Forms of Interaction in
Sustainable Supply Chain Management:
An Analysis of Organisational Spheres

Submitted by

Dorli Harms

Born 5 August 1978 in Uelzen

This framework paper and the core publications listed on the page after next
are submitted to the Leuphana University Lüneburg, Faculty of Sustainability Science
in partial fulfilment of the requirements for
doctoral dissertation in economics and social science (Dr. rer. pol.)

Apart from the framework paper the individual contributions constituting this paper-based doctoral dissertation have been published as follows. They meet the formal requirements for a paper-based dissertation. They are ordered by content as presented in the framework paper.

Contribution I (journal article, double blind peer reviewed, published)

Harms, D.; Hansen, E.G. & Schaltegger, S. (2013): Strategies in Sustainable Supply Chain Management: An Empirical Investigation of Large German Companies, Corporate Social Responsibility and Environmental Management, Vol. 20, No. 4, 205–218.

Contribution II (journal article, double blind peer reviewed, published)

Hansen, E.G.; Harms, D. & Schaltegger, S. (2011): Sustainable Supply Chain Management im globalen Kontext: Praxisstand des Lieferantenmanagements in DAX- und MDAX-Unternehmen, Die Unternehmung, Vol. 65, No. 2, 87–110.

Contribution III (journal article, double blind peer reviewed, published)

Harms, D. (2011): Environmental Sustainability and Supply Chain Management: A Framework of Cross-Functional Integration and Knowledge Transfer, Journal of Environmental Sustainability, Vol. 1, No. 1, 121–141.

Contribution IV (journal article, double blind peer reviewed, published online)

Windolph, S.E.; Harms, D. & Schaltegger, S. (2013): Motivations for Corporate Sustainability Management: Contrasting Survey Results and Implementation, Corporate Social Responsibility and Environmental Management.

Contribution V (study, published)

Schaltegger, S.; Harms, D.; Hörisch, J.; Windolph, S.E.; Burritt, R.; Carter, A.; Truran, S.; Crutzen, N.; Ben Rhouma, A.; Csutora, M.; Tabi, A.; Kokubu, K.; Kitada, H.; Haider, M.B.; Kim, J.D.; Lee, K.-H.; Moneva, J.M.; Ortas, E.; Alvarez-Etxeberria, I.; Daub, C.; Schmidt, J.; Herzig, C. & Morelli, J. (2013): International Corporate Sustainability Barometer. An empirical analysis in 11 countries, Lüneburg: Center for Corporate Sustainability Management.

Contribution VI (book chapter, double blind peer reviewed, published)

Harms, D. & Klewitz, J. (2013): Innovation in sustainable supply chains – Interaction for resources from an SME perspective, in: Bogaschewsky, R.; Eßig, M.; Lasch, R. & Stölzle, W. (Hrsg.): Supply Management Research. Aktuelle Forschungsergebnisse 2013, Wiesbaden: Gabler, 105–130.

The following publications are not part of the formal requirements but support the argumentation. They are ordered alphabetical.

Harms, D.; Hansen, E.G. & Schaltegger, S. (2011): Sustainable Supply Chains im globalen Kontext: Lieferantenmanagement in DAX- und MDAX-Unternehmen, in: Bogaschewsky, R.; Eßig, M.; Lasch, R. & Stölzle, W. (Hrsg.): Supply Management Research. Aktuelle Forschungsergebnisse 2011, Wiesbaden: Gabler, 231–244.

Klewitz, J., & Harms, D. (2012): Beyond the Supply Chain – Sustainability-Oriented Product Innovations through a Transdisciplinary Approach, in: Heinrichs, H. (Hrsg.): Sustainability: Enabling a Transdisciplinary Approach: Abstract Band, Leuphana Sustainability Summit, 29th February – 2nd March 2012, Leuphana University.

Schaltegger, S. & Harms, D. (2010): Sustainable Supply Chain Management: Praxisstand in deutschen Unternehmen. Lüneburg: Centre for Sustainability Management.

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Windolph, S.E.; Hörisch, J.; Harms, D. & Schaltegger, S. (2013): Mehr Partizipation wagen? Wirkungen und Potenziale einer intensiven Einbindung von Stakeholdern in Unternehmen, Umweltwirtschaftsforum, Vol. 21, No. 1–2, 119–126.

Acknowledgements

I will remember these recent years as of full of very valuable insights and a lot of fun, while having the opportunity to develop further together with great people.

Thank you.

Dorli Harms

Leuphana Universität Lüneburg

September 2013

Contents

Forms of Interaction in Sustainable Supply Chain Management:

An Analysis of Organisational Spheres

Dorli Harms

Centre for Sustainability Management (CSM), Leuphana University Lüneburg

Scharnhorststr. 1, 21335 Lüneburg, Germany

Abstract

This framework paper aims to outline and discuss how a company can interact with its stakeholders to facilitate the creation of sustainable supply chains. Based on research and rooted in literature on corporate sustainability, supply chain management and its intersection, a conceptual framework is developed to analyse four spheres of interaction in sustainable supply chain management (SSCM). First, the *inter*-organisational sphere refers to how a focal company can interact with its so-called primary supply chain stakeholders (i.e. suppliers at the supply side and customers at the demand side). Second, the *intra*-organisational level describes the interaction between functional units that constitute the company's internal supply chain such as purchasing, manufacturing and sales, which is discussed with regard to SSCM. Third, the sub-organisational interaction is also located within the company, but it focuses on supplementary functional units, such as the sustainability or accounting department, that support the supply chain. Finally, the supra-organisational sphere provides insights about how a focal company can interact with secondary supply chain stakeholders, external to the company (also understood as non-traditional chain members) such as NGOs and universities to contribute to SSCM. This paper does not merely study the different spheres of interaction, but also discusses the interaction of the spheres from a theoretical and practical point of view. Essentially, one aspect highlighted in the paper is that SSCM asks for advanced forms of interaction to address the multifaceted environmental, social and economic challenges companies are facing nowadays. Thereby, further insights into risk and opportunity-oriented approaches of companies to SSCM are provided.

Keywords: corporate sustainability, interaction, resources, spheres, stakeholder, sustainable supply chains, sustainable supply chain management, sustainability management

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1 Introduction

Companies face the challenge of being held responsible for environmental, social and economic impacts not only of their own business but also their supply chains (e.g. Amba-Rao 1993; Seuring & Müller 2008). Stakeholder demands for sound labour conditions at suppliers' sites in the textile sector or for more fuel-efficient transportation leading to lower greenhouse gas emissions in worldwide logistics exemplify the considerable relevance of sustainable supply chain management (SSCM). This paper deploys the argument that a company can gain competitive advantage and it can foster the sustainable development of the economy, the environment and society when it engages in creating sustainable supply chains. A sustainable supply chain, thereby, can be broadly defined as "one that performs well across all three dimensions" (Ashby et al. 2012, p. 509) of sustainability. In this paper, it is argued that a company's engagement for SSCM can be facilitated if it interacts, meaning if it exchanges resources with different types of *supply chain stakeholders* that can be located within and related to the company's supply chain.

Stakeholders that are located within the supply chain are termed *primary supply chain stakeholders* in the remainder of this paper (e.g. Cetinkaya 2011; Harms & Klewitz 2013). Those being within the supply chain, but external to the focal company are, for instance, suppliers and customers (e.g. Lambert et al. 1998; Mentzer et al. 2001; Seuring & Müller 2008). In addition, departments such as purchasing, manufacturing and sales are also part of the supply chain, but internal to the company (Harland 1996; Lambert et al. 1998; Harms 2011). Apart from this, *secondary supply chain stakeholders* (e.g. Cetinkaya 2011; Harms & Klewitz 2013) are not part of the supply chain, but are related to it and they can support a company's SSCM engagement. Functional units that are internal to the company such as the sustainability/corporate social responsibility (CSR) department and human resources (HR) can be regarded as examples. Finally, secondary supply chain stakeholders that are also related to the supply chain, but are external to the company such as non-governmental organisations (NGOs) or competitors (e.g. Pagell & Wu 2009) can interact with the focal company.

By building on these distinctions and by pursuing the aim of analysing possible forms of interaction in SSCM the following research question can be formulated: *How can a company interact with its supply chain stakeholders to facilitate the creation of sustainable supply chains?*

In order to address this question, the analysis of a company's interaction with the different kinds supply chain stakeholder is put forward by introducing four *spheres of interaction*. As it

will be explained in more detail in the following the *inter-* respectively *intra*-organisational sphere of interaction refers to interaction with primary supply chain stakeholder that are external respectively internal to the focal company. The *sub-* respectively *supra*-organisational sphere, in contrast, refers to the cases when a company exchanges resources with secondary supply chain stakeholders that are internal respectively external to the company.

While considering the different interaction spheres, in more general terms, SSCM can be understood as the connection between corporate sustainability (CS) and supply chain management (SCM; e.g. Seuring & Müller 2008; Schaltegger & Harms 2010; Ahi & Searcy 2013). Thereby, SSCM not only involves dealing with risks such as damaged reputation due to unfavourable conditions at the suppliers' site or extra costs when environmentally or socially-driven measures are implemented within the company and along the supply chain. SSCM can also provide opportunities (Seuring & Müller 2008; Harms et al. 2013; Harms & Klewitz 2013). Choosing an opportunity-oriented SSCM strategy and incorporating sustainability criteria, companies can develop new products and services or introduce innovations on the process or organisational level (Geffen & Rothenberg 2000; Carter & Jennings 2004; Seuring & Müller 2008; Harms & Klewitz 2013). A suitable illustration of such innovation and possible market opportunities in SSCM is, for instance, a company establishing product recycling as a closed-loop supply chain that includes a new product design in order to optimise resource use (e.g. Matos & Hall 2007; Halldórsson et al. 2009). More generally speaking, literature refers here not just to SSCM but also to terms such as environmental supply chain innovations, sustainability-oriented innovations (SOIs) and innovations for sustainability (Fichter & Paech 2004; Hall 2006; Klewitz & Hansen 2013; Harms & Klewitz 2013).

In other words, when dealing with risks and opportunities in SSCM, a focal company can foster the relationships with its primary and secondary supply chain stakeholders and can interact with them in different organisational spheres. *Interaction* itself is here understood as mutual or reciprocal action among two or more elements, which affect each other (Siggelkow 2001; Grönroos 2011; for more detail on this definition see section 2.3). For a better understanding of the following sections, here, it has also to be noted that this framework paper focuses on interaction between a focal company and its supply chain stakeholders. This comes about while being aware that a huge variety of other stakeholders not impacting the supply chain also exist. In addition, this paper mainly refers to supply chains rather than to networks.

While the focus on supply chains implies reduced complexity, integrating sustainability thinking, i.e. incorporating the three dimensions of business, environment and society into the con-

text of supply chains, appears even more complex when compared with conventional SCM (e.g. Gold et al. 2010; Kuik et al. 2011). Apart from the economic dimension (including a considerable number and a diverse set of suppliers, a broad range of purchased products and services), companies also need to consider the environmental and social dimensions relating to their own areas of operations. These peculiarities of complex supply chains can refer, for instance, both to dissimilarities in environmental laws or social circumstances in different countries and to widespread expectations of a company's engagement in SSCM by different stakeholders such as NGOs (e.g. Seuring & Müller 2008; Walker et al. 2008).

Accompanying this complexity, SSCM encompasses the management of a multitude of relationships between interacting partners. If supply chains are examined from the viewpoint of interaction, research can build on a large body of literature (e.g. Seuring & Müller 2008; Peters et al. 2011). However, the study of sustainable supply chains, and in particular the interaction between a company and its primary and secondary supply chain stakeholders, is a relatively new and evolving field of research and, consequently so far, it has been examined rather less frequently (e.g. Ashby et al. 2012; Ahi & Searcy 2013). As a consequence, by drawing on the inter-, intra-, sub- and supra-organisational spheres, and by combining these spheres, this framework paper aims to simultaneously provide a systematic and a novel approach to the analysis of interaction for sustainable supply chains.

A thorough analysis of forms of interaction is facilitated by the application of different theoretical lenses hereafter, which are linked to stakeholders and resources exchanged as well as a mixed-method approach. The next section outlines the theoretical background on interaction in SSCM, while the third section elucidates the typology of forms of interaction presented in this paper. In section 4, the chosen interaction approach is discussed and extended, and some propositions and managerial implications are put forward. Section 5 discusses several limitations and suggests directions for future research. The framework paper closes with concluding remarks.

2 Theoretical Foundation for SSCM and Interaction

In addition to the distinction between a risk-oriented and an opportunity-oriented SSCM strategy, further deliberations can be found in the academic literature. For instance, literature analyses other strategic approaches to SSCM (e.g. Halldórsson et al. 2009; Peters et al. 2011), designs models of SSCM practices and their linkage to innovation (e.g. Pagell & Wu 2009) and investigates the management of relationships in SSCM that are internal and external to the

company (e.g. Harland 1996; Lambert et al. 1998). Nevertheless, current research suggests that there is a particular need for further studies with a view to building a more advanced theory and a need for the development of new concepts for SSCM (e.g. Carter & Easton 2011; Seuring 2011). Furthermore, a potential shift in research has been observed in companies from conventional SCM and purchasing to more sustainability-oriented efforts (Pagell et al. 2010). In this framework paper aiming at the discussion of interaction in SSCM from the different organisational spheres, the outline of this PhD thesis is presented in

Figure 1.
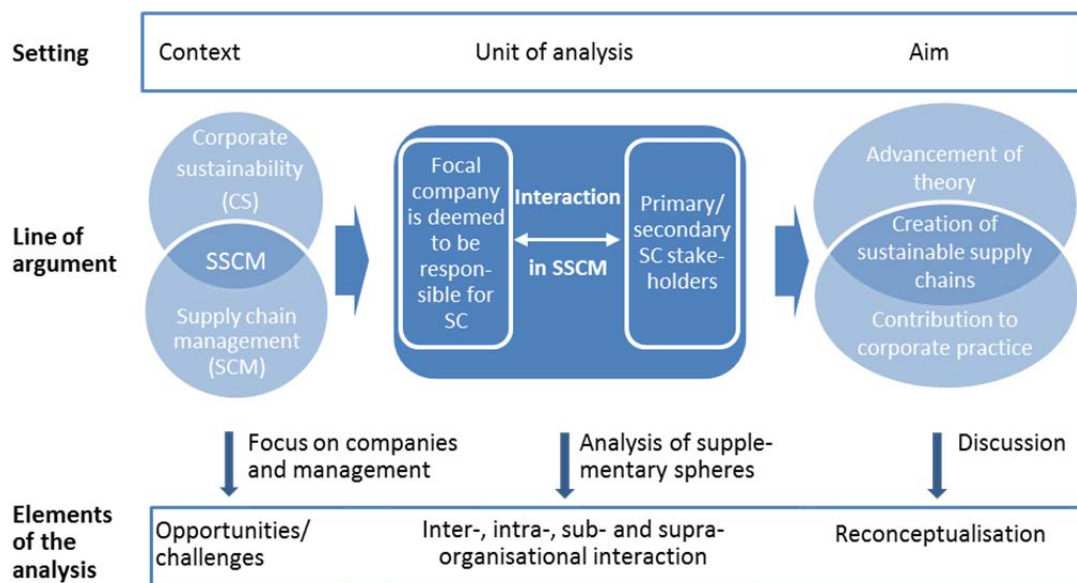
Figure 1: Outline of paper-based PhD thesis

Grounded both in the fields of CS and SCM, this *context* makes it possible to shed light on SSCM research and practice from different points of view. The distinction between opportunities and challenges of SSCM offers a pragmatic classification of various SSCM aspects that have also been taken into account by other scholars in their studies of drivers and barriers of environmental SCM (Walker et al. 2008).

The *unit of analysis* of this framework paper is the interaction in sustainable supply chains between at least two parties, i.e. between a focal company and its primary or secondary supply chain stakeholder. The choice of interaction as the unit of analysis is based on the assumption that competitive advantage can be gained when considering 'supply chain vs. supply chain', rather than 'firm vs. firm' (Lambert & Cooper 2000; Persson & Håkansson 2009). This is due

to companies competing on the basis of their supply chains, rather than as single entities. Having this in mind, interaction along the supply chain can facilitate the acquisition, exchange and use of resources, while also promoting the development of new products (e.g. Lambert & Cooper 2000; Hartono & Holsapple 2004; Hult et al. 2010). Some authors even contend that inter-organisational knowledge and the capabilities developed in supply chains can themselves be considered a resource that offers a competitive advantage (e.g. Gold et al. 2010; Lai et al. 2010; Sarkis et al. 2011). The debate on resources and interaction with supply chain stakeholders based on theoretical points of view, such as the resource-based view (Barney 1991) and the relational view (Dyer & Singh 1989), will be covered in further depth later in the paper (section 3.4).

The *aim* of this thesis is reflecting on and reconceptualising SSCM approaches to facilitate the creation of sustainable supply chains by building on empirical analyses and conceptual schemes in the fields of CS and SCM. Thereby, this framework paper strives for contributing to the development of SSCM theory and at the same time to being relevant from the practitioner's viewpoint. With this in mind, the next sections lay the theoretical foundations for the analysis of interaction in SSCM.

2.1 SSCM as the Connection between CS and SCM

As the study of SSCM is an evolving field, it is not surprising that a wide range of definitions is found, which can be reviewed comparatively (Ahi & Searcy 2013). Before the characteristics of SSCM are specified, understandings of both CS and SCM are presented. These have developed independently but parallel to SSCM over the last years (Ahi & Searcy 2013).

Corporate sustainability (CS) implies that all three dimensions of sustainability are simultaneously integrated into a company's activities so that companies can contribute to both the sustainable development of their own firm and the overall sustainable development of the economy, environment and society (Schaltegger & Burritt 2005). Terms like CSR, sustainability management and business sustainability also arise and are sometimes used interchangeably (Loew et al. 2004). The meaning of *supply chain management* (SCM) is also subject to constant change. It was introduced as a new concept in the early 1980s, but since then the focus has moved from the planning and control of material flows to include the management of other flows, such as service and information. Further noticeable aspects are the references to internal and external relationships and networks, value creation or efficiency and performance

orientation (Harland et al. 1996; Lambert et al. 1998; Mentzer et al. 2001; Ahi & Searcy 2013).

Combining the understanding of CS and SCM allows the identification of some major characteristics that form the basis for definitions of *SSCM* and *Green SCM*. In their literature analysis, Ahi and Searcy (2013) compare 12 SSCM and 22 Green SCM definitions with those of business sustainability and SCM. While they bear out that the SSCM definitions address a wider range of aspects than their Green SCM counterparts, they also show that none of the definitions investigated cover all of the aspects identified in CS and SCM definitions. They therefore propose a more comprehensive definition:

> *"The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term."*
> (Ahi & Searcy 2013, p. 339)

In line with the definition by Seuring and Müller (2008, p. 1700), which was also part of the comparative literature analysis, Ahi & Searcy (2013) emphasise inter alia a) the *integration* of the economic, environmental and social dimensions into the business activities, b) the *flow* of resources (material, information and capital) and c) the company's *externally and internally linked* business activities. These three aspects – including expanded, more intense treatment of the third – will also be the cornerstones of this framework paper. To deepen the understanding of SSCM, the next section draws on theoretical and methodological approaches in research so far.

2.2 Organisational Theories and Methodological Approaches in SSCM Research

Just as the definitions and research agendas in SSCM are multifaceted, so are the corresponding organisational theories and methodological approaches. To structure this field, systematic literature reviews that analyse definitions (Ahi & Searcy 2013), identify specific schools (Seuring & Müller 2007) or develop frameworks and models for (re-)conceptualising SSCM (Carter & Rogers 2008; Seuring & Müller 2008; Pagell & Wu 2009; Gold et al. 2010) provide orientation. In addition, common theoretical approaches were analysed to propose future research directions (Carter & Easton 2011; Sarkis et al. 2011). Thus, Sarkis et al. (2011) ana-

lysed 14 organisational theories to establish their usefulness in expanding the understanding in the field of Green SCM research. One of their results was that *organisational theories* were well suited to the investigation of the organisation of sustainable supply chains. They further claimed that it was possible to make use of established theories such as the resource-based view (Barney 1991) and then develop new theories to address current as well as unforeseen challenges. Carter and Easton (2011), in addition, reviewed the SSCM literature of the last 20 years focussing inter alia on the subject, the theoretical perspective and the methodological approaches incorporated in the 80 papers investigated. With respect to the *subject*, they found, for instance, that environmental issues were predominant compared to safety issues. They also noted an increased adoption of multiple *theoretical perspectives* in one paper. Papers applying one theoretical lens were most frequently based on the stakeholder approach (Freeman 1984) while papers referring to the (natural) resource-based view (Barney 1991; Hart 1995) came next. The *methodology* employed in most publications was the conduction of surveys, though this reduced over time, while case study research increased. They also identified other methodological approaches, such as archival data, systematic literature reviews, interviews and conceptual theory building; however, these were found less often. In earlier research Seuring et al. (2005) and Seuring (2008) had also investigated appropriate methodologies for (S)SCM. While more recent studies were concerned with case study research, the earlier work particularly highlighted the wide range of possible approaches and made suggestions on that what was needed for new research methodologies was advanced conceptual and theoretical approaches. Based on these findings this framework paper aims particularly at advancing the theory while structuring the field of SSCM in different spheres of interaction.

2.3 Interaction in Inter-, Intra-, Sub- and Supra-Organisational Spheres

The term *interaction* as it is applied in this paper, builds on definitions introduced in management literature. Firstly, interaction in the social context can be defined as a mutual or reciprocal action between at least two parties, which affect each other (Grönroos 2011). A more abstract definition considers two elements "to interact, if the value of one element depends on the presence of the other element" (Siggelkow 2002, p. 127). Embedded in research on complex interdependent systems, this second definition would also appear to be applicable to the discussion of sustainable supply chains, which are equally considered to be complex. Thirdly, the Industrial Marketing and Purchasing – in short IMP – group (e.g. Håkansson 1982; Persson & Håkansson 2009) introduced an interaction model by connecting the dimensions of the agent, the environment, the atmosphere and the interaction process itself, whereby the last

encompasses the exchange of products and services, information, capital and social exchange (Alfonso et al. 2010). The focus on the processual character of interaction in this framework paper ergo implies that it will mainly be the 'how' of interaction that is analysed, while the 'who and with whom' (companies and stakeholders) and the 'what' is exchanged (resources) will not be investigated in any great detail. However, to the enhance understanding of interactions in (sustainable) supply chains, the next section provides some brief remarks on stakeholders and resources.

2.3.1 Stakeholders and Resources

Stakeholders are characterised as groups or individuals, who affect or are affected by companies (Freeman 1984). While this is a broad definition for stakeholders in general, particular characteristics can be depicted when stakeholders represent actors in the supply chain setting. The so-called *primary supply chain stakeholders* relate directly to the focal company and its business by having an official, formal arrangement with(in) the focal company, whereas the *secondary supply chain stakeholders* are either not part of the supply chain, but have an influence on it, or they are themselves affected by the supply chain (Cetinkaya 2011). Another way to classify the interacting partners can be seen in this five-fold distinction between stakeholders (Henriques & Sardosky 1999; Harms & Klewitz 2013):

- *Organisational* stakeholders: are able to directly impact the focal company (e.g. customers, suppliers, employees);
- *Regulatory* stakeholders: set regulations or have an impact on the setting (e.g. governments, standardisation organisations, competitors);
- *Community* stakeholders: have the ability to mobilise public opinion (e.g. NGOs, local communities, advocacy groups);
- *Science* stakeholders: generate and disseminate knowledge (e.g. universities, science parks, research institutes);
- *Media*: exchange of information about e.g. current debates on sustainability issues (e.g. press, telecommunication, internet media).

In the sustainability management literature, these five stakeholder groups have been widely studied so that in the following sections frequent reference will be made to this research. Associated with the SSCM definition, Figure 2 illustrates this classification of stakeholders complemented by illustrating the flow of resources between the supply chain partners. In

SCM terms, three kinds of resources are usually entailed (see also Seuring & Müller 2008; Harms & Klewitz 2013):

- *Material*: characterised as a feedstock or physical product with regard to its environmental/social impact when used;
- *Capital*: regarded as a financial means that indicates the monetary value of what is bought from the seller or paid by the customer;
- *Information*: can be understood as "the creation of purpose-oriented knowledge" (Schaltegger & Burritt 2000, p. 404).

As it will be shown in section 3.4, other resources may also be exchanged between the interacting partners, such as energy or personnel commitment, but for now, the characterisation of resources is restricted to those that are conventionally mentioned (Schaltegger 2002; Blanco 2009; Harms & Klewitz 2013).
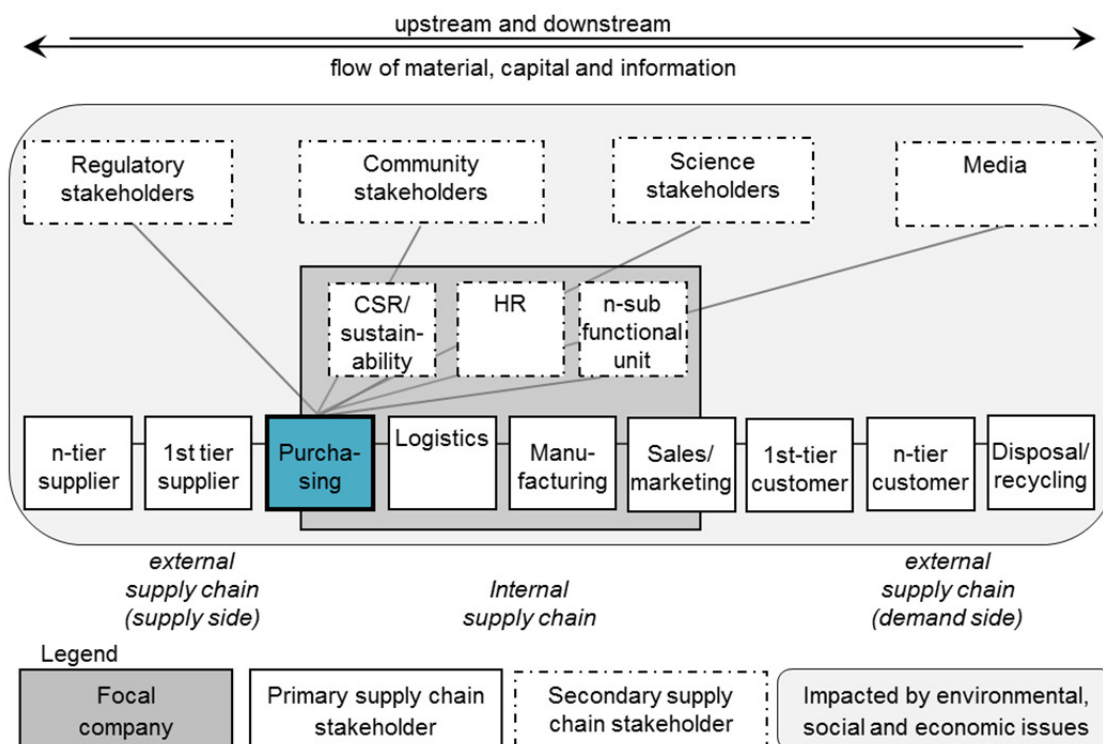
Figure 2: Stakeholders and flow of resources in SSCM interaction

(based on Harms & Klewitz 2013, p. 113 and according to the understanding of Harland 1996, p. S63; Seuring & Müller 2008, p. 1700, Cetinkaya 2011)

After having illustrated the understanding of interaction in the SSCM context in the following sub-section, the different organisational spheres identified as relevant for facilitating the creation of sustainable supply chains will be presented and discussed in detail.

2.3.2 Organisational Spheres

The extent and nature of a company's interaction with their stakeholders for the exchange of the necessary resources affect their capacity to manage innovation and risks. By referring to work on networks (e.g. Clarke & Roome 1995), stakeholder impact (e.g. McLarney 2002) and socialisation (e.g. Antonacopoulou & Pesqueux 2010) that distinguish between three levels of interaction (inter- respectively trans-, intra- as well as supra-organisational), this paper conceives the interaction within a company more diversely and adds sub-organisational interaction as a fourth sphere. Consequently, this thesis adopts a typology of four organisational spheres to illustrate how interaction in the context of sustainable supply chains can be understood.

- *Inter-organisational* interaction: This can be considered as a conventional interaction sphere in (S)SCM, since many according definitions include the direct relationship with external supply chain partners such as suppliers and customers (e.g. Lambert et al. 1998, p. 1; Carter & Rogers 2008, p. 368; Seuring & Müller 2008, p. 1700; for an overview see Ahi & Searcy 2013). Sometimes also termed verbatim as trans-organisational (e.g. Clarke & Roome 1995; Hult et al. 2007), this form of interaction usually refers to SSCM that stretches from the demand to the supply side of the external supply chain.

- *Intra-organisational* interaction: Such interaction is often discussed specifically in the context of the connection between functional units or departments of an individual organisation (Clark & Roome 1995; Lambert et al. 1998; Harms 2011; Kuik et al. 2011). In applying these findings to the supply chain, there are the purchasing, production, distribution and also sometimes mentioned the sales departments (Harland 196; Pagell 2004), which shape the internal supply chain, as they are "involved in the flow of materials and information from inbound to outbound ends of the business" (Harland 1996, p. S64).

- *Sub-organisational* interaction: As a complement to the intra-organisational sphere, other functional units that are not part of the internal supply chain such as the sustainability/CSR department, HR or accounting can also interact. In the context of this paper, they support the company's business activities aiming to create a sustainable supply chain by developing environmental programmes, recruiting qualified employees or providing current data on internal costs (Lambert et al. 1998; Epstein 2008).

- *Supra-organisational* interaction: This can be understood as the interaction of a focal company with other organisations such as NGOs, competitors or universities, which share "a common concern or set of problems" (Clark & Roome 1995, p. 193). So far, only a few

in-depth studies on the supra-organisational perspective exist in the literature on knowledge transfer, learning and innovation (e.g. Carayannis 1999). Pagell and Wu (2009) were able to give examples of focal companies that interact with "nontraditional chain members" (Pagell & Wu 2009, p. 39 with reference to Johnston & Linton 2000) such as NGOs or regulators, while also pointing to the need for further research in the field of sustainable supply chains. The authors use the expression to 'reconceptualise' the supply chain, thereby proposing more refined approaches in SSCM.

Having outlined the key elements of this framework paper, the next section presents the findings on the four spheres of interaction exposed in the dissertation project.

3 Findings on Spheres of Interaction in the Sustainable Supply Chain Context

Building on both empirical studies and conceptual work developed in the paper-based PhD thesis, the findings on interaction in the sustainable supply chain context are critically evaluated with the aim to achieve an advancement of theory and to contribute to corporate practice. Figure 3 condenses the different spheres of interaction serving as a basis for future discussion. The left side of the matrix represents the relation of stakeholders to the supply chain. Supply chain stakeholders can be located within or related to the supply chain. The upper side of the matrix refers to the relation to the company with locating stakeholders external and internal to the company. Combining these two relations leads to four quadrants. If, for instance, a company interacts on an inter-organisational level with stakeholders within the supply chain and external to the company this is illustrated by the upper left quadrant. Following this structure clockwise all four interaction spheres can be examined as it will be done in the sections 3.1 to 3.4.
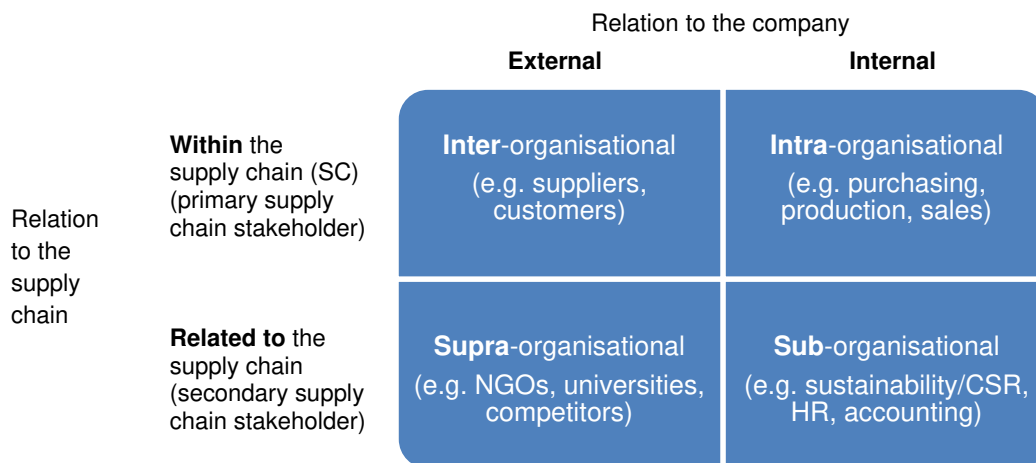
Figure 3: Matrix of interaction spheres in the SSCM context

3.1   Inter-Organisational Interaction

If a focal company exchanges resources with its suppliers or customers, these partners interact on an inter-organisational level. There are contractual relationships between the focal company and its first tier suppliers and customers whereas at a higher tier, usually no formal contract is given. In closed-loop supply chains, the group of primary supply chain stakeholders comprises all (n-tier) suppliers and customers, as well as other business partners such as disposal and recycling, as they – even if not bound by contract – have a direct impact on the supply chain (Cetinkaya 2011; Kuik et al. 2011).

In the present research, a survey among 32 large German listed companies was conducted between November 2008 and January 2009 to depict the current state of large German companies (Schaltegger & Harms 2010; Hansen et al. 2011; Harms et al. 2013). By referring to the conceptual distinction of SSCM strategies by Seuring and Müller (2008), Harms et al. (2013) analysed two SSCM strategic approaches – a risk-oriented and an opportunity-oriented strategy – and focussed on supplier management. The risk-oriented strategic direction refers to supplier evaluation and supplier selection, two of the three key aspects of supplier management (Reuter et al. 2010), whereas the opportunity-oriented approach to managing supply chains for sustainable products is rather assigned to supplier development. The analysis of the large listed companies in Germany reveals that they pursue a risk-oriented strategic approach rather than an opportunity-orientated one. Harms et al.'s (2013) findings, for instance, result from the insight that the companies mainly formulated defensive goals for SSCM, such as securing reputation or risk reduction. In addition, reactive supplier management measures such as the exhortation of suppliers were more frequently employed, while market-oriented departments such as research and development (R&D) and sales/marketing were not predominant drivers in SSCM. However, there were also signs of opportunity-oriented strategic approaches in SSCM: the large German companies expected customers to be their main future drivers and also engaged in supplier development, which can be regarded as a more progressive supplier management approach.

When examining Germany's largest listed companies in terms of their size (by market capitalisation; Schaltegger & Harms 2010; Hansen et al. 2011; Harms et al. 2011), the findings demonstrate that the largest listed companies (large cap) had progressed further in the implementation of SSCM practice and that their processes were more formalised than those of the second largest companies (mid cap). One reason for this can be seen in the fact that large cap companies usually source from a larger number of suppliers from a wider range of countries

compared to the mid cap companies. Therefore, supplier management is more formally organised to handle the complex process. In addition, larger companies seem to be more publicly exposed (Hall 2000; Bernstein & Greenwald 2009) and therefore SSCM and supplier management are organised on a superior level.

Abstracting from these results and applying the empirical results of SSCM research to the context of inter-organisational interaction allows some further suggestions and conclusions. First, the key role of large focal companies in managing their supplier relationships becomes evident because large companies may have the power not just to initiate environmental and social measures in their supply chains, they also have the resources to develop their suppliers in terms of reducing waste or improving the labour conditions at the suppliers' sites. Such improvements can subsequently trickle down (Holt 2004; Hansen et al. 2011). A multiplier effect on the n-tier suppliers may result if the direct suppliers of a focal company in turn demand similar enhancements from their suppliers (Preuss 2001; Hansen et al. 2011). Secondly, a focal company can also learn and benefit from the interaction with its suppliers, as they may have first-hand information on alternative material or sourcing options. Thirdly, the suppliers may provide detailed data on the material properties that the companies demand for calculating the product's environmental footprint, which, in turn, might be required by stakeholders of the focal company. Fourthly, if supplier management and the creation of sustainable supply chains are viewed from a more opportunity-oriented perspective, the basic understanding of the interaction as being reciprocal, then a focal company can be well-advised to exchange knowledge and experiences with its primary supply chain stakeholders in developing new products and services and in developing the supply chain. Following this thought, the term 'environmental supply chain innovation' introduced by Hall (2000; see also Franks 2000; Hall 2006; Arlbjørn et al. 2011) also highlights the inter-organisational innovation dynamic that supports new value creation for stakeholders along the supply chain (Harms & Klewitz 2013).

Of course, although various opportunities for a focal company and primary supply chain stakeholders can be created, inter-organisational interaction may not be as easy and simple as it may appear at this point. In terms balance of power, for instance, it is conceivable that a company is dependent on its suppliers because the supplier holds a monopoly position in the market or a small and medium-sized enterprise (SME) has no access to needed resources (Håkansson 1982; Hardy & Phillips 1998; Harms & Klewitz 2013). Therefore, with regard to challenges of information asymmetry and uncertainty as well as transaction costs that consider the new institutional economics (Coase 1937; Williamson 1975; Simpson et al. 2007; Hansen et al. 2011), a focal company, its suppliers and its customers would be well advised to scruti-

nise how they actually interact with company external supply chain partners. In addition, companies can also interact within the supply chain in the intra-organisational sphere what will be discussed in the next section.

3.2   Intra-Organisational Interaction

The exchange of resources between stakeholders internal to the company across the internal supply chain and thereby the combined knowledge and experiences of several functional units and departments of an individual organisation allows product features, such as material properties, market opportunities and sourcing options to be taken into account (Harland 1996; Pagell 2004; Lambert et al. 1998; Darnall et al. 2008; Harms 2011; Kuik et al. 2011). Purchasing, production, distribution as well as sales are mainly considered as the departments forming the internal supply chain (e.g. Harland 1996; Pagell 2004). Purchasing, thereby, is the department that fulfils the key role in managing the supply chain (e.g. Preuss 2001; Carter & Jennings 2004).

Therefore, supply chain-related interaction within a company can be appropriately discussed from a purchasing point of view. By adopting a conceptual study design and making use of the knowledge-based theory (Grant 1996; Sveiby 2001), Harms (2011) studies, inter alia, the interaction between purchasing and other functional units, which deal with sustainability as well as SSCM issues. Based on the understanding that sustainability and the creation of sustainable supply chains can be regarded as a cross-functional challenge, particular mechanisms of knowledge transfer are evaluated in what follows to give us a better understanding of the options for SSCM-associated information and the knowledge transfer between functional units.

In this paper (Harms 2011), two distinctions were taken into account: a distinction between explicit and tacit knowledge and another one between formal and informal communication (Grant 1996). If, for instance, a company aims to develop a novel, environmentally friendly and socially responsible product, its various functional units need to understand how they might cooperate to adequately fulfil the economic, environmental and social demands. For this type of product development, formal communication is helpful in making knowledge transfer across the internal supply chain explicit; on the other hand, informal communication will further the establishment of a common language across the various functional units (Harms 2011). By referring to the development of a product, this paper already partly addresses interaction between functional units within the internal supply chain (such as purchas-

ing and production) and related to it (such as research & development (R&D) and sustainability/CSR). This interaction will be discussed in further detail (section 4.2), dealing with the linkage between the intra- and the sub-organisational sphere.

If intra-organisational interaction takes place, internal improvements, such as more resource-efficient production or services processes, can be achieved (Sarkis 2001; Windolph et al. 2013), since the according departments are working jointly together. However, similar to the line of argument articulated in the context of inter-organisational interaction, hindering factors can also be observed since departments such as purchasing and marketing and sales, traditionally, appear structurally separated (Darnall et al. 2001). Moreover, it is imaginable that cultural differences between the departments or conflicting interests can hamper an advantageous interaction. Here, collateral activities require striving for the same or at least complementary (strategic) goals. Developing and pursuing common goals might be facilitated by mechanism related to the knowledge-based view such as routines or directives (Grant 1996; Harms 2011). Weekly meetings or fixed guidelines on procedures, to name but a few, allow developing a mutual understanding on how to interact.

3.3 Sub-Organisational Interaction

Establishing complex sustainability goals and practices within an organisation may also affect given processes or create the requirement for the development of new processes, which can result in the involvement of all functional units (Darnall et al. 2008; Epstein 2008, p. 90ff.; Windolph et al. 2013). The importance of cross-functional interaction and exchange of ideas, moreover, becomes clear if a company develops new products or services (e.g. Tan & Tracey 2007). In applying these findings to CS and SCM, apart from the intra-organisational interaction (see section 3.2) functional units that support supply chain activities can interact in a sub-organisational sphere.

Empirical research on functional units, not focussed on sustainable supply chains, but on corporate sustainability, builds on a survey among 468 large companies from eleven economically developed countries that was conducted between February and August 2012 (Schaltegger et al. 2013). The findings reveal that, although sustainability was considered as a cross-functional task, companies had different views on the way, in which functional units impact sustainability. In all countries surveyed, sustainability engagement was promoted most strongly by departments that were explicitly sustainability-related and externally-oriented, such as sustainability/CSR and corporate communications/public relations (PR). In contrast, perfor-

mance-oriented departments, such as finance and accounting appeared to show less of an active commitment to sustainability issues. When compared to the other departments examined (as cross-referenced to section 3.2), the departments of the internal supply chain ranked in a range between the middle and the lower third when it was assessed to what extent they promote corporate sustainability. These results are in line with an earlier survey of 109 large German companies, conducted between November 2009 and February 2010, which also demonstrates that sustainability is as not yet implemented cross-functionally (Schaltegger et al. 2011; Windolph et al. 2013).

In accordance with the typology introduced in this paper, strictly speaking the sub-organisational sphere does not embrace all functional units because it focuses on departments that do not form part of the internal supply chain but rather support the supply chain activities. At a first glance, this distinction between main and supporting functional units appears similar to the categorisation Porter (1985) proposed in his value chain concept (see also Lambert et al. 1998). However, Porter's differentiation between primary and secondary activities refers to the value chain and not to the supply chain, which implies that some functional units are regarded differently. Procurement, in particular, is part of the secondary activities in the value chain concept, while it is one of the core functional units of the internal supply chain. In this paper, the value chain concept is not discussed in great detail. Based on the idea of division of labour, all departments which sub-organisationally interact are characterised by the circumstances that they are indirectly related to the product and service creation process, and they undertake particular activities to support this creation process. For instance, one of the main tasks of accounting is to provide the top management with relevant information for well-founded decision making while establishing and maintaining a company's legitimacy is one core task of corporate communications/PR (Metzler 2001; Epstein 2008, p. 82; Windolph et al. 2013). In addition, it has to be noted that sub-organisational interaction is subject to similar challenges as intra-organisational interaction because every functional units is characterised by its cultural and structural particularities as well as differing goals and tasks. This leads to the understanding that not only a network of company external or internal supply chains is complex but also the interaction related to the supply chain activities.

This argument will be developed further in the next section when the fourth sphere of interaction, supra-organisational, is explained.

3.4   Supra-Organisational Interaction

Supra-organisational interaction reaches furthest in terms of novel approaches in research on sustainable supply chains while other fields of research, e.g. on networks or innovation (e.g. Clarke & Roome 1995), more often discuss this sphere of interaction. For the creation of sustainable supply chains, there is little knowledge at this point on how a focal company can interact with its secondary supply chain stakeholders (Cetinkaya 2011; Harms & Klewitz 2013), e.g. NGOs, the local community and competitors. On the one hand, it can be expected that exchanging resources with these stakeholders on a supra-organisational level challenges companies because the traditional view on supply chain management is broadened. On the other, interaction with the organisations mentioned may offer companies innovative ideas that lead to new products or sustainability-related improvements of the supply chain such as fewer costs because of a less waste, reduced greenhouse gas emission due to optimised transport or better occupational health and safety conditions due to appropriate precautionary measures.

Using the resource-based view (Barney 1991) and the relational view (Dyer & Singh 1989), Harms and Klewitz (2013) developed a conceptual framework on "how resource flows can occur in the interaction with different supply chain stakeholders" (Harms & Klewitz 2013, p. 105). The basis for the analysis was the idea that a company – in this case an SME – can come up with innovations in products/services, processes or organisational structures, which are environmentally and socially superior in character compared to a prior or other entity (Fichter & Paech 2004; Hansen et al. 2009; Hansen & Klewitz 2012). In the development of the so-called sustainability-oriented innovations (SOIs), it appears essential to take into account not only the resources needed, but also the sourcing alternatives, as supply chain characteristics, especially the duration of transport or the working conditions at the supplier's sites, may become particularly relevant for the marketability of the product/service. Due to their smaller size and their consequent lack of resources, SMEs in particular need to interact with other partners. Unlike the approaches introduced in sections 3.1 to 3.3, in the case of supra-organisational interaction, the feasibility of the development of innovations with secondary supply chain stakeholders, which can offer additional resources, such as information about trends in consumption patterns (by consumer assistance office), or about new technological trends (by science partners) is argued here. In the context of the 'information' resource, Pagell and Wu (2009) classify these interaction partners also as 'knowledge suppliers', whereas in this paper such stakeholders are rather broadly referred to as 'secondary supply chain stakeholders'. As proposed by Harms and Klewitz (2013), apart from the three types of resources, typically considered in the (S)SCM research, of material, capital and information, other re-

sources might also be exchangeable, such as natural resources and energy or personnel-oriented resources, such as organisational commitment and learning (Schaltegger 2002; Blanco 2009).

A fundamental aspect of the supra-organisational approach is that the concept is based both on the deliberations of the resource-based view and the relational view, and therefore considers gaining a competitive advantage as a key principle. In this way, Dyer and Singh's (1989) relational view can be regarded as an extension of Barney's (1991) resource-based view (Gold et al. 2010).

The interaction at a supra-organisational level can be more challenging, as the divergence of objectives and problem-solving strategies amongst secondary supply chain stakeholders is greater. Yet, "levelling knowledge disparities, differences in communication styles, etc., such interaction may lead to more radical innovations and initiate learning along supply chains" (Harms & Klewitz 2013, p. 121).

4   Discussion of Interacting Spheres to Create Sustainable Supply Chains

Pursuing the overall aim of this thesis, which is contributing to the creation of sustainable supply chains, the discussion is mainly based on deliberations on the relational view (Dyer & Singh 1998) as well as the resource-based view (Barney 1991). While these theoretical lenses as well as further deliberations on, for instance, the principal agent theory (Coase 1937; Williamson 1975), the stakeholder approach (Freeman 1984) and strategic approaches in SSCM (Seuring & Müller 2008) are more extensively discussed in the single papers of the PhD thesis, they are not explicated in great detail here, but are regarded as underlying fundamentals.

In detail this section aims to contribute to an advanced SSCM theory and the development of new approaches also for corporate practice. Having exemplified the different spheres and by linking the spheres of interaction by twos (see Figure 4) the following sub-sections 4.1 to 4.4 will discuss *interacting spheres*. Thereby, these sections put forward theoretical propositions and explicate managerial implications. The implications provided here shall be considered as exemplary because sustainable supply chains can be very different due to a great variety of companies and sectors.

Drawing on the matrix introduced in Figure 3 the Figure 4 illustrates the linkages between the interaction spheres represented by the four numbered arrows. In addition, each linkage is characterised by on notion to highlight its particularity. Spanning, for instance, combines inter- and the intra-organisational interaction and allows for discussing its relevance in terms of

boundary-spanning in the context of creating sustainable supply chains. Similarly, when turning in clockwise direction, all other three linkages can be investigated.

Spanning

Expanding

Crossing

Bridging
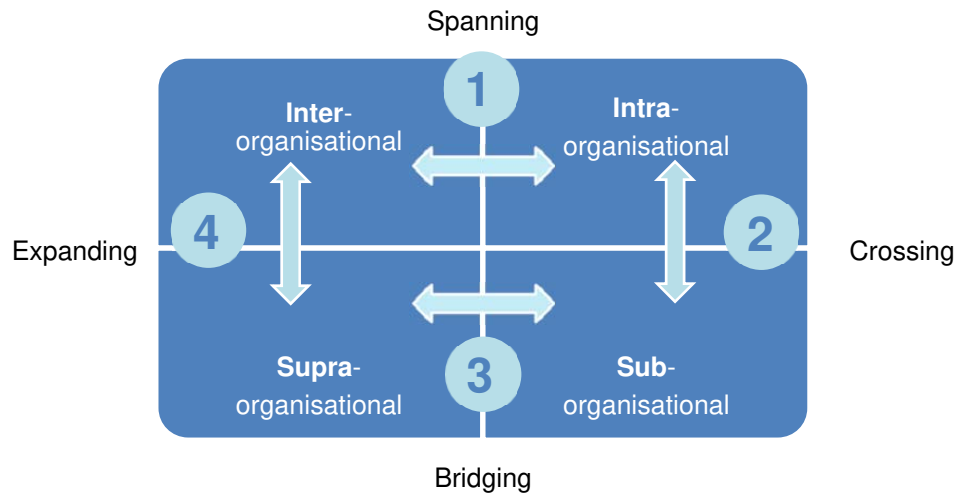
Figure 4: Framework of interacting spheres

4.1 Spanning through Inter-Intra-Linkage

Bringing together the inter- and intra-organisational sphere leads to combining interaction with primary supply chain stakeholders both internal and external to the company. This in turn means that SCM can be understood as a boundary *spanning* activity (Fawcett et al. 2008 with reference to Bowersox et al. 1999). If interaction along the entire external and internal supply chain is intended to develop approaches in order to reduce negative environmental or social impacts such as greenhouse emissions and occupational accidents or to jointly develop SOIs, boundary spanning teams can be formed (Matos & Hall 2007; Harms et al. 2011). Such teams allow for covering sustainability issues of the entire product life cycle – including considerations on win-wins or trade-offs as well as substitution and rebound effects (Seuring & Müller 2008; Boons et al. 2012; Harms & Klewitz 2013) – because the team members can exchange know-how, combine their expertise and can jointly develop new ideas (Matos & Hall 2007; Harms et al. 2011; Kuik et al. 2011). Of course it has also to be noted that, as commonly known, such teaming up may lead to extra cost of coordination and other related difficulties (Matos & Hall 2007). Imaginable difficulties are, for instance, differing expectations and goals by the team members or that they are differently equipped in terms of time, personal and financial resources. As a consequence, a company may weigh advantages and disadvantages of building boundary spanning teams that incorporate external supply chain partners such customers and suppliers as well internal supply chain stakeholders such as marketing and sales as well as purchasing.

Apart from assigning, purchasing a boundary spanning role (e.g. Preuss 2001; Carter & Jennings 2004; Persson, & Håkansson 2009) with regard to inter-intra-organisational interaction purchasing is also credited with a gatekeeping function (Peters et al. 2011). This is due to the potentially high relevance of evaluating, selecting and developing the suitable suppliers at the right time in the integration of environmental and social issues in procurement. Gatekeepers can be understood as key nodes within a system where communication and information flows play as central role such as in SSCM and developing innovation (Tushman 1977; Peters et al. 2011). As consequence result, the purchasing department can be considered as to be or at least to become strategically highly relevant when it comes to corporate responsibility of economic, environmental and social impacts of the own business and of the supply chains. Especially when novelties across the entire internal and external supply chain or of products/services such as sustainable supply chain innovations or SOIs concerning improved eco-efficiency or socio-efficiency (Lai et al. 2012; Boons et al. 2012; Windolph et al. 2013) are required, the purchasing department may need to be facilitated not just with bargaining experiences but also with supplementary knowledge, capabilities and tools like skills on how to take into account environmental and social issues or how to guide change processes and collaborate with others. When relation-specific investments such as seminars on collaboration are undertaken for the purchasing department and its internal and external supply chain partners, the relational view (Dyer & Singh 1998) argues that this can lead to a competitive advantage.

Proposition P1:

As purchasing plays a key role in SSCM, an advancement of capabilities and responsibilities of purchasers in the functional unit is required to build up long-lasting relationships across the entire external and internal supply chain.

Managerial implication:

Companies are well-advised to analyse how purchasing and supply chain processes are organised in terms of how inter- and intra-organisational interaction takes place. Such an analysis allows for identifying potentials for more intense collaboration between the primary supply chain partners and for focussing on strategically relevant partners. If it becomes apparent that either the internal or external primary supply chain stakeholders are lacking essential knowledge, capabilities and tools, two relation-specific investments can be made. First, companies are asked for integrating environmental issues and social issues within their business activities while also taking responsibility beyond the corporate boundaries in terms of creating sustainable supply chains. Second, companies are also asked for approaching these sustaina-

bility issues not purely as a risk, but as an opportunity to develop SOIs as well as supplier relationships. Although this change process may take some time due to traditional practice pioneers who try out new ways – first maybe in a pilot project – can gain competitive advantage by developing new relational-specific capabilities.

4.2   Crossing through Intra-Sub-Linkage

Both the intra- and the sub-organisational sphere cover forms of interaction within a company. Yet, the distinction made in this thesis between functional units being within the supply chain and related to it, on the one hand, appears to be useful in the context of sustainable supply chains. This is because SSCM-main activities such managing the material, information and capital flows and SSCM-supporting activities such as developing environmental programs or recruiting employees can be separately examined. On the other hand, work on *cross-functionality*, i.e. with regard to teams, processes, tasks, etc., is not just discussed in the (sustainable) supply chain context, but also widely in general management and corporate sustainability literature (e.g. Lambert & Cooper 2000; Epstein et al. 2008; Peters et al. 2011; Schaltegger et al. 2013; Windolph et al. 2013). In addition, it has to be noted that literature sometimes uses the term 'cross-functional' in a broader sense not making explicit which functional units are actually meant.

Cross-functionality can be regarded as a pre-requisite to address sustainable supply chain challenges and to comprehensively incorporate sustainability thinking and practice into day-to-day responsibilities and business because it is often so complex that several departments are required to contribute their proprietary knowledge (e.g. Matos & Hall 2007; Pagell & Wu 2009; Schaltegger et al. 2013). However, in order to enable fruitful interaction between the different functional units, a consideration of appropriate mechanisms should be supplemented by further aspects, such as establishing common goals, different cultural, etc. backgrounds or the ability to acquire new knowledge (Harms 2011). Therefore, apart from just the strategy and the structure of SSCM also cultural aspects can be addressed (Rüegg-Stürm 2005), within the purchasing department and the entire company. Here, companies can test alternative forms of organisational structures to increase the capacity to meet the demands of intra-organisational challenges in the integration of sustainability in the company and the supply chain structures. In the context of manufacturing and information technology, for instance, agile systems may be employed to continuously adapt to complex and constantly changing tasks.

As often discussed, top management's commitment and leadership to encourage needed changes and innovation also play a significant role in the CS and SCM context (e.g. Henriques & Sadorsky 1999; Tan & Tracey 2007; Pagell & Wu 2009; Harms et al. 2013). While the inclusion of SSCM issues in CSR reports document their relevance for the corporate image, which also affect strategic management decisions and management behaviour, (Tate et al. 2010) it is necessary to emphasise that additionally middle management and eventually every employee can have an impact on creating and further developing sustainable supply chains.

Moreover, one must not lose sight of the fact that it is individual human beings, who transfer not just knowledge, but also material and capital in the context of sustainable supply chains. This will produce another set of challenges to intra-organisational interaction since individuals are likely to have different perceptions of situations, assign different values to environmental and social concerns and represent imbalances in power, information and degree of uncertainty.

Proposition P2:

Establishing cross-functional relationships enables all functional units to jointly create sustainable supply chains because complementary subject areas are brought together. This is also true for departments that may not be part of the internal supply chain but are supporting it.

Managerial implication:

Although the general advantages of cross-functional teams are known, companies might devote more efforts in incorporating sustainability thinking into day-to-day business. For instance, a company may invest in developing a common understanding of what creating sustainable supply chains actually means for the entire company as well as for the single departments. Thereby, a shift from being risk-oriented to becoming more opportunity-oriented can help to develop new approaches. New forms of company internal cooperation or improved processes that foster the design of innovation or make the work more efficient due to regular routines are illuminating examples. In addition, incentive systems that reward cooperation with other departments or working temporary in a different functional unit can foster building cross-functional relationships which are in line with mentioned changes on a strategically, structural and cultural level.

4.3 Bridging through Sub-Supra-Linkage

According to the typology introduced in this paper, a company interacts in the sub- or supra-organisational sphere if it exchanges resources with its secondary supply chain stakeholders whose typical area of activity is not within the supply chain, but is related to it. If a company is divided into specialised functional units, cross-functional interaction takes place firstly between the different departments such as sustainability/CSR, R&D and the legal department, to name but a few. Secondly, on a supra-organisational level a company can interact with its external secondary supply chain stakeholders such as NGOs, science partners or regulatory bodies. Combining both spheres means that, for instance, the R&D department and a university body can jointly engage in an innovation process. For instance, the design of a product-service-system (Hansen et al. 2009) that incorporates improvements along the supply chain such as optimised transport can stem from the interaction of innovative minds inside and outside firm. If a company interacts with stakeholders that are more distant to the core business, the idea of open innovation can be regarded (e.g. Chesbrough 2006; Harms & Klewitz 2013). Open innovation refers to the idea of making "use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough 2006, p. 1). As a second example, the sustainability/CSR department together with an NGO can establish voluntary sustainability initiatives in the context of SSCM. These are regarded as institutional arrangements that include, inter alia, guidelines, policies, codes of conduct, certification schemes and roundtables (UNEP 2000; Peters et al. 2011). Of course, a multitude of more examples, also within a network of three and more interaction partners, is conceivable.

Building a *bridge* between functional units and external stakeholders with both being related to and not being within the supply chain offers the opportunity to incorporate know-how and experiences distant to the main supply chain activities when sustainable supply chains are created. Certain know-how of an NGO on local conditions in a distant country or experiences of how to establish codes of conduct by the sustainability/CSR department can be valuable for the purchasing department and the entire company. Bringing together resources of remote interaction partners can lead to more diverse and innovative approaches, however at the costs of more disparities and more coordination needed (e.g. Matos & Hall 2007). Therefore, although less usual relationships can lead to unique relation-specific capabilities and, thus, can offer competitive advantage (Dyer & Singh 1998), in turn, possible negative consequences have also to be considered. Moreover, it has to be taken into account that albeit diverse points

of view might be useful in discussions to come up with new ideas in a company's context practicable solutions in terms of time and money are required.

Proposition P3:

Interaction with and between secondary supply chain stakeholders is valuable to broaden the scope of action fields in sustainable supply chains.

Managerial implication:

Although bridge building between different (secondary) supply chain stakeholders might be a challenging task due to a wide-ranging field of interests and backgrounds, a company can benefit from new insights. A discussion on the (future) scarcity of natural resources, for instance, is essential in terms of sustainable development of business and society as well as of the company but can also be challenging when a diverse set of stakeholders and their demands are considered. Nevertheless, assessing and possibly revising a company's short-, mid- and long-term goals of establishing sustainable supply chain can be worthwhile exercise together with stakeholders. These efforts can be a legitimation for a company's business and can provide market opportunities for product and service innovations.

4.4 Expanding through Supra-Inter-Linkage

Compared to inter-organisational interaction in the context of supply chains interacting on supra-organisational level is a rather new idea, although research in the fields of innovation and knowledge transfer offers work at this level (Clarke & Roome 1995; Chesbrough 2006; Pagell & Wu 2009). Based on empirical research Pagell & Wu (2009) exemplify how *expanding* the interaction with non-traditional supply chain members can take place with the result that supply chains can actually be reconceptualised. Therefore, combining both spheres for interaction offers a vast number of opportunities. First, companies are less dependent on particular interaction partners given they have access to a larger range of possible external supply chain stakeholders. Second, the company can have access to so far more remote resources. However, it has also to be taken into account that an increased number of primary and secondary external supply chain stakeholders require a proper management of the reciprocal relationships so that the costs for extra interaction may offset the advantages. In addition, it is worthwhile to note that the interaction partners themselves can be interconnected. Therefore, it is reasonable to view the structure of supply chains not just as single chains but as a net of relationships of primary and secondary supply chain stakeholders. As a consequence, establishing networks can help to prevent contrary arrangements with the interaction partners. Of

course, here it is also necessary to mention that setting up networks implies new challenges such as interdependencies between the network partners as well as the risks related to information asymmetry and uncertainty.

Proposition P4:

Expanding sustainable supply chain activities to interaction with external secondary supply chain stakeholders allows for reconceptualising traditional approaches and become more innovative.

Managerial implication:

As the supra-organisational perspective has only recently been translated to research of sustainable supply chains, adopting and reconceptualising established (S)SCM approaches, such as supplier management, to the interaction with secondary supply chain stakeholders offers further exciting opportunities. If a company evaluates, selects and develops also its external secondary supply chain stakeholders, such as NGOs or universities, it may benefit also from the knowledge of and experience in the management of secondary supply chain stakeholder. Moreover, a company can benefit from encouraging a supplier, for instance, to work together with a local NGO. If, all three partners aim at the same goal to improve the environmental conditions at the supplier's site, this might be not just favourable in terms of reduced risk of reputation damage of the focal company, but also for the environment in-situ. Here, a company may also consider alternative approaches such as collaborating with in industry associations to share costs for investing in developing the supplier.

5   Limitations and Directions for Future Research

Considering interaction in the SSCM context in literature the use of terms such as *external and internal relationships*, *collaboration*, *cooperation,* etc. is widespread (e.g. Håkansson & Ford 2002), and it appears that it is inevitable to understand them as key elements of SSCM. In order to contribute to novel insights to this viewpoint, the present paper investigates supplier management from the risk-oriented, as well as the opportunity-oriented side. In noting that opportunity-orientation is not as frequently applied, future research could be directed to more proactive approaches in the purchasing and supply chain departments. The IMP interaction approach (e.g. Håkansson 1982) might offer a suitable basis for investigating market-orientation in purchasing. Moreover, sustainable supply chain innovation (e.g. Hall 2001; 2006) features innovative approaches, as it asks for innovations across the supply chain, such, which also provide value for the supply chain stakeholders.

While this framework paper aimed at providing a structured analysis of interaction spheres to facilitate the creation of sustainable supply chain some limitations provide directions for future research. First, this thesis mainly refers to linear approaches in SSCM while closed-loop systems can also be discussed from a critical point of view. On the one hand, they may offer opportunities in terms of considering the entire life cycle of a product. On the other hand, such approaches might also be challenging due to difficulties in organising the return system (Halldórsson et al. 2009). In addition, future research may also be devoted not just to supply chains but networks. Here, the interaction between more than two parties might be discussed as well as the fact that a company can have two roles. Since a company can be a customer and a supplier at the same time, this may lead to possible challenges such a different dependencies with its business partners. Third, further studies can dedicate additional work to analyse the time dimension with respect to a short-, mid- and long-term perspective, which has be just briefly touched (see 4.3).

Apart from further developing theoretical approaches of SSCM, future studies may also devote more attention to transdisciplinary research designs. Such a research design might be in particular suitable to address key SSCM issues as it incorporates the practitioner's viewpoint and at the same time allows conducting rigorous academic research. Not only current but also future challenges appear to be of considerable relevance for companies because an increasing demand for resources, unstable economic and political conditions in distinct regions or disparity in health conditions can be observed worldwide. Transdisciplinary approaches may facilitate companies and scholars to develop concepts and measures that improve local, national and global conditions, although the complexity of sustainable supply chains will probably remain.

From a critical point of view, Halldórsson et al. (2009) bring also into the field that conventional supply chain management might be considered as amongst the roots of unsustainable behaviour due to (short-termed) economic driven management decisions. These decisions may hamper the development of innovations, such as new ways of resource supply or the development of sound working conditions. Yet, they argue that if sustainability becomes the predominant constituent of a company's strategy alternative solutions such as a local sourcing instead of global sourcing might be developed. Here, alternative forms of interaction with primary and secondary supply chain stakeholders could also be regarded as advancing the conventional field of SCM. Teaming up with NGOs or competitors might be challenging due to – in the first instance – different goals or due to concerns of disclosing sensitive information, but interacting with such stakeholders might also offer opportunities in terms of learn-

ing about different points of view or sharing information and experiences in the same field of business. Here, it has also to be noted that this framework paper focused on business. Of course, endeavours to facilitate the creation of sustainable supply chain can also be undertaken by political bodies, such as fostering environmental or social initiatives to remedy shortcomings, such as poor labour conditions, across the supply chain.

More generally speaking, scholars, companies as well as political bodies are asked to reflect on the question whether they strive for a *sustainable* supply chain management or even *sustainability* supply chain management. This is in line with the distinction between *sustainable management* and *sustainability management*. While *sustainable management* means that a company addresses environmental and social issues supplementary to the established business, *sustainability management* implies that a company attempts to contribute to the sustainable development of the enterprise as well as of the society and economy as whole (Schaltegger & Wagner 2011). Taking this into account *sustainability supply chain management* can be understood as an advancement of conventional SCM approaches. Here, measures taken along the supply chain can, on the one hand, be attributed to the economic success of a focal company and its suppliers and customers. On the other, these measures could also contribute to sustainable development in terms of improved environmental and social conditions along the entire supply chain. With this in mind, together with their primary and secondary supply chain stakeholders companies may start to reconceptualise their products and services as well as the according supply chains. One already existing example is the fair trade idea, where companies offer sustainable products while also having the explicit goal to improve the supply chain in terms environmental and social aspects.

6   Concluding Remarks

Aiming for the creation of sustainable supply chains, understood as linking CS and SCM, is increasingly of interest in research and for companies. Yet, current research also argues that there is a need for an advanced theory building and a development of new concepts. With this in mind, this thesis provided a structured analysis of how a company can interact with its primary and secondary supply chain stakeholders to facilitate the creation of sustainable supply chains. Based on the distinction between the inter-, intra-, sub- and supra-organisational sphere, this framework paper discusses alternative forms of interaction in order to provide value for both scholars and practitioners. Thereby, this paper aims at a deeper understanding of how interaction can take place and how the forms of interaction between supply chain

stakeholders and the exchange of resources can be reconceptualised. Essentially, such a re-conceptualising of supply chain thinking allows for the development of products and services as well as supply chain innovations that contribute to sustainability while the companies can gain a competitive advantage.

7   Literature

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Annex

Contribution I (journal article, double blind peer reviewed, published)

Harms, D.; Hansen, E.G. & Schaltegger, S. (2013): Strategies in Sustainable Supply Chain Management: An Empirical Investigation of Large German Companies, Corporate Social Responsibility and Environmental Management, Vol. 20, No. 4, 205–218.

Contribution II (journal article, double blind peer reviewed, published)

Hansen, E.G.; Harms, D. & Schaltegger, S. (2011): Sustainable Supply Chain Management im globalen Kontext: Praxisstand des Lieferantenmanagements in DAX- und MDAX-Unternehmen, Die Unternehmung, Vol. 65, No. 2, 87–110.

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Harms, D. (2011): Environmental Sustainability and Supply Chain Management: A Framework of Cross-Functional Integration and Knowledge Transfer, Journal of Environmental Sustainability, Vol. 1, No. 1, 121–141.

Contribution IV (journal article, double blind peer reviewed, published online)

Windolph, S.E.; Harms, D. & Schaltegger, S. (2013): Motivations for Corporate Sustainability Management: Contrasting Survey Results and Implementation, Corporate Social Responsibility and Environmental Management.

Contribution V (study, published)

Schaltegger, S.; Harms, D.; Hörisch, J.; Windolph, S.E.; Burritt, R.; Carter, A.; Truran, S.; Crutzen, N.; Ben Rhouma, A.; Csutora, M.; Tabi, A.; Kokubu, K.; Kitada, H.; Haider, M.B.; Kim, J.D.; Lee, K.-H.; Moneva, J.M.; Ortas, E.; Alvarez-Etxeberria, I.; Daub, C.; Schmidt, J.; Herzig, C. & Morelli, J. (2013): International Corporate Sustainability Barometer. An empirical analysis in 11 countries, Lüneburg: Center for Corporate Sustainability Management.

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Contribution I (journal article, double blind peer reviewed, published)

Harms, D.; Hansen, E.G. & Schaltegger, S. (2013): Strategies in Sustainable Supply Chain Management: An Empirical Investigation of Large German Companies, Corporate Social Responsibility and Environmental Management, Vol. 20, No. 4, 205–218.

Strategies in Sustainable Supply Chain Management: An Empirical Investigation of Large German Companies

Dorli Harms,* Erik G. Hansen and Stefan Schaltegger

Centre for Sustainability Management (CSM), Leuphana Universität Lüneburg, Germany

ABSTRACT

Companies which manage global supply chains face a high level of complexity with a large number of suppliers in diverse socio-economic contexts and growing expectations of customers and standardization schemes to control social and environmental aspects. In the context of sustainable development, the effective management of supplier relationships has therefore attracted particular attention in sustainable supply chain management (SSCM). This paper investigates two SSCM strategic approaches in Germany's largest stock companies with regard to supplier management. Supplier evaluation and selection adopts a risk-oriented strategic perspective whereas supplier development represents a business-opportunity-oriented approach to managing supplier chains for sustainable products. The survey-based analysis reveals that large German stock companies mainly implement risk-oriented SSCM strategies. Copyright © 2012 John Wiley & Sons, Ltd and ERP Environment

Introduction

TO REDUCE COSTS, MANY COMPANIES TRANSFER LARGE PARTS OF THEIR VALUE-ADDED PROCESSES TO SUPPLIERS IN countries with lower cost levels (Beske *et al.*, 2008; Cheung *et al.*, 2009; Reuter *et al.*, 2010). This often goes along with high reputational risks due to poor working or environmental conditions at the production sites of the suppliers (Reuter *et al.*, 2010). Media attention and consumer boycotts in, for instance, the textile or food industry illustrate this reputational risk (Locke, 2003; Teuscher *et al.*, 2006). It does thus not astonish that customers, media, and regulators ask for a proof that sustainability aspects have been considered well at all stages of the global supply chains (Beske *et al.*, 2008; Leire and Mont, 2010).

Hence, supply chain management (SCM) is not only challenging because of complex international distribution channels of goods and services or long distances between a large number of suppliers (Reuter *et al.*, 2010), but also because of the diverse and often unstable political and socio-economic conditions, particularly with regard to suppliers from developing and emerging countries (Teuscher *et al.*, 2006; Beske *et al.*, 2008).

In addition to such risk-related aspects sustainability can also be a source of business opportunities and innovations. First, the demand for environmentally friendly and socially responsible products and services has increased in many countries worldwide (Geffen and Rothenberg, 2000; Carter and Jennings, 2004; Guoyou *et al.*, 2012), and secondly,

*Correspondence to: Dorli Harms, Centre for Sustainability Management (CSM), Leuphana Universität Lüneburg, Scharnhorststr. 1, 21335 Lüneburg, Germany. E-mail: dharms@uni.leuphana.de

sustainability-oriented innovations have become a major competitive driver between companies (Hansen *et al.*, 2009). Since sustainability-oriented innovations aim at developing products and services with (substantially) lower social and environmental impacts across the whole life cycle (primary resources, parts and module supplies, production, consumption, end-of-life, and waste/recycling), they also heavily depend on process innovations (Schumpeter, 1934, 2007; Geffen and Rothenberg, 2000; Hansen *et al.*, 2009). Such innovations call for cooperation among partnering companies and are related to supplier development as cooperation with suppliers involves the transfer of knowledge and information – about economic, environmental, and social issues – between supply chain partners (Seuring and Müller, 2008a; Pagell and Wu, 2009).

Against this background, it is not surprising that academics and practitioners alike have started to discuss a wide range of sustainability issues in SCM. Sustainable supply chain management (SSCM) aims at integrating environmental and social issues in supply chain management (Seuring and Müller, 2008a; Bai and Sarkis, 2010; Gold *et al.*, 2010; Wittstruck and Teuteberg, 2011). Systematic literature reviews document this growing interest (Carter and Easton, 2011; Sarkis *et al.*, 2011).

Based on such a literature review on SSCM Seuring and Müller (2008a) propose a framework which analyzes triggers for SSCM and distinguishes two norm strategies (Seuring and Müller, 2008a, p. 1703): 'supplier management for risks and performance' (2008a, p. 1704) and 'supply chain management for "sustainable" products"' (2008a, p. 1705). Although both norm strategies comprise complementing elements (Seuring and Müller, 2008a), they emphasize distinct aspects which are referred to as a *risk-oriented strategy* and an *opportunity-oriented strategy* in the remainder of this paper. The risk-oriented strategy is considered to be more reactive to pressures from stakeholders and focuses on the avoidance of risks in SSCM; however, strictly speaking Seuring and Müller's (2008a) first norm strategy also involves supply chain performance matters. In contrast, the opportunity-oriented strategy that is also discussed in this paper focuses on opportunities related to SSCM and on developing sustainable products as well as being innovative.

One important aspect of SSCM, which is addressed by these two strategies, is that they represent different approaches in aligning suppliers with regard to sustainability. Two types of supplier management processes are distinguished in this paper, which is based on existing literature: evaluation and selection, on the one hand, and development of suppliers, on the other (Carter and Jennings, 2004; Koplin *et al.*, 2007; Reuter *et al.*, 2010). As discussed later in more detail, the risk-oriented strategy refers more to evaluation and selection processes, whereas the opportunity-oriented strategy emphasizes supplier development and training.

Existing research on supplier management refers to conceptual contributions (Carter and Dresner, 2001) or case study designs (Mamic, 2005; Pagell and Wu 2009; Reuter *et al.*, 2010). Up to now, only few quantitative studies refer to supplier management processes in stock companies (Beske *et al.* (2008) carried out an explorative study in the German automotive industry) and some quantitative studies more narrowly focus on one selected aspect of sustainability in SSCM (Holt (2004) examined the ecological dimension of SSCM). Moreover, some studies may also have partly lost their topicality due to dynamic changes in recent years (Beske *et al.* (2008) and Holt (2004) use survey data collected in 2003 and 2002, respectively). None of the listed studies analyzes the norm strategies suggested by Seuring and Müller (2008a) and their linkages to managing supplier relationships.

It is thus the aim of this paper to shed light on the practice of these two strategies in aligning supply chains for sustainability by exploring supplier management processes in large German stock companies and to investigate: *which strategic approaches large German companies apply to manage social and environmental issues in the supply chain?* In more detail, the paper analyzes:

- Do large German companies approach SSCM rather with a risk- or from an opportunity-oriented strategy (or a combination of both) with regard to goals, drivers, and organizational responsibility?
- How do companies engage in specific supplier management practices (evaluation, selection, development)?

The research questions are addressed by means of an exploratory survey conducted among large and mid-cap companies listed on the German stock exchange (DAX and MDAX). These leading companies can be considered as focal companies (Handfield and Nichols, 1999; Seuring and Müller, 2008a) which influence the supply chains to a large extent.

The paper is structured as follows: The next section provides an overview on risk- and opportunity-oriented strategies in SSCM and sustainable supplier management. The subsequent section depicts the research methodology and the sample of companies surveyed, followed by a presentation of the results. Thereafter, the results are

discussed in light of a comparison between the two strategic approaches. The paper concludes with a summary and implications for managers and policy makers.

Literature Review

Supply Chain Management and Sustainability

SSCM extends the conventional scope of SCM by environmental and social issues and it attempts to explicitly consider all three dimensions of sustainability in designing and optimizing the supply chain (Seuring and Müller, 2008a; Bai and Sarkis, 2010; Gold *et al.*, 2010). In recent years, SSCM has developed into an important field of research (Seuring and Müller, 2008b; Carter and Easton, 2011; Hansen *et al.*, 2011; Sarkis *et al.*, 2011). Important goals of SSCM are the reduction of social and environmental risks across the supply chain or to improve the company's reputation (Cousins *et al.*, 2004; Teuscher *et al.*, 2006; Cheung *et al.*, 2009). Furthermore, the realization of opportunities like product development and process innovations are considered to be relevant goals (Geffen and Rothenberg, 2000; Seuring and Müller, 2008a).

The motivation for SSCM can result from pressures and requirements of different internal and external stakeholders to improve the sustainability of products. Internally the top management and specialized support functions like the sustainability and corporate responsibility department may play a crucial role in driving SSCM. They translate stakeholder pressure and demands into actions or they implement the company's policy on social responsibility (Wycherley, 1999; Walker *et al.*, 2008). External drivers can be grouped on three levels and typically include:

- Regulators and governments on the regulatory level (Carter and Dresner, 2001; Min and Galle, 2001).
- Customers and competitors on the market level (Lamming and Hampson, 1996; Klassen and Vachon, 2003; Zhu and Sarkis, 2006).
- Non-governmental organizations (NGOs) and the general public on the societal level (Sharma and Vredenburg, 1998; Wycherley, 1999; Koplin *et al.*, 2007).

Research also focuses on the relationship between the focal company (the company that governs the supply chain; Seuring and Müller, 2008a) and its suppliers (Walton *et al.*, 1998; Holt, 2004) to integrate sustainability into supplier management processes (Bowen *et al.*, 2001; Wolf, 2011). These processes include activities such as the assessment and education of suppliers, the communication between the focal company and its suppliers, or developing purchasing criteria and checklists (Holt, 2004; Seuring and Müller, 2008b).

Based on the distinction between supplier evaluation and selection on the one hand and supplier development on the other (Reuter *et al.*, 2010) the next sections describe the risk- and the opportunity-oriented strategies which have been derived from Seuring and Müller's (2008a) framework and their linkages to supplier management. These strategies will be empirically investigated afterwards.

Risk- and Opportunity-oriented Strategies

SSCM and supplier management taking a risk-oriented strategy
While companies are asked to take responsibility for their own business and for their supply chains, they are confronted with a wide range of economic, environmental, and social challenges and risks (Cousins *et al.*, 2004; Teuscher *et al.*, 2006). This is why SSCM deals with a broad variety of issues, such as the avoidance of child and forced labor, the replacement of toxic substances, excessive energy and material consumption, or biodiversity protection (Mamic, 2005; Halldórsson *et al.*, 2009).

Instead of managing each issue in an isolated way, companies tend to conform to norms or to apply commonly accepted standards (Beske *et al.*, 2008; Seuring and Müller, 2008a). Examples of such norms and standards (Koplin *et al.*, 2007; Beske *et al.*, 2008) categorized by economic, environmental, and social aspects are:

- Economic criteria: for example, OECD guidelines or in the sense of quality aspects DIN ISO 9000.
- Environmental criteria: for example, Eco-Management and Audit Scheme (EMAS) and DIN ISO 14001.
- Social criteria: for example, conventions of the International Labor Organization (ILO) and the UN Global Compact.

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DOI: 10.1002/csr

Companies refer to codes of conduct to control the environmental or social impact of supplier activities across their global supply chains (Pedersen and Andersen, 2006; Neilson and Pritchard, 2007). Codes of conduct as well as norms and standards can serve as criteria for *evaluating* and *selecting suppliers* and to determine a minimum level of improvement in order to create more sustainable products. In addition, the focal company can ask its suppliers for labels and certificates which authenticate the compliance with environmental and social requirements. Such norms, standards, and codes can provide valuable criteria for decision-making and, therefore, requiring compliance deems appropriate for both risk avoidance and performance improvements along the supply chain.

Since the focal company governs its supply chains (Seuring and Müller, 2008a), it also evaluates its suppliers by means of setting criteria and minimum requirements. Therefore, suppliers can provide completed self-assessments on environmental or social requirements. Supplier evaluation as part of supplier management processes can be accompanied by incentives or sanctions (Peters, 2010). In the most extreme case, a negative evaluation may lead to the termination of the business relationships (Delmas and Montiel, 2009). However, a termination always entails a new search and selection of suppliers – which means additional costs. An alternative to this termination is to develop suppliers, which is an important aspect of the opportunity-oriented strategy.

CSSCM and supplier management as an opportunity-oriented strategy

With Seuring and Müller's (2008a) second strategic approach of 'supply chain management for sustainable products', the focal company aims at developing and offering sustainable products. To develop products, which meet environmental requirements while being produced under good social working conditions and at reasonable costs, the members of the supply chain have to collaborate (Lamming and Hampson, 1996; Bowen *et al.*, 2001; Pagell and Wu, 2009). The adoption of a life-cycle perspective broadens the scope of buyer–supplier relationships (Carter and Dresner, 2001; Matos and Hall, 2007) and a market- and opportunity-oriented perspective is taken.

With regard to supplier management processes, the relevance of *supplier development* is emphasized. Possible measures of supplier development are, for instance, dialogues with suppliers, joint development of new products and processes, awareness raising for sustainability aspects, and ensuring supplier continuity (Mamic, 2005; Pagell and Wu, 2009). The focal company can invest in education and trainings of its suppliers and sub-contractors or also can use – together with the suppliers – further specific measures such as establishing an R&D cooperation or taking joint actions to reduce CO_2-emissions in the supply chain (Mamic, 2005; Reuter *et al.*, 2010). When a focal company develops its suppliers it invests time and money to improve the supplier's performance. Pagell and Wu (2009) highlight that by collaborating with suppliers companies may also strive for acquiring new knowledge. Thus, supplier development can lead to product and process innovations for both the buyer and suppliers (Geffen and Rothenberg, 2000; Guoyou *et al.*, 2012).

Nevertheless, some drawbacks of supplier development have also to be mentioned. The development of suppliers means that the improved conditions at the supplier's site can be understood as common resources (Dyer and Nobeoka, 2000) and other buying companies can also benefit from these efforts. Hence, investments in supplier development are linked to the problem of free riding and, in the case that the focal company decides to change the supplier at a later point of time, implies sunk costs (Mamic, 2005; Pagell and Wu, 2009).

Whilst a large body of literature exists on the specifics of the two strategies, only few empirical studies simultaneously analyze the practices of companies with regard to both strategies. Figure 1 summarizes the characteristics of risk- and opportunity-oriented strategies in SSCM which are empirically analyzed in the next sections.

In the following we investigate whether the largest German stock companies rather implement a risk- or an opportunity-oriented strategy in their SSCM and supplier management practices.

Methodology

The analysis is based on a quantitative survey in autumn and winter 2008/2009 among large and mid-cap companies listed on the German stock exchange. A questionnaire with 38 questions (partly closed, partly open-ended) was
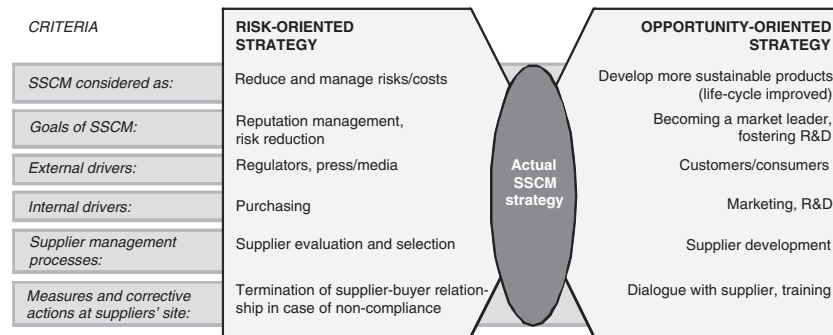
CRITERIA	RISK-ORIENTED STRATEGY	OPPORTUNITY-ORIENTED STRATEGY
SSCM considered as:	Reduce and manage risks/costs	Develop more sustainable products (life-cycle improved)
Goals of SSCM:	Reputation management, risk reduction	Becoming a market leader, fostering R&D
External drivers:	Regulators, press/media	Customers/consumers
Internal drivers:	Purchasing	Marketing, R&D
Supplier management processes:	Supplier evaluation and selection	Supplier development
Measures and corrective actions at suppliers' site:	Termination of supplier-buyer relationship in case of non-compliance	Dialogue with supplier, training

(center: Actual SSCM strategy)

Figure 1. Risk- and opportunity-oriented strategies and supplier management in SSCM

designed on the basis of the literature on SSCM as introduced in the previous section and was used to depict the state of SSCM practices in the enterprises as comprehensively as possible. The questions addressed different SSCM aspects such as drivers and barriers as well as standards. To test the questionnaire, a pre-test was conducted with people who worked in different companies in the area of purchasing or corporate sustainability.

The 80 largest companies listed on the German stock exchange (30 large-cap and 50 mid-cap companies) were contacted with an initial telephone call to identify the responsible manager and to confirm the contact information. Since 8 companies in general denied participating in surveys, the questionnaire was mailed to the remaining 72 companies by post or e-mail. The contacted addressees were predominately from the purchasing/SCM/logistic department (57%); 25% worked in the sustainability or a related (quality/health/safety/environment) department; and 9% in other departments (e.g. external relations). The remaining respondents (9%) did not reveal information about the department for which they work. Table 1 illustrates the sample characteristics. The survey yielded 32 usable questionnaires, equaling a response rate of 44%.

Results

This section firstly discusses the characteristics of the supply chains of the surveyed companies as well as the perceived risks and opportunities in the supply chains. Then the goals and drivers of SSCM are analyzed and means

Sample characteristics	Data
Number of companies	32
Average number of employees	90,158
Average annual turnover in Mio. Euro (number of companies)[1]	27,294 (25)
Sectors (sectors according to German stock exchange)	
- Automobile	3 (9%)
- Banks/insurances	7 (22%)
- Chemicals/pharmaceuticals	6 (19%)
- Consumer	3 (9%)
- Industrial	6 (19%)
- Transport & logistics, retail	3 (9%)
- Others	4 (13%)
Total	*32(100%)*

Table 1. Sample characteristics (Data from annual reports 2007/2008).
[1]Twenty-five of the 32 companies disclose the turnover in their annual reports. The seven remaining companies belong to the financial or insurance sector and disclose their total assets or gross premiums. These figures are thus not used for calculating average figures.

to address sustainability requirements are examined. Finally the measures and corrective actions related to supplier management processes in SSCM are presented.

General Supply Chain Characteristics and Sustainability Issues

This empirical investigation shows that large German stock companies often have a multitude of suppliers (53% have more than 5000 and 25% have 1000 to 5000 suppliers) and that they source from a large number of different countries (industrial, emerging, and developing countries; 47% of the companies source from 50 and more countries). Moreover, they receive supplies from emerging (44%) and developing countries (28%). In line with this variety, most of the respondents evaluate the international relationships with their suppliers as complex (50%) or very complex (31%). Furthermore, the service and production sites of large German stock companies have become more international in the last five years. These results indicate that international sourcing and production are confronted with highly complex and diverse sustainability challenges. This confirms the results of earlier empirical research on companies in the textile sector (Seuring *et al.*, 2004) as well as in the oil and gas and agricultural biotechnology industry (Matos and Hall, 2007). The data, furthermore, illustrates the growing importance of the globalization of the supply chains and associated challenges, in particular with regard to emerging and developing countries (Beske *et al.*, 2008; Reuter *et al.*, 2010). Table 2 summarizes the sustainability issues which the companies perceived as most important.

The wide range of relevant sustainability issues underlines that companies have to deal with a high level of diversity of all three dimensions of sustainability (Seuring *et al.*, 2004; Kumar and Malegeant, 2006). As discussed in the following, the multitude of relevant sustainability issues in SSCM is related to a variety of risks and opportunities.

Perceived Risks and Opportunities of SSCM

When answering the direct question about which influence environmental and social issues have in the supply chain, the companies assess SSCM rather as an opportunity than as a risk (Table 3). Nevertheless, the degree of affirmation varies; factors such as reputation received a high percentage value whereas the potential for cost reduction and turnover scored lowest.

Interestingly enough, 81% of the surveyed companies assess the innovation potential of SSCM as a relevant issue (Table 2), although as less important compared to other economic issues such as supplier reliability or quality assurance (both 97%).

Sustainability dimension	Sustainability issues	Relevance (% of companies)
Economic aspects	Supplier reliability	97%
	Quality assurance	97%
	Cost reduction	94%
	Competitive pressure	91%
	Innovation potential	81%
Environmental aspects	Waste reduction	91%
	Reduction of greenhouse gas emissions	84%
	Reduction of negative impacts on the environment	84%
	Use of materials and resources	81%
	Renewable energy	63%
	Biodiversity	25%
Social aspects	Health protection	88%
	Human rights	88%
	Child and forced labor avoidance	84%
	Equal rights	81%
	Freedom of association	75%
	Job security	69%

Table 2. Sustainability issues relevant in the supply chain (multiple answers possible).

Perceived influence on	...**seen as** ... (% of companies)		
	an opportunity	a risk	without influence
Reputation	84%	13%	6%
Employer attractiveness	84%	0%	9%
Potential for innovation	81%	6%	6%
Turnover	66%	16%	16%
Potential for cost reduction	59%	34%	0%

Table 3. Perceived influence of environmental and social issues in the supply chain (total may be more or less than 100% due to multiple answers or no response).

Comparing these survey results with earlier research shows that risks of reputational damage and additional costs also are emphasized in literature, for instance, for the chemical industry (Reuter *et al.*, 2010). Research also underlines that cost and reputation advantage, supply chain pressure, and legislation are motives for product and process innovations and that there is a need for a more fundamental change of the company to increase sustainability innovations through SSCM (Preuss, 2007). Whilst companies perceive a stronger opportunity-oriented approach to SSCM, the next sections investigate actual goals, drivers, and practices and how they relate to the two strategy patterns.

Goals of SSCM

Asked as a general question, 88% of the surveyed companies state they consider environmental and social aspects in their procurement. Figure 2 illustrates which goals the companies pursue when considering sustainability in their purchasing activities.

The main 'permanent' goals are securing and improving corporate reputation (81%) as well as risk reduction (66%). This is in line with a risk-oriented strategy, which is linked to a rather reactive attitude towards managing sustainability issues in the supply chain. According to the companies, cost optimization is also an important goal and supports the above-mentioned strategy interpretation, although this goal is formulated in a less systematic manner (permanent 56% and temporarily 28%). In comparison, goals which can represent an opportunity-oriented strategy such as fostering R&D or becoming a market leader were less frequently mentioned as permanent goals and thus less relevant in practice. Innovation and product development, therefore, seem be less important in the SSCM context than taking measures to safeguard the existing supply chain structures.
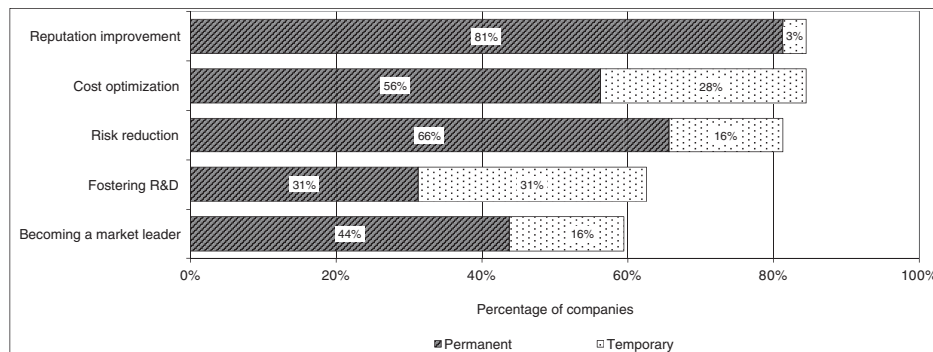

Figure 2. Goals (permanent/temporary) for the integration of environmental and social aspects in procurement

External and Internal Stakeholders as Drivers

The company representatives consider customers/consumers (72%), legislators (national/international) (69%), shareholders (56%), and press/media (50%) as the most important external drivers in the future. This shows that the results of previous studies about the relevance of stakeholders are also valid for large German stock companies (Min and Galle (2001) conducted a survey to investigate green purchasing practices among US firms; Klassen and Vachon (2003) used a survey design for assessing the linkages between suppliers and customers in Canada). These answers reflect both a risk- and an opportunity-oriented perspective on drivers for SSCM as market-related stakeholders (customers/consumers) are nearly as often mentioned as regulatory stakeholders (legislators). Societal stakeholders (press/media) which can be linked to the emergence of reputational risk are less frequently seen as important.

In contrast, the following internal drivers are most often seen as important: the sustainability/environmental department (78%), top management (75%), the purchasing department (59%), and owners/shareholders (50%). Other departments currently only play a subordinate role for SSCM: production, marketing, and R&D (each 19%), strategic planning (16%), as well as accounting and management control (each 3%).

As the marketing and R&D departments are less involved in SSCM, these results indicate that large German stock companies do not particularly pursue a market- and opportunity-oriented strategy. This outcome seems to be surprising, taking into account that amongst the external stakeholders companies consider customers as one of the main future drivers for SSCM. For a more opportunity-oriented management of the supply chain, the customers' demand for more sustainable products – and the related need to improve the product's entire life cycle (Hansen *et al.*, 2009) – communication and collaboration between the purchasing department and more customer-related functions (e.g. marketing) would be essential. For example, information about sustainability efforts and improvements throughout the supply chain can be used for marketing campaigns or for product labeling (Carter and Dresner, 2001).

Means to Address Sustainability Requirements in Supplier Management Processes

As part of supplier management companies can use standards to formulate requirements for suppliers. Table 4 outlines how often companies integrate environmental or social requirements as explicit parts in formal (i.e. written) supplier agreements.

When a focal company requires minimum sustainability standards (Table 4) as purchasing requirements, the respective sustainability criteria are applied to the suppliers. These standards can be used for supplier evaluation and selection since each supplier has to declare if and to what extent it complies with the established requirements (Seuring and Müller, 2008a). However, minimum standards may not only indicate a risk-oriented SSCM strategy for selection and evaluation processes, but they can also serve as benchmarks and common guidelines for both suppliers and the focal company to facilitate the development of more sustainable products and to improve the sustainability performance of suppliers (Cousins *et al.*, 2004; Seuring and Müller, 2008a).

With regard to the overall life cycle, differences may exist in how deep a focal company actually reaches upstream into the supply chain. The respondents of the survey state that they mostly ask all or many of their first-tier suppliers for proof of compliance to codes of conduct (63%) as well as the globally well-known standards ISO 9000 (44%) and

Means to address sustainability used in formal (i.e. written) agreements with suppliers	Issues addressed (% of companies)	
	Environmental	Social
Minimum standards	84%	75%
Supply agreement, general terms and conditions	78%	72%
Code of conduct	66%	56%
Own supplier evaluation	66%	53%
Audits by own staff	66%	56%
Audits by external service providers	28%	28%
External supplier evaluation	25%	25%

Table 4. Environmental/social requirements set in supplier agreements explicitly in a written form.

ISO 14001 (41%). Compliance with further standards such as the ILO core labor standards (25%), Global Compact (13%), OECD guidelines for multinational companies (9%), EMAS, AA 1000, or SA 8000 (each 3%) are considered less often. On the one hand, some standards such as SA 8000 may be required more rarely because of their limited practical applicability in several sectors (Graafland, 2002; Koplin et al., 2007). On the other, the findings for large German stock companies do not show a widespread use of EMAS, which is in contrast to results of earlier studies for the German automotive industry (Koplin et al., 2007).

Though there is case-based evidence that suggests a reach out to n-tier suppliers (Wolf, 2011), companies surveyed show that they mostly address only first-tier suppliers with their management processes. This may be explained by the more difficult access to information from n-tier suppliers. Furthermore, focal companies may count on 'green multiplier effects' or 'trickle-down effects'(Preuss, 2001; Holt, 2004; Zhu et al., 2008) where their first-tier suppliers push environmental and social performance further upstream into the supply chain.

Measures and corrective actions in SSCM

Apart from selection and evaluation processes supplier development can also be an adequate method to establish new SSCM practices. A focal company can use a wide range of measures to motivate and empower suppliers to change and improve environmental and social conditions at their sites (Table 5).

Forty-seven percent of the surveyed companies state that they 'always' exhort a supplier in case of non-compliance whereas the termination of a supplier–buyer relationship is an option for one quarter of the companies. Both measures indicate a reactive, risk-oriented strategy of SSCM as they can serve as rapidly implementable measures to respond to a non-compliant behavior of a supplier. The own control in situ (19%) is more a risk- than an opportunity-oriented activity as it can help to prevent and avoid risks. Dialogues with suppliers (32%) and training of suppliers for the improvement of sustainability conditions (9%), however, are opportunity-oriented measures. Compared with the two risk-oriented measures (exhortation, termination of relationship), they are rarely adopted.

Thus, when investigating the concrete operative measures, companies are more risk-oriented and less opportunity-oriented in their SSCM engagement with suppliers. This result may not be astonishing since significant investments are necessary to improve the sustainability performance of suppliers. Nevertheless, the termination of supplier relationships is not the first choice of the German companies either. In some industries and regions, non-compliance with sustainability standards is a crucial issue (Welford and Frost, 2006; Peters, 2010) and a termination of supplier–buyer relationships is not viable. Holt (2004), for example, demonstrates that suppliers are rarely affected by contract termination. Also from a sustainable development perspective, it mostly makes more sense to use instruments such as standards and codes of conduct as a starting point for collaborative supplier development (Mamic, 2005).

Discussion

Sustainable supply chain strategies constitute the fundamentals for aligning suppliers to improve the economic, environmental, and social issues in the supply chain. A distinction between two SSCM strategies has been previously

Type of measure	Rule of application (% of companies)			
	Always	Sometimes	Never	Do not know/no answer
Supplier exhortation in case of non-compliance	47%	35%	9%	9%
Dialogue with supplier to define potentials for improvement	32%	53%	9%	6%
Termination of the supplier relationship	25%	50%	9%	16%
Own control in situ	19%	69%	9%	3%
Trainings of suppliers for improving social and environmental conditions	9%	56%	25%	9%

Table 5. Measures and corrective actions in the SSCM of large German stock companies.

suggested, for example by Vachon (2007) who observed a dichotomy of SSCM practices with sustainability 'monitoring' as a market-based approach and sustainability 'collaboration' as an internalization approach in the organizational hierarchy. Based on Seuring and Müller's (2008a) conceptual work, this paper examines the existence of risk- and opportunity-oriented strategies in SSCM in large German companies. These strategies emphasize distinct perspectives, however, they do not reflect totally opposing views, as they are rather complementary (Seuring and Müller, 2008a; Wolf, 2011).

The Risk-oriented SSCM Strategy

The surveyed companies largely follow a risk-oriented SSCM strategy, which is expressed in their stated goals, in the internal departments or functions that are considered relevant, and in the nature of supplier management processes applied. First, regarding the stated goals, the companies consider risk reduction, reputation improvement, and cost optimization as the most important goals for integrating sustainability aspects in purchasing.

Secondly, only a few companies consider departments such as marketing and R&D as drivers for SSCM. The predominating internal drivers next to top management are the corporate functions that directly deal with SSCM such as purchasing and the sustainability department. This indicates the challenge of cross-functional collaboration to create sustainability in supply chains (Harms, 2011; Schaltegger, 2011; Wolf, 2011).

Thirdly, in supplier management processes, the risk-oriented strategy is expressed in the dominant use of minimum standards such as ISO 9000 or ISO 14001 to evaluate and select suppliers. Standards are a (cost-) efficient way for a focal company to pass the requirement of providing proof of compliance with sustainability requirements on to its suppliers, i.e. to ask for signaling by the supplier (Koplin *et al.*, 2007; Beske *et al.*, 2008; Hansen *et al.*, 2011).

Moreover, in the continuous monitoring and evaluation of suppliers, focal companies apply various measures and corrective actions to assure the compliance of their suppliers with environmental and social criteria. Exhorting suppliers in cases of non-compliance is a measure which is most often used as a standard practice. Although the termination of supplier relationships caused by non-compliance with environmental and social requirements exists, it is not a frequent practice (Pedersen and Andersen, 2006). It bears the risk of additional costs as a new supplier has to be found and a new supplier–buyer relationship has to be established. This shows that existing practices are mostly targeted to secure the continuity of supplies (Pagell and Wu, 2009). This may at the same time make sense from a sustainability perspective, as there is no guarantee that a substitute supplier would better fulfill the social and environmental requirements; the termination of a supplier contract might imply that the abandoned supplier is likely to continue unsustainable practices when supplying other focal companies.

Although the relevance of risk-oriented SSCM strategy patterns could be found empirically (Cousins *et al.*, 2004; Teuscher *et al.*, 2006; Beske *et al.*, 2008), the survey results also show signs of an emerging opportunity-oriented SSCM strategy.

The Opportunity-oriented SSCM Strategy

The emergence of an opportunity-oriented strategy becomes apparent in the perceived role of SSCM, in the recognized external drivers, and in the emerging practice of supplier development. First, companies generally perceive SSCM as an opportunity rather than a risk (though, as the previous section showed, actual SSCM practice is still risk-oriented).

Secondly, companies identify customers amongst all external stakeholders as the strongest future drivers of SSCM practices. This indicates a strong awareness of potential market opportunities driven by customer demand for more sustainable products (Carter and Jennings, 2004; Guoyou *et al.*, 2012). The fact that this is not (yet) mirrored by a high involvement of the respective departments (e.g. in the marketing and R&D departments) demonstrates that the opportunities have not been grasped so far through an opportunity-oriented strategy. One reason may be that companies are aware of customers' unwillingness to pay substantially higher prices for more sustainable products (Wolf, 2011), a phenomenon also known as the attitude-behavior gap (Vermeir and Verbeke, 2006).

Thirdly, the companies' stated relevance of supplier development reflects an opportunity-oriented strategy. These general statements, however, rather indicate intention than current practice as approaches like dialogues for improvements with suppliers and training of suppliers are rarely applied compared to risk-oriented measures.

Apart from the illustrated merits, supplier development can also be accompanied by various difficulties. A focal company runs the risk of strong resource dependency as its investments in supplier development may create sunk costs (Holt, 2004). To protect their investments companies can make specific contractual and structural arrangements such as R&D partnerships and supplier integration which may also increase trust between the supply chain partners. Moreover, both partners can benefit from knowledge exchange and closer cooperation as which may lead to process as well as product innovations (Bowen *et al.*, 2001; Seuring and Müller, 2008a; Guoyou *et al.*, 2012). Capacity building through supplier development is furthermore important for an opportunity-oriented SSCM strategy as a means to (continuously) improve sustainability performance in the upstream stages of the supply chain (Leire and Mont, 2010).

In terms of sustainable development, supplier development seems to be preferable to the termination of supplier contracts because if suppliers are developed instead of being listed out, the local economic, social, and environmental conditions at the production sites of the suppliers can be improved. In case of the termination of a supplier relationship, conditions and practices may remain unchanged as the suppliers neither have incentives nor financial resources to change. A second reason for preferring supplier development compared to termination is that trickle-down effects (Holt, 2004; Zhu *et al.*, 2008) can be provoked if the first-tier supplier formulates sustainability requirements for sub-suppliers. Furthermore, spill-over effects (Kolk *et al.*, 1999) can be realized in the supplier's region and sector. From the perspective of an opportunity-oriented strategy, companies can capitalize on proactive supplier development practices if they lead to better relationships and represent new sources for sustainability communication and reporting. Overall, the literature is clearly in favor of supplier development for sustainability (Pagell and Wu, 2009; Bai and Sarkis, 2010; Reuter *et al.*, 2010).

Conclusions

Based on the conceptual distinction of SSCM strategies by Seuring and Müller (2008a); Vachon 2007; Reuter *et al.*, 2010) the empirical analysis of supplier management strategies shows that large German stock companies rather pursue a risk- than an opportunity-oriented approach. Signs for a risk-oriented SSCM strategy are when companies formulate defensive SSCM goals such as risk reduction or securing a good reputation. Other indications for this strategy pattern are when market-oriented departments (e.g. marketing or R&D) are only of marginal relevance for SSCM, and when a company employs reactive measures in its supplier management (e.g. the exhortation of suppliers).

Notwithstanding the dominance of a risk-oriented SSCM strategy and related practices, also indications could be found that companies envisage aspects of an opportunity-oriented strategy. For instance, various companies consider customers as main future drivers for SSCM, aim at using SSCM to foster R&D and engage in progressive practices such as supplier development.

Limitations and Future Research

Based on an exploratory survey, this paper examines SSCM practices in large German stock companies. The results provoke the question as to whether supplier management strategies are culturally influenced and whether large companies also show a risk-oriented SSCM pattern in other countries, or whether differences exist between developed and developing countries. As company size may also influence SSCM strategies, further research could conduct a comparative analysis of internationally operating small and medium-sized enterprises such as hidden champions (Simon, 1996). Our empirical analysis focuses on practices which Pagell and Wu (2009, p. 52) classify as 'supply base continuity' (e.g. evaluation, development). The analysis of new SSCM practices of 'reconceptualizing who is in the chain' (Pagell and Wu, 2009, p. 50) could provide further insight. Such strategies include practices such as creating closed-loop supply chains or the involvement of societal stakeholders such as NGOs or trade organizations who are not conventional members of the supply chain, but related to supply chain issues.

Implications for Business Strategy and Management

Some companies have started to implement measures of an opportunity-oriented SSCM strategy. A more far-reaching and consequent opportunity-orientation, however, would require further integration and development of new customer expectations (e.g. for more sustainable products) and a more substantial change of procurement policies which are not dominated by cost considerations only. As with sustainability management in general there is no 'automatic' business case for SSCM. A business case for sustainability, and in this case SSCM, needs to be proactively created (Schaltegger *et al.*, 2012). Managers are thus challenged to actively develop markets with sustainability-oriented customers, to facilitate cross-functional integration, particularly between more market-oriented functions (e.g. marketing, R&D) and procurement (Harms, 2011), and to focus on a smaller group of suppliers with whom sustainability improvements are strategically developed.

Implications for Policymakers

Considering the importance of an opportunity-oriented strategy for sustainable development, policymakers are challenged to facilitate such endeavors, particularly by creating incentives for companies to engage in supplier development processes. This includes approaches such as cross-sectoral partnerships and collaborations with NGOs and development agencies such as South Africa's Agricultural Ethical Trading Initiative (Chartered Institute of Purchasing & Supply, 2009). This could also involve engaging companies in an industry-specific network which collaboratively develops suppliers, such as the Business Social Compliance Initiative does for retailers in Europe (Teuscher *et al.*, 2006). Such collaborative arrangements may decrease the risk of free-riding by competitors. Another means to support the implementation of an opportunity-oriented SSCM strategy is to increase transparency (Gold *et al.*, 2010) on social and environmental conditions at production sites and of product characteristics. For example, stricter laws on the listing of ingredients and labeling would support companies engaged in more proactive SSCM practices.

Our empirical analysis shows that in spite of the dominance of risk-oriented strategies of large stock companies evidence exists that opportunity-oriented strategies for SSCM are emerging and could be supported with joint efforts of companies, social organizations and politicians.

Acknowledgements

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Contribution II (journal article, double blind peer reviewed, published)

Hansen, E.G.; Harms, D. & Schaltegger, S. (2011): Sustainable Supply Chain Management im globalen Kontext: Praxisstand des Lieferantenmanagements in DAX- und MDAX-Unternehmen, Die Unternehmung, Vol. 65, No. 2, 87–110.

Sustainable Supply Chain Management im globalen Kontext

Praxisstand des Lieferantenmanagements in DAX- und MDAX-Unternehmen

Erik G. Hansen, Dorli Harms und Stefan Schaltegger

Nachhaltigkeit, Sustainability, Lieferantenmanagement, Lieferantenentwicklung, Global Sourcing, Supply Chain

Sustainability, supplier management, supplier development, global sourcing, supply chain management, standards

Das Management globaler Supply Chains mit einer Vielzahl von Lieferanten aus teils sehr unterschiedlichen sozio-ökonomischen Kontexten ist durch hohe Komplexität gekennzeichnet. Die zunehmend geforderte Integration ökologischer und sozialer Aspekte in das konventionelle Lieferkettenmanagement, wie es durch das Sustainable Supply Chain Management (SSCM) repräsentiert wird, steigert diese Komplexität zusätzlich. Damit stellt sich die Frage, wie das SSCM in der Unternehmenspraxis umgesetzt wird. Die vorliegende Studie untersucht die Massnahmen der grössten börsennotierten Unternehmen in Deutschland. Der komparative Vergleich von Umsetzungsmassnahmen des SSCM in DAX- und MDAX-Unternehmen zeigt, dass die Massnahmen bei DAX-Unternehmen häufiger angewendet und formalisierter ausgestaltet werden. Einfach umzusetzende Massnahmen wie schriftliche Anforderungen werden häufiger verwendet als ressourcenaufwendigere Bewertungs- und Audit-Verfahren. Gleichzeitig wird die steigende Bedeutung der Lieferantenentwicklung deutlich.

Global supply chains, often spreading across countries from developed and developing nations, are exposed to diverse socio-economic contexts. The increasing demand for a better control of social and environmental criteria in supply chains, as Sustainable Supply Chain Management (SSCM) argues for, further increases this complexity. This raises the question how SSCM is implemented in corporate practice. The presented survey-based study compares the implementation measures of the largest German stock companies (large caps) with the second largest ones (mid caps). The results show that large caps have progressed further in their implementation and that the processes are more formalized. Measures which are easier to implement, such as written requirements and standards, are more often applied than resource-intensive processes of evaluation and audits. At the same time, the increasing importance of supplier development becomes apparent.

1. Einführung

Aufgrund eines starken Kostendrucks lagern Unternehmen häufig bedeutende Anteile des Wertschöpfungsprozesses an Zulieferer aus Ländern mit komparativ niedrigerem Preisniveau aus und sehen sich somit mit einer höheren Anzahl von Lieferanten und einer grösseren Diversität an Lieferländern konfrontiert (*Jahns et al.* 2007; *Reuter et al.* 2010). Das Management globaler Supply Chains (Güter, Information etc.) und die Berücksichtigung von Logistik- und Transportleistungen wird dadurch zunehmend erfolgsrelevant (*Arnold/ Eßig* 2002, 243; *Kotzab et al.* 2006; *Stölzle/Lukas* 2007).

Supply Chain Management (SCM) im globalen Kontext ist jedoch nicht nur aus logistischer Sicht komplex (*Goldbach* 2001; *Stölzle/Heusler* 2004; *Jahns et al.* 2007). Die internationale Verteilung der Zulieferer und die grosse räumliche Distanz beeinflussen die Geschäftsbeziehungen durch sehr stark variierende politische und sozio-ökonomische Rahmenbedingungen, die eine Reihe von ökologischen, sozialen und ökonomischen Nachhaltigkeitsherausforderungen beinhalten (*Wittstruck/Teuteberg* 2010 a). Dies gilt insbesondere für Zulieferer aus Entwicklungs- und Schwellenländern (*Teuscher et al.* 2006; *Beske et al.* 2008). Die globale Verteilung der Lieferanten und starke Zergliederung der Lieferketten führt zu Informations- und Kontrollverlusten des fokalen (d.h. die Wertschöpfungskette kontrollierenden) Unternehmens (*Seuring/Müller* 2008), zu Reputations- und Produkthaftungsrisiken sowie Optimierungs- und Kontrollschwierigkeiten bei der Berücksichtigung der Nachhaltigkeitsaspekte, die von immer mehr Kunden nachgefragt werden (*Goldbach* 2001; *Bruhn/Meffert* 2006; *Peters* 2010, 28). Reputationsprobleme bei Unternehmen der Bekleidungs-, Lebensmittel- oder Automobilindustrie, die aufgrund von Missständen in Zulieferbetrieben in die Kritik geraten sind (*Locke* 2003, 40; *Zadek* 2004; *Mamic* 2005), gehören zu den zahlreichen bekannten Beispielen, die zeigen, wie bedeutsam ökonomische Nachhaltigkeitsaspekte in Lieferketten sein können.

Vor diesem Hintergrund ist das zunehmende Forschungsinteresse an *Sustainable Supply Chain Management* (SSCM) – also die Gestaltung globaler Liefer- und Wertschöpfungsketten unter ökologischen, sozialen und ökonomischen Gesichtspunkten – zu erklären (*Seuring/Müller* 2007; *Seuring/Müller* 2008; *Bai/Sarkis* 2010; *Gold et al.* 2010; *Wittstruck/Teuteberg* 2010 b).

Ein zentraler Aspekt für die Umsetzung des SSCM ist die integrative Berücksichtigung von Nachhaltigkeitsaspekten in das Lieferantenmanagement – d.h. in die Prozesse der Bewertung, Selektion und Entwicklung von Lieferanten (*Reuter et al.* 2010). Es existieren bisher wenige quantitativ-empirische Studien, die diese *Umsetzung* von SSCM im Lieferantenmanagement ins Zentrum der Analyse stellen. Ein Teil der Untersuchungen ist rein konzeptionell (*Carter/Dresner* 2001; *Zsidisin/Siferd* 2001) oder in Form von Fallstudien aufbereitet (*Mamic* 2005; *Pagell/Wu* 2009; *Reuter et al.* 2010). Bisherige quantitative Studien fokussieren meist auf einzelne Aspekte zur Einführung eines SSCM (*Min/Galle* 2001; *Vachon* 2007; *Beske et al.* 2008) oder konzentrieren sich auf Teilbereiche wie *Holt* (2004) auf die ökologische Perspektive im SSCM. Andere quantitativ-ökonometrische Studien behandeln hauptsächlich die Verbindung aus SSCM-Massnahmen und finanzieller Performance (*Chien/Shih* 2007). Aufgrund der dynamischen Veränderungen der letzten Jahre haben viele Untersuchungen an Aktualität verloren (z. B. *Beske et al.* 2008 mit einer Befragung aus dem Jahr 2003; *Holt* 2004). Internationale Studien zeigen zudem, dass SSCM bezogen auf die Unternehmensgrösse unterschiedlich ausgestaltet ist (z. B.: *Bernstein/*

Greenwald 2009). In diesem Beitrag wird daher den folgenden Forschungsfragen nachgegangen:

1. Wie wird ein globales SSCM in Bezug auf das Lieferantenmanagement von grossen börsennotierten Unternehmen *umgesetzt*?
2. Inwiefern unterscheiden sich die Ansätze von *sehr grossen* und *grossen* börsennotierten Unternehmen?

Zur Beantwortung der Forschungsfragen dient eine Unternehmensbefragung bei den grössten (DAX) und nächstgrossen (MDAX) Unternehmen an der Deutschen Börse. Dieser Fokus ermöglicht eine hohe Aussagekraft bzgl. des Managements *globaler* Supply Chains, verfügen einige grosse Unternehmen doch über eine sehr ausgeprägte internationale Wertschöpfungsstruktur (*Mamic* 2005). Diese Untersuchung nimmt die Perspektive der Agenturtheorie ein, um die Überwindung von Unsicherheit und Informationsasymmetrien zwischen Unternehmen und Lieferanten zu erklären (*Williamson* 1975; *Simpson et al.* 2007).

Der Beitrag ist wie folgt gegliedert: Kapitel 2 gibt einen Überblick über Ziele, Treiber und Themen des SSCM. Das dritte Kapitel zeigt auf, wie Nachhaltigkeit in das Lieferantenmanagement integriert werden kann. Kapitel 4 präsentiert die zentralen Ergebnisse der Unternehmensbefragung. Darauf folgt im fünften Kapitel eine Diskussion der Ergebnisse. Kapitel 6 schliesst mit einem kurzen Fazit und Ausblick.

2. Ziele, Treiber und Themen des SSCM

Neben den Zielen des konventionellen SCM verfolgt das SSCM weitere Ziele, die von einer Reihe von Treibern unterstützt bzw. von Stakeholdern geäussert werden. Die konkreten Inhalte des SSCM werden dabei einerseits von diesen Stakeholdern benannt. Andererseits entwickeln sich die Ziele des SSCM aus der Kombination des Strebens nach Unternehmenserfolg und diesen Stakeholder-Erwartungen an das SSCM.

2.1 Ziele des SSCM

Das konventionelle SCM betrachtet in erster Linie Versorgung, Entsorgung und Recycling über Teile der Lieferkette oder die gesamte Lieferkette (*Wildemann* 2000, 12; *Stölzle/ Heusler* 2004; *Werner* 2008, 25 ff.). Dabei werden logistische, informatorische und finanzielle Aspekte optimiert (*Gomm* 2008; *Hofmann/Westerfeld* 2010). Bei der Erfüllung dieser Aufgaben wird besonders auf Quantität, Qualität, Kosten, Zeit sowie Liefer- und Lagermodalitäten geachtet. Gut abgestimmte und aktuelle Informationsflüsse sowie die funktionierende Koordination zwischen den Partnern innerhalb der häufig globalen Lieferkette gelten als wesentliche Herausforderungen (*Cooper et al.* 1997; *Stölzle/Heusler* 2004).

Von SSCM wird gesprochen, wenn bei der Gestaltung und Optimierung von Lieferketten zusätzlich die Zusammenhänge zwischen ökonomischen, ökologischen und sozialen Aspekten explizit berücksichtigt werden *(Seuring/Müller* 2008; *Bai/Sarkis* 2010; *Gold et al.* 2010; *Teuteberg/Wittstruck* 2010). Ein besonderes Augenmerk gilt dabei der *Integration* dieser drei Zieldimensionen (*Schaltegger et al.* 2007), was auch unter dem Stichwort der „Triple Bottom Line" diskutiert wird (*Elkington* 1999; *Schaltegger/Burritt* 2005). Zu den Zielen des SSCM gehören demnach die Reduktion sozialer und ökologischer Risiken in der Lieferkette und die Realisierung von Chancen, z. B. durch kooperativ entwickelte Produkt- und Prozessinnovationen. Vorrangiges Ziel ist eine über die Unternehmensgrenzen hinausgehende, unternehmerische Entwicklung des Wertschöpfungsnetzwerks, das zu

einer nachhaltigen Entwicklung beiträgt und sich positiv auf den Unternehmenserfolg aus-wirkt (*Pagell/Wu* 2009).

2.2 Treiber des SSCM

Die vermehrte Befassung mit SSCM wird durch unternehmensexterne und -interne Treiber angeregt. Als wichtige externe Treiber für das SSCM gelten auf der Regulierungsebene die Gesetzgebung (*Hall* 2000; *Carter/Dresner* 2001; *Min/Galle* 2001; *Walker et al.* 2008), auf Marktebene die Kunden und Wettbewerber (*Lamming/Hampson* 1996; *Klassen/Vachon* 2003; *Zhu/Sarkis* 2006) und auf gesellschaftlicher Ebene die NGOs und die Öffentlichkeit (*Sharma/Vredenburg* 1998; *Wycherly* 1999; *Hall* 2000; *Preuss* 2001; *Koplin et al.* 2007). Entweder auf Basis dieser externen Treiber oder aufgrund eigener Wertvorstellungen tre-ten auch intern verschiedene Akteure als Treiber in Erscheinung, insbesondere die Ge-schäftsführung und die Nachhaltigkeitsabteilung (*Wycherly* 1999; *New et al.* 2000).

Die Interessen der identifizierten Treiber sind für das fokale Unternehmen mit einigen Risiken und Chancen verbunden. Ein Risiko ist die Produkthaftung, die teilweise die Ver-antwortung für Zulieferer einschliesst (*Loew* 2006; *Winkler et al.* 2007, 39). Durch die Entwicklung des Internets und der Social Media haben Reputationsrisiken stark zugenom-men, ermöglichen sie doch eine schnelle Informationsverbreitung über in beliebigen Wert-schöpfungsgliedern vorhandene, soziale oder ökologische Missstände (*Koplin et al.* 2007). Durch das gestiegene Bewusstsein für Nachhaltigkeitsthemen von Konsumenten ist dies besonders kritisch (*Bruhn/Meffert* 2006; BMU 2008). Diesem marktseitigen Risiko steht die Chance gegenüber, hinsichtlich einer ansteigenden Nachfrage von Produkten mit ho-hen ökologischen und sozialen Standards, Differenzierung zu erreichen (*Reuter et al.* 2010).

2.3 Themen und Standards des SSCM

Unter dem Begriff der Nachhaltigkeit sehen sich Unternehmen einer Vielzahl verschiedener ökologischer und sozialer Themen wie Kinder- und Zwangsarbeit, Materialverbrauch oder Erhalt der Artenvielfalt gegenüber, die entlang der Wertschöpfungskette von Bedeutung sein können (*Mamic* 2005). Eine sehr umfangreiche, weiter ausdifferenzierte Liste von Nachhaltigkeitsthemen generell für die Unternehmensführung enthalten die internationa-len Richtlinien zur Nachhaltigkeitsberichterstattung der Global Reporting Initiative (GRI 2006). Des Weiteren sind für das SSCM Standards von Bedeutung, die Teilaspekte dieser ökologischen und sozialen Themen explizit für die Lieferkette bzw. das SSCM einbeziehen (*Beske et al.* 2008; *Seuring/Müller* 2008). Zunächst kann unterschieden werden zwischen sozial- bzw. gesellschaftsorientierten Standards (z. B. Kernarbeitsnormen der Internationa-le Labour Organization (ILO); Global Compact) sowie ökologieorientierten (z. B. Eco-Management and Audit Scheme (EMAS); DIN ISO 14001) und wirtschaftlich ausgerichte-ten Standards (z. B. im Sinne von Qualität: DIN ISO 9000; OECD Leitlinien). Dabei zeigt sich, dass diese Standards z. T. mehr als eine Nachhaltigkeitsdimension ansprechen (*Kop-lin* 2006, 223).

Parallel dazu nutzen Unternehmen firmen- oder brancheneigene (Verhaltens-)Kodizes, sogenannte Codes of Conduct, um die Umwelt- und Sozialwirkungen der Lieferanten zu steuern (*Kolk et al.* 1999, 152; *Handfield et al.* 2002). Codes of Conduct sind schriftlich niedergelegte Richtlinien, die als Grundlage für das Verhalten von Unternehmen gegen-

über ihren Zulieferern, der Belegschaft oder anderen Akteuren, mit denen ein Unternehmen Geschäftsbeziehungen pflegt, dienen sollen (*Mamic* 2005). Sie sind i.d.R. spezifischer als internationale Standards auf die jeweiligen Charakteristika der Branche und der betroffenen Länder und Kulturen ausgerichtet und greifen als Branchen-Kodizes häufig einer drohenden staatlichen Regulierung vor (*Kolk et al.* 1999, 152).

Codes, Normen und Standards dienen im Lieferantenmanagement häufig auch als Bewertungs- und Auswahlkriterium, auf das im Folgenden näher eingegangen wird.

3. SSCM und das Lieferantenmanagement

Ein globales SSCM ist charakterisiert durch interorganisationale Zusammenarbeit über nationale und kulturelle Grenzen hinweg und ist damit Risiken ausgesetzt (*Teuteberg/Wittstruck* 2010). Unternehmen haben üblicherweise keine genaue Einsicht in die ökologischen und sozialen Bedingungen vor Ort bei den Lieferanten (*De Nardo et al.* 2010). Aus agenturtheoretischer Sicht besteht eine grosse Unsicherheit aufgrund dieser hohen *Informationsasymmetrie* zwischen fokalen Unternehmen (Prinzipal) und Lieferanten (Agenten). Diese Asymmetrie nimmt mit jeder vorgelagerten Stufe (Vorlieferanten) weiter zu und kann durch Lieferanten opportunistisch ausgenutzt werden (*Coase* 1937; *Willliamson* 1975; *Picot et al.* 2003, 59). Diese Überlegungen sind zu beachten, wenn Nachhaltigkeitsaspekte in das Lieferantenmanagement und dessen Handlungsfelder integriert werden (*Carter/Jennings* 2004; *Koplin et al.* 2007; *Simpson et al.* 2007; *Müller et al.* 2009; *Reuter et al.* 2010). Die Handlungsfelder können unterschieden werden in: Bewertung, Selektion und Entwicklung (*Reuter et al.* 2010).

3.1 Lieferantenbewertung und -selektion

Im Zentrum agenturtheoretischer Überlegungen bei der Lieferantenbewertung und -selektion steht das Problem der falschen Lieferantenauswahl vor Vertragsabschluss (*Adverse Selection*) sowie das Problem, das Verhalten des Lieferanten nach Vertragsabschluss nicht beurteilen zu können (*Moral Hazard*). Die systematische Bewertung und Selektion sowie die Ausgestaltung expliziter Verträge sind daher zentrale Bestandteile des Lieferantenmanagements (*Reuter et al.* 2010).

Als konkrete Instrumente zur *Lieferantenbewertung* dient häufig eine Selbsteinschätzung der Lieferanten mittels Fragebögen (*Mamic* 2005). Weiterhin sind Zertifizierungen und Audits vor Ort, jeweils durch Vertreter des fokalen Unternehmens selbst oder aber mit Hilfe externer Dienstleister, möglich. Insbesondere die Auditierung und Zertifizierung von Lieferanten durch branchenübergreifende Organisationen oder externe Dienstleister hat an Bedeutung gewonnen (*Vachon* 2007). Die bereits erwähnten Codes of Conduct, Normen und Standards können als Basis für die Bewertung und Zertifizierung dienen (*Walton et al.* 1998; *Holt* 2004). Die verschiedenen Anforderung und Bewertungsmechanismen können auch innerhalb von *Lieferantenverträgen* eingebunden werden, mit deren Verhandlung und Durchsetzung allerdings Transaktionskosten entstehen (*Mamic* 2005; *Simpson et al.* 2007).

Zusätzlich zu Labels und Zertifikaten, welche die Einhaltung von Umwelt- und Sozialstandards im Voraus bescheinigen (Signalling), kann auch die Lieferantenbewertung als Entscheidungskriterium in die *Lieferantenselektion* einfliessen. Darüber hinaus wird die Bewertung als Bestandteil eines *kontinuierlichen Monitorings* genutzt (*Walton et al.* 1998;

Holt 2004*)*. Mit dem Monitoring sind üblicherweise Anreize oder Sanktionen verbunden. Bei negativen Evaluierungsergebnissen können Lieferanten auch *ausgelistet* werden (*Darnall/Carmin* 2005; *Delmas/Montiel* 2009). Eine Beendigung der Lieferantenbeziehung bedeutet allerdings auch die Suche und Auswahl eines neuen Lieferanten, was mit zusätzlichen Transaktionskosten verbunden ist und nicht garantiert, dass der neue Lieferant in der Umsetzungspraxis dann tatsächlich im Sinne der Erfüllung von umwelt- und sozialorientierten Anforderungen besser arbeitet. Eine Alternative zur Auslistung eines Lieferanten kann darin bestehen, Lieferanten mit Schulungsmassnahmen zu entwickeln.

3.2 Lieferantenentwicklung

Wenn auch im geringeren Masse als durch Bewertung und Monitoring (*Holt* 2004), spielt das Instrument der Lieferantenentwicklung eine zunehmende Bedeutung für das SSCM (*Schaltegger et al.* 2007; *Seuring/Müller* 2008; *Vachon et al.* 2009; *Reuter et al.* 2010). Sie dient der Qualifizierung der Lieferanten zu Nachhaltigkeitsthemen und ermöglicht so – im Gegensatz zum Lieferantenwechsel – längerfristige Geschäftsbeziehungen. Die Lieferantenentwicklung dient zudem der Reduzierung von Informationsasymmetrien (und damit der Verhinderung eines Moral Hazards), denn im Rahmen von Entwicklungsmassnahmen kann ein (im Unterschied zum Monitoring) noch detaillierteres Bild der Lieferanten entstehen.

Mögliche Entwicklungsinstrumente sind beispielsweise Gespräche mit den Lieferanten, um das Bewusstsein für die Bedeutung der Nachhaltigkeitsaspekte zu schärfen oder Verbesserungsmassnahmen zu vereinbaren (*Mamic* 2005; *Delmas/Montiel* 2009). Weiterhin können konkrete Umsetzungsprojekte (z. B. um die CO_2-Emissionen zu verringern) gemeinsam durchgeführt oder in Schulungen und Trainingsmassnahmen investiert werden (*Mamic* 2005; *Reuter et al.* 2010). Durch gemeinsame Projekte entstehen zwar z. B. Koordinationskosten, Informationskosten und -unsicherheiten werden jedoch reduziert.

4. Empirische Untersuchung der Managementpraxis von DAX- und MDAX-Unternehmen

4.1 Methodisches Vorgehen

Die vorliegende empirische Untersuchung basiert auf einer umfassenden Studie zum Praxisstand des SSCM in DAX- und MDAX-Unternehmen. Der DAX umfasst die nach Marktkapitalisierung und Börsenumsatz grössten und der MDAX die nächstgrossen Unternehmen (Deutsche Börse 2007). Auch andere Studien, die internationale Wertschöpfungsketten analysieren, unterscheiden zwischen Unternehmen hinsichtlich der Marktkapitalisierung (*Bernstein/Greenwald* 2009). Wie *Tabelle 1* zeigt, spiegeln sich die Grössenunterschiede der beiden hier untersuchten Unternehmensgruppen im Durchschnitt auch bezüglich Jahresumsatz und Mitarbeiterzahl wider, obgleich Werte für einzelne Unternehmen leicht abweichen. Die Analyse basiert auf einer schriftlich-postalischen Erhebung mit standardisiertem Fragebogen (mit geschlossenen und offenen Fragen), die von September 2008 bis Januar 2009 durchgeführt wurde (eine Übersicht von Fragen befindet sich in *Tabelle 4* im Anhang). Insgesamt nahmen 32 Unternehmen (15 DAX, 17 MDAX) an der Befragung teil (vgl. *Tabelle 1* für die Branchenverteilung nach der Deutschen Börse). Für die empirische Untersuchung wurden die an der Börse notierten 30 DAX- und 50 MDAX-Unternehmen zunächst telefonisch kontaktiert, wobei acht der MDAX-Unternehmen eine Teilnahme an der darauf folgenden schriftlichen Befragung grundsätzlich ablehnten. 15

der insgesamt 30 DAX- und 17 der verbleibenden 42 MDAX-Unternehmen haben einen ausgefüllten Fragebogen zurückgesendet. Dies entspricht einer Rücklaufquote von 50% bei DAX und 40% bei MDAX. Die kontaktierten Unternehmensvertreter waren in den Bereichen Einkauf/Supply Chain Management/Logistik (57%), Nachhaltigkeit/Quality, Health, Safety, Environment (25%) und anderen Bereichen (9%) tätig. Einige der Personen (9%) beantworteten die Frage zur organisatorischen Zuordnung nicht.

Charakteristika	DAX	MDAX
Anzahl Unternehmen	15	17
Ø Mitarbeiterzahl	165.258	23.894
Ø Jahresumsatz in Mio. Euro (Anzahl Unternehmen)[1]	52.298 (11)	7.648 (14)
Branchenzuordnung (nach Sektoren der Deutschen Börse)		
▪ Banken/Versicherung	4 (27%)	3 (18%)
▪ Chemie/Pharma	3 (20%)	3 (18%)
▪ Handel und Transport/Logistik	1 (6%)	2 (11%)
▪ Industrie/Konsumgüter	3 (20%)	6 (35%)
▪ Andere	4 (27%)	3 (18%)
▪ *Gesamt*	*15 (100%)*	*17 (100%)*

Tabelle 1: Übersicht des Samples (basierend auf Daten der Geschäftsberichte aus 2007/2008)

In der vorliegenden Empirie werden zunächst die Charakteristika der Wertschöpfungsketten der zwei Unternehmensgruppen, die wichtigsten Treiber für das SSCM und die Relevanz unterschiedlicher sozialer und ökologischer Themen dargestellt. Dann werden die Massnahmen zur Integration von Nachhaltigkeit in das Lieferantenmanagement untersucht.

4.1 Charakteristika der Supply Chain, Treiber und Nachhaltigkeitsthemen

4.1.1 Komplexität der internationalen Supply Chains

Im Vergleich zu MDAX-Unternehmen haben die grösseren DAX-Unternehmen eine höhere Lieferantenanzahl (mehr als 5.000 Lieferanten: 73% DAX; 35% MDAX) und lassen aus einer grossen Anzahl von Ländern liefern (mehr als 50 Beschaffungsländer: 60%

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1 11 der 15 DAX-Unternehmen und 14 der 17 MDAX-Unternehmen weisen in ihren Geschäftsberichten einen Jahresumsatz aus; die verbleibenden 4 DAX-Unternehmen und 3 MDAX-Unternehmen sind Banken bzw. Versicherungen, die in ihren Geschäftsberichten die Bilanzsumme bzw. Bruttobeiträge angeben. Da die beiden letztgenannten Grössen nicht mit dem Jahresumsatz vergleichbar sind, werden sie hier nicht zur Durchschnittsberechnung herangezogen. Hinsichtlich der Grössenordnung ist jedoch ähnlich zum Jahresumsatz festzustellen, dass Bilanzsummen bzw. Bruttobeiträge bei DAX-Unternehmen im Vergleich zu MDAX-Unternehmen im Durchschnitt deutlich höher liegen (5- bis 31-fach höher).

DAX; 35% MDAX). DAX-Unternehmen beziehen häufiger als MDAX-Unternehmen aus Schwellen- und Entwicklungsländern (während aus ähnlich vielen Ländern Asiens geliefert wird, beziehen DAX-Unternehmen aus 9-31% mehr Ländern aus Afrika und Lateinamerika Produkte bzw. Dienstleistungen). Des Weiteren ist bei beiden Unternehmensgruppen eine deutliche Internationalisierungstendenz der Produktions- bzw. Dienstleistungsstandorte erkennbar (73% der DAX- und 76% der MDAX-Unternehmen geben dies an).

Wird nach Gründen gefragt, die für die Komplexität in Lieferantenbeziehungen ausschlaggebend sind (vgl. *Abbildung 1*), zeigt sich, dass die DAX-Unternehmen in der Tendenz fast alle abgefragten Gründe als ausschlaggebender bewerten als MDAX-Unternehmen (mit Ausnahme der „Geringen Währungsstabilität"). Insgesamt beurteilen die befragten Unternehmen ihre internationalen Lieferantenbeziehungen i.d.R. als komplex bis sehr komplex (80% DAX; 82% MDAX). Die seitens der Unternehmen genannten Gründe spiegeln dabei die besondere Rolle der Internationalität in der Komplexität der Lieferkette wider. Andere empirische Studien bestätigen die durch die Unternehmensgrösse induzierte, zunehmende Internationalität, insbesondere hinsichtlich der Entwicklungs- und Schwellenländer (*Reuter et al.* 2010).
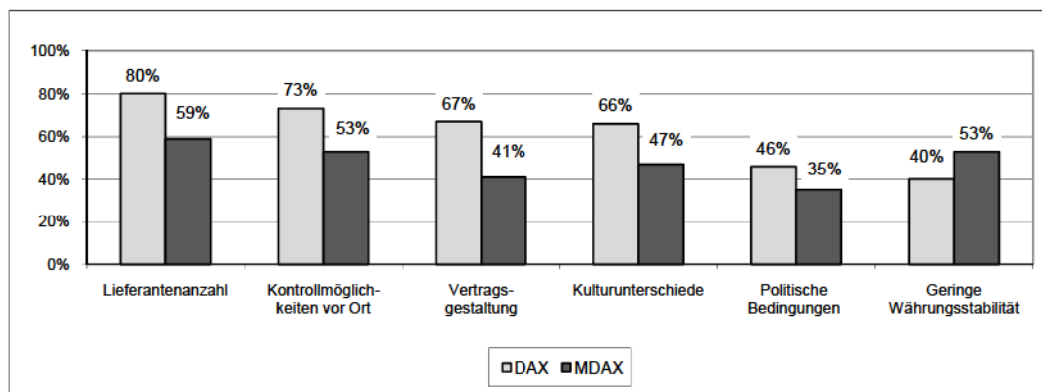

Abbildung 1: Gründe für Komplexität in Lieferantenbeziehungen (Antworten „ausschlaggebend"/„sehr ausschlaggebend" zusammengefasst)

Die befragten Unternehmen ordnen in der Supply Chain vielen Nachhaltigkeitsthemen eine grosse Bedeutung zu (jeweils Minimalwert der Nennungen von DAX oder MDAX): Abfallreduktion (≥ 88%), Gesundheitsschutz (≥ 87%), Kinder- und Zwangsarbeit (≥ 82%), Menschenrechte (≥ 82%), Reduktion von Treibhausgas-Emissionen (≥ 82%), Verminderung von negativen Umwelteinflüssen (≥ 82%), Gleichberechtigung (≥ 80%), Material- und Ressourcenverbrauch (≥ 71%), Vereinigungsfreiheit (≥ 71%) und Arbeitsplatzsicherheit (≥ 65%). Trotz einer insgesamt hohen Relevanz in DAX- und MDAX-Unternehmen zeigt sich im Detail, dass die DAX-Gruppe mit wenigen Ausnahmen (Gesundheitsschutz; Kinder- und Zwangsarbeit) die Themen höher gewichtet als die MDAX-Gruppe. Darüber hinaus ist feststellbar, dass die Bedeutung erneuerbarer Energien in der DAX-Gruppe (80%) sehr viel grösser ist als bei der MDAX-Gruppe (47%). Ausserdem wird dem Thema der „Artenvielfalt" (als Teilaspekt der Biodiversität) trotz internationaler und nationaler Aktionsprogramme (z. B. nationale Biodiversitätsstrategie der deutschen Bun-

desregierung (BMU 2007) für die Supply Chain die geringste Bedeutung beigemessen (27% DAX; 24% MDAX). Diese geringe Bedeutung zeigt sich auch in neueren empirischen Untersuchungen zum unternehmerischen Nachhaltigkeitsmanagement (*Schaltegger et al.* 2010).

Die als am bedeutendsten bewerteten Themen des SSCM, Abfallreduktion, Gesundheitsschutz, Kinder- und Zwangsarbeit, Menschenrechte, Reduktion von Treibhausgas-Emissionen und Verminderung von negativen Umwelteinflüssen, sind häufig *nahe an den Produktionsprozessen* verortet. Weniger Gewicht werden tendenziell Themen wie Artenvielfalt oder Arbeitsplatzsicherheit beigemessen, die nur indirekt oder mittelbar mit den Produktions- und Logistikprozessen in Verbindung gebracht werden können. Dabei sind nur wenige Unterschiede in der Gewichtung ökologischer gegenüber sozialen Themen festzustellen.

Die als relevant angesehen Nachhaltigkeitsthemen verdeutlichen, dass das SSCM im Vergleich zum konventionellen SCM insgesamt mit einer höheren Komplexität umgehen muss (*Goldbach* 2003; *Seuring et al.* 2004; *Kumar/Malegeant* 2006; *Gießmann/Lasch* 2010). Dennoch befassen sich immer mehr Unternehmen mit SSCM. Hierzu tragen eine Reihe von Treibern bei.

4.1.2 Treiber

Das SSCM wird durch eine Vielzahl von Treibern ausserhalb und innerhalb der Unternehmen befördert. Die wichtigsten zukünftigen *externen* Treiber der DAX-Unternehmen, beinahe gleich häufig genannt, sind Kunden, Gesetzgebung, Aktionäre (jeweils 60%) und Medien (53%). Die hohe Bedeutung dieser Stakeholder zeigt sich auch in vorausgegangenen Studien (vgl. u.a. *Carter/Dresner* 2001; *Walker et al.* 2008). Diese vier Treiber sind auch im MDAX am wichtigsten, aber mit grösseren relativen Unterschieden in der Häufigkeit der Nennungen (Kunden 82%; Gesetzgebung 76%; Aktionäre 53%; Medien 47%). Im Vergleich zeigt sich, dass bei MDAX-Unternehmen Kunden und Gesetzgebung hinsichtlich ihres Prozentanteils häufiger genannt werden als bei DAX-Unternehmen; für Medien und Aktionäre ergibt sich ein umgekehrtes Bild.

Aufgrund des vorliegenden Untersuchungsfokus auf die Umsetzung von SSCM, werden im Folgenden insbesondere die unternehmensinternen Treiber für das SSCM diskutiert (*Abbildung 2*).
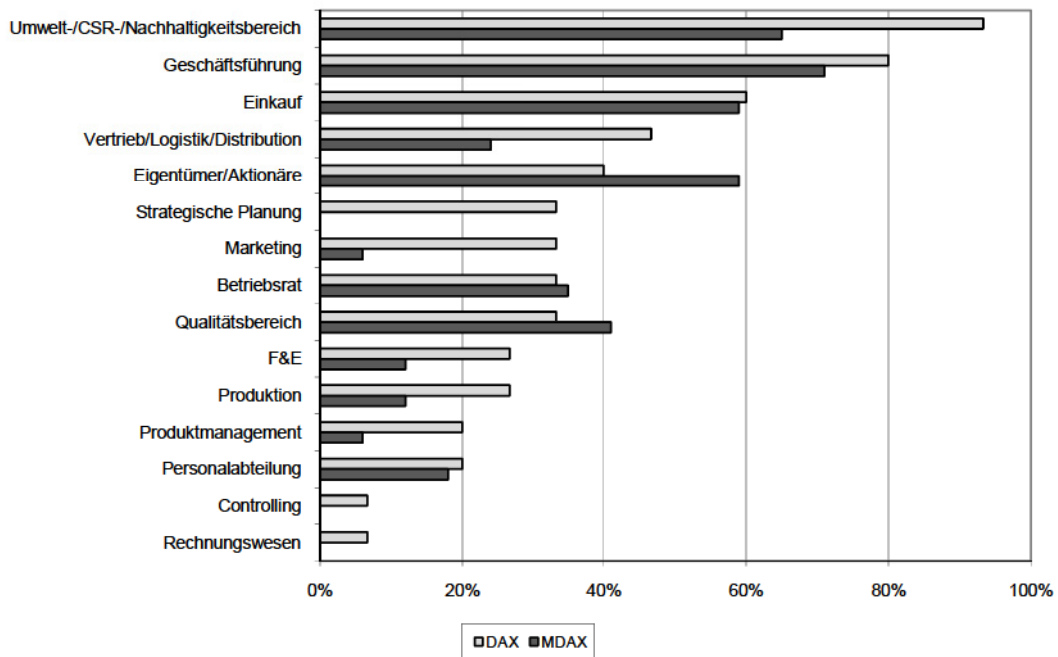
Abbildung 2: Interne Treiber für das SSCM

Wie in *Abbildung 2* dargestellt, werden von mehr als der Hälfte der DAX- und MDAX-Unternehmen sowohl der Nachhaltigkeitsbereich (bzw. Umweltbereich) als auch die Geschäftsführung und der Einkauf am häufigsten als treibende Kräfte für das SSCM gesehen (mind. 59%). Die bedeutende Rolle der Geschäftsleitung für die Umsetzung von SSCM wird vielfach genannt (vgl. u.a. *Pagell/Wu* 2009). Allerdings zeigen *Carter et al.* (1998) auch, dass ökologische Beschaffung eher durch das mittlere Management unterstützt wird. Auffällig ist, dass *marktseitige* Funktionsbereiche (Vertrieb/Logistik/Distribution, Produktmanagement und Marketing) sehr viel häufiger von den DAX- als von den MDAX-Unternehmen als *interne* Treiber benannt werden.

Die Ergebnisse lassen den Schluss zu, dass bei den kleineren MDAX-Unternehmen die zentrale Verantwortung für Nachhaltigkeitsthemen und das SSCM meist nicht in einer spezifischen Nachhaltigkeitsabteilung liegt, sondern im Qualitäts- oder Personalmanagement als Zusatzaufgabe verortet wird. Weiterhin zeigt sich, dass die sonstigen Funktionen – insbesondere die marktlichen (z. B. Vertrieb, Marketing) – beim MDAX viel seltener als Treiber auftreten. Bei ihnen scheint noch keine systematische Integration in die weiteren Funktionsbereiche stattgefunden zu haben. Eher wird Nachhaltigkeit als „parallele Organisation" in den oben erwähnten, hauptverantwortlichen Stellen betrieben (*Schaltegger/ Wagner* 2006; *Hansen* 2010, 143).

4.2 Massnahmen im Lieferantenmanagement

4.2.1 Anforderungen, Bewertung und Auswahl

Für die Umsetzung des SSCM im Lieferantenmanagement formulieren Unternehmen z. B. in Form von Standards explizite Anforderungen an ihre Lieferanten (vgl. Abschnitt 2.3), um beispielsweise der Gefahr von Adverse Selection vorzubeugen. *Tabelle 2* zeigt, dass Anforderungen von DAX-Unternehmen häufiger als von MDAX-Unternehmen schriftlich festgehalten werden. Weiterhin lässt sich für beide Gruppen feststellen, dass eine explizit schriftliche Fixierung eher für *ökologische* Anforderungen als für *soziale* stattfindet. Ein bedeutender Unterschied besteht auch in der Rolle der schriftlichen Fixierung bei eigener Bewertung/Auditierung im Kontrast zu derjenigen durch externe Dienstleister.

Anforderung	Ökologisch		Sozial	
	DAX	**MDAX**	**DAX**	**MDAX**
Mindeststandards	100%	71%	93%	59%
Lieferverträge, AGBs	87%	71%	80%	65%
Code of Conduct	87%	47%	80%	41%
Audits durch eigenes Personal	60%	71%	60%	53%
Eigene Lieferantenbewertung	67%	65%	60%	47%
Audits durch externe Dienstleister	27%	29%	33%	24%
Externe Lieferantenbewertung	33%	18%	27%	24%

Tabelle 2: Anteil der Unternehmen, die ökologische/soziale Anforderungen in Verträgen/Vereinbarungen mit ihren Lieferanten explizit schriftlich festhalten

Die erkennbare stärkere Gewichtung ökologischer *Anforderungen* (im Vergleich zu sozialen) steht dem Ergebnis gegenüber, dass in DAX- und MDAX-Unternehmen Umwelt- und Sozialthemen etwa *gleich relevant* sind (vgl. Abschnitt 4.1.1). Diese Abweichung kann darauf zurückgeführt werden, dass Themen zwar ähnlich relevant sind, die ökologischen Aspekte jedoch besser zu quantifizieren und kontrollieren sind und somit besser als *Anforderung* dienen können (*Richards/Gladwin* 1999; *Schaltegger et al.* 2007). Dies erweitert die Erkenntnis aus der Literatur, in der *allgemein* eine höhere Bedeutung ökologischer Themen beobachtet werden kann (*Seuring/Müller* 2008).

Unter der Annahme, dass grundsätzlich die gleichen ökologischen/sozialen Massstäbe bei internen oder externen Bewertungen angesetzt werden, zeigen sich dennoch Unterschiede bei der entsprechenden Durchführung. So ist zu erkennen, dass eigene Lieferantenbewertung und Audits im Unterschied zur Durchführung durch externe Dienstleister etwa doppelt so häufig angewendet werden, und dies, obwohl eine zunehmende Anzahl externer Dienstleister am Markt vorhanden ist (*Mamic* 2005). Die interne Durchführung scheint mehr Freiheitsgrade zuzulassen und den eigenen Kompetenzaufbau zu fördern. Insbesondere unter externem Legitimitätsdruck kann es jedoch erforderlich sein, die zunächst interne Durchführung auf (unabhängigere) externe Dienstleister zu übertragen

(*Zadek* 2004). Einschränkend ist jedoch zu erwähnen, dass externe Prüfer nicht immer unabhängig sind (*Mamic* 2005; *Müller et al.* 2009).
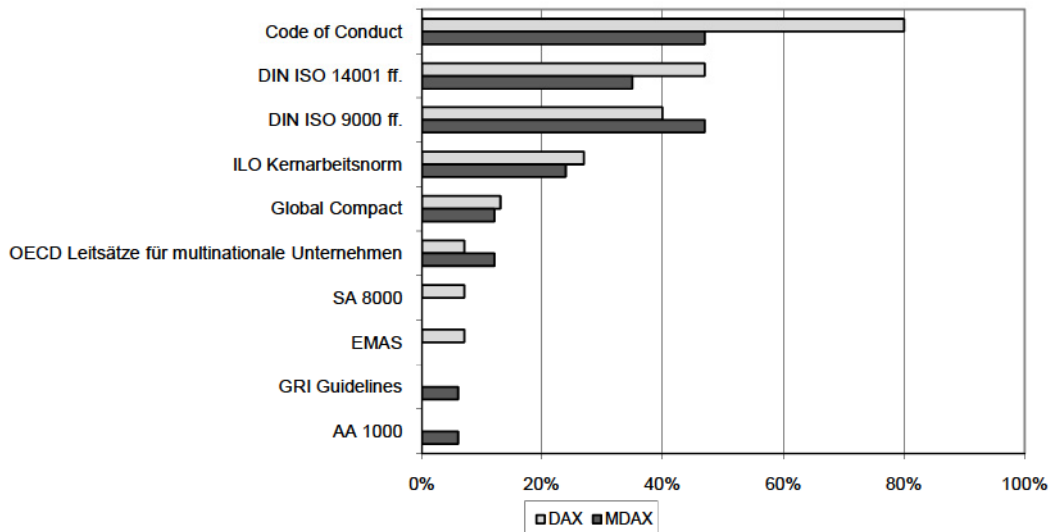

Abbildung 3: Anteil der Unternehmen, die von „vielen bis allen" Lieferanten die Einhaltung von Standards verlangen

4.2.2 Einhaltung von Standards

Grundsätzlich kann jedes Unternehmen von seinen Lieferanten im Sinne von Signalling Nachweise über die Einhaltung von Qualitäts-, Umwelt- und Sozialstandards einfordern. Die DAX-Unternehmen geben an, bei ihren Lieferanten am häufigsten über Codes of Conduct oder die bekannten Standards und Normen (z. B. ISO 9000 und 14001) Nachweise zu verlangen (*Abbildung 3*). Ähnliches gilt für die MDAX-Unternehmen, wobei Codes of Conduct eine sehr viel geringere Rolle spielen und zu Umweltmanagementstandards etwas weniger häufig ein Nachweis verlangt wird (35%).

Einerseits bestätigen die empirischen Ergebnisse, dass einige Standards wie SA 8000 und AA 1000 wegen ihrer Branchenspezifität nur wenig eingesetzt werden, andererseits widersprechen sie der üblicherweise weiteren Verbreitung des EMAS-Standards (*Koplin et al.* 2007; *Beske et al.* 2008). Die globalen Supply Chains der hier untersuchten Unternehmen sprechen dafür, dass in diesem globalen Umfeld die internationalere ISO 14001-Norm dem EMAS-Standard vorgezogen wird.

Wird darüber hinaus nach der Anzahl der *Vor*lieferanten gefragt, von denen ein Nachweis über die Einhaltung von Nachhaltigkeitsstandards verlangt wird, zeigt sich, dass dies im Gegensatz zu den *direkten* Lieferanten kaum eine Rolle spielt (maximal 13% der DAX- bzw. 12% der MDAX-Unternehmen geben an, entsprechende Nachweise zu verlangen). Hier liegt die Erklärung nahe, dass dies an der noch grösseren Anzahl von Vorlieferanten und deren schwierige Erreichbarkeit auf vorgelagerten Stufen liegt. Anstatt direkte Massnahmen zum Abbau der stark ansteigenden Informationsasymmetrien bzgl. der Vorlieferanten zu ergreifen, können „Trickle Down"- oder „Green Multiplier"-Effekte (*Preuss* 2001; *Holt* 2004) erwägt werden, bei denen Lieferanten ihrerseits Massnahmen bei den

Vorlieferanten durchsetzen. „Trickle down" bedeutet hier, dass Wirkungen der vom fokalen Unternehmen getroffenen Massnahmen von den direkten Lieferanten zu weiteren Vorstufen in der Lieferkette „durchsickern".

4.2.3 Lieferantenentwicklung

Unternehmen verfügen über ein breites Sanktions- und Massnahmenspektrum, um Sozial- und Umweltleistungen bei ihren Lieferanten nach Vertragsabschluss zu verbessern (*Tabelle 3*). DAX-Unternehmen legen dabei bereits in den Liefervereinbarungen Sanktionsmöglichkeiten deutlich häufiger schriftlich und mündlich fest (74%) als MDAX-Unternehmen (36%), wie zudem aus *Abbildung 4* ersichtlich ist. Wird nach der Häufigkeit des Ergreifens von entsprechenden Standard-Massnahmen (Massnahmen die „immer" durchgeführt werden) bei Lieferanten gefragt, zeigt sich, dass bei DAX-Unternehmen die folgenden Massnahmen am häufigsten genutzt werden (mit sinkender Bedeutung): Verwarnung, Potenzial-Gespräche, Beendigung der Lieferantenbeziehung und gleichermassen eigene Kontrollen sowie Schulungen. Die MDAX-Unternehmen scheinen in ihrem Standardvorgehen wesentlich weniger kooperativ zu sein: Hier wird seltener verwarnt, es werden weniger Gespräche geführt oder Schulungen durchgeführt, dafür aber öfter eigene Kontrollen vor Ort vorgenommen und die Lieferantenbeziehung beendet. Bei den Massnahmen, die fallspezifisch (d.h. „manchmal") durchgeführt werden, relativiert sich zumeist die schwächere Ausprägung der MDAX-Unternehmen, mit Ausnahme der Schulungsmassnahmen.

Dass DAX-Unternehmen wesentlich stärker in kooperative Lieferantenentwicklung investieren, ist aus Sicht der Ressourcensicherung verständlich, kann aber auch durch das höhere Engagement in Entwicklungs- und Schwellenländern erklärt werden, da in diesen Ländern das Risiko besonders hoch und der Bedarf nach Know-how-Aufbau ausgeprägt ist (*Teuscher et al.* 2006; *Beske et al.* 2008).

Häufigkeit	Immer		Manchmal		Nie / k.A. / weiss nicht	
Massnahmen	DAX	MDAX	DAX	MDAX	DAX	MDAX
Eigene Kontrolle vor Ort	13%	24%	67%	71%	20%	5%
Gespräche, um Verbesserungspotenziale zu bestimmen	40%	24%	47%	59%	13%	17%
Verwarnungen bei Nicht-Einhaltung von Forderungen	53%	41%	34%	35%	13%	24%
Beendigung der Lieferantenbeziehung	20%	29%	60%	41%	20%	30%
Schulungen für Verbesserung von Sozial- und/oder Umweltbedingungen	13%	6%	67%	47%	20%	47%

Tabelle 3: Massnahmen, um Umwelt-/Sozialleistungen bei Lieferanten zu verbessern
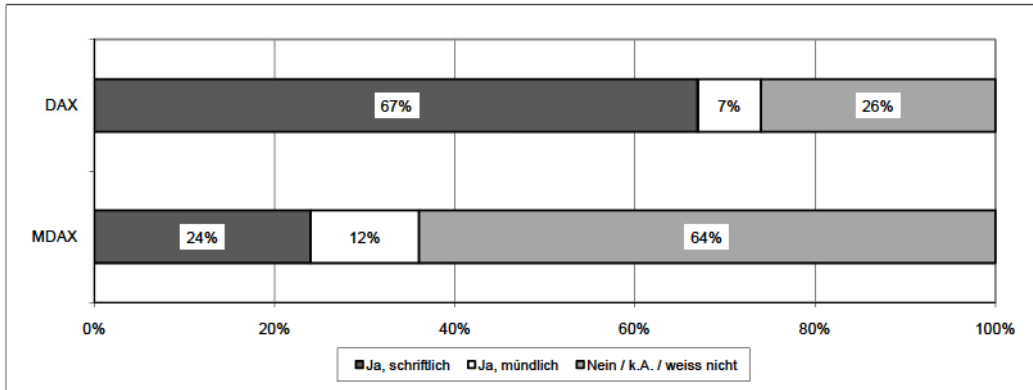
Abbildung 4: Festschreibung von Sanktionsmöglichkeiten in Lieferantenvereinbarungen

Unter einer zusätzlichen offenen Frage geben Unternehmen an, dass verschiedene Massnahmen (z. B. Schulungen; schriftliche Verwarnungen und Auftragskürzungen) einer Beendigung der Geschäftsbeziehung vorgezogen werden. Die Auslistung von Lieferanten ist also tendenziell anderen Massnahmen nachgestellt. Andere empirische Studien zeigen ein ähnliches Bild: Verstösse gegen Standards werden in manchen Branchen eher als Regel denn als Ausnahme identifiziert (*Peters* 2010, 50 f.; PwC/Oekom Research 2009), so dass auch eine Beendigung der Lieferantenbeziehung nur begrenzt als praktikabel angesehen wird. Ausserdem wird beobachtet, dass Anforderungen in Bezug auf Standards und Codes of Conduct nur als Ausgangspunkt für einen kollaborativen Entwicklungsprozesses gelten und somit die harte Sanktionierung durch Beziehungsabbruch im Hintergrund steht (*Mamic* 2005; *Bernstein/Greenwald* 2009). Auch *Holt* (2004) berichtet davon, dass Lieferanten selten mit einem Beziehungsabbruch konfrontiert sind. Dies bedeutet, dass ein Lieferantenwechsel derzeit hohe Wechselkosten verursacht und keinen entscheidenden Gewinn an Information und Sicherheit bezüglich ökologischer und sozialer Aspekte bringt, während die Lieferantenentwicklung als ökonomisch sinnvoller bewertet wird, da die Kombination aus Schulungskosten und zusätzlichem Informations- und Sicherheitsnutzen höher eingestuft wird.

5. Diskussion und Forschungsbedarf

5.1 Unternehmensgrösse und Supply Chain Charakteristika

Die empirische Untersuchung der DAX- und MDAX-Unternehmen zeigt, dass die Unternehmensgrösse für die Ausgestaltung des SSCM Bedeutung hat, insbesondere im Sinne einer höheren Formalisierung der Massnahmen. Sie bestätigt damit Ergebnisse bisheriger Studien zur Rolle der Unternehmensgrösse für das SSCM (*Delmas/Terlaak* 2001; *Neilson/ Pritchard* 2007; *Peters* 2010). Vor dem Hintergrund, dass die bisherigen Studien z.T. Grossunternehmen mit KMUs verglichen haben, ist es bemerkenswert, wie stark der Unterschied bereits zwischen börsennotierten Grossunternehmen des DAX und den nächstgrossen Unternehmen des MDAX ausfällt. Dies kann zwei Ursachen haben: *Erstens* scheint zusätzlich zu der Rolle der Unternehmensgrösse, die (im Mittel) bei DAX-Unternehmen grösser als bei MDAX ist, die Bedeutung der (nach Marktkapitalisierung vorge-

nommenen) Zuteilung zu Large Cap (DAX) oder Mid Cap (MDAX) für eine höhere Exponiertheit (vgl. auch *Peters* 2010, 61) in der Öffentlichkeit ausschlaggebend zu sein. Die mediale Aufmerksamkeit konzentriert sich danach insbesondere auf die „führende" Gruppe der Large Caps. Auch internationale Studien im SSCM zeigen wesentliche Unterschiede zwischen Mid und Large Caps (*Bernstein/Greenwald* 2009). *Zweitens* bedingt die Unternehmensgrösse auch die Charakteristika der Supply Chain selbst. So haben die DAX-Unternehmen im Vergleich zu MDAX-Unternehmen sowohl knapp doppelt so häufig Lieferantenbeziehungen mit mehr als 5.000 Lieferanten als auch mehr als 50 Beschaffungsländer sowie eine wesentlich höhere Beschaffungsquote aus Entwicklungs- und Schwellenländern. Dieser höheren Komplexität versuchen die DAX-Unternehmen mit formalisierteren Managementmassnahmen zu begegnen. Da grössere Unternehmen i.d.R. auch über eine umfangreichere Ressourcenausstattung verfügen, können sie diese Massnahmen auch eher realisieren (*Neilson/Pritchard* 2007). Darüber hinaus ist zu bedenken, dass sich die offenkundige Komplexität in internationalen Lieferantenbeziehungen noch weiter durch die Berücksichtigung von Umwelt- und Sozialaspekten in der Wertschöpfungskette erhöht.

Parallel zu diesen Ergebnissen hinsichtlich der Unternehmensgrösse lassen sich verschiedene Entwicklungen hinsichtlich der konkreten Massnahmen im Lieferantenmanagement aufzeigen.

5.2 Anforderungen, Bewertung und Auswahl

Zur Festschreibung ökologischer und sozialer Aspekte in Vereinbarungen und Verträgen setzen die DAX- und MDAX-Unternehmen am stärksten auf Signalling der Lieferanten hinsichtlich der vom Unternehmen erwarteten Mindeststandards (vgl. *Tabelle 2*). Am zweithäufigsten werden Anforderungen in Lieferverträgen festgeschrieben und somit ein Interessenausgleich zwischen fokalem Unternehmen und Lieferanten durch mögliche Sanktionsmöglichkeiten geschaffen. Die drittwichtigste Gruppe beinhaltet die Bewertungs- und Auditierungs-Mechanismen, die bei Anwendung *vor* Vertragsabschluss einer Adverse Selection entgegen wirken sollen sowie bei Nutzung *nach* Vertragsabschluss der Verhinderung des Moral Hazards dienen. Insgesamt werden also zum Abbau von Informationsasymmetrien bezüglich ökologischer/sozialer Aspekte eher auf leicht zu implementierende Mechanismen zurückgegriffen (Mindeststandards, Vertragsinklusion) als auf ressourcenaufwendige Screening- und Kontroll-Mechanismen. Nachhaltigkeitskriterien bleiben also häufiger auf dem ersten oder zweiten Niveau der (wenn auch verbindlichen) Anforderung. Die Anforderungen werden allerdings nicht immer mit konkreten Kontroll- bzw. Auditierungsmechanismen unterlegt. Dies könnte ein Zeichen für eine oberflächliche sowie auf Reputation ausgerichtete Umsetzung sein (*Müller* 2005, 88).

Mit Blick auf die Anforderungen der Unternehmen zeigt sich, dass bei einer entsprechenden *schriftlichen Fixierung* eine Tendenz zugunsten ökologischer Themen gegenüber den sozialen beobachtet werden kann, obwohl Unternehmen die *Bedeutung* der Themen weitgehend gleichmässig einschätzen (vgl. Abschnitt 4.2.1). Die rund ein Jahrzehnt frühere Betonung ökologischer Themen (1980er Jahre) im Vergleich zu den sozialen Themen (1990er Jahre) mag noch heute eine Rolle für die Formulierung von Anforderungen spielen (*Andersen* 2005, 67). Die grundsätzlich bessere Messbarkeit – und damit bessere Kontrollmöglichkeiten – von ökologischen Aspekten kann ein weiterer Grund hierfür sein (*Richards/Gladwin* 1999; *Schaltegger et al.* 2007).

5.3 Lieferantenentwicklung

Die Untersuchung zeigt, dass zur Verbesserung der Nachhaltigkeitsleistung von Lieferanten Vor-Ort-Kontrollen, Verwarnung, Potenzialgespräche sowie Schulungs- und Entwicklungsmassnahmen genutzt werden (vgl. *Tabelle 3*). Auch die *Beendigung einer Lieferantenbeziehung* wird als letztes Mittel wahrgenommen. Diese ist allerdings weder eine wirksame noch effiziente Pauschallösung, ist sie doch mit hohen Transaktionskosten (z. B. Such- und Vereinbarungskosten) verbunden. Noch wichtiger als die Rolle der Transaktionskosten erscheint jedoch, dass der Markt für Lieferanten, die umfangreiche Nachhaltigkeitskriterien erfüllen können, viel knapper ist als für solche, die nur konventionelle Lieferkriterien erfüllen (z. B. Qualität etc.; *Reuter et al.* 2010). Ausserdem besteht bei neuen Lieferanten keine Sicherheit, dass diese tatsächlich nachhaltig im Sinne der Anforderungen des fokalen Unternehmens handeln. In diesem Kontext erscheinen alternative Massnahmen und dabei insbesondere die Lieferantenentwicklung von besonderem Interesse.

Im Unterschied zu älteren Studien (z. B. *Holt* 2004), aber in Einklang mit anderen aktuellen empirischen Untersuchungen (*Mamic* 2005; *Reuter et al.* 2010) lässt sich auch in dieser Analyse eine *hohe Bedeutung der Lieferantenentwicklung* feststellen. Insbesondere bei den sehr stark internationalisierten Supply Chains der DAX-Konzerne und der grossen Relevanz von Entwicklungs- und Schwellenländern spielt die Lieferantenentwicklung für den Know-how-Aufbau eine wichtige Rolle.

Der Bedeutungsgewinn der *nachhaltigkeitsorientierten Lieferantenentwicklung* ist aus mindestens zwei Gründen wünschenswert: *Erstens* werden im entgegengesetzten Fall der Lieferantenaufkündigung soziale oder ökologische Missstände nicht aufgehoben, sondern ggf. sogar zementiert, da sich Lieferanten durch ökonomische Einbussen gezwungen sehen können, weiter vornehmlich auf kurzfristige Kostenaspekte zu schauen. *Zweitens* führt die Lieferantenentwicklung zu erwünschten *Spillover-Effekten*, so dass die nachhaltigkeitsorientierte Entwicklung der Lieferanten auch bei deren Vorlieferanten und in anderen Wertschöpfungsketten, in denen die Lieferanten beteiligt sind, hineinwirkt. Lieferantenentwicklung gibt daher Impulse für die Verbesserung der Nachhaltigkeitsleistung in ganzen Regionen und Branchen.

Die Lieferantenentwicklung ist jedoch nicht ganz unproblematisch und sollte gut gemanagt werden. Im Unterschied zu *Adverse Selection-* und *Moral Hazard-*Problemen spielt bei der Lieferanten*entwicklung* eher die *Hold-up-*Problematik (Gefahr einer Ressourcenabhängigkeit des fokalen Unternehmens durch getätigte Investitionen bei Lieferanten) eine Rolle. Bei einem Wegfall des Lieferanten (z. B. durch opportunistisches Verhalten des Lieferanten, der sich durch verbesserte Leistungsfähigkeit auch anderen Kunden zuwenden kann; vgl. *Holt* 2004) stellen bisher investierte Massnahmen wie Schulungen etc. verlorene Kosten („Sunk costs") dar. Unternehmen sollten daher anreizkompatible Verträge (z. B. langfristige Lieferverträge, strategische Partnerschaften, Lieferantenintegration) ausgestalten, um die Investitionen in die Lieferantenentwicklung abzusichern.

Letztendlich kann eine Lieferantenentwicklung die Basis für eine angestrebte längerfristige Zusammenarbeit zwischen Unternehmen und Lieferanten sein. Dadurch wird es wiederum möglich, dass einem raschen Wechsel von Lieferantenbeziehungen durch Ausnutzen von Standortvorteilen entgegengewirkt wird – da der Wechsel z. B. für soziale Aspekte wie Arbeitsbedingungen oder langfristige Beschäftigung kritisch ist. Müssen nämlich neue Lieferanten an anderen Standorten und in weniger entwickelten Ländern wieder neu mit sozialer und ökologischer Expertise aufgebaut werden, wird ein schneller Lieferantenwechsel

weniger interessant. Der Vertrauensaufbau zwischen Unternehmen und Lieferanten einerseits und die Reduzierung von Lieferantenwechseln andererseits vermindern schliesslich Transaktionskosten und können sich so auch ökonomisch positiv auf die Kostenstruktur des fokalen Unternehmens auswirken.

5.4 Forschungsbedarf und Limitationen

Die steigende Bedeutung der Kooperation mit Lieferanten sollte auch in der weiteren Forschungsagenda berücksichtigt werden. Drei Strategien sind denkbar:

- Mögliche Gründe, weshalb die weniger grossen Unternehmen (MDAX) insgesamt weniger Umsetzungsstärke im SSCM zeigen, können hohe Kosten für Informationsbeschaffung und Kommunikation sowie Monitoring und Entwicklung sein. Des Weiteren können *Spillover-Effekte* eine Rolle spielen, wo andere Unternehmen (und vielleicht Wettbewerber) von den jeweiligen Massnahmen bei Lieferanten profitieren, ohne selbst zu investieren. Daher sind interorganisationale Ansätze wie horizontale *Einkaufskooperationen* oder *-netzwerke* (*Picot et al.* 2003, 306; *Holt* 2004) zu untersuchen.
- Die empirische Untersuchung bestätigt die hohe strategische *Bedeutung der Beschaffungsabteilung* für die Umsetzung von Nachhaltigkeit in Unternehmen (*Günther et al.* 2005, 8; *Preuss* 2007). Zusätzlich ist sie herausgefordert, neben dem konventionellen Know-how des Einkaufs zusammen mit anderen Funktionsbereichen soziale und ökologische Expertise auf- und auszubauen. Zukünftige Forschung sollte daher Ansätze untersuchen, die eine intensivierte funktionsübergreifende Zusammenarbeit ermöglichen, wie z. B. sog. „1:1 Gespräche" zwischen Abteilungen (*Hansen* 2010, 215).
- Die enge Lieferantenkooperation kann auch als Basis für kollaborative Entwicklungsprozesse von nachhaltigkeitsorientierten Produkten dienen – denn diese erfordern eine Betrachtung ökologischer und sozialer Aspekte über den gesamten physischen Lebenszyklus (*Preuss* 2007; *Vachon* 2007; *Seuring/Müller* 2008; *Wagner* 2008; *Hansen et al.* 2009). Eine enge Zusammenarbeit im Rahmen der Lieferantenentwicklung kann eine gute Ausgangsbasis für solche F&E-Kooperationen in der Supply Chain sein.

Bei der Interpretation der Ergebnisse ist zu beachten, dass die empirische Untersuchung auf grundlegenden statistischen Analysen (insb. Häufigkeiten) aufbaut, die keine prognostische Wirkung haben. Eine Generalisierung der Ergebnisse ist auch aufgrund der kleinen Anzahl der Unternehmen in den Untersuchungsgruppen DAX und MDAX (trotz der sehr hohen Rücklaufquote) eingeschränkt. Weiterhin unterliegt die Studie durch den Fokus auf soziale und ökologische Themen wie andere Studien in diesem Bereich dem Störfaktor der sozialen Erwünschtheit (*Fernandes/Randall* 1992). Durch die anonymisierte Behandlung der Unternehmen sowie durch das spezifische Design des Fragebogens (z. B. notwendige Angabe von Beispielen) wurde dieser so weit wie möglich eingeschränkt. Zukünftige Studien könnten über die Selbstauskünfte der Unternehmen hinaus eine direkte Befragung von Lieferanten und kritischen Stakeholdern vornehmen.

6. Fazit und Ausblick

SSCM befasst sich mit der Gestaltung von Wertschöpfungsketten unter ökonomischen, ökologischen und sozialen Gesichtspunkten. Insbesondere durch die hohe Internationalisierung der Wertschöpfungsketten und der Beschaffung aus Entwicklungs- und Schwellenländern erlangt das SSCM sowohl in der Wissenschaft als auch der Praxis eine steigende

Bedeutung. Das Lieferantenmanagement ist dabei von zentraler Bedeutung für die Umsetzung von Nachhaltigkeitsaspekten in der Lieferkette. Die durchgeführte Unternehmensbefragung bei DAX- und MDAX-Unternehmen zeigt, dass bei einem Grossteil der an der Befragung teilnehmenden Unternehmen ökologische und/oder soziale Aspekte im Lieferantenmanagement des Unternehmens integriert werden. Dabei unterscheiden sich DAX- und MDAX-Unternehmen in der Ausgestaltung des SSCM.

Entwicklungsbedarf besteht in Bezug auf die *Ausweitung des Themenfokus* des SSCM von den direkt mit Produktionsprozessen in Verbindung stehenden Themen auf indirekt wirkende Themen wie Artenvielfalt oder Arbeitsplatzsicherheit. Bezüglich der Massnahmen ist eine Entwicklung von Kontroll- und Überwachungsansätzen hin zu Ansätzen einer *partnerschaftlichen Lieferantenentwicklung* zu erkennen und erforderlich. Vor dem Hintergrund, dass die Kontrollkosten sehr hoch sind, die Nachhaltigkeitsrisiken entlang der Lieferkette nur beschränkt reduziert werden können und der Markt für Lieferanten mit hohen Sozial- und Ökostandards begrenzt ist, sind Massnahmen zur Lieferantenentwicklung ökonomisch sinnvoll. Lieferantenentwicklungen sind auch für die (soziale und ökologische) Nachhaltigkeit wünschenswert, da durch *Spillover-Effekte* weitergehende Entwicklungsprozesse angestossen werden. Die Lieferantenentwicklung ist angesichts der *Hold-up*-Problematik jedoch mit anreizkompatiblen Verträgen auszugestalten oder durch Unternehmenskooperationen zu realisieren.

Zukünftige Forschung sollte ein besonderes Augenmerk auf kooperative Lernprozesse in der Supply Chain legen, da Kooperation für die Realisierung von nachhaltigkeitsorientierten Geschäftsprozessen und Innovationen einen zentralen Faktor darstellt.

Anhang (Auszug aus dem Fragebogen)

Referenz	Fragen
Abb. 1:	Wenn Sie Ihre internationalen Lieferantenbeziehungen betrachten, wie ausschlaggebend sind folgende Gründe für die Komplexität Ihrer Lieferantenbeziehungen? *(Auf der Skala: Überhaupt nicht ausschlaggebend / Wenig ausschlaggebend / Ausschlaggebend / Sehr ausschlaggebend / Weiss nicht)*
Abb. 2:	Wer in Ihrem Unternehmen verlangt die Berücksichtigung von ökologischen und/oder sozialen Aspekten (z. B. die Verminderung von Emissionen, Anti-Diskriminierung, Reduzierung von Gesundheits- und Unfallgefahren) in Ihrem Supply Chain Management durch schriftliche oder mündliche Äusserungen? *(Mehrfachnennungen möglich)*
Tab. 2:	Sind ökologische / soziale Anforderungen (wie z. B. die Einhaltung von Umweltstandards / Einhaltung von Unfallschutzmassnahmen) in Verträgen bzw. Vereinbarungen mit Ihren Lieferanten explizit schriftlich festgehalten? *(Nein, da nicht relevant / Nein, jedoch geplant / Nein, jedoch mündlich / Ja, schriftlich / Weiss nicht)*
Abb. 3:	Bei wie vielen Lieferanten Ihres Unternehmens verlangen Sie den Nachweis über folgende Qualitäts-, Umwelt- und/oder Sozialstandards (inkl. Audits)? *(Keine Lieferanten / Wenige Lieferanten / Viele bis alle Lieferanten / Weiss nicht)*
Tab. 3:	Wie häufig ergreifen Sie folgende weitere Massnahmen, um Sozial- und/oder Umweltleistungen bei Ihren Lieferanten zu verbessern? *(Nie / Manchmal / Immer / Weiss nicht)*
Abb. 4:	Haben Sie bei Nichteinhaltung von ökologischen und/oder sozialen Vorgaben in Ihren Lieferantenvereinbarungen Sanktionsmöglichkeiten festgeschrieben? *(Ja, schriftlich / Ja, mündlich / Nein; Wenn ja, welche Sanktionsmassnahmen haben Sie gegenüber Ihren Lieferanten bzw. Vorlieferanten schon durchsetzt)*

Tabelle 4: Auszug aus dem Fragebogen

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Erik G. Hansen, Dr., ist als wissenschaftlicher Assistent am Centre for Sustainability Management (CSM) der Leuphana Universität und als Visiting Fellow am Doughty Centre for Corporate Responsibility der Cranfield University, UK tätig.

Dorli Harms ist wissenschaftliche Mitarbeiterin am Centre for Sustainability Management und promoviert zum Thema Sustainable Supply Chain Management.

Stefan Schaltegger, Prof. Dr., ist Ordinarius für Betriebswirtschaftslehre, Leiter des Centre for Sustainability Management und des MBA Sustainability Management an der Leuphana Universität Lüneburg.

Anschrift: Centre for Sustainability Management (CSM), Leuphana Universität Lüneburg, Scharnhorststr. 1, 21335 Lüneburg, Tel.: +49 (0)4131/677-2260,
E-Mails: erik.hansen@uni.leuphana.de; dharms@uni.leuphana.de;
schaltegger@uni.leuphana.de

Contribution III (journal article, double blind peer reviewed, published)

Harms, D. (2011): Environmental Sustainability and Supply Chain Management: A Framework of Cross-Functional Integration and Knowledge Transfer, Journal of Environmental Sustainability, Vol. 1, No. 1, 121–141.

Environmental Sustainability and Supply Chain Management — A Framework of Cross-Functional Integration and Knowledge Transfer

Dorli Harms
Leuphana University Lüneburg
dharms@uni.leuphana.de

ABSTRACT: The purpose of this paper is to discuss mechanisms of intra-organizational knowledge transfer within sustainable supply chain management (SSCM). Through a conceptual study design, the focus of this paper is on the transfer of SSCM-associated information and knowledge between functional units. Furthermore, the external stakeholder perspective is taken into account. To support this conceptual framework, the knowledge-based theory provides a theoretical foundation in order to study a company's ability for knowledge sharing. Within this perspective one approach distinguishes between internal and external structures and the individual competence. These findings will be used as a basis to further develop a framework of intra-organizational SSCM knowledge and information transfer as well as cross-functional integration.

KEYWORDS

Conceptual Paper, Cross-Functional Integration, Knowledge-Based Theory, Sustainable Supply Chain Management

I. INTRODUCTION

The linkage between sustainability management and conventional supply chain management (SCM) has gained an increasing amount of interest in the academic and business community (Carter and Rogers; Sarkis, Zhu, and Lai; Seuring and Müller) to the extent that sustainable supply chain management (SSCM) is now seen as an established research field (Seuring). Theoretical approaches refer, for instance, to the differentiation between product- and process-oriented perspectives on SSCM (Bowen et al.) or internal and external relationships (Harland; Lambert, Cooper, and Pagh). Nevertheless, current studies still address the need for further research, in particular with regard to an advanced building of SSCM theory and development of new concepts (Carter and Easton; Seuring). Overall, research indicates (Pagell, Wu, and Wassermann) that there is a potential shift from conventional SCM and purchasing to more sustainability-oriented efforts.

This shift can be described as a decisive move for a company's current and future procurement and supply management activities because a company often faces a high level of complexity. Such complexity can be triggered by the necessity to manage a large number of suppliers in diverse

socio-economic contexts or by a growing demand for an integration of environmental and social criteria in supply chain management (Halldórsson, Kotzab, and Skjoett-Larsen; Seuring and Müller). This integration is demanded, for instance, by customers or media (Andersen and Skjoett-Larsen; Carter and Dresner; Walker, Di Sisto, and McBain). If a company is not able to meet these requirements, it may risk a reputation loss. In contrast, however, SSCM can also create opportunities such as product and process innovations, which fit the increasing market for environmental-friendly and socially responsible products and services (Carter and Jennings; Geffen and Rothenberg; Kassinis and Soteriou). As a consequence of these challenges and opportunities, the purchasing department is involved in a dialogue not only with its suppliers, but also has to exchange information and knowledge with other departments within the same company such as research and development (R&D), production, or the sustainability department.

In this process, supply chains can be divided into external (inter-organizational) and internal (intra-organizational) components. *External supply chains* (upstream and downstream; Vachon and Klassen, "Extending Green Practices") are characterized by the flow of materials, capital, and information between the different external partners (e.g. suppliers, focal company, retail, consumers, disposal/recycling), whereas *internal supply chains* encompass the interaction among the different functional units within the (focal) company (Harland; Lambert, Cooper, and Pagh; Seuring and Müller). Combining both supply chain perspectives implies that functional units have to exchange sustainability-relevant information internally to meet the requirements of external stakeholders (e.g. information about human rights compliance) or to comply with internal quests (e.g. reduction of CO_2 emissions across the supply chain).

In this paper, focusing on the necessity of transferring internal SSCM-related information and knowledge raises the following question: *How does cross-functional integration play a role in intra-organizational transfer of SSCM-relevant information and knowledge?*

To answer this question, a conceptual framework has been developed. Although, there is a considerable interest for SSCM and for new theoretical approaches from both academic and practitioner sides (Matos and Hall; Reuter et al.; Simpson, Power, and Samson), the SSCM literature is limited with regard to a discussion of intra-organizational alignment from a theory-based perspective (e.g., Gattiker and Carter). In order to help fill this gap and to investigate SSCM with the focus on cross-functional collaboration and knowledge transfer, the knowledge-based theory (Grant; Sveiby) has been deemed suitable for this paper. This theory emphasizes the role and relevance of knowledge for a company—the "creating, storing, and applying knowledge" (Dyer and Nobeoka 345)—to gain competitive advantage (Grant; Spender). Sveiby applies this knowledge-based approach of the firm (in the following simply referred to as the *knowledge-based view*) to explore a company's internal and external transfer as well as conversion of knowledge. However, Sveiby does not explicitly portray the intra-organizational integration or refer to sustainability issues so his model will be modified conceptually with regard to intra-organizational SSCM characteristics.

The paper is divided into five sections. After the introduction, the second section gives an overview on the background literature regarding sustainable supply chain management and cross-functional integration. The third section sketches the knowledge-based view with focus on intra-organizational aspects. In the fourth section, a conceptual framework of cross-functional integration in intra-organizational SSCM is developed and discussed with regard to corresponding

measurements. The final section draws a conclusion and points out areas for future research.

II. SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND CROSS-FUNCTIONAL INTEGRATION

As SSCM is already seen as an established research field (Seuring) and cross-functional collaboration has been discussed since the 1980's (Takeuchi and Nonaka), the following section provides an overview on related literature and findings in these two fields so far.

II.I. SUSTAINABLE SUPPLY CHAIN MANAGEMENT

SSCM can be understood as a further development of the conventional SCM—extended by the integration of the three (environmental, social, and economic) dimensions (Carter and Rogers; Seuring and Müller). In order to outline the underlying meaning of the management concepts, this section sketches their main characteristics.

The traditional notion of *supply chain management* encompasses both the demand-oriented (downstream) and supply-oriented (upstream) processes (Cooper and Ellram; Esper et al.; Vachon and Klassen, "Extending Green Practices"), although the term literally focuses on the supplier's side. SCM aims at "delivering enhanced customer service and economic value" (Mentzer et al, with reference to La Londe). This term refers to the management of the

> *activities associated with the flow and transformation of goods…as well as the associated information flows…. Supply chain management (SCM) is the integration of these activities through improved supply chain relationships, to achieve a sustainable competitive advantage* (Handfield and Nichols 2).

This definition implies that SCM can be rather complex, especially when regarding the different stages of the supply chain. The focal company has to manage not only the flow of materials and goods but also the flow of information. To achieve a proper flow, a company can use information system tools, such as enterprise resource planning (ERP) software or face-to-face interaction with external and internal members of the supply chain (Pagell).

External members are the different suppliers (1st tier, 2nd tier, etc.) on the supply side, whereas customers (e.g., wholesalers), consumers, and waste disposal recycling companies, respectively, are members on the demand side. Furthermore, the buying, producing, moving, storing and selling of a company are core activities that characterize the *internal* supply chain (New; Sweeney). All departments that require purchased products or services are, in the wider sense, a part of the internal supply chain. In a narrower sense, these are the functional units that participate in the internal supply chain (e.g. purchasing, manufacturing, sales, and distribution) (Harland S63). In addition to these internal supply chain members, Lambert, Cooper, and Pagh (2) included the departments' R&D as well as finance. First and foremost, the purchasing and logistics departments play the central role in the management of supply chains since they create an interface with external suppliers (Cooper and Ellram).

For several years, SCM also has been discussed with regard to environmental and social issues (e.g., Carter and Easton; Carter, Ellram, and Ready; Sarkis, Zhu, and Lai). Referring to Jayaraman, Klassen, and Linton as well as Cruz, the authors Pagell, Wu, and Wassermann (58) argue with regard to SSCM that

> *evidence is growing that the field is reaching a critical tipping point where wide-scale adoption of sustainable sourcing practices may potentially become a dominant dynamic in the supply chain context.*

This further development of SCM leads to a more comprehensive understanding of SSCM. In line with the triple bottom line approach and the notion of sustainable development (Elkington; Kleindorfer, Singhal, and van Wassenhove; Schaltegger and Burritt, "Corporate Sustainability"), Seuring and Müller (1700) define *sustainable supply chain management* as

> *the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements.*

In sustainable supply chains, environmental and social criteria need to be fulfilled by the members to remain within the supply chain, while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria.

Their definition is illustrated in Figure 1. As shown, there are several internal and external stakeholders who deal with sustainable supply chain management issues.

For instance, there are external stakeholders such as the (national and international) legislation (Carter and Dresner; Walker, Di Sisto, and McBain) and competitors (Klassen and Vachon; Zhu and
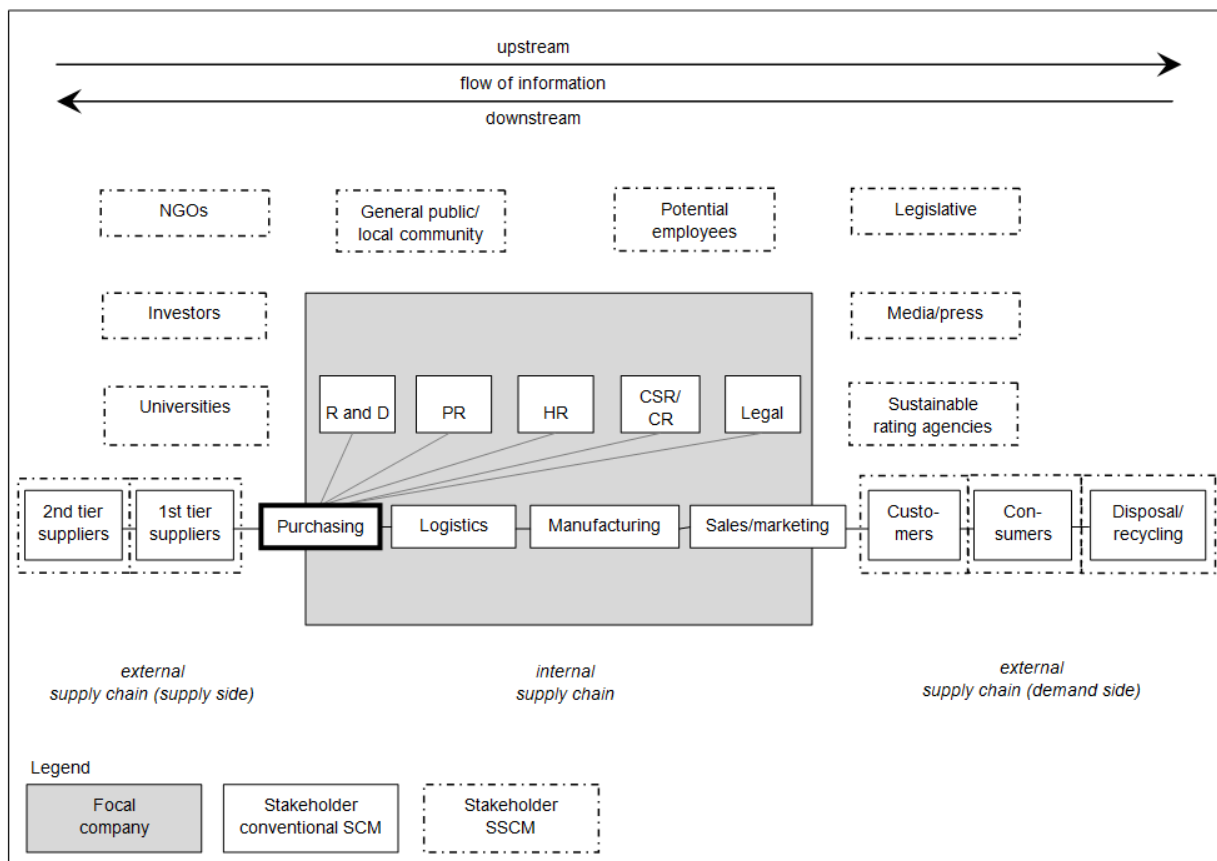

Figure 1: Sustainable internal and external supply chain (according to the understanding of Harland S63; Salzmann et al. 15; Seuring and Müller 1700).

Sarkis), investors and rating agencies as well as NGOs and the general public (Koplin, Seuring, and Mesterharm; Salzmann et al.; Svensson; Wycherly). In addition, suppliers and customers are external stakeholders (Carter and Dresner; Klassen and Vachon). Due to the fact that in recent years the amount of stakeholder requirements has increased for corporate responsibility as well as for environmental-friendly and socially responsible products and services (Carter and Jennings; Kassinis and Soteriou; Sarkis, Zhu, and Lai; Seuring and Müller), the importance of the company internal knowledge transfer between functional units such as public relations (PR) or the sustainability also has risen.

After a summary of different elements and links within sustainable supply chains, an overall objective of SSCM can be formulated as

> *to make the supply chain more sustainable with an end goal of creating a truly sustainable chain. When we refer to a sustainable supply chain we are in essence referring to an outcome for that supply chain* (Pagell and Wu, "Building Theory" 38).

This goal seems to be—similar to the one of sustainability—rather abstract, since it cannot easily be defined in terms of form and extent (Haake and Seuring). In order to put SSCM in more concrete terms, Halldórsson, Kotzab, and Skjoett-Larsen evaluated related issues, such as the carbon management in the supply chain, and developed possible generic SSCM strategies. The integrated strategy is considered when sustainability issues become consistent with SCM. Within the alignment strategy, sustainability is complementary to SCM, and in the replacement strategy, the conventional SCM is substituted by full implementation of a sustainability-oriented approach. Whereas these strategies differ widely with regard to the extent of change, the integrated strategy currently seems to be

the most probable in terms of practicability.

According to the above-mentioned SSCM definition by Seuring and Müller, companies have to manage *material, information, and capital flows* within their internal and external sustainable supply chains. This means the various stakeholder requirements, such as the customers' demand for more sustainable products and services or the need for compliance with norms and regulations on sustainability issues have to be taken into account (e.g. Bowen et al.; Seuring and Müller). These requirements are relevant since they are linked to risks such as possible reputation damages or they are related to opportunities, such as a market potential due to sustainability-oriented innovations and product developments. As a consequence, the different functional units are supposed to work together in order to meet the mentioned requirements and to take the different disciplinary perspectives (Wagner). Such cross-functional cooperation (Hsu and Hu) demands a transfer of information and knowledge. According to Schaltegger and Burritt (*Contemporary Environmental Accounting* 404), such management of information can be understood as "the creation of purpose-oriented knowledge." Key characteristics of cross-functional integration are displayed in the next section in order to improve the understanding of how and which information can be transferred between the functional silos.

II.II. CROSS-FUNCTIONAL INTEGRATION IN THE CONTEXT OF SSCM

As previously described, SSCM is not just an issue that affects procurement but also departments such as marketing, R&D, or production (Carter and Dresner; Sarkis, Zhu, and Lai). Addressing several sustainability issues (e.g. waste reduction, health protection, or energy savings) that can be relevant for more than just one functional unit, this

phenomenon is, in fact, encompassing sustainability measures since these often cover at least two of the three (environmental, social, and economic) aspects (Darnall, Jolley, and Handfield; Schaltegger et al. 6). For instance, waste reduction can be both a matter handled by the purchasing and in the human resources departments since the employees might have to be trained how to avoid waste in the most efficient and effective way.

Nevertheless, every functional unit within a company covers its own area of specialization in order to fulfill particular tasks that are associated with appropriate qualifications. From the perspective of the knowledge-based view, specialization is needed since

> *bounded rationality is recognition that human brain has limited capacity to acquire, store and process knowledge. The result is that efficiency in knowledge production… requires that individuals specialize in particular areas of knowledge* (Grant 112).

However, it has to be taken into account that specialization increases interdependencies and the need for coordination between the separate functional units (Olson, Walker, and Ruekert). As a consequence, a balance should be kept between benefits derived from specialization and the integration costs incurred (Galbraith 118–119; Thompson, 64; Turkulainen 16).

Looking at the SSCM literature, some scholars emphasize that SSCM may be facilitated by cross-functional collaboration and with the partners working in unison (Bowen et al.; Gold, Seuring, and Beske). However, there is indication that cross-functional collaboration sometimes is just wishful thinking (Pagell) and barriers do exist (Carter and Dresner; Moses and Åhlström). These barriers lower the potential of transferring internally or externally (sustainability-oriented) information from one member of the supply chain to another. Moses and Åhlström found problems in cross-

functional processes of sourcing decision making, such as the interdependency between the functional units, strategy complications, and functional goals that are not aligned. In order to hurdle these barriers, Moses and Åhlström recommend that all functional goals should be strategically coordinated so that the purchasing strategy is in line with the sourcing decision processes. Regarding these sourcing decision processes, they also stress the necessity of updated information (Leenders, van Engelen, and Kratzer; Pagell) as well as the risk of information overload (Olson, Walker, and Ruekert).

Therefore, it has to be assumed that the "right" management of information and knowledge is crucial for a successful SSCM. A lack of knowledge might be an explanation for no or partial cross-functional integration (Pagell). For this reason, the knowledge-based view is used to expose the potential of cross-functional interaction. Moreover, the application of this theory-based approach is an attempt to help overcome the mentioned challenges within sustainable supply chains, such as risk of a reputation loss and demand for environmental-friendly and socially responsible products.

III. KNOWLEDGE-BASED VIEW FROM AN INTERNAL SSCM PERSPECTIVE

The importance of knowledge transfer is discussed in inter-organizational contexts (e.g., Dyer and Nobeoka; Martinkenaite), intra-organizational contexts (e.g., Gattiker and Carter), or both (e.g., Cousins and Spekman; Frazier). Information can be defined as purpose-oriented knowledge (Schaltegger and Burritt, *Contemporary Environmental Accounting* 404), whereas knowledge can be understood as "which is known" (Grant 119). Although there are various definitions of knowledge and of associated concepts (e.g., for a typology of knowledge management, cf. Geisler, Lavergne and Earl), this paper refers principally

to the understanding of knowledge provided in Grant's knowledge-based view. Based on the resource-based theory (Barney; Wernerfelt), *knowledge* is considered a very important strategic resource that can promise competitive advantage to the firm (Gold, Seuring, and Beske; Grant; Kogut and Zander).

For setting up the foundations of the theory, Grant (110–112) describes five characteristics of knowledge that are relevant for the application within a company:

- *Transferability*: The knowledge has to be transferrable with regard to time, space, and between individuals. For a more precise determination regarding transferability, knowledge can be distinguished into tacit and explicit. *Tacit* knowledge—also known as *knowing how*—is what implicitly exists through its application. Its transfer is uncertain and can be costly and slow (Kogut and Zander). *Explicit* knowledge, in contrast, is the *knowing about*. Regarding SSCM issues within a company, corresponding explicit knowledge can be transferred by communication between the different functional units.

- *Capacity for aggregation*: Knowledge can be transmitted, receipted, and aggregated. However, knowledge transfer is dependent on the recipient's capacity to gain knowledge. If there is a common language, this capacity is expanded. A company's internal job rotation system can be a possible way to increase a person's capacity to acquire new knowledge. For instance, job rotation can mean that a purchasing manager works in the sustainability department or in marketing and sales. By rotating jobs, he or she will have the chance to better understand the tasks and processes within the other functional units. Furthermore, he or she can become familiar with the specific language and culture in the other functional units (Turkulainen 136).

- *Appropriability*: Regarding the appropriability of knowledge, a distinction should be made between the already mentioned tacit and explicit knowledge. Tacit knowledge cannot be appropriated, as it is stored within individuals; however, explicit knowledge might be acquired. As a consequence for cross-functional integration, Matos and Hall recommend that collaborative teams should use both tacit and explicit knowledge so that they cover "a diverse spectrum of skills and expertise" (Matos and Hall 1097).

- *Specialization in knowledge acquisition*: As already mentioned (cf. II.II.), individuals have limited capacities for acquisition, storage, and processing knowledge. Hence, specialization helps persons and organizations to manage profound knowledge. However, this specialization requires coordination between the different employees and functional units within a company (Turkulainen 58).

- *Knowledge requirements of production*: Finally, the knowledge transfer starts from "the assumption that the critical input in production and primary source of value is knowledge" (Grant 112). This statement refers to the understanding that knowledge is a prerequisite for people to be productive. Therefore, they have to possess and apply knowledge to, for instance, construct or operate a machine (Grant).

As indicated, these five described characteristics of knowledge have to be taken into account when SSCM-relevant information and knowledge are exchanged between the different members of the

internal supply chain.

Knowledge within sustainable supply chains

Regarding sustainable supply chains, detailed information about environmental, social, and economic impacts and performance across the entire (external and internal) chain has to be collected and processed (Foster and Green). This requirement is due to the fact that external stakeholders, such as customers or media, are interested in product properties (e.g. product carbon footprint) or production conditions at the company's and supplier's sites (e.g. human rights compliance). As a consequence, the different functional units have to exchange corresponding information (Carter and Dresner; Foster and Green). For example, the purchasing department requires environmental information from its suppliers, such as left out hazardous substances. This information has to be submitted to the production department, and finally, sales and marketing can provide this information to the company's customers. Such typical information flow within a supply chain can be associated with the *product life cycle* perspective (Birou, Fawcett, and Magnan; Carter and Dresner; Hayes and Wheelwright). According to this perspective, several members of the internal and external supply chain are aligned so that there is a "greater cooperation across functional boundaries" (Birou, Fawcett, and Magnan 37). This collaboration requires transmitting and receiving knowledge within the cross-functional cooperation.

Transfer of knowledge in SSCM

In order to coordinate the transfer of knowledge, Grant points out that the differences between tacit and explicit knowledge (Nonaka) have to be considered. As a consequence, the more informal "knowing how" and the quite formal "knowing about" have to be merged so that the specialized knowledge of the different functional units can be integrated. Here, Grant (114–115) suggests four mechanisms, where the first three aim at reducing communication and learning costs and the last one aims at relying on communication:

- *Rules and directives*: These mechanisms present a standardized format of communication (Van de Ven, Delbecq, and Koenig). In the context of SSCM, there exist the European directives on hazardous substances in the electronics industry (Preuss). In another example, some companies have created internal rules concerning purchasing restrictions to suppliers who exploit child labor (Koplin, Seuring, and Mesterharm). Furthermore, rules can convert tacit knowledge into explicit (Grant).
- *Sequencing*: According to Thompson, sequencing can be coordination by plans, meaning that knowledge and other issues such as capabilities and activities can develop gradually and dynamically (Helfat and Raubitschek). Regarding a logistical integration, production planning or inventory management could be measurements that affect energy consumption across the entire supply chain (Vachon and Klassen, "Supply Chain Management").
- *Routines*: In comparison to the mechanism sequencing, routines can be understood as "simple sequences" (Grant 115). They can differ greatly (Pentland and Rueter) and, within a company, they can be used for simultaneous activities (Hutchins). Examples are assessment or monitoring routines that help to evaluate the environmental performance within a company (Klassen and Vachon; Simpson, Power, and Samson).

- *Problem solving by groups and decision making*: Since problem-solving processes by groups are communication intensive, they can be rather resource consuming (regarding time and capital). Thus, the building of cross-functional task force teams should focus on "unusual, complex, and important tasks" (Grant 115). Product development (Pagell) or crisis management (Hutchins) are two such examples of cross-functional teams.

With reference to product development activities, Pagell states there are a considerable number of related studies that emphasize the importance of cross-functional team work (e.g., Wheelwright and Clark). Although Pagell expresses a need for internal cross-functional integration in such occasional tasks, he also stresses that repetitive tasks require other approaches. Such approaches, in turn, can be connected to Grant's first-mentioned mechanisms, the rules and directives, sequencing, and routines.

Based on Grant's knowledge-based view, Sveiby aimed at expanding the field of knowledge transfer by focusing on strategy formulation. His work will be outlined in the following section.

Strategies toward knowledge transfer

In his work, Sveiby distinguishes between three dimensions of "intangible assets" (Sveiby 346–347) of a company: *external structures* (e.g. relationships with suppliers, customers, and the company's image), *internal structures* (e.g. staff, infrastructure, and patents), and *individual competences* (e.g. competences of the company's employees). All three dimensions are linked reciprocally to each other. When knowledge is transferred within a company, its value can be created (Lavergne and Earl; Sveiby). Furthermore,

the knowledge transfer can occur in different kinds of activities within the internal structure. For instance, such activities can focus on using comprehensive database or ERP software (Pagell; Sveiby). The enabling of these activities is "the backbone of a knowledge strategy" (Sveiby 348).

In the following section, Sveiby's model (347) will be used and adjusted in such a way as to focus on the particularities of sustainable supply chains and the company's internal perspective. After having set this framework on intra-organizational SSCM, potential measurements will be discussed in regard to facilitating knowledge transfer in internal SSCM.

IV. FRAMEWORK OF INFORMATION AND KNOWLEDGE TRANSFER IN SSCM

When Sveiby's model is modified with regard to SSCM, three different kinds of knowledge transfer can be depicted (*Figure 2*): (1) the intra-organizational knowledge transfer within the company's internal structure; (2) the inter-organizational transfer of knowledge with external stakeholders; and (3) the transfer between individuals and the internal structure.

Knowledge transfer within *internal structures* (1) implies that SSCM-relevant tacit and
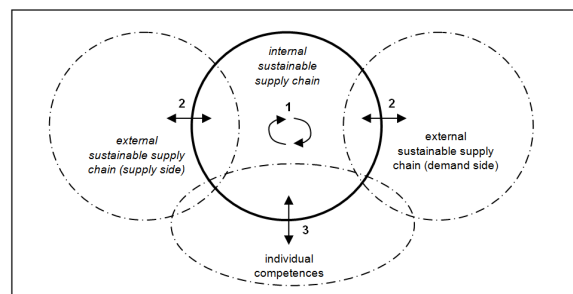

Figure 2: Knowledge transfer in sustainable supply chains (modified from Sveiby 347).

explicit knowledge can be shared and spread within the internal boundaries of the company. Activities such as using a common database (Sveiby), tools to improve interactive IT communication (e.g. intranet, company's internal wiki), or holding meetings on a regular basis can support such knowledge transfer. Furthermore, cross-functional collaboration can facilitate the transmission and receipt of information and knowledge. Since an internal structure is related to a manifoldness of economic, environmental, and social problems and solutions, the integration of different functional units is proposed (Sweet, Roome, and Sweet). The idea is to

> capture this system complexity by integrating information from different sources, and relating this information to the unique environmental and business contexts within which it arises (Sweet 266; with reference to Roome, *Sustainability Strategies, Taking Responsibility*).

Furthermore, information and knowledge transfer is not only necessary within the internal structure but also with external stakeholders (2). Regarding the entire supply chain, a company has to consider both direct stakeholders, such as suppliers and customers, and indirect stakeholders, such as legislative bodies, NGOs, and media (cf. II.I., Figure 1). While Foster and Green focus on the information flows and links for sustainability-oriented innovation processes, they also refer to consultants and universities as possible external collaboration partners for innovations. Thus, it is worth noting that a lot of different flows generally are related to sustainability-oriented product and process innovations (Hansen, Große-Dunker, and Reichwald). Furthermore, in addition to the sheer quantity of information, the variety of information and knowledge flows to and from the different stakeholders has to be taken into account. For the purpose of transferring knowledge, collaborative teams can be built by internal and external supply chain members (Matos and Hall).

These cross-boundary spanning teams are able to combine their expertise and exchange ideas, and they have to develop specific goals and strategies as well as tasks. Nevertheless, such extensive team work can consume many resources (e.g., time, capital). This option is only of interest if the efforts are reasonable with regard to the benefits, such as new product development and effective crisis management (Hutchins; Pagell).

The information and knowledge transfer *from individuals* (3) to internal structures might involve the integration of an individual's competences in the company's structure (Sveiby). Since every employee possesses his or her own skills, knowledge, and experiences (Bowen et al.; Müller and Gaudig; Sweet, Roome, and Sweet), these skill sets can lead to a great diversity of capabilities, which, in turn, can create competitive advantage (Gold, Seuring, and Beske). With regard to the diversity of capabilities and company size, research indicates that larger companies do not only have more resources, but also a wider variety of them at their disposal (Gupta and Govindarajan; Van Wijk, Jansen, and Lyles). Nevertheless, it can be more challenging than in smaller companies to manage these different kinds of specialized knowledge (Turkulainen 141).

After having outlined the constituent parts of the framework of information and knowledge transfer in internal SSCM, the section below focuses on measurements on how the transfer can take place.

IV.I. MEASUREMENTS TO FACILITATE KNOWLEDGE TRANSFER IN INTERNAL SSCM

The measures that facilitate knowledge transfer within and into internal SSCM can be structured as "levels of knowledge transfer in SSCM" and "coordination mechanisms" (*Table 1*). Whereas the levels of knowledge transfer refer to the

classification proposed by Sveiby, the categorization of the coordination mechanisms is based on the work of Grant. Within this paper, both perspectives are placed in the context of internal SSCM.

Given the matrix above, 12 categories can be distinguished with regard to how SSCM-relevant information and knowledge can be transferred within and into a company. In order to relate these categories to practical application, the set of potential measurements will be discussed by using appropriate examples in the following.

(a) Within internal structures / Rules and directives

In cross-functional collaboration, rules and directives can serve as coordination mechanisms that minimize communication (Grant). These mechanisms can be useful if there is no or little need for coordination. For instance, internal rules can refer to how IT

should be used. In such a way, internal policy can govern how and when ERP systems are in operation and what kind of SSCM-relevant information should be integrated into the system. Furthermore, Bowen et al. (177) suggest "detailed purchasing policies and procedures" to formulate guidelines as to how sustainability issues can be implemented in day-to-day purchasing decisions. Rules and directives do not only help to organize recurring tasks, they also can facilitate an efficient mode of working in collaborating with other functional units. Although rules and directives might be used with little effort and less communication once they have been issued, it can take time and can create a need for deliberation for establishing them in the first place.

(b) Within internal structures / Sequencing

Sequencing means it is already planned how different functional units can share their expertise on SSCM-

Levels of knowledge transfer in SSCM Coordination mechanisms	(1) Within internal structure	(2) From external to internal structure	(3) From individual competence to internal structure
Rules and directives	(a) Setting rules on the use of IT systems for transferring SSCM information	(e) Issuing directives for suppliers about information transfer between suppliers and the focal company	(i) Establishing rules on how individuals should behave in case of difficult SSCM decisions
Sequencing	(b) Transfer of information from internal experts	(f) Learning from suppliers (e.g., job rotation between suppliers and focal company)	(j) Transmitting new knowledge (obtained in seminars, trainings, etc.) into a database
Routines	(c) Holding regular meetings of different functions (specific to management level)	(g) Establishing knowledge-sharing routines (exchange of information between the focal company and its suppliers on regular basis)	(k) Behaving sustainability-oriented (waste/energy reduction)
Group solving	(d) Setting up a task force group for internal improvements (waste reduction, health protection, energy cost savings)	(h) Developing sustainability-oriented products; stakeholder-advisory boards/stakeholder committees	(l) Providing experiences (with crisis management)

Table 1: Measurements to facilitate internal knowledge transfer in sustainable supply chains

relevant issues. For instance, if a new product has to be assessed with regard to its environmental impact, the different functional units, such as purchasing, R&D, and manufacturing, can transfer their specific knowledge into a database. Since some of this information is dependent on background data from other departments, this data collection can be organized sequentially, meaning that a work flow is generated. Alternatively, an (electronic) route card can be used to inform the several functional units about the new product and its environmental, social, and economic characteristics so that the individual departments can also process this information within their unit.

(c) Within internal structures / Routines

Within internal structures, routines can help to share knowledge between the various functional units. Brief daily meetings of employees from different departments can facilitate the transfer of up-to-date information. In such cases, the emphasis is on basic information and on exchanging information between functional units, such as purchasing, sustainability department, PR, manufacturing, R&D, marketing, and sales. In addition to such daily cross-functional activities, monitoring and assessment routines also can help to estimate the environmental performance within a company (Klassen and Vachon; Simpson, Power, and Samson).

(d) Within internal structures / Group solving

Product development and crisis management are potential application areas of group solving processes (Hutchins; Pagell) within a company. Group problem solving and decision making are measurements that require the most coordination and interaction, when compared to the three activities explained above (Grant). Therefore, it is reasonable to set up task force groups, whenever this effort

proposes a balance between the associated benefit and the expenditure of time and capital. In this context, Grant (115) cites "unusual, complex, and important tasks" as examples of problem solving by groups and decision making. However, it is worth mentioning that task force groups can generate and exchange SSCM-relevant tacit and explicit knowledge. When they are brought together as a cross-functional team, members can learn from each other's expertise and specialization.

(e) From external to internal structure / Rules and directives

In the context of transferring knowledge from the external structure to the internal, rules and directives can be used to integrate the knowledge from external stakeholders (e.g. suppliers, customers, NGOs, universities). When a company negotiates a cooperation agreement with one of these stakeholders, the company can set rules that stipulate what kind of information and knowledge should be transferred to the company. For instance, a company can be forced by its customers to transmit related information with regard to carbon footprint management (e.g., the retail sector, which has begun to label products with information about the carbon footprint; Halldórsson, Kotzab, and Skjoett-Larsen). As a consequence, the focal company itself can force its suppliers by directives to provide such information.

(f) From external to internal structure / Sequencing

In order to obtain external knowledge by sequencing, companies and suppliers can establish a system of transferring staff knowledge across firm boundaries. This knowledge transfer may involve people actually working temporarily in the other company (Dyer and Nobeoka). The particular know-how of a

staff member from the supplier can be used while he or she works within the focal company, or his or her (explicit) knowledge can be stored in documents and IT systems. The latter alternative offers the chance to integrate the knowledge sequentially at the time it is required.

(g) From external to internal structure / Routines

Dyer and Singh (1998) understand knowledge-sharing routines as one potential source to gain competitive advantage. Referring to Grant, they define a routine as "a regular pattern of interfirm interactions that permits the transfer, recombination, or creation of specialized knowledge" (Dyer and Singh 665). More specifically a company and its suppliers, in the context of SSCM, can create routines by informing each other on a regular basis about the latest developments in product innovation or about relevant legislative projects. Such institutionalized processes can be advantageous due to fact that the partners share unique and detailed knowledge.

(h) From external to internal structure / Group solving

In order to stimulate the development of sustainability-oriented products, a focal company can form cross-organizational teams with its suppliers and customers (Stank, Keller, and Daugherty; Vachon and Klassen, "Supply Chain Management"; Zhao, Selen, and Yeung). Moreover, companies can establish groups with other stakeholders such as the local community or NGOs. Stakeholder advisory boards or corporate responsibility committees (Hansen 215) also are possible institutions to integrate external knowledge of sustainability-related issues and concerns. The purchasing department can organize these committees directly at the suppliers' sites to better understand the local conditions. This acquired knowledge, in turn, can improve risk and opportunity estimating of purchasing requirements and supply chain matters (such as product quality, working conditions, and avoidance of hazardous substances). However, it has to be taken into account that such inter-organizational collaboration might be challenging to organize since several companies (e.g. focal company, 1st tier, 2nd tier suppliers, etc.) and organizations (e.g. NGOs, universities, etc.) can pursue their own goals and strategies to achieve product improvements. Furthermore, the external stakeholders have their own organizational culture and structure that can considerably differ from the focal company's traits. As a consequence, these mentioned barriers have to be considered whenever there are joint efforts to develop more sustainable products and processes. One option to avoid these hurdles might be an open and regular communication between the internal and external stakeholders.

(i) From individual competence to internal structure / Rules and directives

Based on the assumption that critical SSCM decisions exist, such as termination of the supplier relationship due to noncompliance with environmental or social guidelines, a directive can require that multiple parties are involved for these crucial decisions. This approach can be applied by employees of one single department, or, in order to improve knowledge transfer between functional units, it can also be used as a rule so that employees from different departments such as purchasing and R&D have to decide collectively. Adopting such a directive might allow a transfer of individual's knowledge to the internal structure and across the internal supply chain. However, it has to be taken into account that an individual's perception and acceptance of such a directive can be different depending on the personal

and organizational context or situation he or she is in. As a consequence, it has to be considered that a successful application of rules and directives is dependent on the attitude and behavior of every single employee, although in general, rules and directives might be of help to facilitate the transfer of knowledge between functional units.

(j) From individual competence to internal structure / Sequencing

With regard to SSCM and to the transfer of individual competences to internal structures, sequencing implies that an employee passes on information that he or she has obtained in SSCM-associated seminars (such as seminars about handling toxic substances, evaluation of suppliers based on sustainability criteria, or using codes of conduct). In order to process this information sequentially, the employee is enabled to transmit his or her knowledge into a database that offers open access for all employees in other departments across the internal supply chain, or the employee is appointed as a contact person for transferring the specialized knowledge. As a consequence, these knowledge transfer methods can encourage cross-functional collaboration since it supports other employees to possess SSCM-relevant know-how.

(k) From individual competence to internal structure / Routines

Measurements, such as waste reduction or energy savings, can be SSCM-related routines of individuals that have an impact on the internal structure. On one hand, this might be understood as a kind of tacit knowledge since it is "revealed through its application" (Grant 111). On the other hand, this can demonstrate explicit knowledge provided the employee informs colleagues about his or her activities.

(l) From individual competence to internal structure / Group solving

If, for instance, an employee has gained experiences in an exigency, such as an environmental accident within the supply chain, he or she may transfer his or her acquired knowledge to others within the same organization. This knowledge might refer to how the problem was solved, what kinds of measurements were taken to minimize the risk within the supply chain, and how this environmental accident harmed the company. A pragmatic approach to convert this knowledge can be that the employee plays an active role in a company's internal training programs (e.g. during seminars that deal with crises management). Although such seminars are be provided by external service companies, an additional company's internal seminar can be more specific with regard to the peculiarities of the company such as its culture and structure. Furthermore, employees can be trained in specific skills, such as being a mediator or intermediary, so that they can contribute to problem-solving processes by their specialized knowledge and experience.

After proposing the application of the 12 different measurements of knowledge transfer in internal SSCM, the following section addresses some practical implications for cross-functional integration in the context of knowledge transfer.

IV.II. IMPLICATIONS FOR CROSS-FUNCTIONAL INTEGRATION IN INTERNAL SSCM

Based on the discussion of mechanisms to facilitate internal knowledge transfer, this conceptual paper offers practical implications. The outcome of the widely conducted discussion can provide suggestions concerning the role of cross-functional integration with regard to the transfer of SSCM-relevant information and knowledge.

Knowledge sharing

Knowledge-sharing routines with suppliers are seen as one potential source to gain competitive advantage (Dyer and Nobeoka). This sharing of knowledge also can be beneficial in the intra-organizational context. If the different functional units across the internal supply chain spread their know-how and experiences among each other, they can improve their understanding for internal and external SSCM-relevant information. Furthermore, these units can learn to speak a "common language" so that sustainability-relevant information (e.g. about the product carbon footprint, necessary information for cause-related marketing activities, or details about standards and norms) can be transferred more easily between the different functional units. Since "efficiency of knowledge aggregation is greatly enhanced when knowledge can be expressed in terms of common language" (Grant 111), it is useful to take such appropriate measurements. Potential measurements can be holding brief daily meetings, where persons of different functional units come together (cf. *c*), or setting up a task force group for internal improvements (cf. *d*). In addition, incentive systems can be an appropriate measurement with regard to integration since incentives can encourage individual employees of the different departments to pursue one common goal (Pagell and Wu, "Enhancing Integration"). Such reward systems might include remunerations (e.g., when waste reduction is achieved within the company through the internal supply chain) or incentives when SSCM goals (e.g., establishing a carbon management system across the entire supply chain) are reached commonly by the different functional units.

Informal and formal communication

Cross-functional integration and knowledge transfer can occur in different modes of communication.

Grant points out the difference between explicit and tacit knowledge: explicit knowledge can be transferred by communication, whereas tacit knowledge cannot. Tacit knowledge, in fact, is transferred via its application. Tacit knowledge in cross-functional collaboration refers to knowledge of an individual person, e.g. an employee from purchasing can know how he or she is able to find the most suitable supplier for components when a new product is developed and how to reach a compromise together with other departments such as R&D as well as marketing and sales when there are conflicting goals between the different functional units about the components. In this context, the employee from purchasing applies this specific knowledge without making it explicit, e.g. through documented guidelines useable through other individuals. Explicit knowledge, in contrast, refers to knowing about; this type of knowledge is more easily transferred. Consequently, purchasing may have knowledge about the properties of the purchased component (e.g. its recyclability) and is able to transfer it to other departments. Thus, practitioners may wish to consider this difference when establishing communication channels between the various functional units. This implies, on the one hand, that cross-functional meetings are useful so that knowledge can be applied more easily and, on the other, that communication tools such as a database are helpful to store explicit knowledge and make it retrievable.

Furthermore, research suggests distinguishing informal and formal communication. Informal communication is seen as an effective way to address problems in real time that occur in the different functions across the supply chain. In contrast, formal communication such as reporting systems can help to exchange information in a more structured way (Daft 582; Pagell; Pagell and Wu, "Enhancing Integration"). This recognition of communication differences results in the fact

that information and knowledge transfer might be communicated formally and be organized by mechanisms such as decision making (cf. *d, h, l*), but informal communication also is necessary to cover all communication levels.

V.   CONCLUSION AND FUTURE RESEARCH

This conceptual paper argues that cross-functional integration assumes a substantial role in the intra-organizational transfer of SSCM-relevant information and knowledge. The knowledge-based view is used to discuss different mechanisms and levels of information and knowledge transfer. In the context of SSCM, there are various internal and external stakeholders whose requirements are of relevance. In addition, to better understand the implications with regard to cross-functional integration in SSCM, the differences between tacit and explicit knowledge, as well as the distinction of formal and informal communication, need to be considered. For example, when a new environmentally friendly and socially responsible product has to be developed, the different functional units need to know how they can work together in order to meet the requirements adequately. Furthermore, they need to know about the demanded properties of the new product. For such a product development, on the one hand, formal communication can be of help to make knowledge transfer across the internal supply chain explicit, on the other, informal communication can be beneficial for establishing a common language across the various functional units.

However, this conceptual framework, like other research papers, also suffers from limitations. First, there are limits regarding the theoretical underpinning of the knowledge-based view. Knowledge cannot be common between all functional units (Grant). This fact involves the assumption that every employee has his or her individual background, and it might be difficult to develop a similar understanding of what is relevant information in SSCM. In addition, sustainability issues have a value-laden character, meaning every individual will have his or her own perception of sustainability and related knowledge (Seelos; Linnenluecke, Russel, and Griffiths).

Since entire supply chains are rather complex, this paper's approach to develop a theoretical framework cannot cover all the specific aspects such as the interdependencies between internal and external stakeholders, the balance of power, or the individual's ability to learn and acquire new knowledge. Also, it should be noted that sustainability is a rather complex construct (Seelos) that involves a great range of environmental, social, and economic concerns and knowledge.

Therefore, in order to investigate more thoroughly the knowledge transfer and cross-functional integration in SSCM, future research could focus on the unique characteristics of knowledge that is to be exchanged between the different functional units. Hence, the question can be raised, what are similarities and differences of environmental, social, and economic-related information in the internal and external supply chain? Furthermore, the transfer of information and knowledge might be influenced by the individual peculiarities of the transmitters and recipients. Hence, it is worth asking who are the particular persons and organizations that exchange information? Within which structures and cultures do they act? Based on the theoretical framework developed in this paper, a case study or an action research approach might be fitting to better understand the complex structures of knowledge and information transfer between different functional units in SSCM.

VI.   ACKNOWLEDGEMENTS

VII.   REFERENCES

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Contribution IV (journal article, double blind peer reviewed, published online)

Windolph, S.E.; Harms, D. & Schaltegger, S. (2013): Motivations for Corporate Sustainability Management: Contrasting Survey Results and Implementation, Corporate Social Responsibility and Environmental Management.

Motivations for Corporate Sustainability Management: Contrasting Survey Results and Implementation

Sarah Elena Windolph,* Dorli Harms and Stefan Schaltegger
Leuphana Universität Lüneburg, Lüneburg, Germany

ABSTRACT
This paper compares empirical findings on the implementation of sustainability management with the results of earlier surveys on corporate motivations to deal with sustainability. We analyze the relevance of three different motivations, i.e. seeking corporate legitimacy, market success, and internal improvement. This is accomplished by matching these motivations with empirical findings on the engagement of functional areas. The underlying rationale is that differences in the engagement of functional areas can be expected to depend on the overall corporate motivation for sustainability management. Our analysis shows low engagement in finance and accounting, whereas the public relations department is actively engaged. Since this functional area commonly aims to legitimize corporate activities, this finding contradicts the results of earlier studies which concluded that legitimacy is not an important motivation for sustainability. We discuss reasons for these contradictions and derive implications for future research and business activities. Copyright © 2013 John Wiley & Sons, Ltd and ERP Environment

Introduction

STAINABLE DEVELOPMENT CANNOT BE REALIZED WITHOUT THE CONTRIBUTION OF COMPANIES (DUNPHY *ET AL.*, 2007; Blindheim and Langhelle, 2010). It is defined as a three-dimensional approach integrating economic, environmental, and social aspects of economic development that aims to consider future generations and intergenerational justice (UNWCED, 1987; Schaltegger and Burritt, 2005). *Sustainability management* on the corporate level includes both the internal development of the company as well as a contribution to the sustainable development of society and the economy (Shrivastava and Hart, 1995; Bansal, 2005; Schaltegger and Burritt, 2005; Küpers, 2011). The extent that companies contribute to this development depends, *inter alia*, on their motivation. Widely discussed motivations for corporate sustainability management in the literature include legitimacy, market success, and internal improvement. This classification has been applied in the literature (Bansal and Roth, 2000; Darnall, 2003; Epstein, 2008) to explain the management of environmental and social issues by companies.

Striving for *legitimacy*, also termed approval or acceptability, refers to a company's ambition to be perceived as 'desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions' (Suchman, 1995, p. 574). It is a reaction to sustainability-related laws and pressure from societal stakeholders, which increasingly consider sustainable development as a value (Black and Härtel, 2004). Legitimacy has been described

*Correspondence to: Sarah Elena Windolph, Leuphana Universität Lüneburg, Centre for Sustainability Management (CSM), Scharnhorststr. 1, 21335 Lüneburg, Germany. E-mail: windolph@uni.leuphana.de

as a motivation for sustainability management in several publications (Bansal and Roth, 2000; Bansal, 2005; Hahn and Scheermesser, 2006). *Market success* is a motivation for sustainability management because consumers and investors may reward the company's engagement for sustainable development through their purchase and investment decisions (Miles and Covin, 2000; Beloe *et al.*, 2004; Dunphy *et al.*, 2007; Babiak and Trendafilova, 2011; Ditlev-Simonsen and Midttun, 2011). *Company-internal improvement* refers to optimizing internal processes and related cost savings (Shrivastava, 1995; WBCSD, 2002; von Weizsäcker *et al.*, 2009).

In recent years, a number of empirical studies have investigated corporate motivations for sustainability management, but their results do not provide a clear overall picture. Whereas legitimacy-related aspects such as societal and political demands or avoiding negative publicity are found to be of lesser importance (Bertelsmann Stiftung, 2005; Hahn and Scheermesser, 2006; A.T. Kearney, 2008), several studies find ethical reasons and ecological or social responsibilities to be of high relevance (Graafland and van de Ven, 2006; A.T. Kearney, 2008; Brønn and Vidaver-Cohen, 2009; Babiak and Trendafilova, 2011). Further studies emphasize competitive pressure, branding, or cost advantages (IFO, 2002; Ditlev-Simonsen and Midttun, 2011) as important reasons for sustainability management.

Various explanations may account for the contradicting results between the empirical studies, including the selection of industries, companies, and countries. The results may also be influenced by the data collection methods. The typical method applied for these investigations is a survey explicitly asking company representatives about their motivations for engagement. Due to society's increasing interest in corporate social responsibility (CSR) and sustainable development (Metzler, 2001; Campbell, 2007) and the pressure on survey respondents to protect the company's reputation, the responses to direct questions are likely to be biased by social desirability (Fernandes and Randall, 1992; Banerjee, 2001; Fifka, 2009).

In contrast to these approaches, we apply an indirect measurement approach to investigate motivations for sustainability management and analyze the extent to which functional areas, such as marketing or accounting, engage in sustainability management. The underlying rationale is that the engagement of functional areas depends on the overall company's motivation for sustainability management (Hoffman, 2001). Afterwards, we compare our empirical findings on which functional areas engage in sustainability management with motivations explicitly stated in other studies. This comparison serves to identify and discuss contradictions.

Whereas a large body of literature argues that the implementation of sustainability management requires the coordination across functional areas (Hoffman, 2001; Dunphy *et al.*, 2007; Epstein, 2008; Lauring and Thomsen, 2009), it has to be acknowledged that sustainability management is still at an early developmental stage (Griffiths and Petrick, 2001; Dunphy *et al.*, 2007; Martin *et al.*, 2007). The division of tasks into specialized functions, in addition to information and communication barriers, as well as departmental prerogatives may hamper collaboration within the company (Hoffman, 2001; Darnall *et al.*, 2008; Epstein, 2008). Thus, we anticipate that sustainability management has not yet been fully implemented as a cross-functional task in companies, and that it is embedded to varying degrees in different functional areas (Dunphy *et al.*, 2007; Martin *et al.*, 2007).

The paper proceeds as follows. Based on a literature review, we match the three corporate motivations for sustainability management with functional areas. Drawing on a survey of large German companies, we assess to what extent these functional areas are engaging in sustainability management. We compare our empirical findings with earlier studies that directly ask companies about their motivation for engagement. Finally, the paper discusses reasons for possible contradictions and derives implications for future management research and business activities.

Corporate Motivations for Sustainability Management

Business motivations for corporate sustainability strategies have been analyzed in various papers (Bansal, 2005; Dunphy *et al.*, 2007; Moon, 2007; Delmas and Toffel, 2008; Frondel *et al.*, 2008; von Weizsäcker *et al.*, 2009; Babiak and Trendafilova, 2011; Ditlev-Simonsen and Midttun, 2011). In the *first part* of this literature review, we analyze publications that differentiate between possible motivations. Based on Bansal and Roth (2000), Darnall (2003), and Epstein (2008), this paper groups motivations into the categories of *legitimacy*, *market success*, and *internal improvement*. We refrain from analyzing ethical or moral attitudes of individuals (e.g. the top manager). Rather, we concentrate on motivations generally relevant for business and potentially interesting to any company.

Motivations for Corporate Sustainability Management

Bansal and Roth (2000) describe legitimation and competitiveness (in addition to ecological responsibility) as motivations for ecological responsiveness. They see economic opportunities reducing environmental impacts while lowering costs (e.g. by intensifying production processes) and increasing revenues through selling sustainability-oriented products and services. Darnall (2003) distinguishes external drivers, including regulatory pressures, market pressures, and social pressures, and internal drivers, featuring resources and capabilities, for example, the capability for continuous improvement. Finally, Epstein (2008) describes the motivation for sustainability management (besides societal and moral obligations) as government regulations, stakeholder pressures, and economic profit. More specifically, he stresses a company's need to gain a 'license to operate' from governments, communities, and other stakeholders, and he emphasizes the increase of sales and the reduction of costs, for example, through process improvements, as important business reasons for sustainability management.

To sum up, three main motivations have been highlighted in the existing literature. First, governments and society exert pressure on companies, forcing them to gain and secure legitimacy. Second, the behavior of consumers, investors, and competitors can create the motivation to achieve market success through sustainability management. Third, internal improvement refers to optimizing processes and reducing costs.

The *second part* of this literature review examines how these motivations are expected to influence which functional areas are particularly concerned by sustainability management. This serves to generate a framework, which we will draw upon in the discussion. Ideally, sustainability-related expectations of stakeholders are managed by those corporate functional areas that are best equipped and that have an established relationship to the stakeholders, for example, marketing addresses customers whereas public relations (PR) deals with regulators and society (Hoffman, 2001; Delmas and Toffel, 2008). Depending on what functional areas engage in sustainability management, particular sustainability management activities can be expected. These different emphases on sustainability issues can furthermore influence the sustainability management of the whole company (Delmas and Toffel, 2008). For example, if the PR department engages more in sustainability management than the marketing department, sustainability-related media activities can be expected to be carried out more frequently than market activities (Hoffman, 2001; Delmas and Toffel, 2008).

Yet, it is unlikely that it is left up to individual functional areas to choose which sustainability management activities to undertake, since top management increasingly influences the overall direction of sustainability management in the whole company (Epstein, 2008; Stead and Stead, 2008; Lauring and Thomsen, 2009). Thus, the choice of which departments to charge with sustainability management expresses the overall corporate strategy. Corporate departments can also engage in sustainability management on their own, but this engagement eventually requires the acceptance of top management.

The next sections link different functional areas to the motivations of legitimacy, market success, and internal improvement based on a literature review. This is followed by an overview of the match between motivations and functional areas.

Functional Areas Striving for Legitimacy

For companies, legitimacy means that their actions are perceived as desirable or appropriate against the background of societal norms or values (Suchman, 1995). To achieve legitimacy, one aspect of sustainability management is to comply with environmental and social regulations and laws (Wheeler *et al.*, 2003; Ramus and Montiel, 2005; Epstein, 2008; Frondel *et al.*, 2008). Institutional pressures are also created through private or self-regulations (DiMaggio and Powell, 1983; Campbell, 2007), and various actors within industries, for example, associations or trade unions, foster the implementation of sustainability management in companies (Bansal, 2005; Aguilera *et al.*, 2006; Frondel *et al.*, 2008; Ditlev-Simonsen and Midttun, 2011).

When discussing legitimacy as a motivation for sustainability management, society also plays an important role (Darnall, 2003). A variety of societal stakeholders, including non-governmental organizations (NGOs), are able to substantially influence companies (Freeman, 1984; Frondel *et al.*, 2008; Babiak and Trendafilova, 2011). In return for considering stakeholder interests, companies may secure access to ('critical') resources (Pfeffer and Salancik, 1978; Suchman, 1995; Mitchell *et al.*, 1997). These resources include workforce, capital, or the willingness to buy products and services from the company (Hill and Jones, 1992). In addition, company violations can be scrutinized by the media (Bansal, 2005; Ramus and Montiel, 2005). Since the monitoring of companies through stakeholders is

well-established nowadays (Metzler, 2001; Campbell, 2007), companies attempt to gain and maintain a license to operate (Bansal, 2005; Moon, 2007), for example, through the prevention of accidents (Frondel *et al.*, 2008; Brønn and Vidaver-Cohen, 2009) and the publication of sustainability reports (Mitchell *et al.*, 1997).

Establishing and maintaining stakeholder relationships is the main task of *public relations* or *communications* (Clark, 2000; Metzler, 2001). This functional area identifies who is affected by corporate activities, and it collects information on trends, opinions, and risks in the political and societal environment (Clark, 2000; Berg and Holtbrügge, 2001; Metzler, 2001). According to Metzler (2001, p. 321), 'establishing and maintaining organizational legitimacy is at the core of most, if not all, public relations activities.' Similarly, Black and Härtel (2004) argue that social responsiveness results from both the CSR-orientation as well as the public relations-orientation of companies.

Functional Areas Striving for Market Success

While societal and regulatory aspects were decisive factors influencing environmental management in the 1990s, today the market also plays an important role. Customers and consumers ask for the consideration of environmental and social aspects which have thus become a competitive factor (Wier and Calverley, 2002; Beloe *et al.*, 2004; Moon, 2007; Delmas and Toffel, 2008). The notion of 'market success' describes an increase in turnover, competitiveness, brand equity, or innovation (Bansal and Roth, 2000; Miles and Covin, 2000; Bansal, 2005; Dunphy *et al.*, 2007; Epstein, 2008; Brønn and Vidaver-Cohen, 2009; Ditlev-Simonsen and Midttun, 2011).

Besides product and service markets, the labor and capital markets increasingly consider sustainability issues (Hockerts and Moir, 2004; Moon, 2007). Sustainability management can improve employee motivation with the company as well as employer attractiveness (Daily and Huang, 2001; Moon, 2007). On the capital market, socially responsible investing (SRI) has also gained relevance (Peeters, 2003; Beloe *et al.*, 2004; Hockerts and Moir, 2004). SRI is defined as 'an investment process that considers the social and environmental consequences of investments, both positive and negative, within the context of rigorous financial analysis' (Social Investment Forum, 2003, p. 3).

The task of *marketing* and *sales* is to identify sustainability-related customer demands and to develop and promote products and services accordingly (McWilliams and Siegel, 2001; Black and Härtel, 2004; Maignan and Ferrell, 2004; Maignan *et al.*, 2005). Sustainability issues can support the development of a unique selling proposition and a targeted customer approach (Dunphy *et al.*, 2007). Moreover, new markets and business models for sustainability products and services can be created (Frondel *et al.*, 2008; Nidumolu *et al.*, 2009; Ditlev-Simonsen and Midttun, 2011). Examples for linking marketing and sustainability management are sustainable product-service combinations (Hansen *et al.*, 2009) and cause-related marketing (Varadarajan and Menon, 1988; Garriga and Melé, 2004).

Another market-oriented department is *research and development* (R&D) which integrates sustainability expectations of customers into product or process innovations (McWilliams and Siegel 2001; Hall and Vredenburg, 2003).

Functional Areas Striving for Internal Improvement

Internal improvement mainly refers to the sustainability-oriented optimization of processes. More specifically, increases in eco-efficiency or socio-efficiency, i.e. the relation between a firm's value added (economic dimension) and its environmental or social impact (Schaltegger, 1998; Dyllick and Hockerts, 2002; Schaltegger and Burritt, 2005), serve to reduce both resource consumption and costs (Shrivastava, 1995; Miles and Covin, 2000; WBCSD, 2002; Darnall, 2003; Bansal, 2005; von Weizsäcker *et al.*, 2009).

Internal improvement requires the engagement of purchasing, logistics, and the production department, which form essential parts of the supply chain and whose collaboration is crucial for material and information flows (Sarkis, 2001; Nidumolu *et al.*, 2009; Gold *et al.*, 2010). *Purchasing* contributes to sustainability management through considering market und societal demands. They can purchase resources from responsible suppliers, they can use recycled materials, and they can reduce packaging (Carter and Jennings, 2004; Gold *et al.*, 2010; Leire and Mont, 2010). Purchasing also has the potential to shape the supply chain and to foster sustainability efforts in other departments such as production or marketing (Carter and Jennings, 2004; Carter and Rogers, 2008).

Production contributes to sustainability management by developing and implementing material-efficient and energy-efficient manufacturing and service processes (Shrivastava and Hart, 1995; Epstein, 2008). Various authors (de Ron, 1998; Sarkis, 2001; Frondel *et al.*, 2008) discuss 'cleaner' production as the result of a continuous

improvement of the quality of products and processes, efficiency, flexibility – for example, handling changes in the material flow or using varying types of material (Sarkis, 2001) – or material recovery – for example, reclaiming recyclable materials from products (Sarkis, 2001). In doing so, companies are able to reduce costs, to realize positive employment effects, and to increase their market share (de Ron, 1998; Frondel *et al.*, 2008). Similarly, *logistics* can improve the efficiency of procedures by reusing resources, reducing waste, and controlling emissions (Kleindorfer *et al.*, 2005; Oglethorpe and Heron, 2010).

Internal improvement also requires the contribution of *finance* and *accounting* departments. These departments provide top management with information for investment decisions, price calculations, as well as product and process designs (Epstein, 2008; Schaltegger and Burritt, 2010). The integration of environmental and sustainability data into corporate information management is essential for well-founded sustainability decisions and for financial reporting and auditing (Epstein, 2008; Schaltegger and Burritt, 2010).

Another issue for internal improvement is employee satisfaction, a task mainly assigned to *human resources* (HR). Sustainability management can contribute to employee motivation and thus enhances productivity (Daily and Huang, 2001; McWilliams and Siegel, 2001; Moon, 2007; Carter and Rogers, 2008; Ehnert, 2009).

Framework: Linking Corporate Motivations and Functional Areas

Many functional areas can be linked to the motivations of legitimacy, market success, and internal improvement. However, not all functions can be unambiguously categorized. For example, PR/communications is not only society-oriented but also internally oriented. Purchasing can be internally oriented and market-oriented as well as society-oriented. In this paper, we match functional areas according to their primary orientation as discussed in literature. Yet, some departments consider societal, market, and internal aspects simultaneously. For instance, *strategic planning* is concerned with all three motivations, as shown by Stead and Stead (2008, p. 72), who describe 'sustainable development strategies' as strategies simultaneously aiming at societal legitimacy, market differentiation, and cost savings. The same holds true for *environment, health and safety* (EHS), *sustainability*, and *CSR* units, which are often closely intertwined with strategic planning (Epstein, 2008). These functional areas are not discussed here with regard to a particular motivation for sustainability management. Table 1 offers an overview of the functional areas that we match with motivations for sustainability management. Of course, the nomenclature may differ from company to company.

Motivation	Aspects addressed	Functional area
Legitimacy	Governmental regulation, private and self-regulation, media and society (values, resources)	PR/communications
Market success	Market for products and services, labor market, capital market	Marketing, R&D
Internal improvement	Process improvements, resource use, eco-efficiency and socio-efficiency	Purchasing, logistics/distribution, production, HR, finance/accounting

Table 1. Matching motivations for sustainability management with functional areas

Table 1 shows that if legitimacy is a crucial motivation for a company, it can be expected that PR/communications will particularly engage in sustainability management. By contrast, a strong market-orientation will probably lead to the engagement of marketing and R&D, whereas production and logistics will be more concerned if internal improvement plays an important role. In the following, we analyze the extent that functional areas actually engage in sustainability management in practice.

Annual turnover/total assets/gross premiums (in million Euro)	Frequency	Percentage
> 50–500	12	11.01%
> 500–1500	18	16.51%
> 1500–2500	24	22.02%
> 2500– 000	16	14.68%
> 5000–50 000	17	15.60%
> 50 000	19	17.43%
No answer	3	2.75%
Total	*109*	*100.00%*

Table 2. Annual turnover/total assets/gross premiums of the survey sample

Number of employees	Frequency	Percentage
51–250	1	0.92%
251–1000	12	11.01%
1000–10 000	55	50.46%
10 001–100 000	31	28.44%
> 100 000	10	9.17%
Total	*109*	*100.00%*

Table 3. Number of employees of the survey sample

Methodology and Sample

To empirically identify which functional areas engage in sustainability management, we use three indicators representing an increasing level of functional engagement: first, which functional areas are *impacted* or affected by sustainability issues; second, which functional areas *promote* the implementation of sustainability management in the company; and third, which functional areas show a *need for development* of management tools (to identify who is concerned with an increased engagement in the future).

The empirical findings are based on a survey of large German companies with more than €50 million turnover and more than 50 employees (based on Welt online, 2009; Tables 2 and 3) conducted between November 2009 and February 2010. We contacted the sustainability managers or those in charge of sustainability issues, and we asked them to take part in our survey. If necessary, they would forward the questionnaire to other departments to secure a high quality response. 331 questionnaires were sent out and the response rate was 32.9% (n = 109). The respondents were mostly sustainability managers, environment, health and safety managers, and CSR managers. In particular cases, PR or communication managers responded as they were the official contact for sustainability management issues. A pre-test was conducted to validate the survey. The data were analyzed with SPSS Statistics 19.

The following section presents the survey findings, which will be compared with the results of other studies in the subsequent section.

Findings and Discussion

Survey Findings

Company representatives were first asked to what extent the departments in their companies are *impacted* or affected by environmental and social issues (Figure 1).

Currently, sustainability/CSR, EHS, and PR/communications are the departments most impacted by both environmental and social issues, whereas HR is particularly impacted by social issues. The findings for

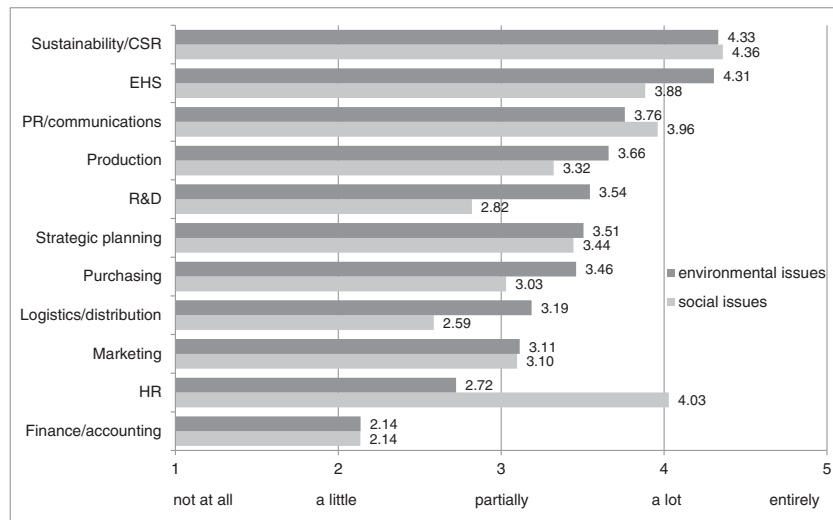## Motivations for Corporate Sustainability Management

Figure 1. Impact of environmental and social issues

sustainability/CSR and HR are not surprising since their main task is to deal with sustainability and social issues, respectively. By contrast, finance and accounting are only marginally impacted by environmental and social issues. Other functional areas, such as production, strategic planning, and purchasing, are moderately impacted.

The company representatives also assessed which departments *promote* the implementation of sustainability management (Figure 2).
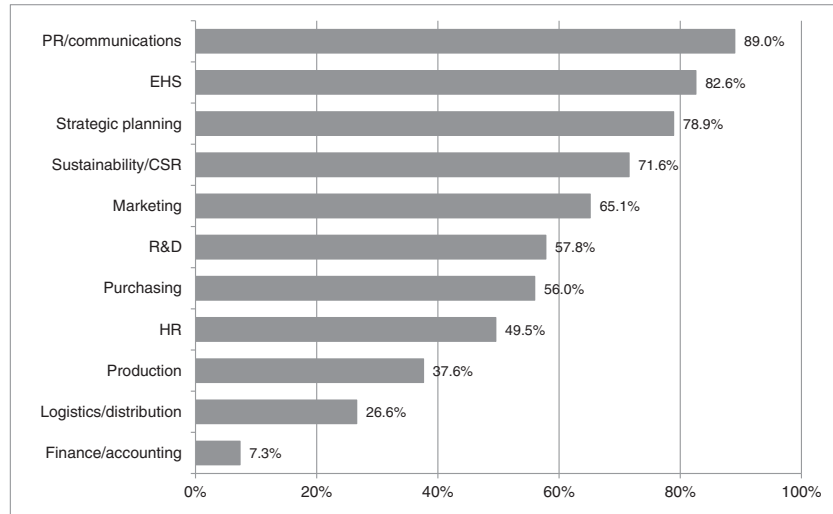
Figure 2. Functional areas promoting sustainability management

PR/communications, EHS, strategic planning, and sustainability/CSR are mentioned most frequently. Moreover, at least half of the surveyed companies evaluate HR, purchasing, R&D, and marketing as promoting the implementation of sustainability management. Production, logistics/distribution, and particularly finance/accounting rank lower. This is also in line with the findings on the impact of environmental and social issues (Figure 1).

Another indication of the engagement of functional areas is the perceived *need for developing* sustainability management tools (Figure 3).
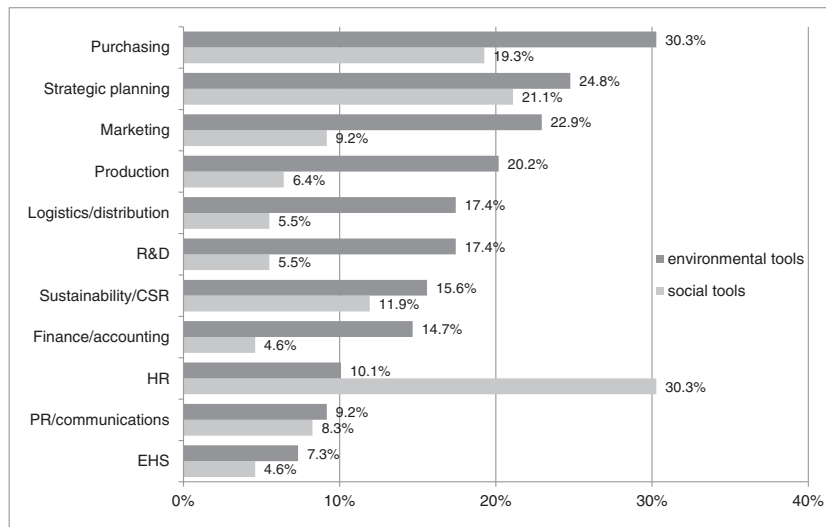
Figure 3. Need for development of environmental and social management tools

The respondents express a particularly strong need for developing new environmental management tools for purchasing and social management tools for the HR function (each more than 30%). More than 20% of the companies perceive a need for developing environmental and social management tools in strategic planning. Combining this with the previous findings on functional areas promoting sustainability management (Figure 2) shows that strategic planning is an important department. Although it is already a strong promoter of sustainability management, the respondents still express a need for the development of further suitable management tools. In comparison, only half of the respondents consider purchasing to promote sustainability management. The pronounced need for sustainability management tools, however, indicates that this functional area has potential to contribute more to sustainability management.

In conclusion, our survey of large German companies reveals that different functional areas place different emphasis on sustainability management, which accordingly is not yet implemented as a cross-functional task. Differences can be found for environmental and social impacts, the extent that functional areas promote sustainability management, and the need for the development of management tools. The survey shows that PR/communications is actively engaged in sustainability management, whereas market-oriented functions such as marketing and R&D are moderately engaged. Finance and accounting, in particular, are only marginally concerned by sustainability management.

Analysis and Discussion

This section analyzes the empirical findings on the engagement of functional areas in sustainability management in German companies. Based on the framework developed earlier (Table 1), the findings are compared with other studies that explicitly examine the motivations for sustainability management. Finally, we discuss contradictions.

Legitimacy as an important motivation

The findings of our survey show high engagement of PR/communications in sustainability management and little need for developing new tools. When matching functional areas with motivations for sustainability management (Table 1), we found PR/communications to be mostly concerned with legitimacy. Thus, our findings indicate that legitimacy is a highly relevant motivation in large German companies.

Other studies which directly asked company representatives about their motivations for sustainability engagement find legitimacy-related aspects to be of lesser importance. In their investigation of German companies, Hahn and Scheermesser (2006) asked for the reasons for sustainability management: environmental and social responsibility was mentioned by more than 50% of the respondents, whereas stakeholder demands and responding to political pressures were rarely classified as 'very important'. Similar results were identified by the Bertelsmann Stiftung

(2005). When asked for the reasons of societal engagement, their respondents mentioned NGO requirements least frequently and employee motivation most frequently, which is matched with the motivation of internal improvement in this paper. In their survey among food retailers and drugstores in Germany, Austria, and Switzerland, A.T. Kearney (2008) identified ethical reasons as most important for the implementation of sustainability initiatives, with avoiding negative publicity and complying with statutory rules and guidelines scoring lowest.

Yet, studies with a particular focus on the integration of functional areas into sustainability management support our findings. Deloitte (2009) investigated the integration of CSR into functional areas in large German consumer goods producers and retailers. In their study, PR scored highest, and correspondingly, reputation was the most important reason for pursuing a CSR strategy, followed by legal and NGO requirements. Viehöver *et al.* (2006) confirm this outcome for German-speaking countries when asking for the departments that are impacted by sustainability issues. They identified PR/communications as second most impacted function right behind top management, and they found reputation to be the main reason for sustainability engagement.

Market success as moderately important motivation
Our findings show that market-oriented departments such as marketing and R&D moderately engage in sustainability management. Nevertheless, their engagement is clearly less than PR/communications. This implies that market success is a moderately strong motivation for sustainability management (Table 1).

Whereas some empirical studies of German companies identify competitive pressure and cost advantages as important motivations for sustainability management (ifo, 2002), in most empirical studies market success is not very important. For a considerable time span, legal and societal pressures were crucial for environmental management, but market factors have become increasingly important (Moon, 2007). The results of other studies support this trend towards a growing relevance of market success for sustainability management. For instance, Bertelsmann Stiftung (2005), Hahn and Scheermesser (2006), and A.T. Kearney (2008) find market demand to be of medium importance.

This has also been confirmed in the studies on the engagement of functional areas by Viehöver *et al.* (2006) and Deloitte (2009). Further potential is seen in an expanded use of labels (Deloitte, 2009). On the one hand, market-oriented functions have become more important over time, and companies increasingly try to exploit the potential of market-oriented sustainability management (Dunphy *et al.*, 2007; Nidumolu *et al.*, 2009; Ditlev-Simonsen and Midttun, 2011). On the other hand, the market still plays a smaller role than sometimes predicted in management literature (Meffert and Kirchgeorg, 1998; Wier and Calverley, 2002; Beloe *et al.*, 2004). In the future, a stronger integration of market-oriented departments is conceivable as our survey respondents indicate a need for developing sustainability management tools in marketing.

Internal improvement as less important motivation
Our survey yields diverse findings when analyzing those functional areas matched with the motivation of internal improvement (Table 1), i.e. purchasing, logistics, production, HR, finance and accounting. Whereas purchasing is impacted by sustainability issues and perceived as promoting sustainability management to some degree, finance and accounting are least impacted by sustainability issues and they promote sustainability management the least.

Compared to the potential contributions of internally oriented departments to sustainability management (Daily and Huang, 2001; Sarkis, 2001; Gold *et al.*, 2010), our analysis shows that their overall engagement is rather low. This is supported by the fact that the respondents see a comparatively high need for developing environmental and/or social management tools for purchasing, production, and HR departments.

The low importance of finance and accounting has to be highlighted. The respondents perceive a need for the development of environmental management tools but not of social management tools. Based on the current situation, it is unlikely that these departments will be significantly more engaged in sustainability management, especially social issues, in the future. The low engagement of finance and accounting presents a real dilemma concerning the supply with sustainability information. It has been emphasized in literature that the task of these departments is to provide management with sustainability information (Henri and Journeault, 2010; Schaltegger and Burritt, 2010). Failing to consider this aspect, companies cannot make well-founded decisions on the implementation of sustainability management (Sarkis, 2001).

Several other studies also conclude that internal improvement such as cost reduction and resource efficiency plays a subordinated role for sustainability management (A.T. Kearney, 2008; Deloitte, 2009). Confirming these results, empirical studies on functional areas find CSR to be of little relevance for finance and accounting, and that these departments rarely engage in sustainability management (Viehöver *et al.*, 2006; Deloitte, 2009).

Analysis of Contradictions

Comparing our survey findings with the motivations for sustainability management discussed in other studies reveals support but also contradictions, which are discussed in this section. First, several studies find legitimacy to be of little relevance for the implementation of sustainability management. However, the related departments (i.e. PR/communications) are actively engaging according to our survey. One possible reason for this contradiction is the social desirability bias which has been addressed by Fernandes and Randall (1992) and Banerjee (2001). Asking explicit questions about the relevance of motivations bears the risk that answers are influenced by social desirability, and that respondents overstate or understate particular aspects. Declaring that sustainability management is motivated by the aim to gain legitimacy could be evaluated negatively by stakeholders and provoke criticism of greenwashing or window dressing (Laufer, 2003; Ramus and Montiel, 2005). Hence, company representatives may prefer not to unveil legitimacy as a driver when asked directly. Querying the relevance of motivations indirectly, for instance through the integration of functional areas (as in our survey), might provide an alternative indication of their actual relevance.

A second reason for contradictions might be that some companies do not communicate their sustainability management motivations at all. Advertising and publicly announcing environmental and social engagement could encourage the customers' concern that this commitment leads to price premiums (Delmas and Grant, 2010). Additionally, a company communicating about sustainability may again be more vulnerable in terms of criticism of greenwashing (Laufer, 2003; Ramus and Montiel, 2005).

A third possible reason is that implementing sustainability management could lead to difficulties. In accordance with the goals or strategy of a company, respondents may imply a high relevance of certain motivations, although the company is not (yet) able to implement sustainability management as aspired. Possible reasons are a lack of suitable management tools or the functional areas' disposition to engage in sustainability management. Additionally, the organizational structure and conflicting sustainability goals may inhibit the cooperation of departments (Hoffman, 2001; Lauring and Thomsen, 2009), and relevant information for managing sustainability issues may not be available.

Fourth, legitimacy and reputation may be suitable overarching goals serving as a 'source of inspiration' (Lauring and Thomsen, 2009, p. 45) for the sustainable development of a company. It allows involving all departments, it is easily understood by everybody, it is accepted to be part of top management's job, and it is broad enough to consider a large number of different sustainability activities. In turn, various functional areas may want to involve PR/communications to leverage the benefits of their engagement and the communication with top management, even if their activities are motivated otherwise, for example, by cost reductions.

Fifth, our paper reveals contradictions between theoretical ideals and corporate practice. Whereas many academic papers postulate the cross-functional implementation of sustainability management, it is currently not implemented as a cross-functional task in practice. Either companies do not see the necessity, or they are not (yet) able to do so. Notwithstanding, the respondents often see a need for developing sustainability management tools, particularly in those units whose main task is to deal with sustainability management and in strategic planning. This indicates a high strategic relevance of sustainability management and that a stronger integration of all functional areas may be achieved in the future.

Limitations

Some limitations of our research have to be highlighted. Matching PR/communications with the motivation of legitimacy may be seen as a simplified approach. First, the field of activity of this department can be wider. Second, legitimacy may also be gained through activities in other areas, for example, offering innovative products or providing solutions to societal problems. Moreover, similar to all surveys, our

questionnaire is subject to different interpretations. The respondents may understand or evaluate differently what it means to be impacted by sustainability issues, and their departmental affiliation may influence their response behavior.

In conclusion, rather than showing the 'true' motivations, our research reveals contradictions between the implementation of sustainability management and earlier surveys on the motivations for this engagement.

Conclusions

This paper argues that the choice which functional areas engage in sustainability management depends on the corporate motivation for such engagement. The motivations of legitimacy, market success, and internal improvement were linked with functional areas whose engagement was empirically assessed in large German companies. The findings indicate that legitimacy is a dominating motivation for sustainability management. Market-oriented motivations are of moderate importance and internally oriented motivations are of little relevance. This result contradicts a number of studies that identify legitimacy as less important motivation. The reasons for these contradictions, especially the possibility of a social desirability bias, may bear implications for future research and management practice.

Implications for Management Research

Our analysis shows that the actual implementation of sustainability management can differ from the responses to explicitly asked questions. This insight is relevant for management research in several respects. First, indirect measures may be considered to cross-reference the results of explicit queries when designing company surveys. Second, the insight gained from our analysis calls for caution when interpreting survey results and drawing implications from them. In particular, sensitive and fundamental aspects like the motivation for corporate sustainability management can be influenced by social desirability. The question of how relevant legitimacy is as a motivation shows that the data collection method can substantially influence the results in surveys and interviews.

These challenges call for further profound analyses of the development of sustainability management practices and the reasons why companies care about sustainable development – or why they do not. Particularly in the realm of a normative topic like sustainable development, it is of vital importance that researchers keep in touch with practice. To keep track of developments and trends, it could be helpful to assess the integration of departments and the role of motivations over time. In this context, a long-term analysis could be conducted on whether sustainability management is becoming a cross-functional task (Shrivastava and Hart, 1995; Hoffman, 2001). Future research could also incorporate small and medium-sized enterprises to assess if motivations differ according to exposure, market power, or company size. Moreover, the survey could be expanded to an international comparison to analyze the relevance of motivations in different countries.

Implications for Business and Management Practice

It is essential to know the motivations for corporate sustainability management for the development of practicable management tools, consulting, and developing effective public policies related to sustainable development (Bansal and Roth, 2000). If legitimacy plays an important role in the sustainability management of many large companies, it needs to be considered by researchers, politicians, and society in the design of measures and in the formulation of expectations. Communicating the relevance of sustainability issues for corporate legitimacy and reputation can also help to reduce criticism of greenwashing in the long run. Through a more open communication of motivations, legitimacy may become a 'legitimate' motivation itself, such as ethical, internal, or market-oriented motivations. To prevent sustainability management activities from being assessed as 'only self-serving', it is important to combine and balance corporate with societal benefits. It is exactly this combination which can be an important driver for sustainability measures (Fifka, 2009). The more businesses consider a variety of motivations for sustainability measures, the more they can contribute to sustainable development in different ways, and the better they will be able to benefit from the positive outcomes that corporate sustainability management can generate.

Acknowledgements

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Contribution V (study, published)

Schaltegger, S.; Harms, D.; Hörisch, J.; Windolph, S.E.; Burritt, R.; Carter, A.; Truran, S.; Crutzen, N.; Ben Rhouma, A.; Csutora, M.; Tabi, A.; Kokubu, K.; Kitada, H.; Haider, M.B.; Kim, J.D.; Lee, K.-H.; Moneva, J.M.; Ortas, E.; Alvarez-Etxeberria, I.; Daub, C.; Schmidt, J.; Herzig, C. & Morelli, J. (2013): International Corporate Sustainability Barometer. An empirical analysis in 11 countries, Lüneburg: Center for Corporate Sustainability Management.

INTERNATIONAL
CORPORATE SUSTAINABILITY BAROMETER

A COMPARATIVE ANALYSIS OF 11 COUNTRIES

INTERNATIONAL CORPORATE SUSTAINABILITY BAROMETER

AUTHORS

Stefan Schaltegger, Dorli Harms, Jacob Hörisch & Sarah Elena Windolph
Centre for Sustainability Management, Leuphana University Lüneburg,
Germany (project lead)

Roger Burritt, Amanda Carter & Stacey Truran
Centre for Accounting, Governance and Sustainability, University of South
Australia, Australia

Nathalie Crutzen
Accenture Chair in Sustainable Strategy, HEC Management School, University of
Liege, Belgium

Amel Ben Rhouma
CERIMES / CEDAG gestion, University Paris Descartes – Paris Sorbonne Cité, France

Maria Csutora & Andrea Tabi
Sustainability Indicators Research Centre, Corvinus University of Budapest,
Hungary

Katsuhiko Kokubu, Hirotsugu Kitada & Mohammad Badrul Haider
Graduate School of Business Administration, Kobe University, Japan & Faculty of
Business Administration, Hosei University, Japan

Jong Dae Kim & Ki-Hoon Lee
Sustainability Management Research Institute, Inha University, South Korea &
Griffith Business School, Griffith University, Australia

Jose M. Moneva, Eduardo Ortas & Igor Alvarez-Etxeberria
Faculty of Economics and Business Administration, University of Zaragoza, Spain &
Faculty of Economics and Business Studies, University of Basque Country, Spain

Claus-Heinrich Daub & Jörg Schmidt
School of Business – Institute of Management, University of Applied Sciences and
Arts Northwestern Switzerland, Switzerland

Christian Herzig
Nottingham Business School, Nottingham Trent University, United Kingdom

John Morelli
Department of Civil Engineering Technology, Environmental Management &
Safety, Rochester Institute of Technology, United States of America

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FOREWORD

Prof. Dr. Ernst-Ulrich von Weizsäcker

Co-Chair, International Resource Panel (UNEP) and Co-President of the Club of Rome

More than forty years after the publication of the Club of Rome's alarming message that humanity exceeds the global limits to sustainable growth, we can still recognize unsustainable business activities all over the world. However, large companies are not only contributing to the fact that humanity is currently living beyond natural planetary boundaries, but they also can play a crucial role in transforming current business practices into strategies for long-term sustainable development.

The International Corporate Sustainability Barometer, jointly prepared by the Centre for Sustainability Management, Leuphana University Lüneburg and ten internationally renowned partner institutions in Asia, Australia, Europe and North America, assists such a transformation, as it surveys and compares the current state of corporate sustainability in eleven economically developed countries. It investigates the intentions of companies to engage for sustainability and highlights the crucial importance of societal stakeholders such as NGOs. It can be applied, I am sure, also in rating companies with regard to the seriousness of their approach to sustainable development.

The survey furthermore reveals progress in the integration of sustainability into the companies' core business activities and depicts the current implementation of sustainability management practices. Based on this portrayal of international similarities and country-specific patterns, potentials for future developments can be detected, such as intensifying stakeholder participation or strengthening profits through increased resource efficiency.

In sum, this report not only emphasises the challenges the sustainability principle poses to companies all over the world, but this research also points out opportunities of corporate sustainability. I am firmly convinced that the future belongs to those companies that contribute to global sustainable development by recognising their social and environmental responsibilities in an economically intelligent manner. In the long run, accepting the challenges of corporate sustainability is the sole way to create profits and safeguard jobs. Therefore, it is a great pleasure for me to contribute to this report with a foreword.

I hope that the results of this report will provide a useful benchmark for managers and researchers around the globe. I humbly also express my hope that policy makers including lawmakers feel encouraged creating a frame within which the best in class, according to this Barometer, will also fare best with regard to economic success.

FOREWORD

John Elkington

Executive Chairman of Volans; co-founder, Environmental Data Services, SustainAbility and Volans Ventures; the inventor of the triple bottom line; and author or co-author of 19 books, the latest being *The Zeronauts: Breaking the Sustainability Barrier*.

The International Corporate Sustainability Barometer is welcome for a number of reasons.

First, it is another signal that the sustainability agenda is finally coming of age. When we set up the company SustainAbility way back in 1987, the same year that the Brundtland Commission published its report, we had to spell the word continuously and for several years. That's no longer the main problem.

Second, experience shows that well-designed surveys of business-related issues and performance can really get the competitive juices flowing in both companies and countries.

Third, it is great to see so many universities and business schools now beginning to get behind at least elements of this agenda. Some have been working in this space for quite some time, but most continue to see this as a set of issues that still struggle to make it to the level of company Boards and C-Suites.

Fourth, it is exciting to see a survey platform that evolved in Germany now going international. Germany has a great deal to offer in this space and it will be very interesting to see how this platform, and the surveys, evolve over time.

Fifth, and by no means finally, I have long been an admirer of Stefan Schaltegger and his work, and congratulate him and his team for producing this first generation survey and set of analyses.

Having said all of that, I also feel strongly that much of what is currently going on in the CSR and even 'sustainability' space is useful to have, but does not really yet add up to the sort of solutions we need to tackle the nature and scale of the global challenges we face.

That is why we are encouraging business leaders to move from 'Change-as-Usual' mindsets and strategies to 'Breakthrough' thinking and action. A growing number of business leaders are speaking out on the need for system change and, for example, for the ending of perverse subsidies that incentivize companies to do unsustainable things.

I very much hope that in future iterations of the International Corporate Sustainability Barometer elements of these wider challenges can be embraced and corporate responses evaluated. In the meantime, welcome to the first international Barometer—and I am sure that your suggestions for future improvements would be valued by the team.

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ABBREVIATIONS AND ACRONYMS

AUS	Australia
BEL	Belgium
CSM	Centre for Sustainability Management
CSR	Corporate social responsibility
EHS	Environment, health and safety
Envtl	Environmental
ESP	Spain
et al.	and others
EU	European Union
FRA	France
GER	Germany
GRI	Global Reporting Initiative
HR	Human resources
HUN	Hungary
i.e.	that is
incl.	including
Intl	International
ISO	International Organization for Standardization
JPN	Japan
KOR	South Korea
mgmt	management
NGO	Non-governmental organisation
PR	Public Relations
R&D	Research and development
SUI	Switzerland
UK	United Kingdom
UN	United Nations
USA	United States of America
WFN	Water Footprint Network

EXECUTIVE SUMMARY

Dealing with sustainability topics is a challenge and an opportunity for large companies all over the world – although every country has its very own peculiarities and priorities.

The goal of the *International Corporate Sustainability Barometer 2012* survey is to depict and compare the state of the art and progress of sustainability management and corporate social responsibility (CSR) practice at the international level. For the report the sustainability, environmental, health and safety (EHS) or CSR managers of the largest companies in eleven countries from Europe, Asia, Australia and North America were asked to fill in the questionnaire providing the data for this survey. This analysis facilitates the identification of patterns, similarities and differences for the countries surveyed, and is meant to stimulate discussion of the managerial implications of the findings. Overall, the survey collected 468 corporate responses with a response rate of 22.5%.

The International Corporate Sustainability Barometer 2012 project builds upon the experience of a series of previous surveys in Germany since 2002. It focuses on three main aspects: the intention, the integration and the implementation of corporate sustainability practice in large companies.

Intention: Why do companies manage sustainability?

This international survey reveals that companies worldwide assess society-oriented *stakeholders* such as non-governmental organisations (NGOs) and the media/public as promoting sustainability management more strongly than market-oriented stakeholders such as suppliers, insurance companies and banks. Securing legitimacy, therefore, appears to be the predominant driver of sustainability engagement.

Also, the companies surveyed seem to primarily *manage those social and environmental issues* that are specifically *required by stakeholders*. Issues such as occupational health and safety, energy consumption, training/development and workplace/employment are of great relevance, unlike biodiversity. International differences exist, for instance, between Spanish and Swiss companies, with the former tending to manage most sustainability issues more closely, and the latter tending to manage most sustainability issues less closely than their international peers. Stakeholder demands in the United Kingdom (UK), Hungary and South Korea are often higher than average whereas the Belgian and Swiss responses tend to be below the international mean.

Integration: To what extent do companies embed sustainability in their core business and in their organisation?

One hallmark of corporate sustainability is how well a company is able to integrate environmental and social policies into its core business. In all investigated countries, the majority of companies claim to *link sustainability to most or all segments of their core business*. Here, the Spanish, Belgian and UK companies score best, whereas linking sustainability and the core business is less well established in Australia.

On average, at the international level almost all *organisational units* are perceived to promote a company's sustainability engagement, although to different degrees. The CSR/sustainability department, top management and public relations (PR)/corporate communications are most often viewed as promoting sustainability management, whereas logistics/distribution, finance and accounting are assessed as being neutral or less involved.

In the international sample the most frequently addressed *drivers of a business case for sustainability* are society-oriented (e.g. reputation) or internally-oriented (e.g. efficiency), whereas market-oriented drivers (e.g. revenue) are less common. For some drivers the responses differ widely between countries. While the largest differences can be found for cost reduction, the smallest difference can be observed for employee motivation.

Implementation: How is corporate sustainability operationalized?

How companies manage their *stakeholder relationships* is one aspect of the implementation of corporate sustainability. In all countries, although the surveyed companies frequently inform their stakeholders about sustainability issues, intensive forms of stakeholder management are less frequently used. More participative stakeholder relationships can be found for South Korean and US companies. In contrast, participative forms of stakeholder engagement are only rarely undertaken in Spain, Japan and Switzerland.

In addition, common patterns can be identified for the most frequently *known and applied sustainability management tools* since flexible working time, environmental management systems and quality management systems are among the most widespread tools in all countries. However, large differences can be found in relation to the awareness and application of tools in the countries investigated: UK, US, Hungarian and Swiss companies know and apply numerous tools whereas the awareness and application of sustainability management tools is less developed in Belgium, France and South Korea. As a special case, the awareness of the most frequently known tools is far above average in Spanish companies, but their tool application is below average.

Most companies measure their *impact* on environmental and social issues such as energy consumption as well as occupational health and safety. In contrast, very few measure their impact on consumer protection, child labour/forced or compulsory labour as well as biodiversity. Yet, some country-specific differences do exist, since the French responses, for instance, are stronger for the issue of freedom of association as well as of child labour/forced or compulsory labour, whereas the Swiss and Australian companies, respectively, score lowest. In addition overall about half or less of the companies analyse the impact of their sustainability management on business success or on competitive advantage, thus hampering the creation of informed business cases for sustainability.

1 INTRODUCTION

"We may have all come on different ships, but we're in the same boat now."
(Martin Luther King, Jr., 1929-1968)

What does Martin Luther King's statement mean for corporate sustainability practice around the world? The International Corporate Sustainability Barometer discusses how companies in different countries deal with the challenges sustainability poses and it investigates their similarities and differences.

Sustainability is on everyone's lips – also in the corporate world. Although sometimes used as a catchphrase, its meaning is defined in the Brundtland Report from the World Commission on Environment and Development (WCED 1987) and has developed a high degree of practical relevance for individuals, countries and companies (e.g. Dyllick & Hockerts 2002; Starik & Kanashiro 2013). The latter, as the focus of this report, play an important role for sustainable development because of the substantial social and environmental impacts of their purchasing, production, communication, design, product and service activities. Some 25 years after the World Commission on Environment and Development in 1987 and some 20 years after the Earth Summit conference of the United Nations (UN) in Rio de Janeiro, it is well worth investigating the current state and progress of corporate sustainability in different countries around the globe.

To survey and analyse the state of corporate sustainability practice in international comparison is the aim of the International Corporate Sustainability Barometer 2012. After a decade of surveys on corporate sustainability management in Germany conducted by the Centre for Sustainability Management (CSM) since 2002, the core elements of analysis, a similar empirical methodology and the experiences gained in the process have been used to expand the project to an international level. Between February and August 2012 the survey was successfully carried out in eleven countries on four continents: Australia (AUS), Belgium (BEL), France (FRA), Germany (GER), Hungary (HUN), Japan (JPN), South Korea (KOR), Spain (ESP), Switzerland (SUI), United Kingdom (UK) and the United States of America (USA).

Whereas many studies concentrate on single sustainability issues or challenges like environmental management, CEO perspectives or sustainability-oriented innovation (Baumast 2000; Wagner 2002; Lacy et al. 2010; Kiron et al. 2013), the International Corporate Sustainability Barometer covers a wide range of corporate sustainability topics. It analyses sustainability issues (such as energy consumption or occupational health and safety), stakeholder relevance (for instance of NGOs and competitors) and corporate measures (such as increasing resource efficiency or communicating environmental and social activities). This allows the International Corporate Sustainability Barometer to identify patterns as well as similarities and differences between the countries surveyed.

In this report, the focus is on each nation's largest corporations by revenue. The survey provides insights into the companies' intentions and goals for corporate sustainability engagement, the integration of sustainability into their core business and their implementation of measures to become more sustainable. The findings of this report can be used to develop management recommendations.

Apart from this report the results of the International Corporate Sustainability Barometer 2012 project will also be presented in an edited volume, discussing in more detail the topics that are only touched on in this report.

Following this Introduction, Section 2 describes the project approach and characterises the international sample. Subsequently, Section 3 presents the findings and international comparisons and discusses implications. It distinguishes three main areas: the *intention*, the *integration* and the *implementation* of corporate sustainability. Finally, the report concludes with a summary and an outlook in Section 4.

2 APPROACH OF THE INTERNATIONAL CORPORATE SUSTAINABILITY BAROMETER

Corporate sustainability implies that economic, environmental and social aspects are simultaneously integrated into a company's conventional management activities. With this ambition, sustainability management does not only foster the sustainable development of the corporation itself, but also contributes to the sustainable development of the economy and society as a whole. Only if a company's sustainability engagement becomes part of its core business and if the management of its social and environmental performance and impacts are strongly linked with economic success, will management be in line with sustainable development. This understanding of corporate sustainability has been developed over the past years and has recently gained increasing attention (Schaltegger & Burritt 2005; Moneva et al. 2006).

2.1 Purpose

The goal of the International Corporate Sustainability Barometer is to depict and compare the current state and progress of sustainability management and CSR in different countries worldwide. Why is such a project needed?

Firstly, sustainability topics are of growing importance for companies all over the world (e.g. Bartels 2008; Lacy et al. 2010; Bartels et al. 2011; Kiron et al. 2013). As a result of globalisation we can thus expect that companies in different countries are similar in some respects concerning their sustainability efforts. Secondly, given that countries differ in history, culture and language as well as in economic, environmental and social conditions, it can also be presumed that differences exist in corporate priorities and management approaches. An empirical survey may thus show global patterns as well as national differences from which research and practice can learn to further improve corporate sustainability management.

To enable international comparisons, the results of this survey are shown and discussed on a country-specific level and are all analysed according to the same structure. The following questions direct the analysis:

- **Intention: Why do companies manage sustainability?**
  Depending on the motivation of a company's sustainability commitment, different strategic patterns for dealing with different sustainability issues may be appropriate.

- **Integration: To what extent do companies embed sustainability in their core business and in their organisation?**
  The hallmark of corporate sustainability is how well a company is able to embed environmental and social policies in its core business, how well it relates sustainability to its value creation and profit-making activities and if it involves all organisational units in this process to ensure full organisational commitment.

- **Implementation: How is corporate sustainability operationalized?**
  The implementation of corporate sustainability is reflected in the intensity of stakeholder relationships, in the awareness and implementation of sustainability management tools and in the measurement of the success of corporate sustainability activities.

2.2 Methodology

The International Corporate Sustainability Barometer is based on an online survey carried out between February and August 2012 in eleven countries in Europe, Asia, Australia and North America. The project was coordinated by the Centre for Sustainability Management (CSM) at Leuphana University Lüneburg in Germany while in every country a national academic institution organised the country-specific survey. The questionnaire was developed by the CSM and was provided to partner institutions in English. Before the survey started, pre-tests were conducted to validate the questionnaire. Each country partner, if necessary, translated the questionnaire into the country's main language. Back translations were undertaken to ensure that the questionnaires asked the same questions in each country and, thus, to enable valid multi-country comparisons.

In each country, the sustainability managers or EHS or CSR managers of the largest companies were contacted by phone or email and were asked to fill in the online questionnaire. In total, 2,076 questionnaires were sent out, which yielded 468 responses. The overall response rate was 22.5% and thus meets the validity requirements set by Bartlett et al. (2001). It is furthermore within the standard deviation range Baruch and Holtom (2008) identify for high quality surveys among organisations. The data can thus be assumed to build a comprehensive picture of sustainability management in large companies around the globe.

This report presents the results as means or as valid percentages, i.e. the percentage is calculated excluding missing responses for the particular question. For each question the number of valid responses is indicated by 'n'. In the very few cases in which data are not available for all countries this is indicated below the figures. The data were analysed using IBM SPSS Statistics 20. The main features of the international dataset are outlined in Table 1.

Country	Abbre-viation	Academic institution	Number of re-sponses	Response rate
Australia	AUS	Centre for Accounting, Governance and Sustainability, University of South Australia	48	26%
Belgium	BEL	HEC Management School, University of Liege	22	16%
France	FRA	CERIMES / CEDAG gestion, University Paris Descartes – Paris Sorbonne Cité	20	22%
Germany	GER	Centre for Sustainability Management, Leuphana University Lüneburg	152	40%
Hungary	HUN	Sustainability Indicators Research Centre, Institute of Environmental Sciences, Corvinus University of Budapest	28	33%
Japan	JPN	Graduate School of Business Administration, Kobe University & Faculty of Business Administration, Hosei University	48	16%
South Korea	KOR	Sustainability Management Research Institute, Inha University South Korea & Griffith Business School, Griffith University Australia	32	15%
Spain	ESP	Faculty of Economics and Business Administration, University of Zaragoza & Faculty of Economics and Business Studies, University of Basque Country	23	26%
Switzerland	SUI	School of Business – Institute of Management, University of Applied Sciences and Arts Northwestern Switzerland	25	12%
United Kingdom	UK	Nottingham Business School, Nottingham Trent University	36	16%
United States of America	USA	Department of Civil Engineering Technology, Environmental Management & Safety, Rochester Institute of Technology	34	19%

Table 1: Participating countries, partner academic institutions and responses

The survey focuses on the largest companies by revenue in each participating country. The companies were identified using national databases such as the Fortune 500 list in the USA (CNN Money 2012), SABI in Spain (Bureau Van Dijk 2012) or Welt online in Germany (Welt Online 2012). If a company indicated that its revenue was below 50 million euros (or the respective equivalent in domestic currency), it was excluded from the analysis. If a parent company and a subsidiary were among the largest companies and the subsidiary did not manage sustainability issues independently, it was excluded from the list in order to avoid double-counting of responses. Corporations of all sectors were taken into account (see Figure 1, 2, 3 and 4 for the sample characteristics).
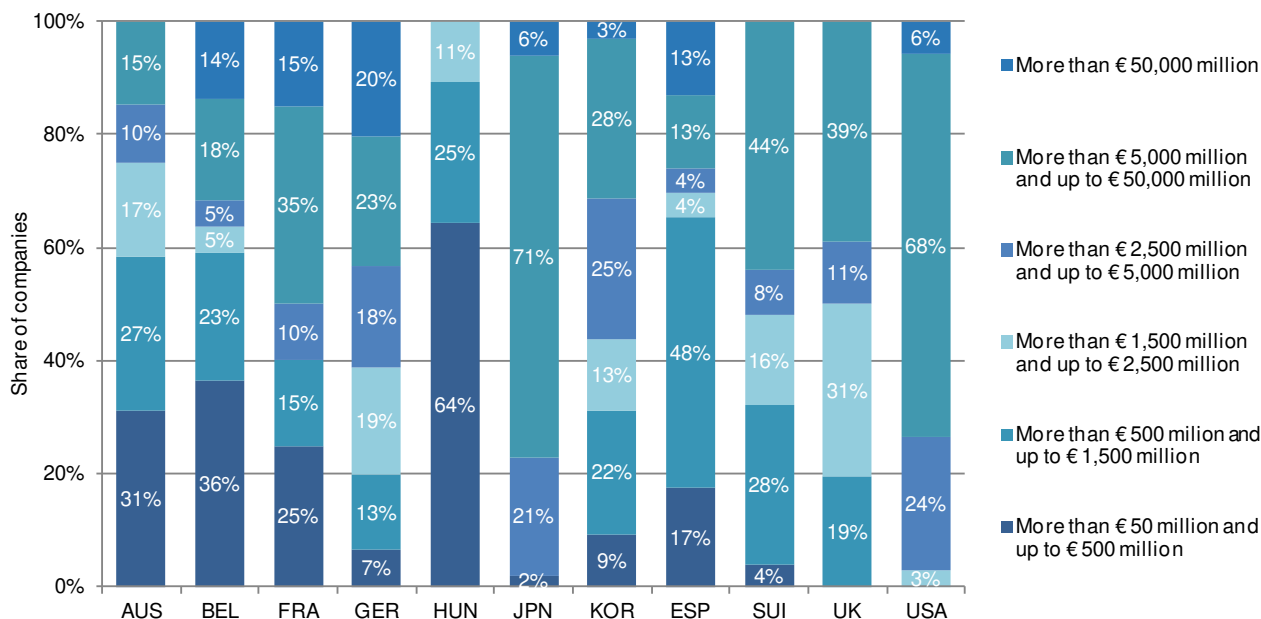

Figure 1: Annual revenue, n = 468
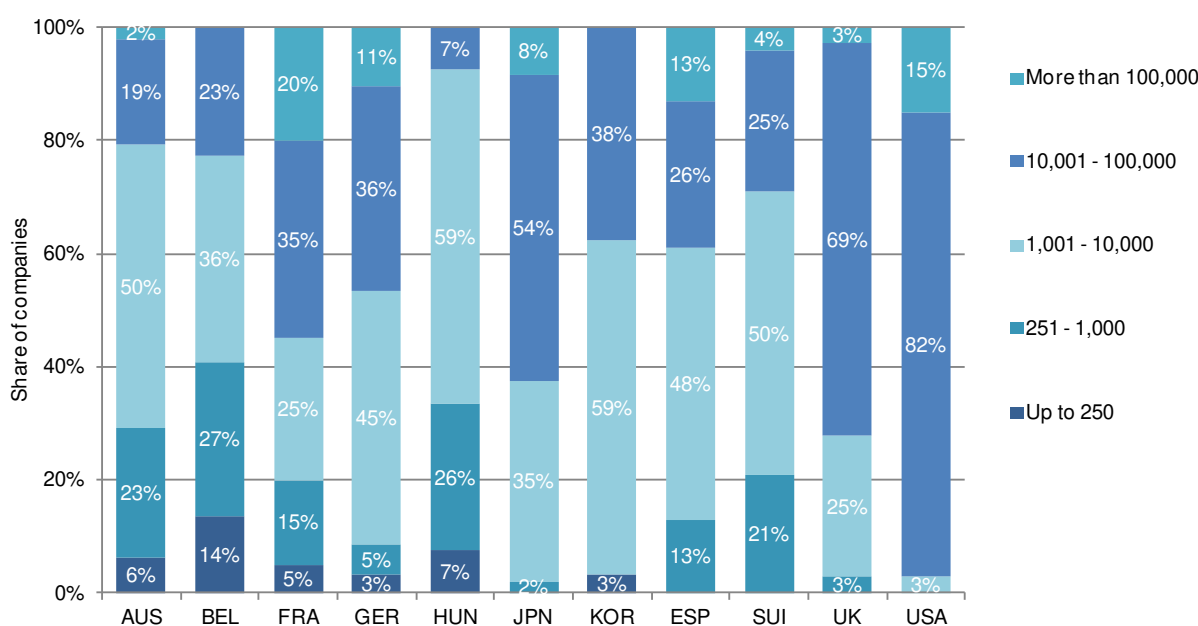(Figures include total assets for banks and gross premiums for insurances companies)
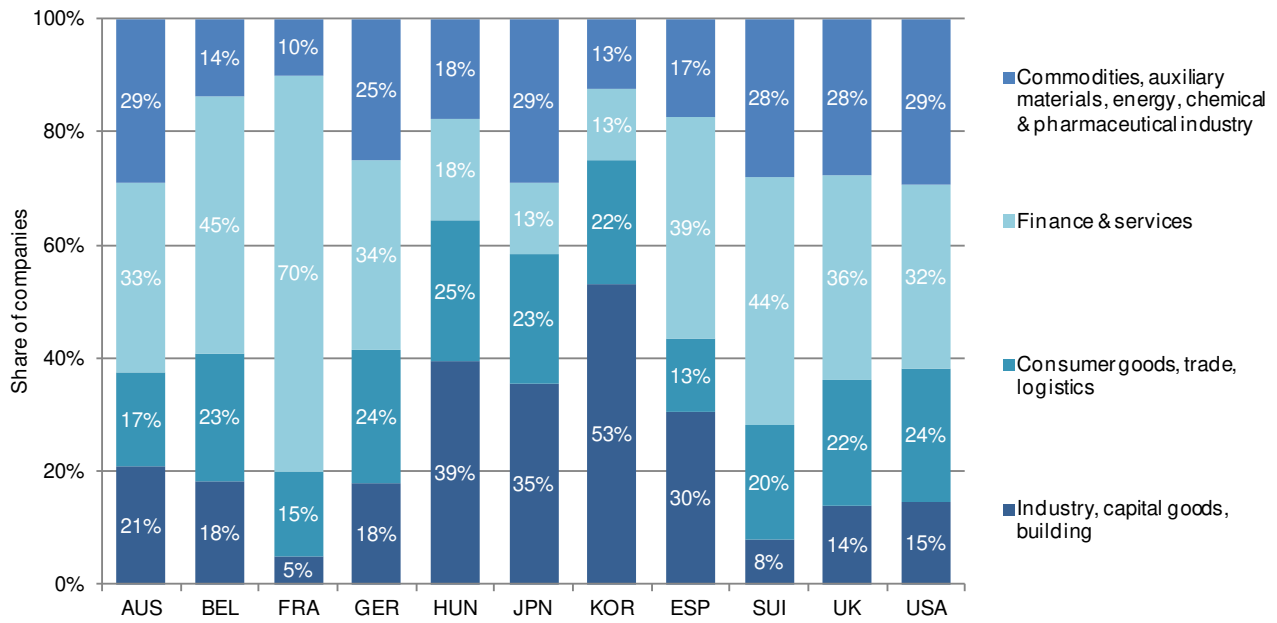

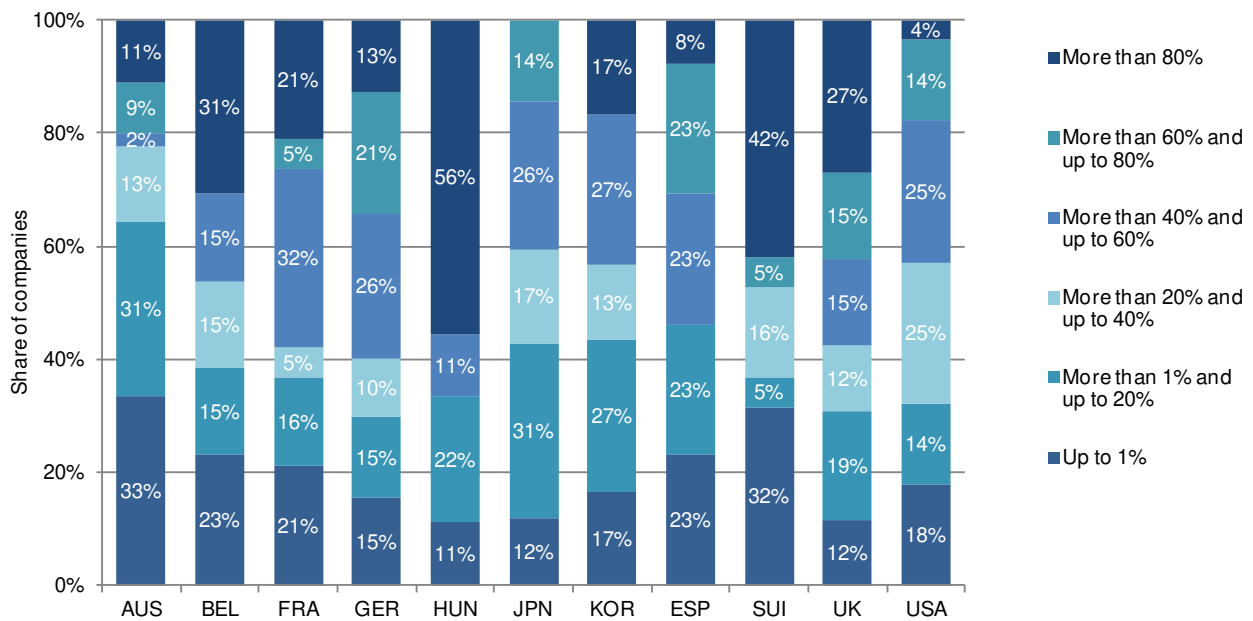Figure 2: Number of employees, n = 465

Figure 3: Core business, n = 468

Figure 4: Share of non-domestic sales in total revenue, n = 370

3 COMPARISON AND PATTERNS

3.1 Intention: Why do companies manage sustainability?

This Section elaborates on motives for corporate sustainability, stakeholder demands and which sustainability issues are particularly relevant to the companies.

Key findings

- On international average and in most countries NGOs and the media/public are the stakeholders promoting corporate sustainability the most.

- Market-oriented stakeholders such as suppliers, insurance companies and banks are frequently ranked as promoting corporate sustainability less strongly.

- Significant differences between the participating countries can be found among the stakeholder demands for specific sustainability issues as well as among the companies' actual management of these issues.

3.1.1 Background

Apart from internal motives for corporate sustainability, such as efficiency improvement or enhancing employee motivation, companies' external *motives* for sustainability engagement include achieving legitimacy and market success (Bansal & Roth 2000; Epstein 2008). On the one hand, striving for organisational legitimacy is a reaction to sustainability-related regulations and pressure from societal *stakeholders* (push factors). Market success, on the other hand, is a motive for corporate sustainability if consumers or investors offer incentives (pull factors; e.g. Dunphy et al. 2007; Moneva & Ortas 2010; Babiak & Trendafilova 2011; Ditlev-Simonsen & Midttun 2011). In the International Corporate Sustainability Barometer this was addressed by the question how different stakeholders influence the implementation of corporate sustainability in the companies.

In addition, there is a wide range of environmental, social and economic *issues* that companies can deal with, such as energy and water consumption, occupational health and safety or consumer protection (Babiak & Trendafilova 2011; GRI 2012). The commitment to engage in specific sustainability issues can be triggered by stakeholder demands. Moreover, the relevance of these issues can also depend on the company's core business. The International Corporate Sustainability Barometer sheds light on what issues are currently in the focus of corporate sustainability management in different countries.

3.1.2 Findings of the International Corporate Sustainability Barometer

Overall, the results on the impact of external stakeholders are fairly consistent (Figure 5, displaying the items with the five highest and lowest values). In all countries most stakeholders promote or are neutral concerning a company's sustainability engagement. On international average company representatives assess NGOs, a society-oriented stakeholder, as most strongly promoting the implementation of corporate sustainability, whereas insurance companies and banks score lowest.

Country specifics can be found, e.g., for Belgian companies, which rate all stakeholder impacts lower than the international average. The opposite is true for the surveyed Japanese companies,

which gauge the impact of all stakeholders (particularly consumers/end users), trade associations and banks) higher. As a consequence, Japanese companies assess the different stakeholders in a more balanced manner than companies in all other countries. It is also striking that in Japan not NGOs but community is regarded as the stakeholder that promotes engagement most strongly. Of all stakeholders and all countries, the US companies regard NGOs to most promote engagement, which is surprising since the US companies evaluate the impact of all other stakeholders more or less comparable to, for instance, the UK.

While some market-oriented stakeholders are assessed with relatively low values in all countries (e.g. banks and insurance companies), the assessment of other market-oriented stakeholders such as competitors, rating agencies and consumers is more diverse. Whereas Belgian companies evaluate competitors and rating agencies as slightly inhibiting, competitors are assessed as tending to promote sustainability engagement in the UK. Investors and consumer organisations are other market-oriented stakeholders assessed as promoting engagement on international average.

It is also interesting to note that Swiss companies view international authorities as promoting engagement more strongly than all other stakeholders, whereas French companies evaluate national authorities as being the most promoting stakeholder. In Hungary, on the other hand, scientific institutions score highest, whereas consumers/end users score lowest.
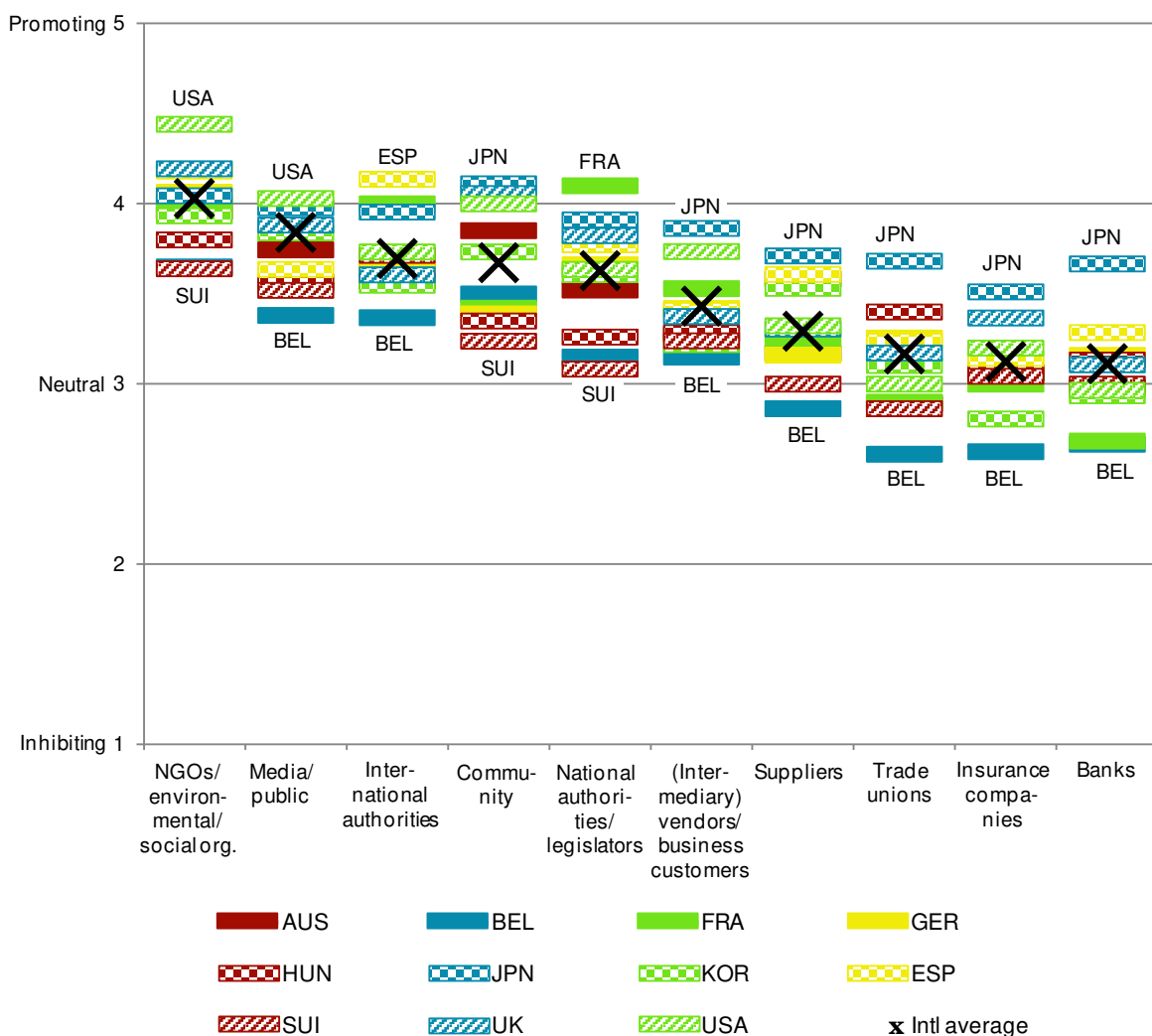

Figure 5: Impact of external stakeholders on corporate sustainability, n ranging from 393 to 450 (Single countries may not be visible due to overlaps; Figure including all items is displayed in the Annex)

The overall picture of the importance of sustainability issues is more diverse. Figures 6 and 7 reveal issue-specific and country-specific differences. The issues range from those that are *managed* closely to those where a necessity to manage is not seen (Figure 6). Whereas occupational health and safety, energy consumption, training/development and workplace/employment are the most important issues, in contrast, transport and child labour/forced or compulsory labour as well as bio-diversity are regarded as less important issues.

These results differ, however, when analysed on a country-specific level. Compared to other issues, biodiversity is only marginally managed on international average, but Japanese and Spanish companies appear as outliers as they report managing biodiversity more closely. Spanish companies also engage in material and water consumption management more frequently than companies in any other country, whereas the Belgian responses for material consumption are far below international average. In addition, the Belgian and French responses are low for the management of emissions/waste water/waste, while German and Swiss companies engage less for freedom of association/right to collective bargaining than companies in any other country. Australian companies differ substantially from the international average because of their low emphasis on transport and child labour/forced or compulsory labour as well as biodiversity. The social issues of diversity and equal opportunity, in contrast, score highest among US companies.
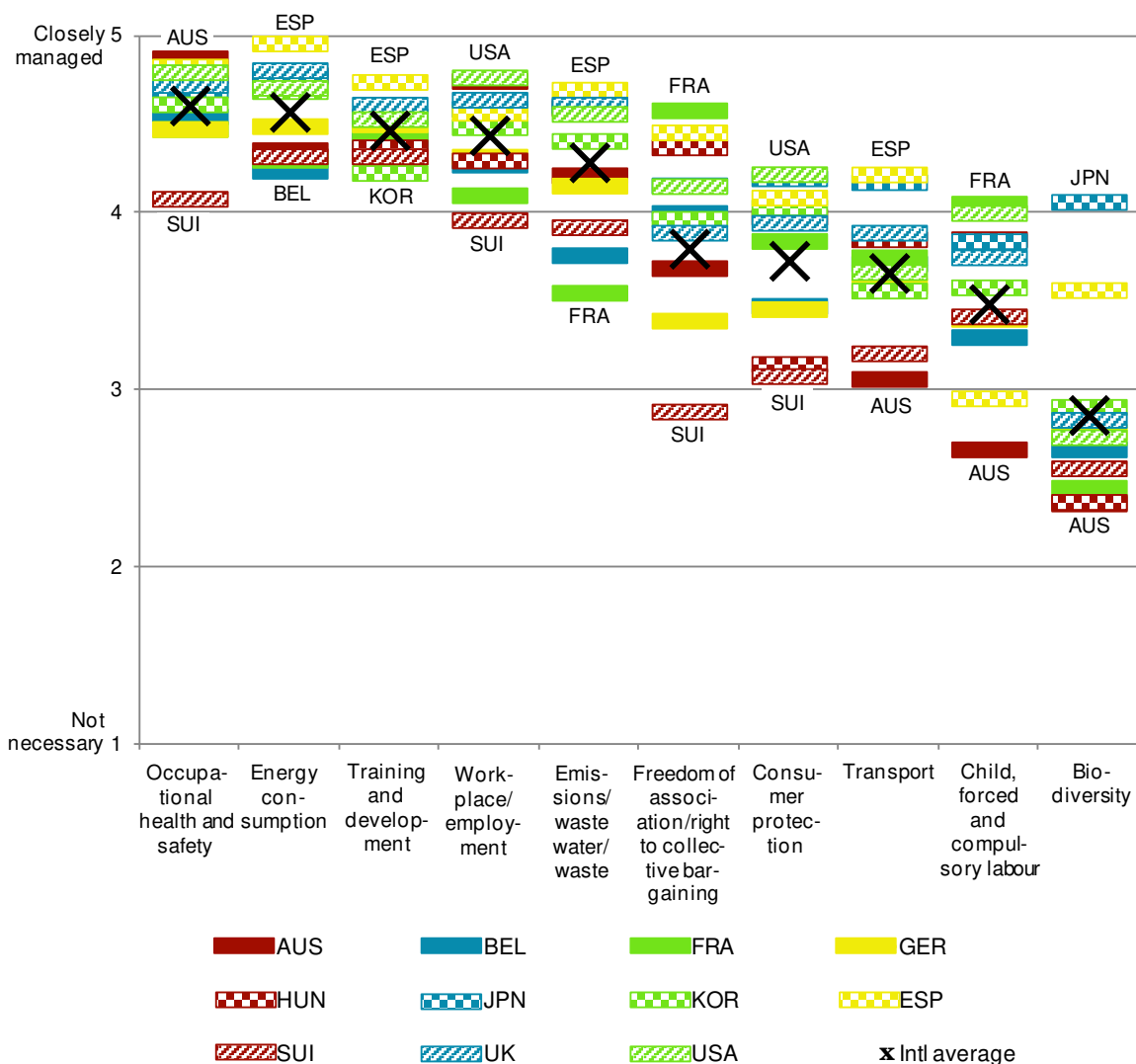
Figure 6: Managed sustainability issues, n ranging from 442 to 463
(Figure including all items is displayed in the Annex)

Generally great similarities exist between the *managed* sustainability issues (Figure 6) and the stakeholder *demands* regarding these issues (Figure 7). On international average occupational health and safety, workplace/employment and energy consumption are the issues with the highest stakeholder demands. In contrast, demands regarding biodiversity, transport, water consumption and child labour/forced or compulsory labour are less strong in most countries.

The actual country-specific extent of stakeholder demands varies strongly. Stakeholder demands tend to be above average in Hungary, South Korea and the UK, whereas particularly the Swiss and to some extent the Belgian responses are far below average. Furthermore, Australian companies face stronger social than environmental demands, since they show high values, e.g., for occupational health and safety, diversity and equal opportunity as well as consumer protection but the lowest value for biodiversity. On the contrary, the Hungarian companies are above average for all environmental issues.

Comparing Figures 6 and 7 also reveals that, although the two scales are not labelled identically, the companies rate their management of sustainability issues with higher values than the respective stakeholder demands. This is particularly true for those issues that show a large difference between the two values. For example, energy consumption as well as training/development rank higher among the managed sustainability issues (Figure 6) than among the stakeholder demands regarding these issues (Figure 7).

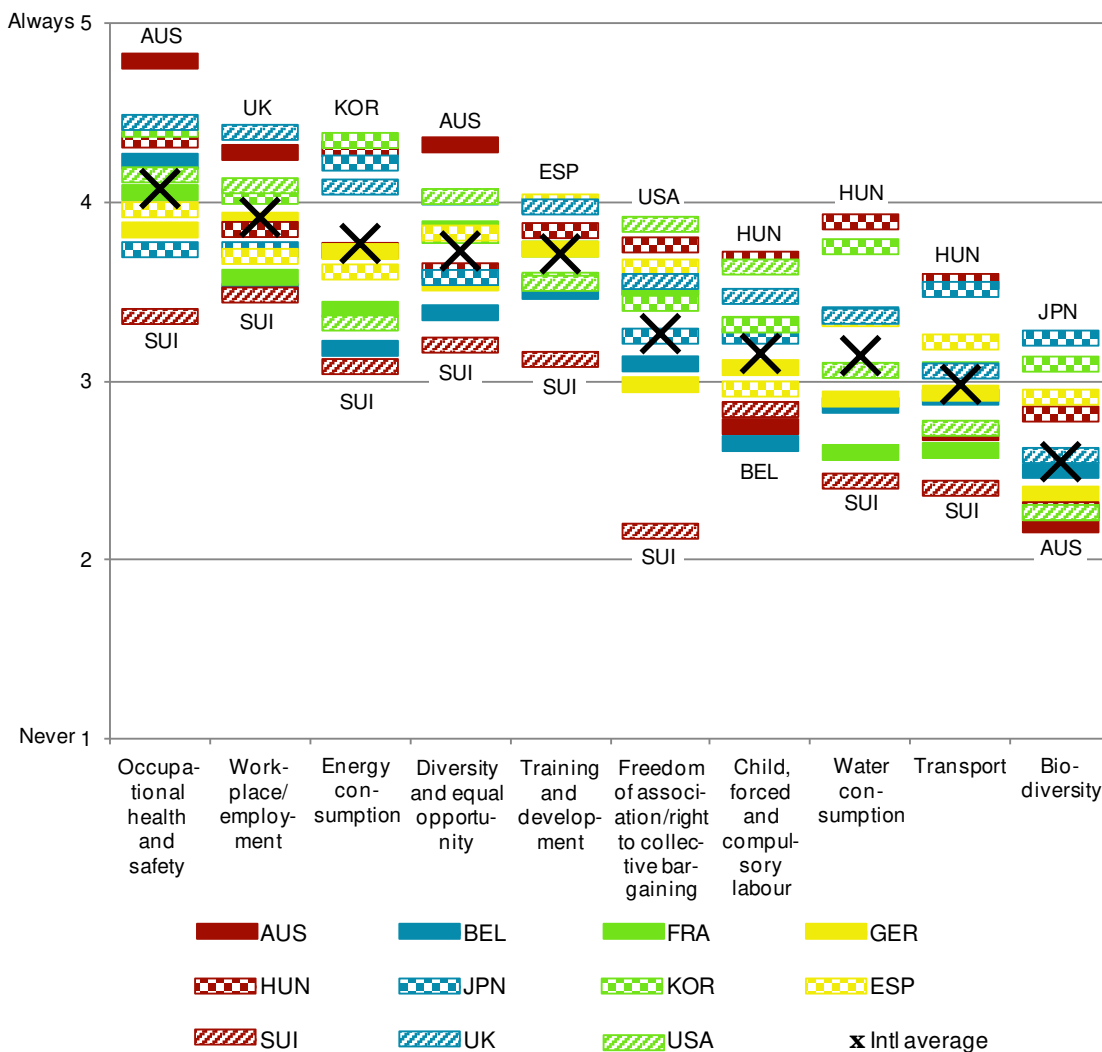Figure 7: Stakeholder demands to manage sustainability issues, n ranging from 443 to 461 (Figure including all items is displayed in the Annex)

The results on the sustainability issues which companies assess as relevant in the future are twofold. On the one hand, some issues (such as energy/GHG emissions in the environmental field or diversity/equal opportunity in the social field) appear to be relevant future issues for companies in nearly all countries investigated (Table 2). On the other hand, in most countries some issues are of particular future relevance for their companies (e.g. transport in France; supply chain management in South Korea). Additionally, it could be observed that single companies reported very specific issues as potentially relevant in future, such as green IT, soil conservation or urban development.

Country	Frequent examples of sustainability issues relevant in the future (in 5 to 10 years)	
	Environmental	Social
Australia	Energy/GHG emissions; water	Diversity/equal opportunity; community development
Belgium	Energy/GHG emissions; reporting/labelling	Training/employee qualification; work-life balance
France	Energy/GHG emissions; transport	Diversity/equal opportunity; demographic change
Germany	Energy/GHG emissions; materials/resources	Diversity/equal opportunity; training/employee qualification
Hungary	Energy/GHG emissions; waste	Workplace/employment; safety/health
Japan	Energy/GHG emissions; water	Human rights; diversity/equal opportunity
South Korea	Energy/GHG emissions; materials/resources	Safety/health; supply chain management
Spain	Energy/GHG emissions; resources	Diversity/equal opportunity; human rights
Switzerland	Energy/GHG emissions; materials/resources	Diversity/equal opportunity; employee generation
USA	Energy/GHG emissions; water	Safety/health; diversity/equal opportunity

Table 2: Sustainability issues assessed as relevant in the future
(UK: no data available)

3.1.3 Interpretation and Implications

Corporate sustainability can be externally and internally motivated. While internal drivers will be discussed in more detail in Section 3.2, this part of the report explores external motives such as striving for legitimacy and market success.

The overall international picture shows, first and foremost, that NGOs are the stakeholders most strongly promoting corporate sustainability and that in nearly every country securing legitimacy seems to be the predominant driver of sustainability engagement. This interpretation is supported by the fact that other societal stakeholders who influence legitimacy and reputation (media, government authorities and community) also have a strong positive influence on companies. Communicating engagement for sustainability, for instance, could help to legitimate corporate activities and secure reputation. Though more transparency might also provoke criticism by societal stakeholders (Laufer 2003; Ramus & Montiel 2005; Morsing & Schultz 2006), such feedback can be beneficial if it is constructive and if the company and its stakeholders establish an open, trustful and on-going dialogue which is used to continuously improve sustainability management. In addition, to prevent corporate sustainability activities from being assessed as 'only self-serving' it is reasona-

ble to combine and balance corporate with societal benefits (Fifka 2009). In this context companies might consider how they can increase their engagement with market-oriented stakeholders.

To some extent, a market orientation in sustainability management can be identified, as investors, competitors and consumer organisations are also assessed as being somewhat important. The influence of these stakeholders can be related to market demands as they are able to stimulate companies to offer environmentally friendly and socially responsible products and services, to invest in sustainability-oriented businesses and to innovate. The integration of end user demands into the product design phase or negotiations with investors about possible effective and efficient projects that fulfil sustainability criteria are examples of the wide range of possible measures combining sustainability with a market orientation.

With regard to sustainability issues both social and environmental issues are of significance, particularly occupational health and safety, energy consumption, training/development and workplace/employment. Furthermore, most countries have in common that biodiversity is given little weight by stakeholders and corporate management. However, by engaging in less popular issues companies may gain a competitive advantage and contribute to sustainable development in neglected areas. Recent reports, initiatives and handbooks on biodiversity (e.g. Earthwatch Institute et al. 2002; Biodiversity Network Japan 2007; Schaltegger & Beständig 2010; Bishop 2012) open up business opportunities such as participating in bio-carbon offset efforts, reinforcing the supply chain or securing the license to operate.

Info box: "United Nations Decade on Biodiversity"

The United Nations has declared the "UN Decade on Biodiversity 2011-2020". The goal of this initiative is to protect global biodiversity as defined at the "Conference of the Parties" (COP; www.cbd.int/cop) in Japan in 2010. Moreover, the goal of the UN decade is to implement the "Strategic Plan for Biodiversity", which covers areas such as agricultural, island and inland waters biodiversity. Current actions on the national level are presented on www.cbd.int/2011-2020.

The results reveal that most companies primarily manage issues that are specifically required by stakeholders. In addition, it can be seen that companies tend to rate their sustainability management efforts for all issues with higher values than the respective stakeholder demands. This provides indication that companies not only respond to external requirements but also manage sustainability issues proactively. Strong engagement might be driven by an intrinsic motivation such as the goal to increase a company's sustainability performance. With respect to resource consumption, companies might expect a cost reduction potential or with respect to training companies might want skilled staff able to deal with the wide range of corporate environmental, social and economic issues. Yet, for instance, while managing material and water consumption at least to a certain degree most companies still seem to have improvement potential when it comes to generating competitive advantage through a more efficient use of resources.

More generally speaking, companies are recommended to identify not only current sustainability issues for which stakeholders require engagement but also issues which may become important for the company's performance in the future. Managers may take international differences into account as public and political awareness of issues can cross national boundaries, creating business risks and opportunities influencing the company's competitive advantage. Collaboration and dialogues with stakeholders might help to identify and prioritise issues. Once relevant issues have been determined a company should develop action plans on how to manage these issues on a national and/or global level. Following international guidelines and principles (e.g. the Equator Principles;

www.equator-principles.com) or participating in roundtables (e.g. the Asia Pacific Roundtable for Sustainable Consumption and Production; www.aprscp.net) may support the effective management of sustainability issues. Last but not least, as corporate sustainability is continuously developing, a professional sustainability management requires the redesign of management systems and the measurement of progress (see Section 3.3).

3.2 Integration: To what extent do companies embed sustainability in their core business and in their organisation?

To develop a sustainable organisation, a company should link environmental and social improvements to economic success and integrate its engagement in sustainability into the core business. Such integration requires the involvement of all organisational units in corporate sustainability and enables the creation of business cases for sustainability.

Key findings

- The majority of the companies surveyed in all countries claim to link sustainability to most or all segments of their core business.

- Almost all organisational units are promoting or at least neutral towards a company's sustainability engagement, although to different degrees.

- On international average the drivers of a business case for sustainability tend to be internally-oriented or society-oriented whereas market-oriented drivers are less frequently addressed.

3.2.1 Background

Around the world, companies are challenged to meet both business and societal requirements such as achieving long-term financial success while avoiding negative environmental and social impacts. To meet these requirements, it is argued that corporate sustainability should not be treated as a peripheral concern but instead needs to be an integral part of a company's core business (Schaltegger & Burritt 2005; Porter & Kramer 2006; Schaltegger et al. 2012a). This integration challenge means that corporate activity has to be linked to sustainability measures. There are numerous examples ranging from ensuring occupational health and safety to the development of more energy efficient production processes or innovative products.

Such integration can be achieved by managers and employees in various corporate functions, like purchasing, manufacturing, research & development (R&D), sales or marketing. In a nutshell, all steps of value creation and all organisational units should be included in sustainability management in order for it to become effective (Porter 1985; Carter & Rogers 2008; Singh et al. 2008; Schaltegger et al. 2011). Involving all organisational units is essential to create comprehensive sustainability solutions and to prevent sustainability problems from being partially or superficially addressed.

Though efforts in environmental and social engagement – like routine managerial activities, too – could be a source of costs, they can also – if managed well – increase corporate success and create business cases for sustainability. A "business case for sustainability is [...] characterized by creating economic success through (and not only along with) a certain environmental or social activity"

(Schaltegger & Lüdeke-Freund 2012, p. II). The starting point is an activity to solve a social or environmental problem and the challenge is to integrate it into the core business in a way that increases competitiveness. In doing so, a company can gain competitive advantage by being a sustainability leader or innovator in a mass market. Commonly, corporate sustainability engagement is divided into efforts linked to societal or market-relevant drivers, such as reputation and revenue, or more internally-oriented drivers, such as efficiency and employee motivation. The characterisation of drivers of business cases for sustainability presented in Table 3 is based on sustainability management literature (e.g. WBCSD 2002; Steger 2004; Schaltegger & Lüdeke-Freund 2012; Schaltegger et al. 2012a).

Driver of business cases for sustainability	Sustainability measure
Costs	Environmental and socially-oriented cost management
Efficiency	Producing with more efficient use of resources
Employee motivation	Promoting employee motivation
Innovation	Developing new business segments related to sustainability
Reputation	External communication of environmental and social activities
Revenue	Developing new customer segments
Risk management	Environmental and socially-oriented risk management

Table 3: Drivers of business cases for sustainability

3.2.2 Findings of the International Corporate Sustainability Barometer

Overall, the integration of sustainability into the core business is similar in all countries since the majority of the companies (54% to 83%) claim to link sustainability to most or all segments of their core business (Figure 8). Only a small minority of companies in all countries state they link sustainability to only a few or no segments of their core business. Core business integration is most pronounced in Spanish, Belgian and UK companies, whereas Australian companies rank lowest. What is striking is that Spanish and French companies most often state they *consistently* integrate sustainability into their core business (43% and 40% respectively).
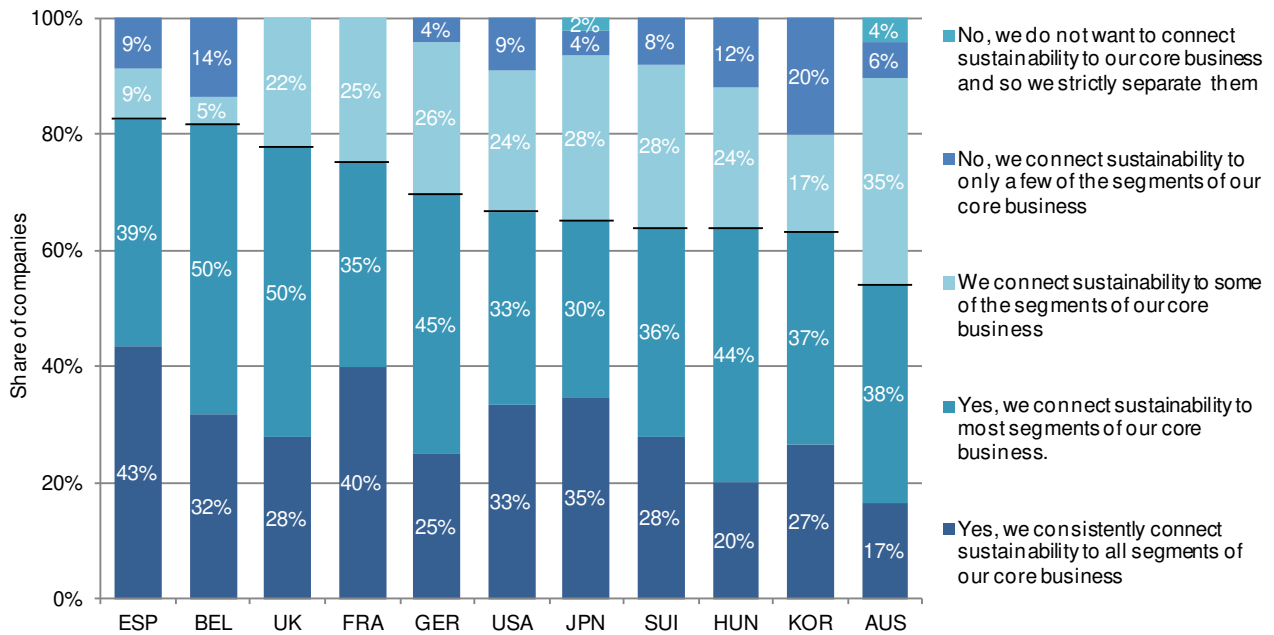
Figure 8: Linking sustainability with the core business, n = 457

Additionally, the companies were asked to provide examples of how they link their sustainability engagement with their core business. Examples mentioned by the companies in the four sectors (see also Figure 3) are:

- *Industry, capital goods, building*: e.g. reduction of environmental impact of construction projects, using renewable energy;

- *Consumer goods, trade, logistics*: e.g. energy efficiency in stores or warehouses, transport emissions control;

- *Finance & services*: e.g. green IT or financial products, ethical bonds;

- *Commodities, auxiliary materials, energy, chemical & pharmaceutical industry*: e.g. usage of renewable resources, clean energy.

Another quite consistent aspect of integration is related to *organisational units*, since the findings show that almost all of them are promoting or at least neutral towards a company's sustainability engagement (Figure 9). On international average, the CSR/sustainability department, top management and PR/corporate communications are evaluated as promoting engagement most strongly, whereas logistics/distribution, finance and accounting are assessed as rather neutral and, thus, less involved.

Contrasting the country-specific results shows that the responses for CSR/sustainability and PR/corporate communication are quite similar whereas the evaluation of manufacturing, logistics/distribution and accounting differs between countries. Japanese companies, for instance, which assess almost all organisational units as (strongly) promoting engagement, also evaluate manufacturing and logistics above average. In contrast, Australian companies evaluate these organisational units more neutrally. Australia, France, Belgium and Switzerland generally assess the surveyed organisational units as promoting sustainability management less strongly. In line with this finding, Figure 9 illustrates some further outliers: the French responses score lowest for investor relations, employee council and accounting whereas the Belgian and Australian responses are lowest for manufacturing.
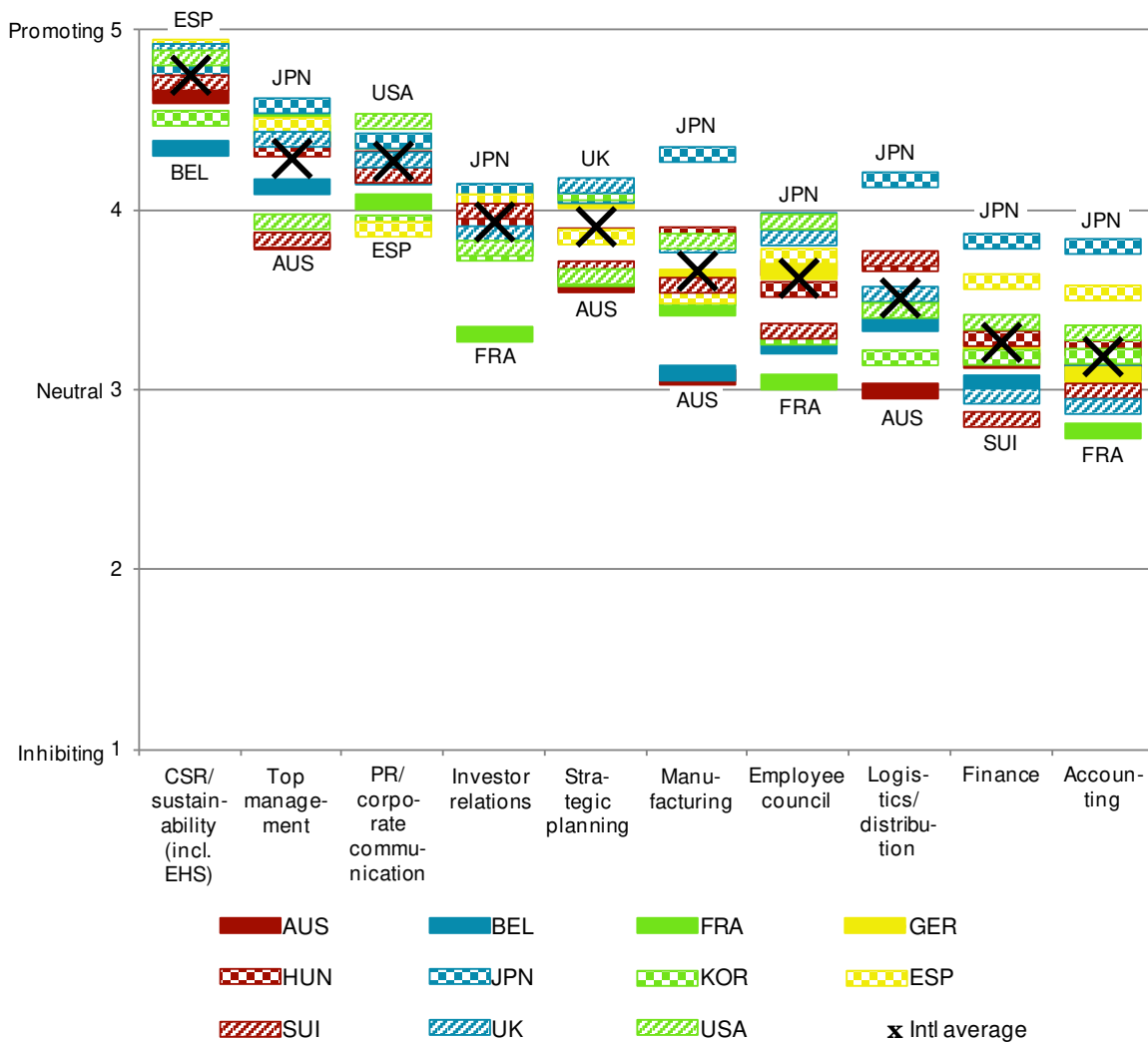
Figure 9: Impact of organisational units on corporate sustainability, n ranging from 325 to 460
(Figure including all items is displayed in the Annex)

Next to linking sustainability with the core business and the involvement of organisational units, the third aspect analysed with regard to integration is the creation of business cases for sustainability. Overall, Figure 10 shows that society-oriented (located to the left in Figure 10), market-oriented (in the middle) and internally-oriented drivers (to the right) of such a business case are addressed with related measures to very different degrees. The most common measures addressing business case drivers on international average are internally-oriented (producing with more efficient use of resources, promoting employee motivation) and society-oriented (environmental and socially-oriented risk management, external communication of environmental/social activities). Market-oriented measures (environmental and socially-oriented cost management, developing new customer segments) are less frequently undertaken (see also Table 3).

For some drivers the country-specific responses differ notably, particularly for costs, reputation, risk management and innovation. Whereas the top values for all drivers are observed in Japanese companies, the drivers are addressed least often in Australia or Belgium or, in the case of innovation, in the USA.
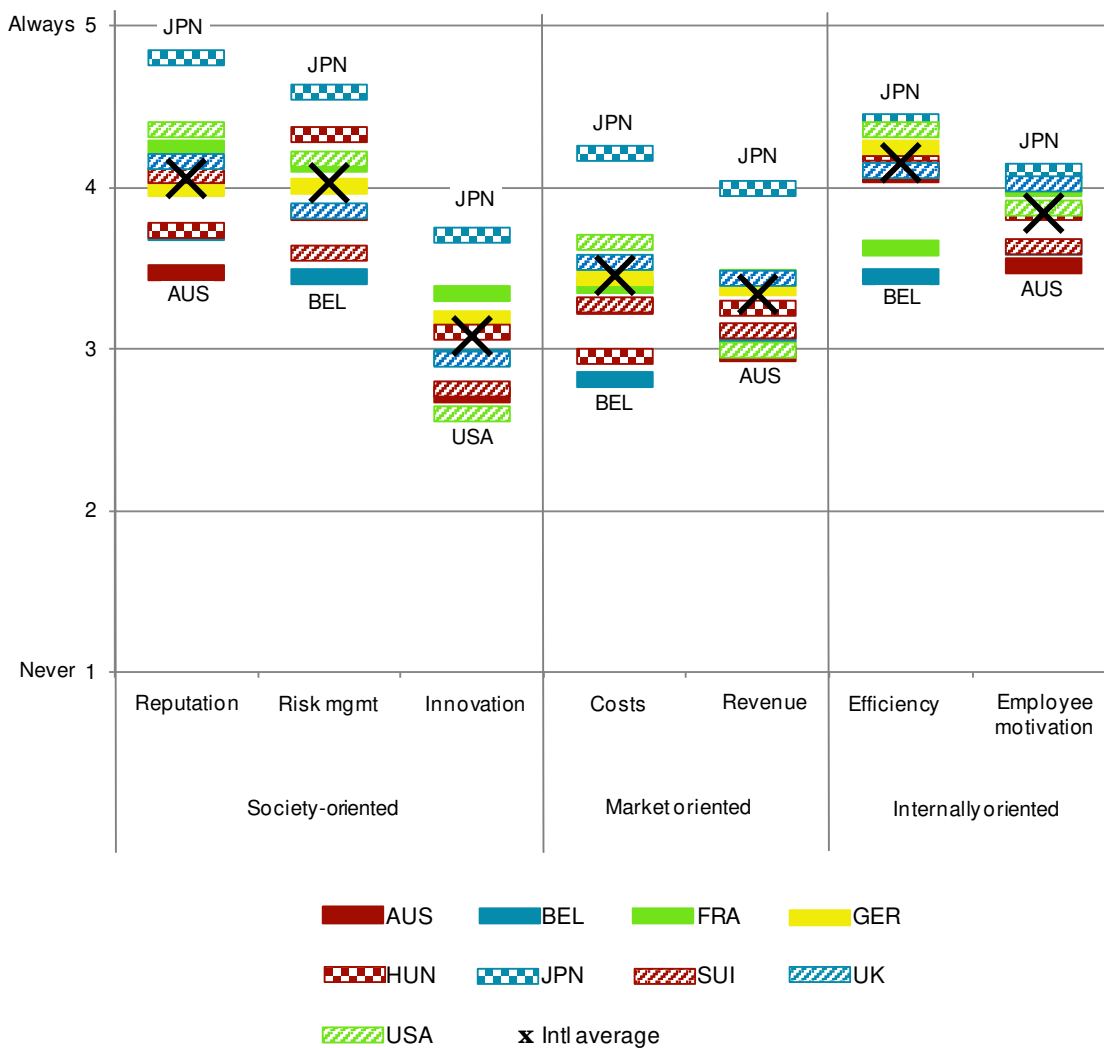
Figure 10: Drivers of business cases for sustainability, n ranging from 397 to 405
(South Korea and Spain: no data available)

3.2.3 Interpretation and Implications

Linking sustainability engagement to the core business and the involvement of all corporate organisational units are needed to systematically integrate environmental and social issues into the company's conventional management and into its value-creating activities. The majority of companies in all countries claim to link their sustainability activities with their core business and give examples of this linking, even though country-specific differences exist. Noticeably, Belgian companies are among the most progressive ones concerning the integration of sustainability into the core business, although for other topics discussed in this report Belgium often ranks low. This can partly be explained by the fact that the Belgian companies in the survey are comparably small. Therefore, with regard to the relatively low Belgian scores both for the management of sustainability issues and the impact of external stakeholders, it is possible that Belgian companies do not possess the means to tackle all sustainability-related issues and are not as exposed to stakeholder demands. Still, the results suggest that there is a high awareness of sustainability among the Belgian companies, which frequently results in the integration of sustainability topics into the companies' core business.

On the whole, the quite high percentage of companies claiming to link sustainability to their core business may serve as a foundation for future efforts to make business activities more sustainable. A

similar result is shown in a recent study with a focus on sustainable energy by Accenture and the United Nations Global Compact (2012) in which the majority of 70 companies from 19 industries state they link their core business with a more sustainable use of energy (that is, energy efficiency, energy access and renewable energy).

When companies evaluate sustainability as an integral part of strategic and operational planning, there is new room for altered business opportunities and changes in processes as well as in products and services offered (e.g. Schaltegger & Wagner 2011). Yet, such a development takes time and further stages of development are not predictable. Companies could, for example, start with a pilot project to gain experience and to learn about possible positive and negative impacts on the company's business and the company's environment. The case study of Electrolux in Sweden (McAloone & Andreasen 2004) exemplifies how testing product service systems in a piloting phase together with consumers served to identify business opportunities and challenges. Such a pilot project, in turn, can be a starting point for rolling out similar sustainability measures in the entire company.

A company striving to integrate sustainability into its core business is called upon to actually include it in its daily business activities in all parts of the organisation and every organisational unit (e.g. Shrivastava & Hart 1995; Schaltegger et al. 2011). On the one hand, R&D, manufacturing, quality control and marketing as well as supply chain-related departments such as purchasing and logistics have to be involved to design, produce and promote sustainable products and services (Carter & Dresner 2001; Darnall et al. 2008; Seuring & Müller 2008). On the other hand, the commitment of top management and the involvement of supporting functions such as CSR/sustainability, strategic planning, PR, investor relations, the legal department/compliance, finance, accounting as well as the personnel department/HR are required to transform key business processes. The involvement of all organisational units and internal stakeholders can promote internal support and appropriate strategic goal setting, can ensure the embedding of sustainability management in the corporate strategy, can foster the provision of adequate information and strengthen employee motivation (Porter 1985; Shrivastava & Hart 1995; Schaltegger & Burritt 2005). In sum, all corporate functions are challenged to contribute to corporate sustainability, no matter whether they engage in company-internal activities or in externally visible measures (Schaltegger et al. 2011).

Within the companies however differences in the impact of organisational units are observable. Explicitly sustainability-related as well as externally-oriented departments such as CSR and PR/communications promote engagement most strongly, whereas internal, performance-oriented units like finance and accounting appear to be left out. These findings reveal a gap between the status quo in practice and the demands formulated in academia to handle corporate sustainability as a cross-functional task.

Furthermore, the results on organisational units indicate that the companies surveyed are largely concerned with securing their reputation and legitimacy through sustainability management – rather than with their actual sustainability performance. However, bearing in mind that accounting designs and manages the core information system for managers and plays a gatekeeper role between top management and other departments, a stronger involvement of these organisational units that have been so far left out is highly recommended in order to link sustainability with financial information (Schaltegger et al. 2011). The country-specific findings also indicate that the organisational units of Japanese companies are more involved in the implementation of corporate sustainability than is the case in the other countries surveyed.

The involvement of all organisational units in corporate sustainability and linking sustainability with the company's core business may support the creation of business cases for sustainability. Business cases can be created by addressing individual business case drivers (Table 3). When analysing the international findings, it is striking that the drivers risk management and reputation are – in general and in particular for Japanese companies – addressed most frequently. As with external stakeholders, this indicates that the companies mostly act in a risk-averse fashion to gain and secure organisational legitimacy.

In addition to these external drivers, internal drivers such as efficiency and employee motivation are also important on international average. This is interesting in so far as it can also be seen that organisational units such as accounting appear to be less involved in corporate sustainability although one of their central tasks is to provide data in order to increase efficiency in a company. This contradiction emphasizes the desirability of cross-functional collaboration between the different organisational units. Since employee motivation is also an important business case driver for sustainability, the CSR/sustainability department and HR are called upon to jointly work on suitable measures to ensure occupational health and safety, to establish sustainability-oriented incentive systems or, for instance, to offer training programmes tailored to meeting sustainability challenges.

In sum, the results on the drivers of business cases for sustainability indicate that, next to internally-oriented ones, society-oriented measures are more common than market-oriented measures. Market-oriented drivers such as innovation and revenue, however, bear the potential to develop new markets, business models and product/service designs not only for a niche but also for the mass market.

3.3 Implementation: How is corporate sustainability operationalized?

The focus of this Section is on the implementation of corporate sustainability, including the management of stakeholder relationships, the awareness and application of sustainability management tools and the measurement of corporate sustainability impacts and success.

Key findings

- To manage their stakeholder relationships, companies in all countries surveyed frequently inform and, to a lesser extent, observe their stakeholders. More intensive forms of stakeholder management are less common.

- Companies primarily apply sustainability management tools which address employee issues, serve to communicate sustainability or help to gain a broad overview of sustainability activities.

- About half or less of the companies analyse the impact of their sustainability management on their business success or competitive advantage.

3.3.1 Background

Stakeholders are defined as groups or individuals who can affect the achievement of corporate goals or, vice versa, who are themselves affected by a company's activities (Freeman 1984). Stakeholders can support a company with resources but they can also express their critical and, ideally, constructive opinion on a corporation's sustainability engagement, which can help a company to receive an external view on its sustainability performance. Moreover, a company and its stakeholders can share ideas and discuss future challenges and trends on environmental, social and economic topics to help the company act and innovate more sustainably and competitively (Ruppel & Harrington 2000; Harting et al. 2006; Troshani & Doolin 2007). Stakeholder relationships can be managed in different ways depending on how strongly the stakeholders are involved into corporate sustainability endeavours. The forms of stakeholder relationship management range from more passive to more participative engagement (modified from Krick et al. 2005):

- Observing stakeholders;
- Informing stakeholders;
- Dialogue with stakeholders/seeking advice;
- Involvement, consideration in decision-making process;
- Cooperating, networking to develop joint solutions;
- Empowerment;
- Delegating decision-making authority.

Management tools supporting interaction with stakeholders include, for instance, stakeholder dialogues, community advisory panels or corporate volunteering (e.g. Schaltegger et al. 2002; Tencati et al. 2004; European Commission 2004). In addition, companies can make use of several sustainability management tools addressing the broad range of sustainability topics. Sustainability management tools serve, for instance, to communicate and market the company's sustainability efforts (e.g. a sustainability report or labels), to develop and plan sustainability-oriented measures, products and services (e.g. risk analysis, sustainable design) or to manage and monitor corporate sustainability (e.g. environmental management systems). The International Corporate Sustainability Barometer analyses 79 tools as well as 12 standards and norms (such as ISO norm 14001 or the OECD Guidelines) and asks which of these are known and applied in the companies surveyed. The awareness and application of such tools is essential for a systematic and effective implementation of corporate sustainability.

In a last step, the International Corporate Sustainability Barometer sheds light on the expected impact of corporate sustainability and identifies which sustainability issues are measured. Only if companies measure their impacts and the success of their sustainability efforts continuous improvements can be achieved.

3.3.2 Findings of the International Corporate Sustainability Barometer

On the whole, the results on stakeholder relationships demonstrate that numerous companies use the full spectrum of stakeholder management approaches – ranging from the observation of stakeholders to the delegation of decision-making – at least on a case-specific basis (Figure 11). A closer look reveals that less participative measures (located to the left in Figure 11) are more common than more participative measures (located to the right). In all of the countries surveyed 'informing

stakeholders' is the most widespread form of stakeholder engagement (ranging from 92% in Hungary to 100% in France, Japan, South Korea, Spain, Switzerland, UK and the USA). In contrast, 'delegating decisions' is the least used method in each country investigated.

Country-specific differences exist, for instance, for 'observing stakeholders', which is used by 100% of the companies surveyed in France, South Korea and the USA. In contrast, only 52% of the companies surveyed in Spain and 71% of the Hungarian companies observe stakeholders. 'Dialogue with stakeholders/seeking advice' belongs to the most often used stakeholder management approaches in Spain (100% of the companies) and in Belgium (95%). Also, the responses for 'delegating decisions' differ considerably: whereas most of the South Korean companies surveyed (63%) state they use this measure at least on a case-specific basis, only few of the Spanish (25%) and Swiss (21%) companies use this measure.

In summary, South Korean and US companies are most participatory in their stakeholder relationship management. In contrast, participative forms of stakeholder engagement are rarely used in Spain, Japan and Switzerland. In general, Hungary uses the methods of engaging with stakeholders less frequently.
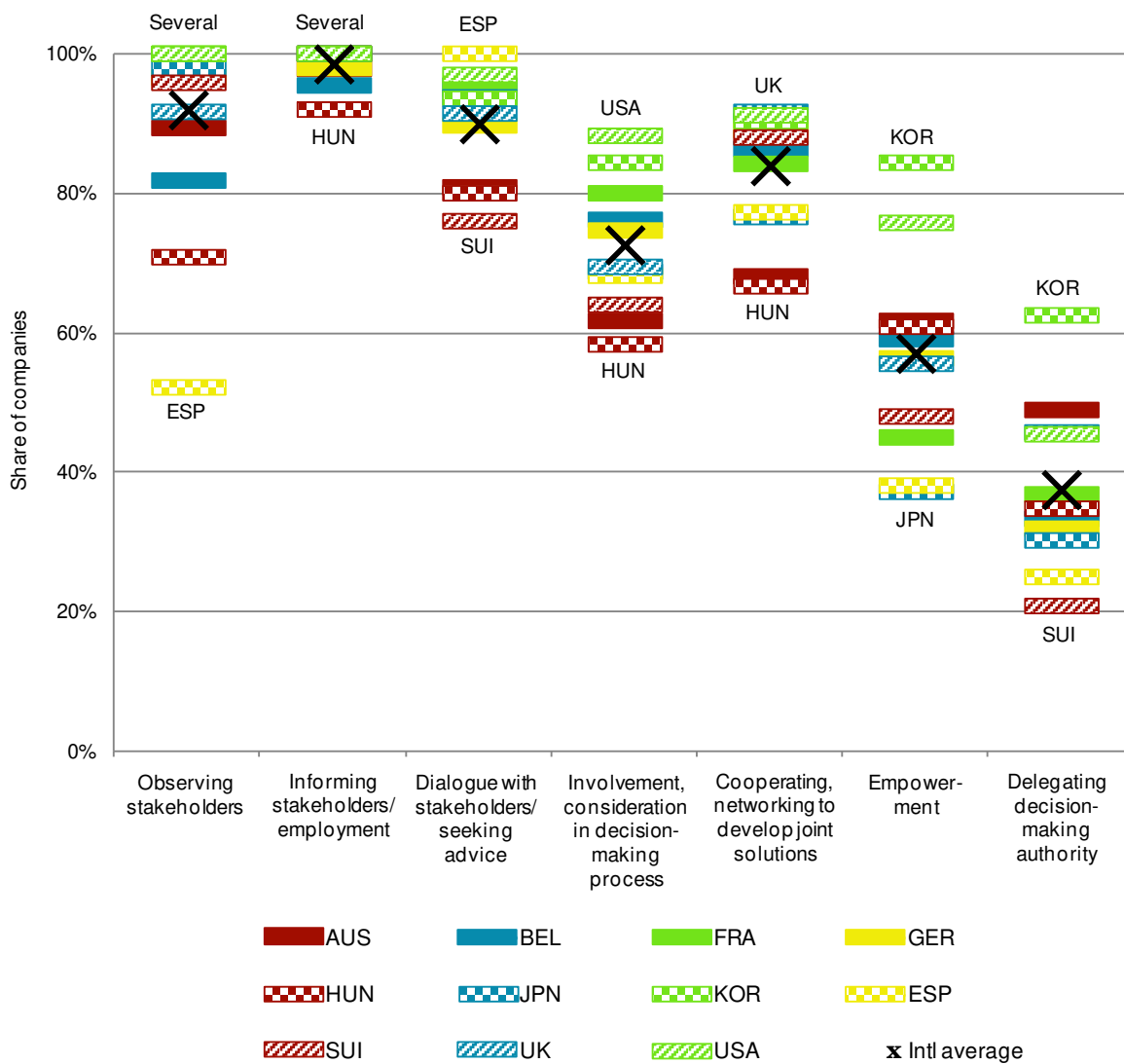

Figure 11: Management of stakeholder relationships, n ranging from 438 to 458 (total of case-specific and general use)

The awareness and especially the application of sustainability management tools are valid indications of whether and how corporate sustainability is implemented on an operational basis. Not only are there many potential sustainability management tools available, but they are being continuously developed. Table 4 (Top 10 *known* tools) and Table 5 (Top 10 *applied* tools) show which tools are currently of relevance in practice. Both tables relate tools (columns) to countries (rows). Blue shaded cells in the matrix highlight values above the international average (bottom row).

The columns in Table 4 show that sustainability management tools ranking among the 10 most *known* sustainability management tools include tools that serve: (i) *employee motivation and involvement* (flexible working time, incentive system, further education and corporate/employee volunteering), (ii) to gain *a broader overview of sustainability activities* (environmental management system, quality management system), (iii) to *communicate corporate sustainability* (sustainability and environmental report and environmental mission statement) and (iv) to *develop and plan* sustainability-oriented measures (risk analysis).

The data in Table 4 reveal that in several countries most of the top 10 known tools are known by a very large number of companies and more than on international average (UK, Spain, Hungary, Switzerland, USA, Germany and Japan). In contrast, this awareness is below average in France, South Korea and Belgium for most or all tools.

Analysing the 10 least known tools shows that most are connected to *measuring and comparing* corporate sustainability performance, such as environmental shareholder value (known in 40% of the companies on international average), sustainability accounting (40%) or eco-compass (31%).

Country	Flexible working time	Envtl mgmt system	Quality mgmt system	Sustaina- bility report	Risk analy- sis	Incen- tive system	Further edu- cation	Envtl report	Corpo- rate volun- teering	Envtl mission state- ment
UK	100%	97%	92%	97%	92%	97%	94%	89%	97%	86%
ESP	96%	96%	96%	91%	87%	96%	91%	83%	83%	83%
HUN	93%	96%	96%	86%	93%	93%	96%	89%	86%	93%
SUI	92%	84%	96%	96%	96%	88%	96%	88%	80%	80%
USA	94%	94%	79%	97%	79%	88%	91%	94%	88%	91%
GER	94%	88%	97%	87%	87%	89%	95%	82%	70%	80%
JPN	92%	98%	94%	81%	81%	69%	56%	96%	98%	85%
AUS	94%	94%	81%	79%	88%	90%	77%	83%	79%	81%
BEL	77%	86%	82%	68%	86%	77%	73%	68%	68%	73%
KOR	72%	91%	88%	81%	66%	66%	63%	78%	81%	50%
FRA	80%	75%	75%	80%	85%	75%	75%	75%	65%	30%
Intl average	91%	91%	91%	86%	85%	85%	85%	85%	80%	78%

Table 4: Top 10 known sustainability management tools, n ranging from 467 to 468
(shaded cells indicate values above international average)

Table 5, illustrating the 10 most *applied* sustainability management tools, shows a similar pattern as for the most known tools. Again, the columns reveal that sustainability management tools which serve (i) to foster *employee motivation and involvement*, (ii) to *receive a broader overview of sustainability activities,* (iii) to *communicate corporate sustainability* and (iv) to *develop and plan* sustainability-oriented measures can be found among the most popular tools. The two most widespread tools are applied by at least 50% of the companies surveyed in each country.

However, the results differ from Table 4 in terms of ranking order. Tools for *employee motivation and involvement* tend to be more often applied than tools which help to communicate corporate sustainability. Moreover, with regard to the application of tools corporate giving replaces the environmental report (see Table 4) in the top 10.

Table 5 reveals that in the UK, the USA and Hungary, followed by Switzerland, numerous tools are more frequently applied than on international average. In Belgium, Spain, Australia, France and South Korea, in contrast, application of most tools is below average. Strikingly, only one of the 10 internationally most applied tools has above average values in Spain although the awareness of tools is above average for nine of the top 10 tools there (Table 4).

An analysis of the 10 least applied tools reveals that these mainly serve to *measure and compare* corporate sustainability such as social cost accounting (applied in 11% of the companies on international average), eco-budgeting (9%) or eco-compass (5%). Only social/fair label (10%) is one of the 10 tools which can be linked to *communication and marketing*.

Country	Flexible working time	Envtl mgmt system	Further education	Quality mgmt system	Risk analysis	Incentive system	Sustainability report	Corporate giving	Corporate volunteering	Envtl mission statement
UK	83%	89%	78%	78%	81%	81%	75%	92%	81%	83%
USA	91%	88%	88%	74%	74%	71%	85%	97%	85%	74%
HUN	82%	79%	89%	93%	79%	86%	46%	79%	54%	64%
SUI	84%	72%	88%	80%	80%	72%	76%	56%	48%	44%
GER	88%	72%	93%	85%	69%	78%	63%	42%	49%	61%
JPN	79%	96%	44%	75%	63%	42%	56%	75%	85%	75%
KOR	50%	84%	50%	78%	44%	50%	63%	59%	69%	38%
FRA	55%	55%	70%	50%	75%	50%	70%	65%	50%	15%
AUS	75%	75%	69%	60%	81%	67%	50%	77%	54%	56%
ESP	74%	74%	74%	65%	70%	65%	74%	48%	43%	35%
BEL	59%	68%	55%	46%	68%	55%	50%	23%	46%	50%
Intl average	**79%**	**78%**	**77%**	**76%**	**70%**	**68%**	**63%**	**61%**	**60%**	**59%**

Table 5: Top 10 applied sustainability management tools, n ranging from 467 to 468
(shaded cells indicate values above international average)

Of the twelve sustainability-relevant standards and norms analysed in this report, only three are applied by more than half of the companies surveyed, i.e. ISO 14001, ISO 9000 and the GRI guidelines of the Global Reporting Initiative. Strikingly, almost all surveyed Japanese companies apply ISO 14001 (98%) and they are also leading with regard to ISO 9000 (79%). The consideration of the GRI guidelines is particularly common in Spain (83% application). Fairly low is the application of these three standards in Belgium and Australia.

Significant differences between the countries also exist concerning the measurement of the company's sustainability impacts (Figure 12). Differences can be found for similar issues as described in Section 3.1.2 with regard to the management of sustainability issues and stakeholder demands. However, the differences identified for measurement are more profound.

On international average, energy consumption, occupational health and safety, workplace/employment, emissions/waste water/waste and training/development are the five most commonly measured aspects (measured in more than 90% on international average). In contrast, only few companies measure their impact on consumer protection (50%), child labour/forced or compulsory labour (45%) and biodiversity (29%).
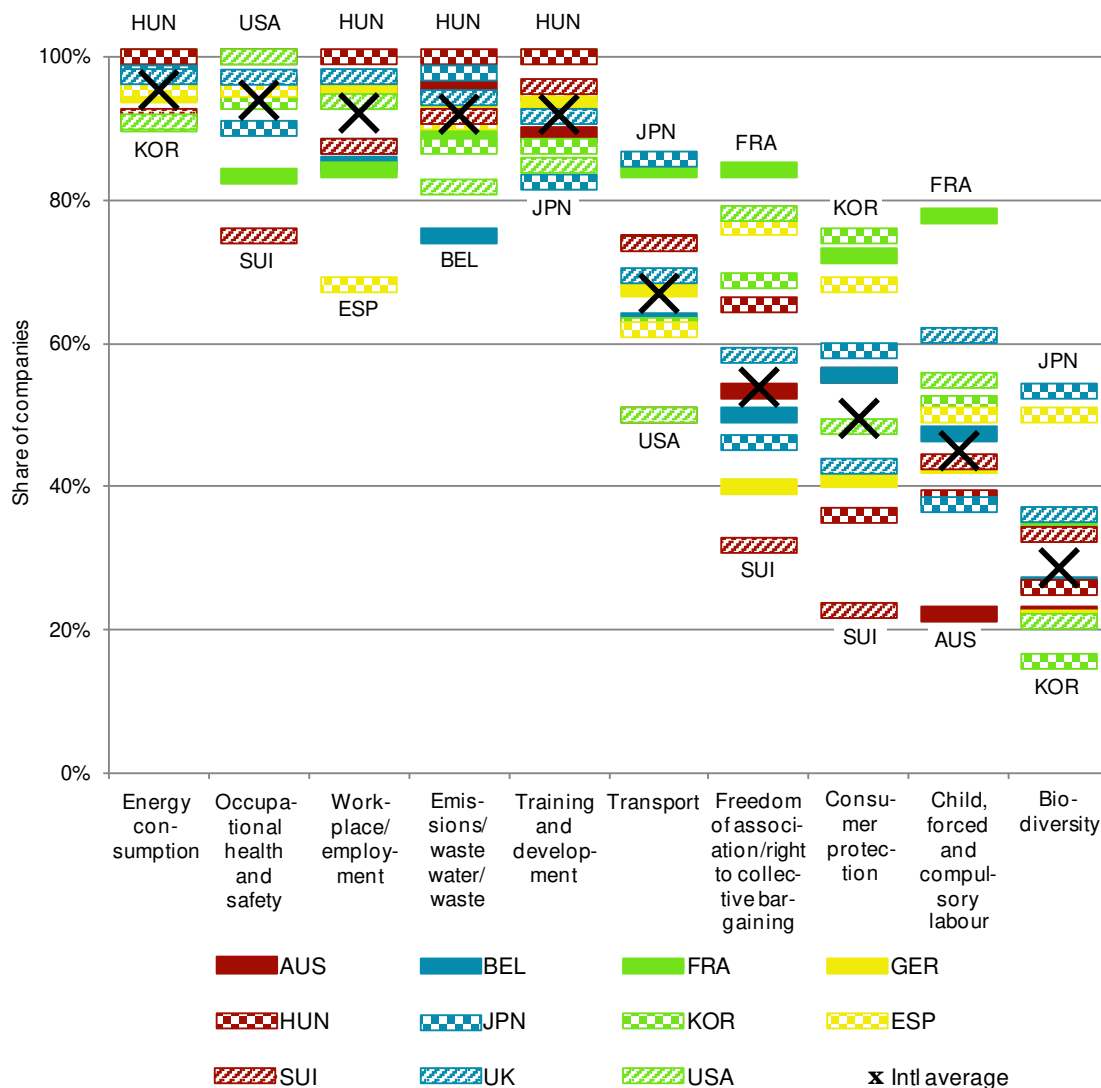

Figure 12: Measured sustainability impacts, n ranging from 425 to 454
(Figure including all items is displayed in the Annex)

On the national level, the results reveal large differences for some of the issues investigated. The largest international difference (56%) exists for child labour/forced or compulsory labour, which is frequently measured in France but only rarely measured in Australia. Similarly, company impact on freedom of association/right to collective bargaining as well as consumer protection, for example, is frequently measured in France, whereas such measurements are made by a minority of companies in Switzerland and Germany. In general, UK companies are above international average for several issues.

The companies surveyed were also asked whether they measure the impact of their sustainability management on corporate success or competitive advantage (Figure 13). On average, about half or less of the companies analyse the effect on the different drivers of business cases for sustainability. In addition, several differences can be found with regard to both drivers and countries. Regarding the drivers, the impact on costs, reputation as well as employee motivation is measured most frequently, whereas the impact on innovations (for products and processes, etc.) and business model innovations is measured least frequently. The effect on these and the remaining drivers is measured very inconsistently in the different countries. Especially, the influence on employee motivation is measured by the companies to very different degrees, ranging from 13% in Belgium to 68% in Spain and Switzerland.
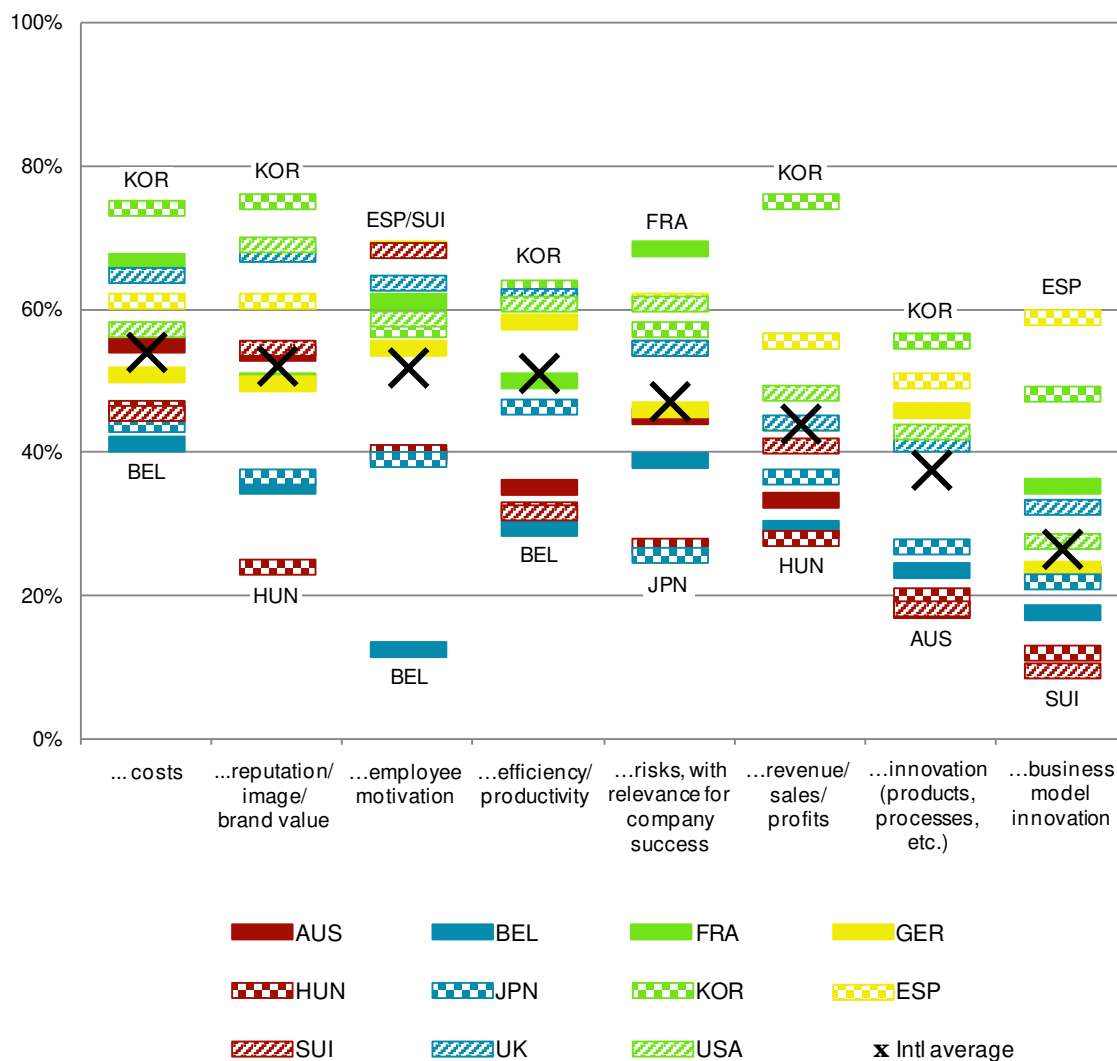

Figure 13: Measured impact on company success or competitive advantage, n ranging from 385 to 395

The country-specific data furthermore show that South Korean and Spanish companies belong to those companies most frequently measuring the impact of their sustainability engagement (between 48% and 75%), whereas especially Belgian and Hungarian companies show lower values (between 12% and 46%).

3.3.3 Interpretation and Implications

If a company is attempting to implement corporate sustainability it is challenged to manage its stakeholder relationships, to choose appropriate sustainability management tools and to measure and assess its sustainability performance and impacts on corporate success.

As companies usually deal with a large number of stakeholders who are able to affect the organisation through their demands and their positive and/or negative criticism, managers are well-advised to incorporate company-internal as well as external views in their management decision-making processes. Certainly not all issues raised by stakeholders are of equal importance, but less important stakeholders and issues could gain attention in the future (for instance suppliers, if unsustainable conditions in the supply chain become apparent). Recently, Deloitte (2012) has characterised stakeholders as 'scorekeepers' who are engaged in evaluating companies by their business impact on the environment and society. In a globalised world not only companies but also their stakeholders make use of real-time media to report on a company's sustainability performance. Knowing that such a fast track option to publish and gain access to information and opinions creates opportunities and risks, a more profound analysis and management of stakeholders and their claims appears appropriate. Deloitte (2012), for instance, suggests a process of managing environmental, social and governance issues by starting to analyse stakeholder perception of the company's performance on these issues. An international study of the Melbourne University on stakeholder interests (Australian Institute of Company Directors 2007) showed that about 40% of the surveyed Australian company directors rank shareholders highest whereas in the USA shareholders rank higher in about 80% of the cases.

Linking these insights to the findings of the International Corporate Sustainability Barometer on stakeholder management, it appears reasonable for an international company to classify relevant stakeholders and to assess sustainability issues of global relevance raised by stakeholders. The company can then decide which of the stakeholder management approaches are appropriate (see Section 3.3.1). Obviously, this decision also depends on financial and time restrictions.

A stakeholder dialogue is one possible measure to interact with stakeholders. Although it is currently not among the 10 most frequently known or applied tools, a dialogue is valuable to effectively gain an external view on a company's sustainability performance. Comparable to other tools in the wide spectrum of available sustainability management tools, stakeholder dialogues do not offer a one-size-fits-all solution. Instead, it is recommendable for companies to frequently examine currently applied as well as potential new tools to further develop them according to changing corporate sustainability challenges. As new tools are created (such as recently the water footprint) and/or existing ones are developed further (such as incentive systems) being up to date seems to be essential to effectively implement corporate sustainability. If the benefit from applying such tools is rather uncertain, a company could start with a pilot project to gain experience. Moreover, when testing and evaluating a new tool, a company can profit from joint projects with other companies, NGOs or academic partners, for instance, to share the costs while learning how to apply, customise and further develop tools.

Info box: "water footprint"

A water footprint measures the use of fresh water by consumers or producers. The Water Footprint Network (WFN), for instance, works as a platform to connect organisations and companies interested in the (global) use of water. The network provides information about current developments, shares data and offers methods such as an assessment of water footprints (www.waterfootprint.org). One of the founders of the WFN in 2008 was the UNESCO-IHE Institute for Water Education, which works to improve capacity building, research and education for water, environmental and infrastructural topics (www.unesco-ihe.org).

Finally, the assessment and measurement of corporate sustainability efforts are essential for a company to examine whether the actions taken fulfil business, social and environmental requirements. Measurement is also necessary to be able to manage and achieve company-specific goals. This includes quantitative data (such as amount of waste, the costs for energy and their impact, the number of occupational accident) and qualitative sustainability information (such as the degree of employee motivation, quality of trainings).

Once the data are collected they can be used by the organisational units that gathered it but also by other departments. Sharing the data initiates company-internal discussions which help to raise awareness and increase innovation. Increasing company-specific knowledge on the sustainability performance can foster a cross-functional understanding of challenges, goals and measures that companies face when implementing corporate sustainability.

4 SUMMARY AND OUTLOOK

Countries as well as companies worldwide differ historically, politically and culturally as well as in their legislative, economic, environmental and social conditions. Yet the International Corporate Sustainability Barometer reveals that dealing with sustainability topics is a global challenge and opportunity that large companies all over the world have in common. Building on the threefold structure covering intention, integration and implementation this report aims to reveal similarities and dissimilarities in corporate sustainability management in eleven countries on four continents.

International *similarities* exist, for example, with regard to securing legitimacy, which currently turns out to be the predominant *driver* of sustainability engagement in nearly all of the countries investigated. This outcome is supported by the fact that the companies surveyed from all over the world assess society-oriented stakeholders as promoting sustainability management more strongly than market-oriented stakeholders. A similar picture emerges for the *drivers of a business case for sustainability*, since internally-oriented and society-oriented drivers are more frequently addressed than market-oriented ones. Still, it should be noted that for some drivers the country-specific responses differ widely.

With respect to different organisational units the CSR/sustainability department, top management and PR/corporate communications promote corporate sustainability most strongly. This result again emphasises reputation and legitimacy as driving forces. The less important role of internal optimisation as a motive for corporate sustainability is also reflected by the fact that, on international average, only few companies measure the impact of their sustainability management on business success or competitive advantage.

International *differences*, however, exist for the management of various sustainability *issues* and *stakeholder demands* to manage these issues. For example, both the surveyed Spanish and Japanese companies manage biodiversity more closely. In contrast, companies in some countries manage several sustainability issues less closely, especially in Switzerland, Australia and partly in Belgium. With regard to stakeholder demands for sustainability, the Hungarian, South Korean and UK companies are often above average whereas the Belgian and Swiss responses tend to be below average. Also, the Australian companies seem to face stronger stakeholder demands for the management of several social issues (such as occupational health and safety, diversity and equal opportunity as well as consumer protection) than other countries.

With respect to the integration of corporate sustainability into the core business Spanish, Belgian and UK companies score best, whereas Australian companies link sustainability to their core business the least. The surveyed Japanese companies, furthermore, state that most of their *organisational units* support corporate sustainability. For the management of stakeholder relationships it is internationally most common to inform and observe stakeholders, whereas, for example, decisions are rarely delegated to them. The country-specific analysis, furthermore, reveals large differences between the international average and specific national patterns. For example, Spanish and Hungarian companies observe stakeholders far less frequently than companies elsewhere. Although the delegation of decision-making is comparably rare on international average, a significant majority of South Korean companies use this means of stakeholder involvement on a case-specific basis.

Large differences exist for the most frequently known and applied sustainability management tools. UK, Hungarian, Swiss and US companies know and apply numerous tools whereas the Belgian, French and South Korean companies know and apply less of the queried sustainability manage-

ment tools. As a special case, the awareness of sustainability management tools is far above average in Spanish companies, but their tool application is below average.

Finally, major dissimilarities can be found for the measurement of corporate sustainability. Firstly, the impact on sustainability issues is measured to different degrees. Whereas energy consumption is measured by a substantial majority of the companies in all countries, large country-specific differences can be observed, e.g. for freedom of association/right to collective bargaining, consumer protection as well as child labour/forced or compulsory labour. Secondly, huge differences exist for the measured impact on company success or competitive advantage. South Korean and Spanish companies measure this impact of sustainability management on company success more frequently than companies from other countries, whereas in Belgium and Hungary the impact is only measured by few companies.

Summarising the results on a country-specific level Table 6 provides an overview of the main findings of the International Corporate Sustainability Barometer.

Country	Characteristics of corporate sustainability
Australia	**Socially-oriented and potential for stronger integration** Australian companies seem to face strong stakeholder demands to manage social issues. However, besides a generally low integration of organisational units into sustainability management, Australian companies do not assess top management as one of the organisational units promoting corporate sustainability the most. Furthermore, several companies state they connect their sustainability engagement only to some segments of their core business and sustainability measures are not systematically integrated into value creation activities (via drivers of business cases for sustainability). Also, the application of sustainability management tools is not yet very widespread among the companies. Taken together, Australian companies appear rather unlikely to take a strategic approach to sustainability management.
Belgium	**Companies small, but high sustainability awareness and potential for stronger implementation** For several issues the Belgian values are below international average. This might be partly explained by the relatively small size of the companies in the Belgian sample. Nevertheless, there seems to be a high awareness of sustainability which is indicated by the pronounced integration of sustainability issues into the companies' core business. However, the implementation of corporate sustainability seems to be in an initial phase, which is indicated by the low integration of organisational units and the low awareness and application of tools.
France	**Mid-position with some particularities** For many of the topics, French companies range around the international average. Yet they often state they consistently link sustainability to their core business, which consists of services and financial services in 70% of the companies in the sample. With regard to the integration of organisational units, however, the French responses score low, particularly for investor relations, employee council and accounting. The application of sustainability management tools is not very widespread among French companies. However, they belong to those companies most frequently measuring the impact of their sustainability management.
Germany	**Close to international average** The German results are neither significantly above nor below average for most topics. One exception can be detected with regard to the awareness of sustainability management tools, which is more comprehensive in Germany. For single issues such as corporate engagement for freedom of association/right to collective bargaining, German companies have a rather weak performance. The Corporate Sustainability Barometer 2012 discusses the German results in more detail (Schaltegger et al. 2012b).
Hungary	**Environmentally conscious while having the potential for stronger market orientation** Although the companies in the sample are small, the Hungarian values for stakeholder demands are above average for several environmental issues. However, in Hungary consumers/end users are the stakeholders who promote corporate sustainability the least. In addition, several Hungarian companies indicate they link their sustainability commitment to only a few segments of their core business. Also, the management of stakeholder relationships is less participative than in other countries. However, numerous sustainability management tools are frequently known and applied.

Japan	**Proactive and foresighted** In many cases the Japanese responses are above international average which indicates that corporate sustainability is of great importance for many companies in the sample, which contains numerous very large but only few service or financial service companies. Especially the integration of organisational units and the integration of sustainability into value creation (via drivers of business cases for sustainability) are strong. Yet while Japanese companies are leading with regard to the application of ISO standards, there is further potential to implement tangible measures, for instance with regard to the increased awareness and application of corporate sustainability tools.
South Korea	**Tackling challenges and opportunities, room for more implementation** Compared to the international average South Korean companies show very pronounced stakeholder demands as well as the most progressive and intensive forms of managing stakeholder relationships. The South Korean companies in the sample, more than half of which belong to the industry/capital goods/building sector, measure the impact of sustainability management on company success more frequently than companies from most other countries. However, several South Korean companies still show potential to strengthen the linking of their sustainability commitment to their core business, to increase the integration of organisational units and to enhance the awareness and application of sustainability management tools.
Spain	**On the right track with a focus on the environment and employees** For several issues, Spanish companies are slightly above international average. For example, together with Japan they manage biodiversity most closely. Spanish companies very often link sustainability to their core business. The personnel department/HR replaces PR/corporate communication among the three organisational units that promote engagement most strongly. Spanish companies know numerous of the top 10 sustainability management tools. Yet, the values for the top 10 applied tools are below average.
Switzerland	**Corporate sustainability enabled by tools, potential for more integration** Swiss companies rank comparatively low compared to the international average with regard to several sustainability topics. The low integration of stakeholders may be due to the fact that stakeholder demands are less pronounced in Switzerland. Sustainability management seems to be of little strategic relevance, since top management is not very involved. Yet, several sustainability management tools are frequently known and applied in the Swiss companies surveyed, of which a large share belongs to the finance and service sector. Compared to other country samples with a large share of service companies (France, Belgium and Spain), the integration of sustainability into the core business is less pronounced in Switzerland.
United Kingdom	**Several highlights and often above average** UK companies evaluate the impact competitors and consumer organisations (market-oriented stakeholders) have on companies' activities as highest of all countries and they are among the top three countries linking sustainability commitment to most or all segments of their core business. Also, in the UK the awareness and application of sustainability management tools is relatively high, and UK companies are among those notable for their measurement of sustainability impacts.
United States of America	**Stakeholder-oriented and well-provided with tools to engage (more) in sustainability** The US sample, which mainly consists of very large companies, shows that the management of stakeholder relationships is more progressive and intensive than in most other countries. Numerous sustainability management tools are frequently known and applied. What is striking, however, is that of all stakeholders and all countries, NGOs are assessed as most strongly promoting engagement by the US companies, whereas top management does not belong to the organisational units promoting sustainability the most. This indicates that sustainability is not necessarily incorporated on a strategic level in the surveyed US companies.

Table 6: Corporate sustainability profile of participating countries

A review of the country-specific findings emphasises that companies in all countries show certain similarities, but that all countries can also be characterised by some individual features. As a consequence, companies are challenged to deal with both their country-specific particularities, such as the national legislation, the economic situation and the given infrastructure, as well as globally relevant opportunities and risks, such as technological developments, poverty or climate change.

Sustainability management can thus not be designed and implemented as a one-size-fits-all solution.

The International Corporate Sustainability Barometer report gives a snap-shot of the current state of corporate sustainability practices in several countries. Future academic studies can build on the results obtained by conducting in-depth analyses on the different aspects of sustainability management such as the drivers of business cases for sustainability, the involvement of organisational units or stakeholder management. Prospective work may also compare sustainability management within different sectors in order to analyse whether particular patterns may be influenced by the industry compositions of different countries. Since this report yields some surprising country-specific findings, further research may address these particularities by analysing national characteristics such as people's attitudes, consumer behaviour and legislation. For practitioners worldwide this report provides a useful benchmark. It identifies country-specific strengths and weaknesses which can serve as a basis for developing corporate sustainability management further.

The International Corporate Sustainability Barometer 2012 project finds companies around the world to be in the same boat regarding a variety of corporate sustainability topics. They are all confronted with stakeholder demands as well as global developments of unsustainability and as a result are increasingly challenged to contribute to sustainable development. To conclude, for most sustainability challenges (like global poverty or climate change) to achieve the necessary progress it is essential for companies from various countries to increase their engagement. We are all in the same boat now – and everyone has to row in the same direction if we are to move forward.

In addition to this report, an edited volume including country-specific analyses of the International Corporate Sustainability Barometer will be available soon.

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A) Supplement to Figure 5 (impact of external stakeholders on corporate sustainability), all items
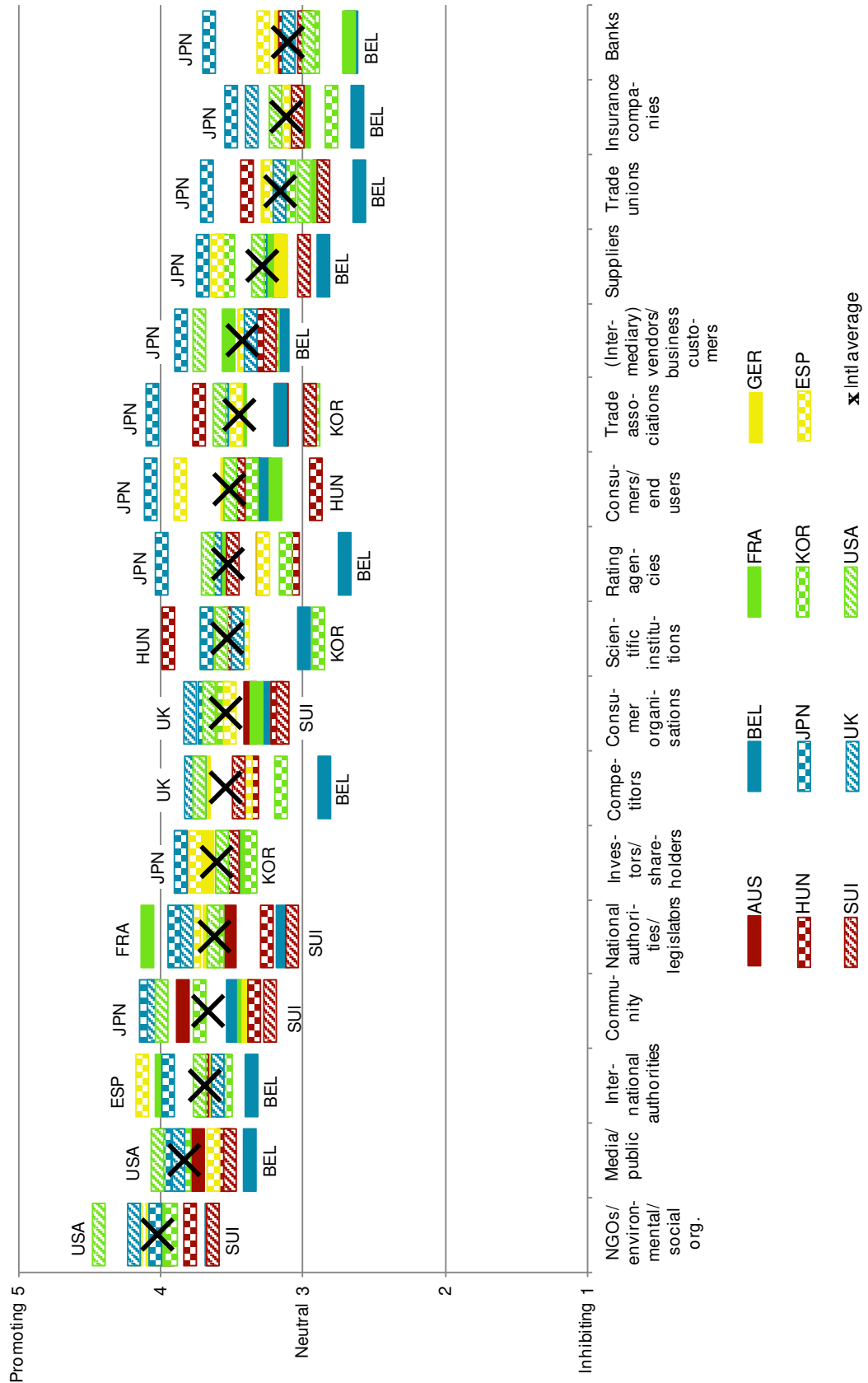
B) Supplement to Figure 6 (managed sustainability issues), all items

C) Supplement to Figure 7 (stakeholder demands to manage sustainability issues), all items

D) Supplement to Figure 9 (impact of organisational units on corporate sustainability), all items

E) Supplement to Figure 12 (measured sustainability impacts), all items
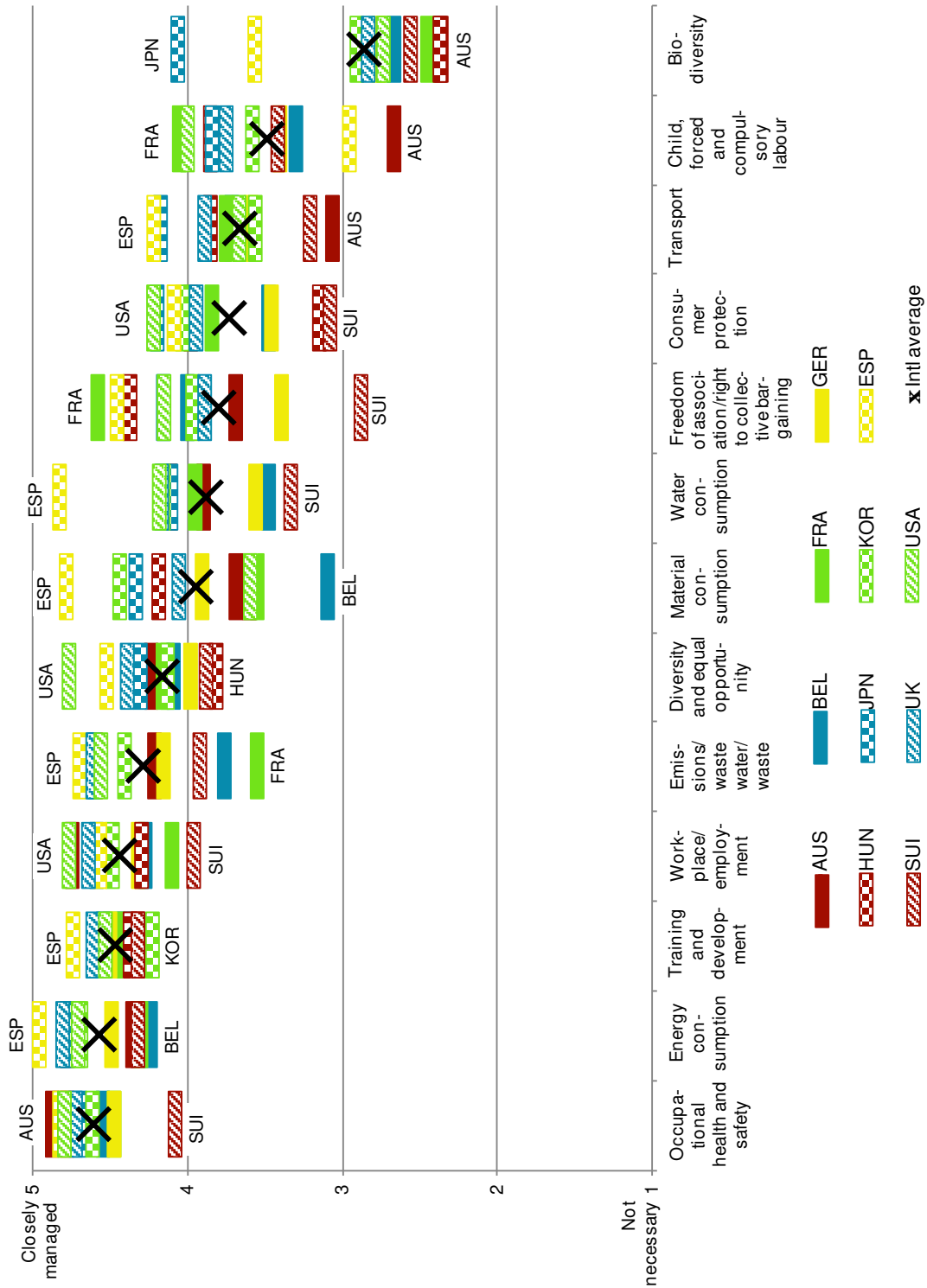
CONTACT

Centre for Sustainability Management (CSM)
Leuphana University Lüneburg
Scharnhorststr. 1
D-21335 Lüneburg, Germany
Phone: +49(0) 4131 677 2181, Fax: 2186
Email: csb@uni.leuphana.de
Web: www.leuphana.de/csm

Prof. Dr. Stefan Schaltegger, Dorli Harms, Jacob Hörisch, Sarah Elena Windolph

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Contribution VI (book chapter, double blind peer reviewed, published)

Harms, D. & Klewitz, J. (2013): Innovation in sustainable supply chains – Interaction for resources from an SME perspective, in: Bogaschewsky, R.; Eßig, M.; Lasch, R. & Stölzle, W. (Hrsg.): Supply Management Research. Aktuelle Forschungsergebnisse 2013, Wiesbaden: Gabler, 105–130.

Innovation in sustainable supply chains – Interaction for resources from an SME perspective

Dorli Harms and Johanna Klewitz

Abstract

Supply chain management is increasingly challenged to integrate environmental (e.g. product recyclability) and social issues (e.g. labor conditions) to establish sustainable supply chains. Apart from a risk-orientation in sustainable supply chain management (SSCM) companies can also pursue an opportunity-oriented strategy linked to innovation. In this paper we develop the argument that SSCM is an opportunity for companies to develop sustainability-oriented innovations (SOIs), that is, improved or new products, processes, and organizational structures. For this purpose we focus our analysis on SSCM from the perspective of small and medium sized enterprises (SMEs) as, so far, little is known on how SMEs manage SSCM within the business-to-consumer (B2C) context, even though SMEs are important for sustainable development. We argue that SSCM can play a central role for SOIs of SMEs by making resources accessible through the interaction with primary (e.g. customers, suppliers) and secondary supply chain stakeholders (e.g. competitors, universities). Building on the resource-based and relational view we develop a conceptual framework which discusses how resource flows can occur in the interaction with different supply chain stakeholders. As a result, we explicate theoretical propositions and implications for practice.

1   Introduction

Supply chain management (SCM) and purchasing is increasingly discussed with regard to environmental and social issues (e.g. Carter et al., 1998; Seuring & Müller, 2008; Walker et al., 2012) as recent systematic literature reviews document (Seuring & Müller, 2008; Carter & Easton, 2011; Sarkis et al., 2011; Hoejmose & Adrien-Kirby, 2012). The integration of environmental and social issues (e.g. product recyclability, sound labor conditions) in traditional SCM is termed as *sustainable supply chain man-*

agement (SSCM; e.g. Carter & Rogers, 2008; Seuring & Müller, 2008; Gold et al., 2010; Tate et al., 2012). In SSCM two strategic directions can be differentiated (Seuring & Müller, 2008; Harms et al., 2012): For one, companies can concentrate on a risk-oriented strategy. Risks can result from requirements and pressures through diverse company-external and -internal stakeholders such as non-governmental organizations (NGOs), customers, or employees to comply with environmental or human rights standards, for instance (Hall, 2000; Carter & Dresner, 2001; Côté et al., 2008; Walker et al., 2008; Foerstl et al., 2010). Second, companies can pursue an opportunity-oriented strategy. This strategy refers to "sustainable supply chain management for sustainable products" (Seuring & Müller, 2008, p. 1703). Based on this understanding companies can view SSCM as an opportunity for innovation and a means to gain competitive advantage by redesigning products, services, and processes (Sharma & Henriques, 2005; Pagell & Wu, 2009). Such sustainability-oriented innovations (SOIs) encompass the development and improvement of products, processes, and organizational struc-tures that are environmentally and socially superior in their characteristics compared to a prior or other entity (Fichter & Paech, 2004; Hansen et al., 2009; Hansen & Klewitz, 2012a; Paech, 2005; 2007).

As SOIs present a process towards sustainability, they require deliberate management (Paech, 2007; Hansen et al., 2009; Hansen & Klewitz, 2012a) and both SSCM strategies can take effect. On the one hand, if companies offer environmentally improved prod-ucts (e.g. which use less water in the entire production process and supply chain) they need to monitor their suppliers' environmental performance (Seuring & Müller, 2008). On the other, companies that aim to minimize social risks (e.g. child labor) in their supply chains (e.g. through supplier development) can realize social improvements in their products (e.g. through social labeling; e.g. Seuring & Müller, 2008). Hence, SSCM offers companies opportunities to innovate for sustainability at the product, process, and organizational level while minimizing risks, improving performance, and thereby achieving competitive advantage.

Even though there is a growing literature on the *issues* in SSCM and to *what* SSCM in practice amounts to (e.g. Peters, 2010; Harms et al., 2012; Tate et al., 2012), studies suggest that there is still little known on *how* companies manage environmental and social issues in their supply chains (Carter & Rogers, 2008; Hoejmose & Adrien-Kirby, 2012).

Furthermore, research on SSCM often focuses on large, multinational companies. On a global level these companies have to deal with a complex set of suppliers and there-fore diverse environmental and social challenges across their supply chains arise such as supplier reliability, reduction of CO_2 emissions, or improved labor conditions (Cili-berti et al., 2008; Pagell & Wu, 2009; Cetinkaya, 2011). Little research has been con-ducted on SSCM from the perspective of small and medium sized enterprises (SMEs) even though they play a considerable role for sustainable development. First, they play a major role economically as figures for the United States show, where small businesses represent 99.7% of all employer firms (SBA, 2007; Zhou, 2012). In the Euro-

pean Union SMEs present 99% of all businesses (ECEI, 2010). Second, even though SMEs are less socially exposed than larger, globally operating companies (Hall, 2000; 2006) they may be particularly responsive to pressure by internal and external stakeholders such as employees, environmental regulators, suppliers, and customers as SMEs are linked more closely to these stakeholders or as they are more dependent on their acceptance to stay in the market (Darnall et al., 2010). Third, with their specific capabilities (e.g. flexibility) and structure (e.g. less structural inertia) SMEs are attributed with innovation propensity for sustainability as they can respond quickly to customer and market demands (e.g. Noci & Verganti, 1999; Bos-Brouwers, 2010; Darnall et al., 2010; Klewitz & Hansen, 2011).

To analyze SSCM from an SME perspective, it is necessary to go beyond the often discussed role of an SME in its position as a supplier to a larger company, that is, within a business-to-business context (e.g. Jorgensen & Knudsen, 2006; Ciliberti et al., 2008). Therefore, the present analysis will take on the perspective of SMEs within a business-to-consumer (B2C) context. We will furthermore focus our SSCM analysis on resources, first, because resources play a pivotal role within SSCM documented in according (S)SCM definitions (e.g. Harland, 1996; Seuring & Müller, 2008). Second, they are crucial to SMEs which can lack initial resources to engage in SOIs (e.g. Noci & Verganti, 1999; Hansen & Klewitz, 2012b) and third SOIs themselves can be resource intensive due to their market and directional risk (e.g. Paech, 2005; Hansen et al., 2009). Thus, a central challenge for SMEs is to identify means by which they can access relevant resources (material, capital, information; e.g. Seuring & Müller, 2008) for SOIs through SSCM.

To access these resources through SSCM two groups of supply chain stakeholders are relevant which can hold and exchange them. The first group refers to members along the supply chain, so called primary supply chain stakeholders (Cetinkaya, 2011). Suppliers, customers, and end consumers are stakeholders which typically belong to this first group. The second group refers to "nontraditional chain members" (Pagell & Wu, 2009, p. 39 with reference to Johnston & Linton, 2000) which are also termed secondary supply chain stakeholders (Cetinkaya, 2011). Non-governmental organizations (NGOs), competitors, local communities, and universities are examples for such stakeholders (Henriques & Sadorsky, 1999; Pagell & Wu, 2009; Cetinkaya, 2011).

Against this background two research questions arise:

> *(1) How can resources be exchanged and shared across an SME's sustainable supply chains for SOIs?*

> *(2) How can the interaction with primary and secondary stakeholders in sustainable supply chains contribute to SOIs of SMEs?*

We will address these questions in a conceptual approach to explore and map the wide-ranging academic field of SSCM, SOIs, and SMEs whereby we can show the interconnection of these so far seldom overlapping literature streams. To underpin our

approach we will build on a resource-oriented perspective including the resource-based view (RBV) as introduced by Wernerfelt (1984) and Barney (1991) and its extension, that is, the relational view (RV) by Dyer and Singh (1998). Both are interconnected and appropriate to discuss the linkages between the resource flows that occur in the interaction with stakeholders.

To develop our argument the paper is organized as follows. We provide a literature-based overview on the interconnections of SSCM and SOIs in an SME context. Here, we also explicate our resource-oriented perspective. In the third section we suggest a conceptual framework of resource flows between an SME and its primary and secondary supply chain stakeholders. Next, we discuss this framework and put forward theoretical propositions. Finally, we provide a conclusion with limitations, an outlook on future research, and implications for practice.

2 Literature review

To analyze SSCM and the according resource flows that can occur in interaction between SMEs and their primary and secondary supply chain stakeholders for SOIs, we consulted literature by searching for terms such as SSCM, SME, sustainability, innovation, product development, resources, collaboration, etc. Thereby, we intended to show the linkages of the research, in particular, rather than presenting a complete overview in the sense of a systematic literature review (e.g. Seuring & Müller, 2008; Hoejmose & Adrien-Kirby, 2012; Tate et al., 2012).

Before analyzing SSCM and resource flows (means perspective), we need to first explicate the context of this paper (*Figure 1*), that is, SMEs (actor perspective) that aim for environmentally and socially superior products, processes, and organizational structures (goal perspective).

The prevailing literature reveals that SMEs are faced with a range of disadvantageous characteristics, such as difficulties in attracting venture capital, resource scarcity, or limits in their capacity to monitor technological knowledge (Spence, 1999; Del Brío & Junquera, 2003; Jenkins, 2004; Bos-Brouwers, 2010). But, research also recognizes that SMEs can capitalize on advantageous characteristics, such as less structural inertia, flexibility, or their owner-manager control (Darnall et al., 2010). Furthermore, whereas resource scarcity may restrict SMEs in their innovation behavior, at the same time it may push SMEs to use their resources differently in order to seek competitive advantage (Noci & Verganti, 1999; Darnall et al., 2010), for instance, through SOIs.

Figure 1:   *Model for literature analysis*
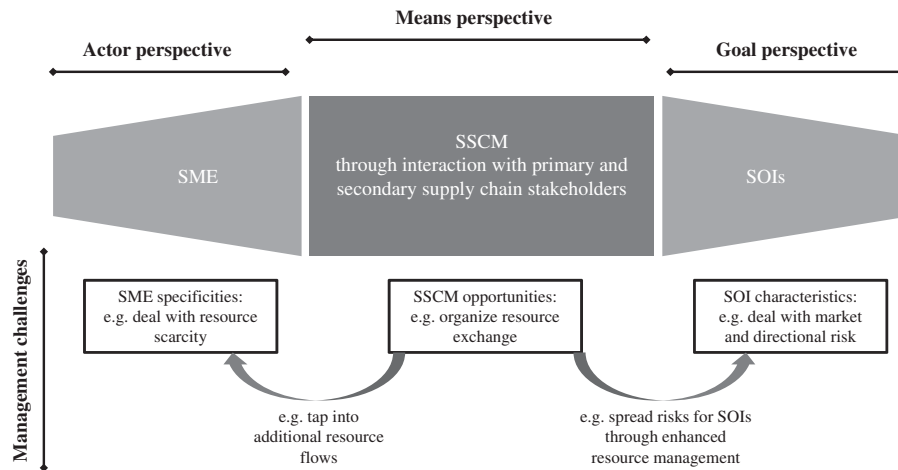
SOIs (see for definitions Fichter & Paech, 2004; Paech, 2005; 2007; Hansen et al., 2009) are products, processes, and organizational structures that incorporate sustainability aspects, i.e. improved economic, environmental, and social outcomes, in their design and can be sold successfully in the market place (e.g. Hansen et al., 2009). Even though SOIs present a range of opportunities, for instance, through product differentiation or unlocking of new markets, they are also attributed with higher risks than conventional innovations, that is, their market and directional risk (e.g. Rennings, 2000; Fichter & Paech, 2004; Paech, 2005; Hansen et al., 2009). To deal with the market (e.g. consideration of price premium in sustainable product as a result of internalizing external costs, e.g. less pollution) and directional risks (e.g. accurate estimation of long term environmental and social effects, consideration of potential rebound effects), SOIs need to be managed deliberately and can be resource intensive (Paech, 2007; Hansen et al., 2009; Hansen & Klewitz, 2012a).

Hence, SOIs of SMEs can be related to specific management challenges (cf. *Figure 1*) because SMEs may be reluctant to allocate its limited resources to SOIs but at the same time are attributed with innovative capacity for SOIs (e.g. Noci & Verganti, 1999; Aragón-Correa et al., 2008; Bos-Brouwers, 2010; Klewitz & Hansen, 2011). Having briefly outlined the management challenges from our actor (SME) and goal perspective (SOIs of SMEs) we now move our focus to the analysis of SSCM.

2.1 Sustainable supply chain management

For several years, SCM has also been discussed with regard to environmental and social issues (e.g. Carter et al., 1998; Seuring & Müller, 2008; Tate et al., 2012; Walker et al., 2012) such as reducing greenhouse gas emissions from transport and avoiding child and forced labor. This indicates that SSCM has reached "a critical tipping point where wide-scale adoption of sustainable sourcing practices may potentially become a dominant dynamic in the supply chain context" (Pagell et al., 2010, p. 58).

Based on a conceptual distinction of SSCM strategies (Seuring & Müller, 2008; Harms et al., 2012) a risk-orientation can be a response to pressures of various company-external stakeholders (e.g. NGOs, local community, and governments; Hall, 2000). Yet, in an SME and B2C context external pressure by NGOs and media might not be the first and foremost reason for implementing SSCM since smaller companies are less socially exposed (Hall, 2000; 2006). Nevertheless, SMEs may be stimulated by customer demands, for instance, to develop environmentally friendly and socially responsible products and services that can be considered as a market opportunity and that can be linked to the second, the opportunity-oriented SSCM strategy. In addition, internal stakeholders may also be drivers for a risk- or opportunity-oriented strategic approach in SSCM (e.g. top management, employees, sustainability manager; Walker et al., 2008).

If an SME develops SOIs and as a focal company implements SSCM various challenges arise from the integration of environmental, social, and economic requirements. Seuring and Müller (2008, p. 1700) imply that SSCM can be rather complex regarding the different requirements across the supply chain when they define it:

> "as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development […]. In sustainable supply chains, environmental and social criteria need to be fulfilled by the members to remain within the supply chain, while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria".

As the definition highlights, on the one hand, resources such as material, information, and capital have to be managed when sustainability issues are integrated in SSCM. On the other, partners along the supply chain as well as other stakeholders and their requirements play a crucial role in implementing SSCM. Regarding interaction with other stakeholders, Pagell and Wu (2009, p. 39) suggest "reconceptualizing the supply chain" meaning that stakeholders which do not form part of the traditional supply chain can help the supply chain members (i.e. focal company, suppliers, customers) to interact. Hence, for SOIs of SMEs it is important that they engage with both their primary and secondary supply chain stakeholders as here essential resource flows occur.

As we argue that a central role of SSCM for SOIs of SMEs lies in making resources accessible through the interaction of primary and secondary supply chain stakeholders, we will next analyze the role of resources.

2.2   Resource-oriented perspective on SSCM

Whereas, the above analysis already points to the importance of resource flows in SSCM, we will now highlight the relevance of resources, first, from a resource-based view (RBV, Wernerfelt, 1984; Barney, 1991) and extend it, second, to the relational view (RV, Dyer & Singh, 1998).

The RBV is appropriate to refer to in this paper as it is one of the main theoretical approaches in SSCM literature (Carter & Easton, 2011). Moreover, it is argued that a broad set of resources and capabilities lead to competitive advantage (Barney, 1991; Sarkis et al., 2011). Lai et al. (2010), for instance, found that knowledge about green issues across the whole supply chain can be understood as a resource itself. The RV, in addition, emphasizes a partner-oriented SCM and enables the investigation of interactions that include the exchange and sharing of resources to gain competitive advantage (Dyer & Singh, 1998; Gold et al., 2010; Paulraj, 2011). These interactions include dyads as well as networks between supply chain partners where resources are exchanged and shared in a unique way (Dyer & Singh, 1998; Chen & Paulraj, 2004; Scholten et al., 2010). With regard to network approaches Chen and Paulraj (2004) incorporate the RV and highlight aspects such as long-term relationships, cross-functional teams, and the integration of suppliers in the development of products. As emphasized by Dyer and Singh (1998) exchanging and sharing, i.e. combing resources, is of great importance.

We build on Barney's (1991, p. 101) understanding when referring to an SME's supply chain and describe resources as those which include all assets, processes, supply chain attributes, etc. combined in a supply chain dyad or network. The main characteristics of a resource-oriented perspective on SSCM can be summarized as follows (Barney, 1991; Carter & Rogers, 2008, Gold et al., 2010; Sarkis et al., 2011):

■ The *goal* is to gain competitive advantage by the possession and use of supply chain-specific resources and capabilities that are valuable, rare, imperfectly imitable, and not strategically substitutable; such as flexibility (e.g. Liao et al., 2010) or in the context of SSCM greening the supply chain (e.g. Gold et al., 2010; Lai et al., 2010).

■ The *problem orientation* focuses on competence development.

■ *Relationships* are established to have access to complementary resources.

■ The *assumption* is that strategic resources are heterogeneous across companies or supply chains and that there is bounded rationality, i.e. a necessity of trust between the interacting partners.

If analyzing SSCM from a resource-oriented perspective, the resources material, capital, and information are predominately discussed (Seuring & Müller, 2008).

Material, in particular, may not only be described as feedstock or a physical (intermediate, finished, or waste) product, but also by its characteristics with regard to its environmental or social impact (e.g. Lee & Billington, 1993). Therefore, aspects such as product recyclability, manufacturing characteristics (e.g. adequate working conditions with reasonable wages), or an improved energy-efficiency are relevant material properties (Lamming & Hampson, 1996; Côté et al., 2008). Nevertheless, the design of innovative products does not just imply to consider new or different types of material, these innovations also need to have a sound financial concept.

Therefore, *capital* is the necessary resource to invest in further development such as new products or advanced infrastructure (Klassen & Vachon, 2003). Capital is also an integrated part of daily business between the SME as a focal company and its primary and secondary supply chain stakeholders, since money represents a value as well as a medium of exchange of offered products and services (e.g. Simmons, 1947). As the assessment of value may differ between distinct organizations, countries, or industries, negotiation about price and value of products are standard practice in SCM and purchasing. In addition, the interaction in (S)SCM is not purely related to material and capital because the exchange of information can also be of value although it is not necessarily charged for.

The management of the resource *information* can be understood as "the creation of purpose-oriented knowledge" (Schaltegger & Burritt, 2000, p. 404). Although there are various definitions of knowledge and of associated concepts (e.g. for a typology of knowledge management, cf. Geisler, 2007) this paper refers to the understanding of knowledge provided in Grant's (1996) knowledge-based view where it is considered an important strategic resource that can lead to competitive advantage (Kogut & Zander, 1992; Grant, 1996; Gold et al., 2010; Harms, 2011).

As the resources material, capital, and information flow through the interaction of supply chain stakeholders the resource-oriented perspective and the RV, in particular, allow us to explore how resources for SOIs are shared and exchanged in a unique way between individual supply chain stakeholders and SMEs.

How and with whom SMEs can interact for resources for SOIs needs to be elaborated further, as is done next.

2.3　Interaction in SSCM for resources

"An interactive process among multiple participants to combine complementary resources" (Hartono & Holsapple, 2004, p. 6) is defined as collaboration. Thus, collaboration can be understood as the interaction of multiple actors that are connected by resource flows. It facilitates companies, for instance, to identify issues needing to be addressed in innovation for sustainability (Van Kleef & Roome, 2007). Moreover, it enables access to new or complementary resources and enhances an SME's problem solving capacity (e.g. Roome, 2001; Lozano, 2007). For instance, if SMEs establish comprehensive stakeholder networks through partnerships with primary and secondary supply chain stakeholders, they can exchange and share information, search for innovation through joint problem identification, seek legitimacy for innovations, or secure and identify future markets (e.g. Van Kleef & Roome, 2007). Hence, for SOIs SMEs are challenged to obtain resources along their supply chains from both primary and secondary supply chain stakeholders. More specifically, the resources have to be combined between the partners.

Figure 2:　　*Relationships in and related to sustainable supply chains*
　　　　　　(according to Cetinkaya, 2011; Harms, 2011, p. 124)
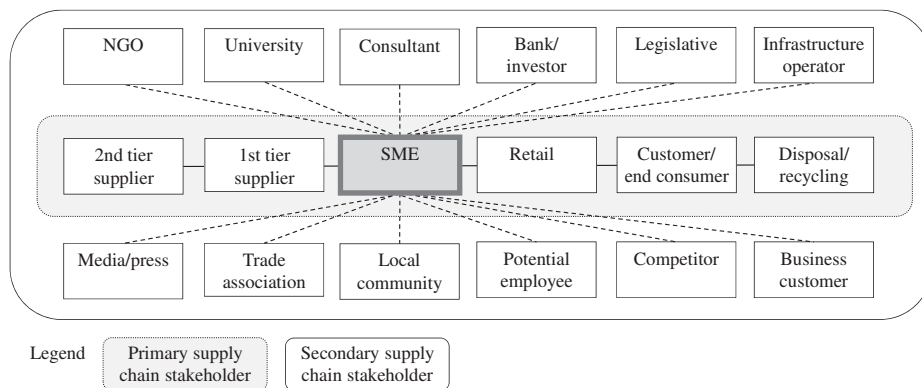
As is visualized in *Figure 2* primary supply chain stakeholders have direct and more formalized relationships to the focal company, whereas secondary supply chain stakeholders are influential without being directly linked to the company's core business (Pagell & Wu, 2009; Cetinkaya, 2011).

To adequately analyze the resource flows that can occur between an SME and its primary and secondary supply chain stakeholders, these stakeholders need to be further distinguished into different types. This we will do based on their relationship to the

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focal company and its supply chain by building on Henrique and Sadorsky (1999, p. 89). Based on this we can differentiate into four types of stakeholders:

- *Organizational stakeholders*: With a tight link to the focal company these stakeholders "have the ability to impact [an organization's] bottom line directly" (Henriques & Sadorsky, 1999, p. 89). Across the supply chain, customers (demand side) and suppliers (supply side) are the stakeholders that directly impact the company's downstream and upstream supply chain processes (e.g. Klassen & Vachon, 2003). Moreover, the company's employees and shareholders are directly linked as they make resources such as knowledge and capital available (e.g. Klassen & Vachon, 2003).

- *Regulatory stakeholders*: They "either set regulations or have the ability to convince governments to set standards" (Hall, 2006, p. 235). Typical regulatory stakeholders are governments, (national and international), the legislative, or standardization organizations (e.g. Carter & Dresner, 2001; Walker et al., 2008). These stakeholders introduce rules, laws, standards, and norms. Moreover, competitors, trade associations or informal networks (e.g. Henriques & Sadorsky, 1999) can influence how the regulations are set and adopted.

- *Community stakeholders*: NGOs, local communities, or advocacy groups are stakeholders "who can mobilize public opinion" (Hall, 2006, p. 236). This leads to both external pressure as well as motivation for the company to seize the opportunity to develop and offer SOIs.

- *Media*: For several years press and media's interest in the companies' sustainability-oriented business, products and services as well as in their supply chain activities has become notable (e.g. Walker et al., 2008). Although, as mentioned above, SMEs are less socially exposed due to their size, a smaller company may overall be stimulated by an increased media interest in sustainability issues in terms of awareness.

Whereas this typology already provides a useful distinction between diverse stakeholders in and related to the sustainable supply chains, we propose to consider an additional type of stakeholder, i.e. *science stakeholders* such as higher education institutions, universities, or research institutes (e.g. Pittaway et al., 2004; Cetinkaya, 2011). If universities, for example, interact more closely with industry (Perkman & Walsh, 2007) universities can turn into key sources of knowledge (e.g. Etzkowitz & Zhou, 2006) and may positively impact the innovative capacity of companies (Bishop et al., 2011).

With this literature analysis we have established our argument that SSCM can contribute to SOIs of SMEs by establishing links between the focal company (here SME) and its primary and secondary supply chain stakeholders to manage the essential resource flows. Thereby, from an SME perspective, SSCM provides an opportunity to first deal with resource scarcity (e.g. capital) inherent within the firm and second to better manage riskier SOIs in a deliberate way (cf. *Figure 1*). We will next elaborate on the re-

source flows between the SMEs and the individual supply chain stakeholders by providing illustrative examples where adequate.

3 Framework of resource flows and stakeholders in SSCM

The interaction between SMEs and its primary and secondary supply chain stakeholders from a resource-oriented perspective can be structured first according to the exchanged *resources* and second with regard to the *primary and secondary supply chain stakeholders* as different interaction partners (*Table 1*). For this purpose, first, we categorize the resources in accordance to the SSCM definition (e.g. Seuring & Müller, 2008) and with reference to a similar approach chosen by Giannakis and Croom (2004): material, capital, information. Second, we classify primary and secondary supply chain stakeholders as possible interaction partners and, here, we differentiate five different types of stakeholders (cf. section 2.3). In the framework we provide illustrative examples for *how* resources can flow between an SME and its supply chain stakeholders for SOIs (e.g. joint R&D between university and SMEs).

Table 1:   *Resource flows in SSCM and primary and secondary supply chain stakeholders*

Supply chain stakeholder / Resource	Primary	Secondary			
	Organizational stakeholder; e.g. supplier, customer, and employee	*Regulatory* stakeholder; e.g. government, competitor	*Community* stakeholder; e.g. NGO, local community	*Media*	*Science* stakeholder; e.g. university, research institute
1) Material	Setting-up a network of reuse processes	Participation in standard-setting processes regarding required material properties	Sharing material with NGOs, e.g. seeds in organic farming	./.	Joint R&D on sustainable materials, e.g. characteristics, sourcing options, product life cycle assessments
2) Capital	Establishment of new/modified capital flows and processes, e.g. leasing instead of buying	Co-opetition when developing innovations and supply chain improvements	Applying for grants for sustainability initiatives with e.g. NGOs	./.	Access to funding through university-government programs
3) Information	Employee involvement to harness internal knowledge on SSCM and SOI by means of e.g. workshops	Information exchange to promote e.g. improved infrastructure or regional development	Monitoring and assessing environmental/social conditions at the sites of the SME's suppliers by e.g. NGOs	Access to information about future trends, current debates on sustainability issues	Exchange of information on SSCM and SOIs based on research and practice

In *Table 1* we distinguish three categories of *resources* (rows) in connection with the *primary and secondary supply chain stakeholders* (columns).

As described in section 2.2 the resource *material* can be described as feedstock or a physical (intermediate, finished, or waste) product as well as by characteristics with regard to its environmental or social impact. Examples for material flows between primary and secondary supply chain stakeholders and SMEs are as follows:

■ *Customers and suppliers* can be one of the key stakeholders for SMEs to develop new products (e.g. Qualey, 2003; Hong & Jeong, 2006) because customers can pressure SMEs to avoid harmful substances in products and in turn SMEs can push customers towards more sustainable consumption with SOIs (e.g. Walker & Preuss, 2008). One form of interaction is boundary spanning teams where the focal company works together with a number of retailers and end consumers as well as suppliers in order to establish a common ground of understanding on market demands and supplier capabilities. Moreover, a focal company, its customers, and suppliers can establish a network of reuse processes for consumer products (Guide et al., 2003; Matos & Hall, 2007), sometimes also termed as closed-loop supply chains (e.g. Guide et al., 2003; Guide & Van Wassenhove, 2009). By exchanging the resource material the interaction partners may become, on the one hand, more dependent on the contributions of others, on the other, they can build up unique relationship that makes their supply chain more competitive (Dyer & Singh, 1998). Furthermore, if a network of reuse processes is established all interaction partners may benefit from a reduction in costs and negative environmental impacts (such as less waste) due to the closed-loop (Guide et al., 2003; Guide & Van Wassenhove, 2009).

■ Interaction with *regulatory stakeholders* such as standardization organizations can be beneficial for an SME when it develops products (McGaughey, 1998) to better monitor environmental and social characteristics of their products along the supply chain. Such interaction may help to lower costs of compliance or even lead to influencing the policy making level (Epstein, 2008, p. 78-80; Gonzalez-Padron & Nason, 2009). Though a single SME may have little power to influence regulatory stakeholders McGaughey (1998) shows that an SME can participate in standard-setting processes while it is developing a new product. Thereby, the SME can attempt to influence the content of the standard. The standard, in turn, may influence the development of the product and the related material properties (e.g. ban of distinct toxic substances) across the entire supply chain. This, however, may prove a time and resource consuming activity.

■ *NGOs* and SMEs can interact, as Farrington and Biggs (1990) show. Here, an SME and an NGO shared material such as different kinds of seeds or equipment as a common resource when they aimed to develop new methods and technologies. Input from NGOs, may also support SMEs in diffusing more radical innovations, as they can act as stakeholders that support the adaption of innovations to the local context (e.g. Van Kleef & Roome, 2007). Nevertheless, interaction with community

stakeholders such as NGOs can be difficult since these types of stakeholders may pursue other, non-economic goals.

■ To supplement its R&D efforts SMEs can interact with *science partners*. This would present an indirect exchange of material, for example the shared use of technologies, access to expertise on material properties and conducting life cycle assessments, or the co-development of prototypes of a product (Matos & Hall, 2007; Bos-Brouwers, 2010). In interaction with universities and research centers, SMEs can strengthen their innovative capacity to become more competitive (e.g. Bishop et al., 2011; Hansen & Klewitz, 2012a). However, SMEs may find it difficult to find access to science partners due to differences in communication, for instance (Hansen et al., 2002).

In SSCM the resource *capital* is necessary to invest in new products or advanced infrastructure (Klassen & Vachon, 2003) and is overall an integrated part of daily business between the focal company and its suppliers as well as customers (i.e. sellers and buyers). Resource flows in terms of capital can occur, for example, between SMEs and these stakeholders:

■ The interaction between *customers* and an SME can lead to fewer costs if material consumption is reduced. Sarkis (2012) shows, by using the example of Xerox, that both the focal company and its customers adopted a leasing approach instead of the sale of copy machines.

■ *Regulatory and community stakeholders* can share costs for SOIs with SMEs. Considering that competitors can also count as secondary supply chain stakeholders (Henriques & Sadorsky, 1999) in terms of capital an SME can gain cost advantage when it engages in co-opetition, i.e. collaborates with a competitor. Thereby, the SME can benefit from a joint investment in an innovation or supply chain improvement. Supplier development in terms of training on environmental and social issues is an example where an SME may benefit from a joint investment (Gnyawali & Park, 2009; Harms et al., 2011). From a resource-oriented view co-opetition appears as a reasonable alternative for SMEs because their competitors are likely to possess relevant resources as their markets are similar and SME and competitor can develop innovations together which strengthens their market position (Gnyawali & Park, 2009). Another form of capital transfer along the supply chain occurs in collaboration with community stakeholders such as NGOs. When an SME and an NGO jointly develop a product both partners can raise capital by applying for grants that aim at fostering such interaction.

■ *Science stakeholders* and SMEs can apply for research funding, for example, to develop a new sustainable product portfolio in an SME. Thereby, an SME can counterbalance its shortage of resources and the science stakeholders have access to real-life business problems in order to pursue rigorous and relevant research. For this purpose financial funding may need to come from a third party, e.g. governmental funding programs (Hansen & Klewitz, 2012a).

The resource *information* flows between SMEs and its stakeholders to stimulate the combination of expertise and exchange of ideas. For information sharing and exchange SMEs can interact with stakeholders as follows:

■ *Suppliers, customers,* and *employees* who are all primary supply chain stakeholders, can provide the resource knowledge essential for innovation (Kogut & Zander, 1992; Grant, 1996). If, for instance, an employee has acquired experiences with sustainability issues such as carrying out an eco-audit, this knowledge residing within the individual employee can be transferred through knowledge management processes or through the common informal communication channels typical in SMEs (e.g. Bos-Brouwers, 2010; Harms, 2011). Moreover, in a study on environmental performance in SMEs, Lefebvre et al. (2003), for example, found that learning for sustainability occurs along the supply chain with an SME's sustainability activity linked to the processes of its suppliers and customers. However, such interaction can also be difficult as the SME may not have the financial resources or power (e.g. Hardy & Phillips, 1998) to initiate and push the whole innovation process.

■ *Regulatory stakeholders* can establish or influence the setting of regulations (Henriques & Sadorsky, 1999; Hall, 2006). Interaction with the local government and authorities, for instance, can lead to knowledge transfer about environmental and social challenges between the SME and public bodies (e.g. Hansen & Klewitz, 2012a). One example is a public-private partnership that aims at waste reduction or the introduction of eco-innovations in SMEs to contribute to the sustainable development of the overall region (Hansen & Klewitz, 2012b). Furthermore, governments can promote sustainable procurement when sourcing from local SMEs (e.g. Walker & Preuss, 2008) which can lead to trickle down effects in the purchasing practice of SMEs.

■ SMEs and c*ommunity stakeholders* such as NGOs can interact to share current information on, for instance, specific local environmental developments (e.g. initiatives for renewable energies). Additionally, NGOs can monitor locally an SME's suppliers and thereby provide it with first-hand information about existing conditions (e.g. Ciliberti et al., 2008).

■ *Media* and SMEs can exchange information on current sustainability trends and existing business practice. However, as SMEs are less socially exposed compared to larger companies (Hall, 2000; 2006) media may be of marginal relevance. Yet, on a regional level media might be able to draw attention to an SME's business and influence positively or negatively the society's perception (Hall, 2006).

■ *Science partners* and SMEs can interact in, for example, workshops, research partnerships, or employee development programs whereby science partners can turn into key sources of knowledge (Etzkowitz & Zhou, 2006; Hansen & Klewitz, 2012a).

By outlining in our framework how resource flows can occur between SMEs and its primary and secondary supply chain stakeholders within SSCM for SOIs we can contribute to the reconceptualization of sustainable supply chains. This we will discuss next by putting forward theoretical propositions.

4 Discussion

Essentially, we view SSCM as an opportunity for SOIs and argue that the corresponding combination of resources that are "more valuable, rare, and difficult to imitate than they had been before they were combined" (Dyer & Singh, 1998, p. 667) is a means by which SMEs can gain competitive advantage (Sharma & Henriques, 2005; Pagell & Wu, 2009).

Based on this understanding and our conducted analysis we develop three theoretical propositions. Our discussion builds on the suggested matrix (cf. *Table 1*) and aims to further develop the two dimensions, namely, the resource dimension (P1) and the supply chain stakeholder dimension (P2). Furthermore, innovation in an SME's supply chain context is discussed from which a third (P3) proposition is deduced.

Resources exchanged within sustainable supply chains

In this paper, so far, the SME's management of sustainable supply chains has mainly been discussed with regard to the resources material, capital, and information that traditionally form part of (S)SCM literature. Through analyzing these resources with regard to interaction with different supply chain stakeholders we were able to demonstrate that most of the resources are relevant in the context of an SME's supply chain. However, literature on environmental and social issues also discusses other resources, such as natural resources and energy (e.g. Schaltegger, 2002) as well as "personnel-based resources (e.g. organizational commitment and learning)" (Blanco et al., 2009, p. 478). Incorporating these may facilitate SSCM practices for SOIs as a common ground of understanding and commitment for environmental and social initiatives is more easily reached between the partners. If such a personnel-based resource is unique it can contribute to an SME's competitive advantage. Moreover, flexibility attributed to SME supply chains for SOIs can also be considered as a resource (e.g. Liao et al., 2010) when considering that the function of purchasing and logistics as well as boundary spanning become of strategic relevance (e.g. Reuter et al., 2010). Here, we argue that flexibility can also be 'transferred' between the supply chain partners so that the whole supply chain becomes more competitive. In sum, we suggest the first proposition:

> P1: To innovate for sustainability through SSCM, SMEs may need to incorporate resources beyond material, capital, and information to adequately address environmental, social, and economic challenges.

Primary and secondary supply chain stakeholders

SSCM requires SMEs to integrate environmental and social issues such as energy-efficient production processes and sound labor conditions at supplier factories into their supply chain (e.g. Seuring & Müller, 2008). Here, interaction with primary as well as secondary supply chain stakeholders is one engagement strategy. This is also reflected in research on open innovation (e.g. Chesbrough, 2006; Fichter, 2009) where a multitude of stakeholders is considered important. The idea of open innovation refers to "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006, p. 1).

As sustainability issues are considered to be interconnected and often complex (Roome, 2001; Schaltegger, 2011) using an interactive approach to innovation for sustainability can be beneficial (Clarke & Roome, 1999; Roome, 2001; Van Kleef & Roome, 2007). Traditional SCM, however, refers above all to interaction with suppliers and customers (or within a larger company to internal collaboration with other departments; e.g. Harland, 1996). Hence, for SOIs the analysis of secondary supply chain stakeholders is important, because thereby SMEs can access traditional and non-traditional resources from a diverse range of stakeholders and can overall incorporate the perspective of non-traditional supply chain partners (e.g. universities, NGOs; Pagell & Wu, 2009; Cetinkaya, 2011).

If an SME interacts with its primary and secondary stakeholders it might be beneficial to first establish common goals (e.g. Hardy & Phillip, 1998; Lozano, 2007) and approaches on where the interaction should lead to. It is also reasonable to define the commitment of the individual partners, for instance, in terms of time and personnel. This may help to avoid genuine conflicts (referring to structures and interests) which can lead to a lock-in situation in the innovation process. Furthermore, co-opetition might be of high value for an SME as interaction with competitors enables access to resources that are similar to the SME market (Gnyawali & Park, 2009). Such similarities, on the other hand, bear the risk that structures are imitated by the interaction partner without explicit permission. As a consequence, it is recommendable to arrange contracts that allow the partners to protect their intellectual property.

In sum, we argue that interaction with primary and secondary supply chain stakeholders holds the potential for SMEs to gain competitive advantage by building sustainable supply chains for SOIs. As a consequence, the following proposition is derived:

> P2: If SMEs incorporate both their primary and secondary supply chain stakeholders in their interaction approach, they may engage more easily in resource intensive and riskier SOIs.

Sustainability-oriented innovation and supply chain innovation

If partners across an SME's sustainable supply chain innovate jointly for SOIs, the innovation is not just limited to a single product, but can reach across the entire supply chain so that closed-loop supply chains can be approached. For instance, recycling networks can be created or reuse processes can be build up. Additionally, a focal company can interact with its supplier by jointly using the same information technology (IT) such as an internet tool that enables every supply chain member to have access to current data (e.g. Arlbjørn et al., 2011) – as for example, on environmental impacts such as CO_2 emissions or water consumption along the supply chain. Such a shared IT tool may help a smaller company, in particular, as they may lack the initial technologies to obtain such specific data. In the long term the shared use of technologies (e.g. planning and modeling tools, databases) may lead to a more effective use of the tools and learning effects across the entire supply chain. Such changes within supply chains that aim to increase new value creation for stakeholders are referred to as supply chain innovations (Franks, 2000; Hall, 2000; 2006; Arlbjørn et al., 2011).

Innovations along the supply chain which incorporate sustainability makes supply chain challenges more complex as the environmental and social dimension need to be considered beside the traditional economic aspects (Ciliberti et al., 2008). To tackle these challenges an SME may benefit from the interaction also with secondary supply chain stakeholders that at first glance have less in common with the focal company. If an SME interacts with a university, for instance, both partners can benefit from this interaction as they have different points of view and playing fields. With regard to SSCM and SOIs, on the one hand, an SME may benefit from the university's knowledge and the scientific approaches currently used. A university might provide knowledge on life cycle assessments, for instance, which help to assess environmental and social impacts of a product in the design phase of an SOI while taking into account the different stages of the supply chain (Viere et al., 2011). On the other hand, the university may also benefit from the interaction with the SME as they can be partners in a research project where the university obtains useful insights into business practice. Even though the interaction between more distant partners can be challenging, for instance, in terms of levelling knowledge disparities, differences in communication styles etc. such interaction may lead to more radical innovations and initiate learning along supply chains. From this we propose:

> P3: If SME supply chains are able to integrate different stakeholder requirements into core business and at the same create value for primary and secondary supply chain stakeholders SOIs and supply chain innovation are facilitated. For this purpose multiple stakeholder interaction (P2) which allow for traditional and non-traditional resource flows (P1) can be important.

5 Concluding remarks

Based on our literature study the interaction with diverse primary and secondary supply chain stakeholders is one strategy for SME supply chains to access relevant resources for SOIs. Interaction presents an opportunity to go beyond traditional ways of developing products, services, and processes. From a resource-oriented perspective, SME supply chains can hereby exchange and share complementary resources, let knowledge permeate organizational boundaries to overall nurse their innovative capacity, and develop new capabilities. Of course, this positive view on interaction with supply chain stakeholders may be also associated with risks and costs, if, for instance, power is unequally distributed. Overall, SMEs are challenged to design strategies for interaction with primary and secondary supply chain stakeholders that enable SOIs and secure a balance of benefits and costs.

5.1 Limitations and future research

As the present research builds foremost on a literature analysis, empirical studies are necessary. Such studies could challenge the suggested framework and the developed propositions with real-life data, for instance, by building a cross-case analysis. Here, SMEs that have failed or have successfully interacted with diverse stakeholders to innovate for sustainability would present valuable polar types for a cross-case analysis. Also by underpinning our framework with the RBV and RV less attention is given to individual SME supply chain characteristics with regard to sustainability strategy, power, history, or industry. As a consequence, a link to the resource dependence theory (e.g. Pfeffer & Salancik, 1978; Carter & Rogers, 2008) could further expose the employment of resources with regard to power imbalances. With the classification of resources as well as primary and secondary supply chain stakeholders based on the reviewed literature, not all resources relevant for SOIs, e.g. shared vision or trust (Peters, 2010), were included in the framework.

Further research is necessary of current SMEs' sustainable supply chain practices. Besides survey based data, in-depth case studies that analyze various resource flows of sustainability-oriented companies (e.g. ecopreneurs or sustainable entrepreneurs; Schaltegger & Wagner, 2008) across diverse industries could greatly develop the understanding of barriers and opportunities encountered. Also the role of micro and smaller companies for developing sustainable supply chains is a promising avenue for future research.

5.2 Implications for practice

For practitioners a thorough analysis of primary and secondary supply chain stakeholders, i.e. potential interaction partners, could aid SME managers to design interac-

tion strategies and to identify the most relevant stakeholders. For instance, the development of an 'interaction-roadmap' for SOIs would be useful tool. Such a roadmap could be used to assess the interaction with (possible future) supply chain stakeholders by gathering relevant information categorized into resources that an SME needs for SOIs, expected cost and benefits as well as possible performance measures. By using such a roadmap, an SME can gain a structured overview of with whom and how it can interact with its primary and secondary supply chain stakeholders for SOIs. Moreover, such a roadmap may include alternative measures or the time dimension to analyze when which resources are needed.

When an SME and its supply chain stakeholders and in particular non-business stakeholders such as NGOs, universities, or local community work together it may be beneficial to incorporate a temporary exchange of personnel as one possible form of interaction. This may promote, for instance, a member of an NGO to get a more comprehensive understanding on sustainability challenges across the SMEs supply chain which helps that the SME and NGO explore ideas how to develop SSCM practice. Additionally, research on learning-action networks (e.g. Clarke & Roome, 1999; Roome, 2001) provide an example for innovative forms of interaction where multiple actors interact via the flow of knowledge, information, and ideas that go beyond and complement organizational learning and innovation (Clarke & Roome, 1999).

As the management of interaction requires time and financial commitment by all partners involved, it is reasonable to agree on contracts or terms of how the collaboration is coordinated. Moreover, an open and regular communication seems inevitable so that the interaction partners can develop a collective understanding, define common goals, and pursue strategies which are suitable for, preferably, all partners.

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