33 (4), p. 306-316.
- Park-Poaps, H. and Rees, K.** (2010): "Stakeholder Forces of socially responsible Supply Chain Management Orientation". *Journal of Business Ethics*. 92 (2), p. 305-322.
- Pedersen, E.R. and Andersen, M.** (2006): "Safeguarding Corporate Social Responsibility (CSR) in global Supply Chains: How Codes of Conduct are managed in Buyer-Supplier Relationships". *Journal of Public Affairs*. 6 (3-4), p. 228-240.
- Perrow, C.** (1986): "Economic Theories of Organization". *Theory and Society*. 15 (1/2), p. 11-45.
- Peters, N.** (2010): "Inter-organisational Design of Voluntary Sustainability Initiatives: Increasing the Legitimacy of Sustainability Strategies for Supply Chains". Gabler, Wiesbaden.
- Peters, N., Hofstetter, J.S. and Hoffmann, V.** (2011): "Institutional Entrepreneurship Capabilities for interorganizational sustainable Supply Chain Strategies". *International Journal of Logistics Management*. 22 (1), p. 52-86.
- Petri, K.** (1976): "Kritische Betriebswirtschaftslehre. Eine Auseinandersetzung mit dem kritischen Rationalismus Karl R. Poppers vor dem Hintergrund der Probleme der betriebswirtschaftlichen Forschungspraxis". Verlag Harri, Frankfurt am Main.
- Pfohl, H.-C.** (2010): "Logistiksysteme: Betriebswirtschaftliche Grundlagen". Springer, Berlin.
- Picot, A., Dietl, H. and Franck, E.** (2005): "Organisation". Schäffer-Poeschel, Stuttgart.
- Picot, A., Reichwald, R. and Wigand, R.** (2008): "Information, Organisation and Management". Springer, Heidelberg.
-

-
- Piecyk, M. and McKinnon, A.C.** (2007): "Internalising the external Costs of Road Freight Transport in the UK". Heriott-Watt University, Edinburgh.
- Pleanjai, S., Gheewala, S.H. and Garivait, S.** (2009): "Greenhouse Gas Emissions from Production and Use of used Cooking Oil Methyl Ester as Transport Fuel in Thailand". *Journal of Cleaner Production*. 17 (9), p. 873-876.
- Poist, R.F.** (1989): "Evolution of Conceptual Approaches to the Design of Logistics Systems: A Sequel". *Transportation Journal*. 28 (3), p. 35-39.
- Popper, K.** (2002): "Logik der Forschung". Mohr Siebeck, Tübingen.
- Porter, L.W. and Lawler, E.E.** (1968): "Managerial Attitudes and Performance". Irwin, Homewood (IL).
- Porter, M.E. and Kramer, M.R.** (2006): "Strategy & Society: The Link between Competitive Advantage and Corporate Social Responsibility". *Harvard Business Review*. 84 (12), p. 78-92.
- Pratt, J.W. and Zeckhauser, R.J.** (1985): "Principals and Agents: The Structure of Business". Harvard Business School Press, Boston (MA).
- Prieto-Carrón, M.** (2008): "Women Workers, Industrialization, Global Supply Chains and Corporate Codes of Conduct". *Journal of Business Ethics*. 83 (1), p. 5-17.
- Pullman, M.E., Maloni, M.J. and Carter, C.R.** (2009): "Food for Thought: Social versus environmental Sustainability Practices and Performance Outcomes". *Journal of Supply Chain Management*. 45 (4), p. 38-54.
- Quariguasi Frota Neto, J., Bloemhof-Ruwaard, J.M., Van Nunen, J.A.E.E. and Van Heck, E.** (2008): "Designing and evaluating sustainable Logistics Networks". *International Journal of Production Economics*. 111 (2), p. 195-208.
- Raffèe, H. and Abel, B.** (1979): "Aufgaben und aktuelle Tendenzen der Wissenschaftstheorie in den Wirtschaftswissenschaften". In: Raffèe, H. and Abel, B.: "Wissenschaftstheoretische Grundfragen der Wirtschaftswissenschaften". Vahlen, München.
- Ransom, P. and Lober, D.J.** (1999): "Why do Firms set environmental Performance Goals?: Some Evidence from Organizational Theory". *Business Strategy and the Environment*. 8 (1), p. 1-13.
- Razzaque, M.A. and Sheng, C.C.** (1997): "Outsourcing of Logistics Functions: A Literature Survey". *International Journal of Physical Distribution & Logistics Management*. 28 (2), p. 89-107.
- Reiskin, E.D., White, A.L., Kauffman Johnson, J. and Votta, T.J.** (1999): "Servicizing the chemical Supply Chain". *Journal of Industrial Ecology*. 3 (2-3), p. 19-31.
- Reuter, C., Foerstl, K.A.I., Hartmann, E.V.I. and Blome, C.** (2010): "Sustainable global Supplier Management: The Role of dynamic Capabilities in achieving competitive Advantage". *Journal of Supply Chain Management*. 46 (2), p. 45-63.
- Rich, P.** (1992): "The Organizational Taxonomy: Definition and Design". *Academy of Management Review*. 17 (4), p. 758-781.
-

-
- Ries, R., Bilec, M.M., Gokhan, N.M. and Needy, K.L.** (2006): "The economic Benefits of green Buildings: A comprehensive Case Study". *The Engineering Economist*. 51 (3), p. 259-296.
- Roiger, M.B.** (2007): "Gestaltung von Anreizsystemen und Unternehmensethik. Eine norm- und wertbezogene Analyse der normativen Principal-Agent-Theorie". Deutscher Universitäts-Verlag, Wiesbaden.
- Roth, A. and Kåberger, T.** (2002): "Making Transport Systems sustainable". *Journal of Cleaner Production*. 10 (4), p. 361-371.
- Rousseau, D.M., Sitkin, S.B., Burt, R.S. and Camerer, C.** (1998): "Not so different after all: A cross-discipline View of Trust". *Academy of Management Review*. 23 (3), p. 393-405.
- Salam, M.** (2009): "Corporate Social Responsibility in Purchasing and Supply Chain". *Journal of Business Ethics*. 85 (2), p. 355-370.
- Sanchez-Rodrigues, V., Potter, A. and Naim, M.M.** (2010): "The Impact of Logistics Uncertainty on sustainable Transport Operations". *International Journal of Physical Distribution & Logistics Management*. 40 (1/2), p. 61-83.
- Santos, F.M. and Eisenhardt, K.M.** (2005): "Organizational Boundaries and Theories of Organization". *Organization Science*. 16 (5), p. 491-508.
- Sarkis, J.** (2003): "A strategic Decision Framework for green Supply Chain Management". *Journal of Cleaner Production*. 11 (4), p. 397-409.
- Sarkis, J., Helms, M. and Hervani, A.** (2010): "Reverse Logistics and Social Sustainability". *Corporate Social Responsibility and Environmental Management*. 17 (6), p. 337-354.
- Sarkis, J., Meade, L.M. and Talluri, S.** (2004): "E-Logistics and the natural Environment". *Supply Chain Management*. 9 (3/4), p. 303-312.
- Sarkis, J., Zhu, Q. and Lai, K.** (2011): "An Organizational Theoretic Review of green Supply Chain Management Literature". *International Journal of Production Economics*. 130 (1), p. 1-15.
- Sbihi, A. and Eglese, R.** (2010): "Combinatorial Optimization and green Logistics". *Annals of Operations Research*. 175 (1), p. 159-175.
- Schaefer, A.** (2007): "Contrasting Institutional and Performance Accounts of Environmental Management Systems: Three Case Studies in the UK Water & Sewerage Industry*". *Journal of Management Studies*. 44 (4), p. 506-535.
- Schanz, G.** (1979): "Die Betriebswirtschaftslehre und ihre sozialwissenschaftlichen Nachbardisziplinen: Das Integrationsproblem". In: Raffèe, H. and Abel, B.: "Wissenschaftstheoretische Grundfragen der Wirtschaftswissenschaften". Vahlen, München.
- Scherer, A.G. and Palazzo, G.** (2007): "Toward a political Conception of Corporate Responsibility: Business and Society seen from a Habermasian Perspective". *Academy of Management Review*. 32 (4), p. 1096-1120.
- Scherer, A.G. and Palazzo, G.** (2011): "The new political Role of Business in a globalized World: A Review of a new Perspective on CSR and its Implications for the Firm, Governance, and Democracy". *Journal of Management Studies*. 48 (4), p. 899-931.
-

-
- Schliephake, K., Stevens, G. and Clay, S.** (2009): "Making Resources work more efficiently - The Importance of Supply Chain Partnerships". *Journal of Cleaner Production*. 17 (14), p. 1257-1263.
- Scott, W.R.** (1987): "The Adolescence of Institutional Theory". *Administrative Science Quarterly*. 32 (4), p. 493-511.
- Scott, W.R.** (2008): "Institutions and Organizations: Ideas and Interests". Sage, Thousand Oaks (CA).
- Seiffert, H.** (1996): "Einführung in die Wissenschaftstheorie 1". Beck'sche Reihe, München.
- Selviaridis, K. and Spring, M.** (2007): "Third Party Logistics: A Literature Review and Research Agenda". *International Journal of Logistics Management*. 18 (1), p. 125-150.
- Seuring, S.** (2008): "Assessing the Rigor of Case Study Research in Supply Chain Management". *Supply Chain Management: An International Journal*. 13 (2), p. 128-137.
- Seuring, S. and Müller, M.** (2008a): "Core Issues in sustainable Supply Chain Management - A Delphi Study". *Business Strategy and the Environment*. 17 (8), p. 455-466.
- Seuring, S. and Müller, M.** (2008b): "From a Literature Review to a conceptual Framework for sustainable Supply Chain Management". *Journal of Cleaner Production*. 16 (15), p. 1699-1710.
- Shah, R.H. and Swaminathan, V.** (2008): "Factors influencing Partner Selection in Strategic Alliances: The moderating Role of Alliance Context". *Strategic Management Journal*. 29 (5), p. 471-494.
- Shapiro, S.P.** (2005): "Agency Theory". *Annual Review of Sociology*. 31 (1), p. 263-284.
- Sharfman, M., Shaft, T. and Anex, R., Jr.** (2009): "The Road to cooperative Supply-Chain environmental Management: Trust and Uncertainty among pro-active Firms". *Business Strategy and the Environment*. 18 (1), p. 1-13.
- Sharma, S.** (2002): "Sustainability: What really matters?". In: Sharma, S. and Starik, M.: "Research in Corporate Sustainability". Edward Elgar, Cheltenham.
- Sharma, S. and Henriques, I.** (2005): "Stakeholder Influences on Sustainability Practices in the Canadian Forest Products Industry". *Strategic Management Journal*. 26 (2), p. 159-180.
- Sharma, S., Pablo, A.L. and Vredenburg, H.** (1999): "Corporate environmental Responsiveness Strategies". *Journal of Applied Behavioral Science*. 35 (1), p. 87-109.
- Sharma, S. and Vredenburg, H.** (1998): "Proactive Corporate environmental Strategy and the Development of competitively valuable organizational Capabilities". *Strategic Management Journal*. 19 (8), p. 729-753.
- Sherman, E., Mathur, A. and Smith, R.B.** (1997): "Store Environment and Consumer Purchase Behavior: Mediating Role of Consumer Emotions". *Psychology & Marketing*. 14 (4), p. 361-378.
-

-
- Sheu, J.-B., Chou, Y.-H. and Hu, C.-C.** (2005): "An integrated Logistics operational Model for green Supply Chain Management". *Transportation Research: Part E*. 41 (4), p. 287-313.
- Shrivastava, P.** (1995): "The Role of Corporations in achieving ecological Sustainability". *Academy of Management Review*. 20 (4), p. 936-961.
- Sikdar, S.K.** (2003): "Sustainable Development and Sustainability Metrics". *AIChE Journal*. 49 (8), p. 1928-1932.
- Simon, H.A.** (1957): "A Comparison of Organization Theories". In: Simon, H.A.: "Models of Man". Wiley, New York.
- Simon, H.A.** (2008): "Introductory Comment". In: Simon, H.A., Egidi, M., Viale, R. and Marris, R.: "Economics, Bounded Rationality and the Cognitive Revolution". Edward Elgar, Cheltenham.
- Simpson, D., Power, D. and Samson, D.** (2007): "Greening the Automotive Supply Chain: A Relationship Perspective". *International Journal of Operations & Production Management*. 27 (1), p. 28-48.
- Skjoett-Larsen, T.** (2000a): "European Logistics beyond 2000". *International Journal of Physical Distribution & Logistics Management*. 30 (5), p. 277-287.
- Skjoett-Larsen, T.** (2000b): "Third Party Logistics - From an interorganizational Point of View". *International Journal of Physical Distribution & Logistics Management*. 30 (2), p. 112-127.
- Slama, M.E.** (1987): "Validating the S-O-R Paradigm for Consumer Involvement with a Convenience Good". *Journal of the Academy of Marketing Science*. 15 (1), p. 36-46.
- Sobczak, A.** (2006): "Are Codes of Conduct in global Supply Chains really voluntary? From soft Law Regulation of Labour Relations to Consumer Law". *Business Ethics Quarterly*. 16 (2), p. 167-184.
- Solomon, A. and Lewis, L.** (2002): "Incentives and Disincentives for Corporate Environmental Disclosure". *Business Strategy and the Environment*. 11 (3), p. 154-169.
- Souder, W.E.** (1977): "Effectiveness of Nominal and Interacting Group Decision Processes for Integrating R&D and Marketing". *Management Science*. 23 (6), p. 595-605.
- Srivastava, S.K.** (2007): "Green Supply-Chain Management: A State-of-the-Art Literature Review". *International Journal of Management Reviews*. 9 (1), p. 53-80.
- Starik, M. and Rands, G.P.** (1995): "Weaving an integrated Web: Multilevel and multisystem Perspectives of ecologically sustainable Organizations". *Academy of Management Review*. 20 (4), p. 908-936.
- Stock, J.R. and Boyer, S.L.** (2009): "Developing a consensus Definition of Supply Chain Management: A qualitative Study". *International Journal of Physical Distribution & Logistics Management*. 39 (8), p. 690-711.
- Stölzle, W.** (1999): "Industrial Relationships". Oldenbourg, München.
- Stölzle, W.** (2002): "Supply Chain Controlling und Performance Management - Konzeptionelle Herausforderungen für das Supply Chain Management". *Logistik Management*. 4 (3), p. 10-21.
-

-
- Stölzle, W., Hofmann, E. and Gebert, K.** (2011): "Logistikmarktstudie Schweiz 2011: Gesamtmarkt, Segmente, Standorte, Potenziale". In: Schweiz, G.: "Logistikmarkt". Swiss Professional Media AG, Bern.
- Suchman, M.C.** (1995): "Managing Legitimacy: Strategic and Institutional Approaches". *Academy of Management Review*. 20 (3), p. 571-610.
- Svensson, G.** (2007): "Aspects of sustainable Supply Chain Management (SSCM): Conceptual Framework and empirical Example". *Supply Chain Management: An International Journal*. 12 (4), p. 262-266.
- Tan, R.B.H. and Khoo, H.H.** (2005): "An LCA Study of a primary Aluminum Supply Chain". *Journal of Cleaner Production*. 13 (6), p. 607-618.
- Taplin, J., R. D. , Bent, D. and Aeron-Thomas, D.** (2006): "Developing a Sustainability Accounting Framework to inform strategic Business Decisions: A Case Study from the Chemicals Industry". *Business Strategy and the Environment*. 15 (5), p. 347-360.
- Tate, W.L., Dooley, K.J. and Ellram, L.M.** (2011): "Transaction Cost and Institutional Drivers of Supplier Adoption of Environmental Practices". *Journal of Business Logistics*. 32 (1), p. 6-16.
- Taylor, J.** (1994): "The Challenge of sustainable Development". *Regulation*. 17 (1), p. 35-51.
- Teng, G.S. and Jaramillo, H.** (2005): "A Model for Evaluation and Selection of Suppliers in global Textile and Apparel Supply Chains". *International Journal of Physical Distribution & Logistics Management*. 35 (7/8), p. 503-523.
- Toolsema, L.A.** (2009): "Interfirm and intrafirm Switching Costs in a vertical Differentiation Setting: Green versus nongreen Products". *Journal of Economics & Management Strategy*. 18 (1), p. 263-284.
- Tukker, A. and Cohen, M.J.** (2004): "Industrial Ecology and the automotive Transport System: Can Ford shape the Future again?". *Journal of Industrial Ecology*. 8 (3), p. 14-18.
- Tyssen, C.** (2010): "Güterverkehrsunternehmen im Überblick". In: Stölzle, W. and Fagagnini, H.-P.: "Güterverkehr kompakt". Oldenbourg, München.
- Ubeda, S., Arcelus, F. and Faulin, J.** (2011): "Green Logistics at Eroski: A Case Study". *International Journal of Production Economics*. 131 (1), p. 44-51.
- Ulrich, H.** (1984): "Management". In: Dyllick, T. and Probst, G.: "Schriftenreihe Unternehmung und Unternehmungsführung". Paul Haupt, Bern.
- Ulrich, H., Krieg, W. and Malik, F.** (1976): "Zum Praxisbezug einer systemorientierten Betriebswirtschaftslehre". In: Ulrich, H.: "Zum Praxisbezug der Betriebswirtschaftslehre in wissenschaftstheoretischer Sicht". Paul Haupt, Bern.
- Ulrich, P. and Hill, W.** (1979): "Wissenschaftstheoretische Grundlagen der Betriebswirtschaftslehre". In: Raffée, H. and Abel, B.: "Wissenschaftstheoretische Grundfragen der Wirtschaftswissenschaften". Vahlen, München.
- UN** (1998): "Kyoto Protocol to the United Nations Framework Convention on Climate Change". United Nations, New York.
-

-
- UNFCCC** (2008): "Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007". United Nations Framework Convention on Climate Change, Bali.
- UNFCCC** (2011a): "Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action". United Nations Framework Convention on Climate Change, Durban.
- UNFCCC** (2011b): "Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its sixth session, held in Cancun from 29 November to 10 December 2010". United Nations Framework Convention on Climate Change, Cancun.
- Uzzi, B. and Gillespie, J.J.** (2002): "Knowledge Spillover in Corporate Financing Networks: Embeddedness and the Firm's Debt Performance". *Strategic Management Journal*. 23 (7), p. 595-618.
- Vachon, S.** (2007): "Green Supply Chain Practices and the Selection of environmental Technologies". *International Journal of Production Research*. 45 (18/19), p. 4357-4379.
- Van De Ven, A.H. and Delbecq, A.L.** (1974): "The Effectiveness of Nominal, Delphi, and interacting Group Decision Making Processes". *Academy of Management Journal*. 17 (4), p. 605-621.
- Van Marrewijk, M.** (2003): "Concepts and Definitions of CSR and Corporate Sustainability: Between Agency and Communion". *Journal of Business Ethics*. 44 (2/3), p. 95-105.
- Verhoef, E.T.** (1994): "External Effects and social Cost of Road Transport". *Transportations Research Part A: Policy and Practice*. 28 (4), p. 273-287.
- Von Paumgarten, P.** (2003): "The Business Case for high-performance green Buildings: Sustainability and its financial Impact". *Journal of Facilities Management*. 2 (1), p. 26-34.
- Waddock, S.** (2009): "Making a Difference?: Corporate Responsibility as a social Movement". *Journal of Corporate Citizenship*. 33 (1), p. 35-46.
- Walgenbach, P.** (2005): "Giddens' Theorie der Strukturierung". In: Kieser, A.: "Organisationstheorien". W. Kohlhammer, Stuttgart.
- Walton, S.V., Handfield, R.B. and Melnyk, S.A.** (1998): "The green Supply Chain: Integrating Suppliers into environmental Management Processes". *International Journal of Purchasing and Materials Management*. 34 (2), p. 2-12.
- Wartick, S.L. and Cochran, P.L.** (1985): "The Evolution of the Corporate Social Performance Model". *Academy of Management Review*. 10 (4), p. 758-769.
- WCED** (1987): "Our Common Future". World Commission on Environment and Development, Oxford University Press, Oxford.
- Weber, J. and Kummer, S.** (1998): "Logistikmanagement". Schäffer-Poeschel, Stuttgart.
- Williams, Z., Lueg, J.E., Taylor, R.D. and Cook, R.L.** (2009): "Why all the Changes?: An Institutional Theory Approach to exploring the Drivers of Supply Chain Security (SCS)". *International Journal of Physical Distribution & Logistics Management*. 39 (7), p. 595-618.
-

-
- Williamson, O.E.** (1979): "Transaction-Cost Economics: The Governance of Contractual Relations". *Journal of Law and Economics*. 22 (2), p. 233-261.
- Williamson, O.E.** (1981): "The Economics of Organization: The Transaction Cost Approach". *American Journal of Sociology*. 87 (3), p. 548-577.
- Wilson, M.** (2003): "Corporate Sustainability: What is it and where does it come from?". *Ivey Business Journal*. 67 (6), p. 1-6.
- Windsor, D.** (2006): "Corporate Social Responsibility: Three Key Approaches". *Journal of Management Studies*. 43 (1), p. 93-114.
- Winsemius, P. and Guntram, U.** (1992): "Responding to the environmental Challenge". *Business Horizons*. 35 (2), p. 12-21.
- Wolf, C. and Seuring, S.** (2010): "Environmental Impacts as Buying Criteria for Third Party Logistical Services". *International Journal of Physical Distribution & Logistics Management*. 40 (1), p. 84-102.
- Worsham, J., Eisner, M. and Ringquist, E.** (1997): "Assessing the Assumptions: A Critical Analysis of Agency Theory". *Administration and Society*. 28 (4), p. 419-440.
- Wright, P.M.** (1989): "Test of the mediating Role of Goals in the Incentive-Performance Relationship". *Journal of Applied Psychology*. 74 (5), p. 699-705.
- Wu, H.-J. and Dunn, S.C.** (1995): "Environmentally responsible Logistics Systems". *International Journal of Physical Distribution & Logistics Management*. 25 (2), p. 20-39.
- Yadong, L.** (2006): "Political Behavior, Social Responsibility and perceived Corruption: A Structuration Perspective". *Journal of International Business Studies*. 37 (6), p. 747-766.
- Yao, Y., Dong, Y. and Dresner, M.** (2004): "Managing Supply Chain Backorders under Vendor Managed Inventory: An Incentive Approach and empirical Analysis". *European Journal of Operational Research*. 203 (2), p. 350-359.
- Yi, Y. and Gong, T.** (2009): "An integrated Model of Customer Social Exchange Relationship: The moderating Role of Customer Experience". *Service Industries Journal*. 29 (11), p. 1513-1528.
- Yin, R.K.** (2003): "Case Study Research". Sage, Thousand Oaks (CA).
- York, R. and Rosa, E.A.** (2003): "Key Challenges to Ecological Modernization Theory". *Organization and the Environment*. 16 (3), p. 273-288.
- Zaheer, A., McEvily, B. and Perrone, V.** (1998a): "Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance". *Organization Science*. 9 (2), p. 141-159.
- Zaheer, A., McEvily, B. and Perrone, V.** (1998b): "The strategic Value of Buyer-Supplier Relationships". *International Journal of Purchasing and Materials Management*. 34 (3), p. 20-27.
- Zendejdel, K., Rademaker, M., De Baets, B. and Van Huylenbroeck, G.** (2008): "Qualitative Valuation of environmental Criteria through a Group Consensus based on stochastic Dominance". *Ecological Economics*. 67 (2), p. 253-264.
-

-
- Zhu, Q.** (2008): "Green Supply Chain Management Implications for Closing the Loop". *Transportation Research: Part E*. 44 (1), p. 1-18.
- Zhu, Q. and Sarkis, J.** (2006): "An inter-sectoral Comparison of green Supply Chain Management in China: Drivers and Practices". *Journal of Cleaner Production*. 14 (5), p. 472-486.
- Zhu, Q. and Sarkis, J.** (2007): "The moderating Effects of Institutional Pressures on emergent green Supply Chain Practices and Performance". *International Journal of Production Research*. 45 (18/19), p. 4333-4355.
- Zhu, Q., Sarkis, J. and Lai, K.-H.** (2007): "Green Supply Chain Management: Pressures, Practices and Performance within the Chinese Automobile Industry". *Journal of Cleaner Production*. 15 (11/12), p. 1041-1052.
- Zhu, Q., Sarkis, J. and Lai, K.** (2008): "Confirmation of a Measurement Model for green Supply Chain Management Practices Implementation". *International Journal of Production Economics*. 111 (2), p. 261-273.
- Zsidisin, G.A. and Ellram, L.M.** (2001): "Activities related to Purchasing and Supply Management Involvement in Supplier Alliances". *International Journal of Physical Distribution & Logistics Management*. 31 (9/10), p. 617-634.
- Zsidisin, G.A. and Ellram, L.M.** (2003): "An Agency Theory Investigation of Supply Risk Management". *Journal of Supply Chain Management*. 39 (3), p. 15-27.
- Zucker, L.G.** (1987): "Institutional Theories of Organization". *Annual Review of Sociology*. 13 (1), p. 443-464.