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# A three-dimensional framework for multi-tier sustainable supply chain management

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## Abstract

**Purpose** – This study aims to investigate the under-researched role of the sub-supplier's direct environment in achieving compliance with multi-tier sustainable supply chain management (MT-SSCM) objectives.

**Design/methodology/approach** – Building on conceptual research, this study aims to generalize the characteristics of multi-tier supply chains in light of institutional theory and supply chain (SC) uncertainty to enhance the understanding of their complex interrelationship.

**Findings** – A three-dimensional framework is built around the supply and demand uncertainty as well as the pressures for sustainability exerted by the supplier's direct environment to propose ideal constellations for the application of MT-SSCM. Moreover, research directions and implications for the alteration of suboptimal constellations are developed.

**Practical implications** – Incorporating the supplier's environment in the choice of MT-SSCM practices couples the sustainability priorities of the focal firm and the supplier. This enables a more complete picture of the sustainability objectives and sustainable development aims of the SC partners.

**Originality/value** – On the basis of institutional theory, the study extends current MT-SSCM concepts by including the supplier's direct environment in the choice of ideal management practices in a particular SC setup. It provides a definition of a multi-tier SC as an institutional field and a number of research implications regarding MT-SSCM as well as generic SSCM. Moreover, the proposed framework helps SC managers to understand the complex interplay of the SC partners' sustainability aims and provides implications for choosing the most suitable MT-SSCM practices.

**Keywords** Sustainability, Institutional distance, Global supply chain, Environmental uncertainty, Multi-tier supply-chain management, Lower-tier supplier management

**Paper type** Conceptual paper

## 1. Introduction

Achieving supplier compliance in supply chain management (SCM) is highly challenging owing to the complex interplay of the supply chain (SC) environment and the management practices employed within it. In SCs, firms cooperate to reduce environmental uncertainty, i.e. supply, demand and technology uncertainty, via mutual cooperation (Chen and Paulraj, 2004). Still, uncertainty is rarely used as a variable in generic as well as sustainable SCM (SSCM) studies (Yawar and Kauppi, 2018), although the reputational damage for focal firms (FFs) following supplier misconduct is a major driver for SSCM (Hartmann and Moeller, 2014; Wilhelm *et al.*, 2016b). Regarding sub-supplier compliance, two characteristics of multi-tiered SCs make it particularly challenging for achieving triple-bottom-line (TBL) sustainability, i.e. achieving a minimum of social, economic and ecological performance (Elkington, 1997). First, major sustainability impacts often occur at the raw materials stage of the SC (Mena *et al.*, 2013). Second, these SC tiers are difficult to manage, as the influence of the FF decreases with rising distance in the SC (Carter *et al.*,

2015; Tachizawa and Wong, 2014) and diverging institutions in the SC (Busse *et al.*, 2016; Wilhelm *et al.*, 2016b).

Multi-tier SSCM (MT-SSCM) recently started to address these challenges and investigated possible practices for achieving sub-supplier compliance with the FF's sustainability aims, i.e. successful SSCM (Grimm *et al.*, 2014; Mena *et al.*, 2013). MT-SSCM explicitly widened the unit of analysis to "any lower tier" (Tachizawa and Wong, 2014, p. 651), which raises new challenges in the evaluation of SSCM practices, as distant SC partners are increasingly heterogeneous. The currently dominating focus on rationality in SCM as well as SSCM is, thus, increasingly challenged in favor of a more complex evaluation of the interplay of social and rational arguments (Autry *et al.*, 2014; Busse *et al.*, 2016; Kauppi, 2013).

A well-recognized theoretical lens in strategic management and SCM research for evaluating compliance with external requirements, such as SC sustainability aims, is institutional theory (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Sarkis *et al.*, 2011; Touboulis and Walker, 2015). It draws on isomorphism, i.e. the convergence of firm characteristics owing to pressures from its environment to gain legitimacy. Legitimacy is essential for an organization's survival and represents a status

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in which the organization's operations are seen as "valid, reasonable and rational" (Deephhouse, 1996, p. 1025). The theory's applicability to SCM and SSCM research has mainly been analyzed at the intraorganizational or dyadic level (Kauppi, 2013; Yawar and Kauppi, 2018). However, the uncertainty induced by the high cultural, processual and managerial distances in multi-tier SCs weakens the influence of the FF (Carter *et al.*, 2015; Tachizawa and Wong, 2014) and, thus, the isomorphic processes in the chain. Owing to this lack of SC influence, suppliers are more likely to adopt practices or structures that are required by the direct environment in which they are embedded (Wilhelm *et al.*, 2016b). Surprisingly, the direct environment of a supplier, i.e. the local community, competitors, regulators, etc., and the resulting institutional pressures on the supplier have largely been bypassed so far in SCM research (Busse *et al.*, 2016; Kauppi, 2013; Miemczyk *et al.*, 2012; Rebs *et al.*, 2017). This paper, thus, incorporates the supplier's direct environment, as well as the FF, as sources of institutional pressures for sustainability, which can either compete with or support each other in the quest for supplier compliance with their institutions. In effect, the research questions investigated in this study are the following:

- RQ1. What is the role of the supplier's direct environment in supplier compliance with SC sustainability aims?
- RQ2. How can FFs capture the resulting environmental uncertainties in a specific FF–sub-supplier relationship and adopt their MT-SSCM practices accordingly?

As suggested by Touboulic and Walker (2015) and Kauppi (2013), this study aims to strengthen the theoretical base of institutional theory's application to SCM and SSCM. It adopts a MT-SSCM focus, as the specific characteristics of multi-tier SCs as well as the challenges in achieving TBL sustainability require the alteration of current research approaches, which have mainly been derived from dyadic SCM research (Choi and Liker, 2002; Kembro *et al.*, 2017). Nevertheless, a number of paragraphs relate to both SCM and SSCM. In these instances, the individual abbreviations are incorporated into (S)SCM to underline their suitability for both. The same applies with regard to the multi-tier focus of the study, thus leading to the use of the terms (sub-)supplier and (MT-)SSCM, which imply that the contents of the paragraph are inspired by a multi-tier context and yield insights relevant to dyadic SCs.

In light of these complexities, the research questions are addressed by means of conceptual reasoning to enhance the understanding of the complex relations that have just been outlined (Meredith, 1993). Therefore, a process of disciplined imagination is performed, as proposed by Weick (1995). This aims to generalize the characteristics of the researched phenomenon and combine them with arguments from different fields to explain and predict the observed outcomes.

Conceptual research has contributed substantially to theory development in (S)SCM and the generation of research propositions (Beske and Seuring, 2014; Busse *et al.*, 2016; Carter and Rogers, 2008; Carter *et al.*, 2015; Tate *et al.*, 2011).

Adopting the typical structure of conceptual papers, (MT-)SSCM, SC uncertainty and institutional theory are first introduced in Section 2 as the basic theoretical building blocks

of this research. These are then integrated in Section 3 to conceptualize a specific FF–sub-supplier relationship and the role of uncertainty in adopting suitable MT-SSCM practices in this relationship. The section closes with the development of a framework for understanding the issue and related adaptation scenarios. In Section 4, the study's contributions are outlined and discussed, and research directions are given. Finally, a brief conclusion sums up the study in Section 5.

## 2. Literature review

### 2.1 Multi-tier sustainable supply chain management and supply chain uncertainty

The SSCM definition by Seuring and Müller (2008) implicitly adopts institutional pressures by stakeholders and customers to achieve sustainability. It defines SSCM as:

The management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements. 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 (Seuring and Müller, 2008, p. 1700).

In effect, SSCM is driven by the expectations of customers and stakeholders (see also Glover *et al.*, 2014; Rebs *et al.*, 2017), including their reactions to the violation of the expectations by any SC member according to the so-called chain liability effect (Hartmann and Moeller, 2014). This effect of stakeholder pressure on the FF in response to supplier misconduct applies independently of the FF's knowledge about a supplier or its influence on the supplier. Thus, FFs define sustainability requirements and try to ensure their implementation in the SC (Hartmann and Moeller, 2014; Schaltegger and Burritt, 2014; Wilhelm *et al.*, 2016b).

This development toward more interorganizational scrutiny for sustainability has been documented in a number of industries and contexts, in which SSCM has recently gained traction. These industries range from the food sector (Beske *et al.*, 2014; Grimm *et al.*, 2014; Mena *et al.*, 2013) and the extractive industries (Hofmann *et al.*, 2018; Sauer and Seuring, 2017, 2018; Silvestre, 2015) to electronic and high-tech products (Brix-Asala *et al.*, 2018; Cucchiella *et al.*, 2014) and retailing (Petljak *et al.*, 2018). Moreover, SSCM is moving from a focus on industrial contexts toward investigating developing and emerging countries (Jia *et al.*, 2018; Khalid *et al.*, 2015; Petljak *et al.*, 2018; Yawar and Kauppi, 2018).

The extension of SSCM toward "multi-tier SSCM" implies the investigation of firm relations beyond a dyadic relationship and moves the focus to sub- or lower-tier suppliers (Mena *et al.*, 2013; Tachizawa and Wong, 2014). Although the SC has long been conceptualized as multi-tiered (Miemczyk *et al.*, 2012; Seuring and Müller, 2008), (S)SCM research has mainly been limited to the buyer–supplier dyad (Choi and Wu, 2009; Miemczyk *et al.*, 2012; Soosay and Hyland, 2015). Another limitation of SSCM research has been the focus on environmental sustainability, which is easier to measure than the social dimension (Ashby *et al.*, 2012; Miemczyk *et al.*, 2012; Wilhelm *et al.*, 2016a). However, the universal claim of lacking investigations into social sustainability can now be rejected, as the social domain

is currently attracting major attention in the community (Nakamba *et al.*, 2017; Quarshie *et al.*, 2016; Yawar and Seuring, 2017). However, there is still a lack of research on social sustainability at the multi-tier level in SCs (Nakamba *et al.*, 2017). Consequently, recent MT-SSCM research is extending the boundaries of the investigation toward all three dimensions of sustainability, as well as further up the SC, to cover the full complexity of the interrelations of SC partners in a sustainable SC (Grimm *et al.*, 2016; Hofmann *et al.*, 2018; Tachizawa and Wong, 2014). This comprehensive coverage of sustainability dimensions is even more relevant in MT-SSCM, as social misconduct remains largely invisible in the chain, which makes it a major supply and reputational risk (Wilhelm *et al.*, 2016a, 2016b).

MT-SSCM practices were first formulated by Mena *et al.* (2013), who defined open (there is no direct interaction between FF and sub-supplier), transitional (FF and sub-supplier begin building a link) and closed (FF and sub-supplier have a formal relationship) multi-tier SC structures. These structures were refined and extended by Tachizawa and Wong (2014) into four MT-SSCM practices, which can overlap and may be used complementarily. First, they defined the “direct” approach, including bilateral actions among FF and supplier, such as training, direct sourcing and monitoring. Second, the “indirect” approach covers the training of first-tier suppliers to enable them to monitor lower-tier suppliers against criteria provided by the FF (Tachizawa and Wong, 2014). It can be seen as a mid-range solution, which outsources the managerial effort for developing and sustaining the sustainability performance of sub-suppliers to the tier-1 supplier. Third, they defined “work with third parties”. In the cases in which neither the FF nor the tier-1 suppliers are able to pressure, train or monitor the lower-tier suppliers, the SC needs to buy in external knowledge from nongovernmental organizations (NGOs), certification bodies or industry associations. Grimm *et al.* (2014) add to this argument by identifying the involvement of business partners and their knowledge as an important factor in MT-SSCM. Finally, the “don’t bother” approach means deliberately bypassing the active management of a sub-supplier and relying on tier-1 suppliers or pressures outside the SC (Tachizawa and Wong, 2014). This approach is either redundant with the indirect one or implies that the FF has “no information about lower-tier suppliers” (Tachizawa and Wong, 2014, p. 652). This is in contrast with this study’s focus on a specific FF–sub-supplier relationship and will, thus, not be discussed further.

Recently, Sauer and Seuring (2018) added the “cascaded” approach to the MT-SSCM debate. This approach essentially combines two or more multi-tier SCs into a cascade of SC segments, i.e. multiple buyer–supplier–sub-supplier relationships. In this cascade, each SC segment drives those sustainability challenges that it can best address. For managing the suppliers and sub-suppliers, the MT-SSCM approaches by Tachizawa and Wong (2014) are applied. “At the same time, the focal firms of each SC segment coordinate the mutual SC goals and the overarching strategy” (Sauer and Seuring, 2018, p. 10). For clarity, the MT-SSCM practices are written in italics in the remainder of the paper, as they are central to the further reasoning.

Uncertainty is a major concern in SCs as it can result from supply- or demand-side processes, as well as the stakeholders of a company (Kauppi, 2013; Silvestre, 2015; Yawar and Kauppi, 2018). van der Vorst and Beulens (2002, p. 413) define SC uncertainty as referring to the following:

Decision making situations in the supply chain in which the decision maker does not know definitely what to decide as he is indistinct about the objectives; lacks information about (or understanding of) the supply chain or its environment; lacks information processing capacities; is unable to accurately predict the impact of possible control actions on supply chain behavior; or, lacks effective control actions (noncontrollability).

This definition reveals the SC’s environment, as well as intra- and interorganizational struggles, as drivers of uncertainty. Chen and Paulraj (2004) use the term “environmental uncertainty”, i.e. supply uncertainty (supplier does not meet requirements), demand uncertainty (volume and quality requirements change) and technology uncertainty (high technology change rate), which can be mitigated by managing the relationships between buyers, suppliers and stakeholders (Seuring and Müller, 2008). This tripartite concept has been further detailed by Simangunsong *et al.* (2012), who have compiled a list of 14 sources of SC uncertainty encompassing demand uncertainty (end-customer demand and demand amplification), as well as supply uncertainty (supplier, parallel interaction, order forecast horizon, chain configuration, infrastructure and facilities). Moreover, they define 10 “reducing strategies”, as well as 11 “coping with uncertainty strategies” (Simangunsong *et al.*, 2012, p. 4495). Both groups of reducing and coping strategies have a strong technical and performance focus, while only the “collaboration” strategies in both groups explicitly cover an interaction with SC partners to integrate processes, decisions and meaning systems (Simangunsong *et al.*, 2012).

While SC uncertainty variables are widely used in SCM and operations management research, these are mostly combined with contingency theory and are limited to the investigation of SC or manufacturing system performance (Simangunsong *et al.*, 2012, 2016). Contrastingly, SC uncertainty is currently underdeveloped in SSCM studies using institutional theory, although it is one of the theory’s core constructs (Kauppi, 2013; Yawar and Kauppi, 2018).

Still, the uncertainty coming from all the actors in a company’s environment drives the adoption of different objectives, i.e. institutions, which give the single company’s action meaning and stability (Scott, 1999). This argument is key to both institutional theory and (S)SCM (Kauppi, 2013) as both rely on the reduction of uncertainty via the adoption of common aims or meaning systems. In (MT-)SSCM, these aims and meaning systems are an orientation to SCM and the TBL, which are both crucial for establishing a successful sustainable SC (Beske and Seuring, 2014; Seuring and Müller, 2008; Pagell and Wu, 2009), i.e. the very aim of this research.

Upon looking again at the definition of SC uncertainty, its complex nature becomes clear. SC uncertainty stems from technical issues, such as gathering and processing information (Kembro and Selviaridis, 2015), as well as investment issues, such as uncertainty regarding future prices and resource



availability (Cucchiella *et al.*, 2014; Fan and Stevenson, 2018; Sauer and Seuring, 2017). But it also stems from social issues, such as defining objectives, building relationships (social ties) and deciding whether to trust partners (Fan and Stevenson, 2018; Kembro *et al.*, 2017; van der Vorst and Beulens, 2002). Both technical and social issues are further complicated by rising SC complexity, which is natural for multi-tier SC (Choi and Liker, 2002; Mena *et al.*, 2013; Tachizawa and Wong, 2014). In effect, the field of (S)SCM needs to integrate “social and economic theories [...] to understand the modern supply chains that are engineered to optimize efficient and effective economic outcomes, but are managed and executed by people” (Autry *et al.*, 2014, p. 63). Institutional theory is one of the main theories used to investigate the struggle of organizations between efficiency-oriented and legitimate practices and structures (Meyer and Rowan, 1977) and has gained traction in SSCM (Touboulic and Walker, 2015). It is, thus, used in this study and is introduced in the next section.

## 2.2 Institutional theory

Institutions represent “cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour” (Scott, 1999, p. 33). In effect, institutional theory draws on isomorphism, i.e. the convergence of firm characteristics within an institutional field, as a response to uncertainty regarding an organization’s strategies or processes (Deephouse, 1996; DiMaggio and Powell, 1983). The aim of such isomorphism is ultimately to gain legitimacy, which “is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (Suchman, 1995, p. 574). DiMaggio and Powell (1983) define three pressures that drive isomorphic change:

- 1 coercive pressure by actors upon which a firm relies, i.e. regulators and customers;
- 2 mimetic pressure, which drives firms to adopt the characteristics of nearby or related organizations that seem more successful and legitimate; and
- 3 normative pressure from industry associations, communities or civil society, stemming from professionalization.

Institutional pressures can be used to explain the actions in a SC and need to be understood in regard to each of the individual actors in a SC, if a successful (S)SCM is to be implemented (Choi and Liker, 2002; Sarkis *et al.*, 2011). The SC and its governance mechanisms represent a coercive pressure by implementing integrated structures and practices among actors, which are dependent on the SC as its customer (Glover *et al.*, 2014; Kauppi, 2013; Tate *et al.*, 2011).

The institutional field represents the unit of analysis, in which the isomorphic pressures and processes work (DiMaggio and Powell, 1983). The definition and conception of the institutional field have recently been debated and criticized as oversimplified (Wooten and Hoffman, 2013). Many SCM studies either lack a sound definition of the investigated field or simply claim to analyze the SC as the institutional field without defining it (Wu and Jia, 2018). In such cases, the definition by DiMaggio and Powell (1983), which sees the institutional field as a given set of buyers, suppliers and related stakeholders, is mostly referred to. This may hold true in dyadic SCs, but the

concept of the SC as an institutional field needs to be altered as the relationships between the SC partners are central to the formation of an institutional field (Wooten and Hoffman, 2013), as well as to the success of (S)SCM (Seuring and Müller, 2008). This is especially relevant in the case of multi-tier SCs or multinational enterprises that face “multiple, fragmented, nested, or often conflicting institutional environments” (Kostova *et al.*, 2008, p. 998) and for which the current definitions of institutional fields are, thus, unsuitable (Kostova *et al.*, 2008; Wu and Jia, 2018). Recently, Wu and Jia (2018) addressed the conceptual vacuum regarding the SC as an institutional field and called for more institutional research at the industry and SC level. However, single fields are nested in countless other fields (Fligstein and McAdam, 2011), and an SC and its parts can be subject to institutional pressure from adjacent fields (Wu and Jia, 2018). To avoid this complication, Wu and Jia (2018) provided a first definition of the SC as an institutional field, which is, however, limited to “individual MNE subsidiaries in a single host country” (Wu and Jia, 2018, p. 3). As the study at hand aims to cover country-spanning multi-tier SCs, it generalizes the characteristics of such a SC in the following section and develops a novel definition of a multi-tier SC as an institutional field that is based on these characteristics (see Section 3.5). It follows the criticism that has just been mentioned and adopts a more nuanced definition of an institutional field as a “relational space” in which “organizations relate to or involve themselves with each other” (Wooten and Hoffman, 2013, p. 138). In effect, the field comes into existence when actors start to “take note of each other and [...] referenc[e] each other” (Wooten and Hoffman, 2013, p. 138). Within the field, organizations share a common meaning system and interact more often and more fatefully than with actors outside the field (Scott, 1999).

This common meaning system and fateful interaction is essential to gaining legitimacy (Suchman, 1995), as well as implementing (S)SCM where it is already synonymously used as “guiding” or “guardrail value” (Pagell and Wu, 2009, p. 48) and “strategic values” or “orientation” (Beske and Seuring, 2014, p. 324). Furthermore, the common meaning system contrasts arguments that see SCM as an almost technical, rationality- and efficiency-focused discipline (Kauppi, 2013). This interplay of social and rational factors is highly relevant for MT-SSCM (Autry *et al.*, 2014), as well as SC risk management (Busse *et al.*, 2016; Fan and Stevenson, 2018). Moreover, it supports the definition of the institutional field as a relational space. The main challenge in this context is that the number of tiers between the FF and the managed supplier affects the creation of such a relational space (Carter *et al.*, 2015; Kostova *et al.*, 2008).

If an organization faces conflicting pressures from its environment, such as pressures to become more sustainable from one source and pressures to become more cost-effective from another source (Adebanjo *et al.*, 2013), or faces highly turbulent and ambiguous pressures, i.e. so-called institutional voids (Silvestre, 2015; Wu and Jia, 2018), it can accommodate the requirements of both sources or decouple (Meyer and Rowan, 1977; Simpson *et al.*, 2012). In the latter option, a pressured supplier makes only cosmetic changes. It can then acquire the legitimacy related to the adoption of requirements while failing to

implement the necessary technical or processual changes (Adebanjo *et al.*, 2013; Meyer and Rowan, 1977; Simpson *et al.*, 2012). The institutional pressures on a company have also been found to limit its options for choosing processes or structures and, in effect, limit its opportunities to achieve operational excellence and, thus, a competitive advantage (Glover *et al.*, 2014). This effect is even worsened if a company is pressured by multiple relational spaces in which different meaning systems are evident (Fligstein and McAdam, 2011; Kostova *et al.*, 2008). If the pressured company aims to comply with both relational spaces, it can only choose from practices and structures that are legitimate in both spaces or decouple from one of them. This phenomenon of competing institutional pressures has been captured in strategic management under the concept of institutional distance (Kostova and Zaheer, 1999), which is further broken down into institution difference and institutional uncertainty (Phillips *et al.*, 2009). In an SCM context, institutional difference has been defined by Busse *et al.* (2016, p. 318) as follows:

Extent of similarity or dissimilarity (incongruence) between the institutions of two legitimacy contexts. Here specified further as mean differences of the cognitive, normative, and regulative elements of institutions in between the countries of the buyer and the supplier.

Additionally, institutional uncertainty denotes the extent of the institutionalization of institutions in an institutional field (Phillips *et al.*, 2009), i.e. the degree to “which social processes, obligations or actualities come to take on a rule-like status in social thought and action” (Meyer and Rowan, 1977, p. 341). Busse *et al.* (2016) introduced these concepts to SCM and underlined their importance for the field. Moreover, they suggested that institutional distance should be measured based on the following:

A means-variance view according to which institutional difference reflects the mean differences of the cognitive, normative, and regulative elements between the institutions in two distinct legitimacy contexts, whereas institutional uncertainty reflects the variance surrounding these elements within a legitimacy context (Busse *et al.*, 2016, p. 321).

The study at hand alters the analysis of institutional distance from a country-level analysis (Busse *et al.*, 2016; Wilhelm *et al.*, 2016a) to the more fine-grained analysis of the institutional distance between the relational spaces that are relevant in a multi-tier SC, as recently called for (Busse *et al.*, 2016; Phillips *et al.*, 2009; Wu and Jia, 2018).

Summarizing the arguments above, there is evidence that the risk of (sub-)supplier decoupling rises with:

- the number of competing relational spaces that pressure the (sub-)supplier; and
- the divergence of requirements by the competing relational spaces, i.e. their institutional distance.

Decoupling further leads to the avoidance of scrutineering activities by the supplier as it tries to maintain legitimacy while saving the related costs (Simpson *et al.*, 2012; Wooten and Hoffman, 2013). Such fraudulent supplier behavior threatens the sustainability of the SC, and the sustainability of suppliers is, thus, to be managed by means of (MT-)SSCM. This study, thus, builds on institutional theory and MT-SSCM regarding the issue of SC uncertainty. These theoretical pillars are conceptually integrated in the following section.

### 3. Development of the three-dimensional framework

#### 3.1 The central theme: reducing uncertainty by applying multi-tier sustainable supply chain management practices

To date, the MT-SSCM practices defined by Tachizawa and Wong (2014) are directed at reducing only the FF's supply uncertainty. To underline how they can reduce SC uncertainty holistically, they are compared with the five sources of uncertainty defined by van der Vorst and Beulens (2002).

The first uncertainty is quite straightforward as the objective within a sustainable SC is clearly to ensure the coupling of the supplier to the FF's sustainability aims (Grimm *et al.*, 2016; Hofmann *et al.*, 2018). Contrastingly, the third uncertainty (information processing) is intraorganizational and is, thus, outside the focus of this paper. The remaining interorganizational sources of uncertainty can, however, substantially affect the success of the FF's MT-SSCM. The gathering of information on the SC and its environment is limited by the visible horizon of the respective agent (Carter *et al.*, 2015). This limits the potential of the *direct* and *indirect* practices, while the *work with third parties* approach potentially excels in this regard, as the selection of third parties can be tailored to optimize their involvement in and impact on a particular sector (Wilhelm *et al.*, 2016a).

The same applies to uncertainty in predicting the impact on SC behavior, which depends on not only the actors' (both the FF and the tier-1 supplier) visible horizons and expertise regarding the supplier (Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016a) but also on the stability of the supplier's environment and the existence of institutional voids in the field (Silvestre, 2015; Wu and Jia, 2018). This again favors the *work with third parties* approach for managing distant (sub-)suppliers. Finally, the effect of control mechanisms is dependent on the power of the actor (Glover *et al.*, 2014; Pilbeam *et al.*, 2012), which differs for the practices. The *indirect* and *direct* practices imply the active management of the supplier by its customer or customer's customer, which is facilitated by their respective buying power (Grimm *et al.*, 2014; Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016b). Contrastingly, a particular characteristic of a third party is its independence from the individual FF's power, as the third party might “implement coalitions with competitors and other industries to improve negotiation power with respect to lower-tier suppliers”, which allows the third party to complement a potential lack of FF power (Tachizawa and Wong, 2014, p. 652; Tate *et al.*, 2011).

In turn, there is a limit to the potential impact of the *work with third parties* practice. In case the main contact with the managed supplier is through the third party, there is a lack of direct interaction between the FF and the supplier. This impedes the creation of strong social ties, long-term relations and trust, which are essential antecedents of a common meaning system (Wooten and Hoffman, 2013) and collaboration in the SC (Soosay and Hyland, 2015). In terms of (S)SCM, direct interaction and strong social ties drive the integration of inter-firm processes, SC risk management and, thus, SC efficiency (Ashby *et al.*, 2012; Beske and Seuring, 2014; Fan and Stevenson, 2018). However, integration without social ties remains superficial and inefficient and vice

versa (Autry *et al.*, 2014). These arguments underline the suggestion by Tachizawa and Wong (2014) to combine the elements of the different practices to maximize their output.

To dive deeper into the suitability of the practices, the following sections will outline the three drivers of uncertainty in a specific FF–sub-supplier relationship, which will then be integrated as the three dimensions of a cube in Section 3.5. First, the SC actors are pressured by the SC and their own environment (Fligstein and McAdam, 2011; Kostova *et al.*, 2008; Wu and Jia, 2018), which can either support or hinder the supplier's adherence to FF requirements in the case of low or high institutional distance (Dimension 1 in the framework, outlined in Section 3.2). Second, the FF experiences supply uncertainty (S-UC) related to the supplier's compliance with SC sustainability requirements (Dimension 2, outlined in Section 3.3). Third, the supplier experiences demand uncertainty (D-UC), depending on the available demand information (Kembro and Selviaridis, 2015) and the SC sustainability requirements, as changes in the latter two variables can ultimately result in changing demand volumes and requirements and, thus, changing D-UC for the supplier (Chen and Paulraj, 2004) (Dimension 3, outlined in Section 3.4).

### 3.2 Dimension 1: the interplay of pressures on the supplier by its direct environment and the supply chain

As this paper analyses a FF–sub-supplier relationship, there is a relevant set of uncertainties in this relationship that builds the basis for a successful MT-SSCM implementation. In sustainable SCs, the FF is pressured by its stakeholders to adopt a TBL orientation and, thus, puts coercive pressure on the (sub-)supplier to comply with this institution (Grimm *et al.*, 2016; Schaltegger and Burritt, 2014; Seuring and Müller, 2008). According to the definition by Wooten and Hoffman (2013), this process of the FF reaching out to the supplier establishes the SC as a relational space with TBL and SCM orientations as its common meaning system.

At the same time, the supplier is embedded in its direct environment (Silvestre, 2015; Wu and Jia, 2018), which represents another relational space (Wooten and Hoffman, 2013). Several pressures by the supplier environment can be found in MT-SSCM. Drivers of coercive and normative pressure have been identified owing to public attention (Grimm *et al.*, 2014) or by regulators (Wilhelm *et al.*, 2016b). Tachizawa and Wong (2014) further add industry characteristics capturing mimetic pressures. They distinguish between industry characteristics, dividing them into the industry's typical pollution level and technology change rate. The former drives public and regulatory attention, while the latter lowers the investment in sustainability standards as technological uncertainty is high (Tachizawa and Wong, 2014). The resulting relational space in the (sub-)supplier context has its own meaning system, which may encompass institutions other than those that are aimed for by the FF.

In effect, both relational spaces overlap at the supplier and drive its external motivation for sustainability (Simpson *et al.*, 2012; Wooten and Hoffman, 2013). In case both relational spaces aim for an equal degree of sustainability or similar processes and structures, i.e. in the case of low institutional distance, the supplier will gain rewards in the SC, as well as in

its direct environment, for being more sustainable. Contrastingly, differing aims or foci on different dimensions of sustainability owing to different contexts, i.e. high institutional distance, (Busse *et al.*, 2016; Wilhelm *et al.*, 2016b) will force the supplier to invest, although it can gain rewards in only one relational space while creating a non-rewarded effort with regard to the other space. In the latter case, the heterogeneity of aims puts the supplier under stress and, thus, reduces its effectiveness (see also Silvestre, 2015). Wilhelm *et al.* (2016a, p. 209). found that relationships with high institutional distance represent “considerable challenges [...], which might not be mastered by actors in the SC on their own”.

In the worst case from an SC perspective, the supplier will decouple from the FF's requirements, putting the SC at risk of being unveiled as sourcing from an unsustainable supplier (Busse *et al.*, 2016). This will result in raised stakeholder pressure on the FF, as put forward in the chain liability effect (Hartmann and Moeller, 2014).

As a result, it is the degree to which the meaning systems of the relational spaces complement each other, i.e. the institutional distance, which defines the supplier's likelihood of coupling with the FF's requirements.

### 3.3 Dimension 2: the role of supply uncertainty as a driver of sub-supplier management

The FF's need to manage a supplier is dependent on the supplier's impact on FF objectives and, thus, the S-UC that the supplier represents for the FF. This has been investigated by Williamson (2008), who defines two major drivers of the FF's need to manage the supplier. First, the impact of supplier inputs on the end product. This study adapts this generic finding to sustainability, as the sustainability of the FF depends on its SC (Schaltegger and Burritt, 2014). However, the current SSCM literature distinguishes the traceability of the TBL dimensions and, thus, the reputational risk associated with environmental and social sustainability (Ashby *et al.*, 2012; Nakamba *et al.*, 2017; Rebs *et al.*, 2017; Wilhelm *et al.*, 2016a; Yawar and Seuring, 2017). Still, the common baseline is that the higher the impact of an input or a supplier, the more the FF depends on the correct delivery of the supplies. This S-UC requires the FF to manage the supplier no matter how small the supplier might be (see also Yawar and Kauppi, 2018). The second driver captures limitations in the possibility of replacing a supplier owing to the specificity of supplier inputs. It describes how easily the FF can source the input from another supplier, i.e. very easy in the case of commodities or impossible in the short term in the case of products tailored to the FF (Williamson, 2008). In summary, the FF's S-UC related to a specific supplier is dependent on the sustainability impact and specificity of supplier inputs (see also Tachizawa and Wong, 2014). Moreover, the S-UC in the relationship defines the potential of this relationship. Developing a supplier with low-impact products will not provide a large increase in SC sustainability and vice versa.

Williamson (2008) proposes spending management resources on only the most important suppliers in terms of input specificity and substitutability, while the relationship with commodity suppliers should be built on pure market processes, thus, requiring minimal management effort.



The combination of both arguments implies that a low level of S-UC should lead to low-effort practices in MT-SSCM, such as the *working with third parties* approach, including monitoring for compliance with rare and inspection-like interaction. Contrastingly, a high level of S-UC implies the use of engaging practices, such as the *direct* or *indirect* approach by Tachizawa and Wong (2014), including frequent, long-term and trustful interaction, to obtain information on the supplier and ensure the effectiveness of its actions (Grimm et al., 2014; Tate et al., 2011). This effect can also be realized by *working with third parties*; however, the *(in)direct* approaches are beneficial for long-term relationships and joint actions, which foster (S)SCM performance (Beske et al., 2014; Grimm et al., 2014; Soosay and Hyland, 2015). To realize these benefits, it is essential to match the FF's need to manage a supplier, i.e. the S-UC, with the FF's ability to do so. This is outlined in the following section.

### 3.4 Dimension 3: the role of demand uncertainty as an enabler of sub-supplier management

Contrasting with the FF's need to manage the supplier, the FF's ability to manage the supplier is driven by the supplier's D-UC related to the FF. Following institutional theory arguments, the FF exerts coercive pressure, i.e. the supplier is dependent on the buyer-supplier relationship with the FF for selling its products and maintaining its operation. The characteristics of this coercion depend on the FF's power over the supplier (Tachizawa and Wong, 2014; Tate et al., 2011; Wilhelm et al., 2016b). Power represents the ability of an organization to influence, control or resist the activities of another (Pilbeam et al., 2012). The power terms used in MT-SSCM range from channel power (Grimm et al., 2014) to power asymmetry (Wilhelm et al., 2016a, 2016b). Still, their core concept is the buying power representing the relative share of the supplier's products purchased by the FF (Grimm et al., 2014) and, thus, the D-UC that the FF induces at the supplier.

Relating the FF's ability to manage the supplier to the MT-SSCM practices proposed by Tachizawa and Wong (2014), one can apply the norm approaches to implementing SSCM proposed by Seuring and Müller (2008). If the D-UC in the relationship is low, the FF can hardly change supplier processes, and the incentives for the supplier to share information or adapt to information given by the FF are low (Kembro and Selviaridis, 2015). The FF is, thus, bound to engage in passive actions covered by the risk management strategy in SSCM (Beske and Seuring, 2014; Seuring and Müller, 2008). The aim of this strategy is to ensure supplier compliance by means of monitoring tools, such as standards and certificates, while having limited potential to enhance sustainability beyond a standardized level. It thus points to the *work with third parties* approach.

Contrastingly, powerful FFs can constrain the supplier's choice of processes to the ones that are legitimate in the SC (Glover et al., 2014) and drive the development of sustainability to diversify from competition and achieve a competitive advantage (Schaltegger and Burritt, 2014). This can be achieved via the "SCM for sustainable products" strategy (Seuring and Müller, 2008) and the practices outlined in Beske and Seuring's (2014) "pro-activity" category. These are best implemented by using the *direct* or *indirect* MT-SSCM

practices proposed by Tachizawa and Wong (2014). Analogously, Wilhelm et al. (2016a) found that power asymmetries with more power upstream, i.e. low D-UC and high S-UC, lead to the adoption of a *don't bother* approach instead of *indirect* or *direct* approaches, as the FF or tier-1 supplier lack the required power to implement changes. This empirical evidence supports the given conceptualization of the uncertainties as drivers and enablers of MT-SSCM, which are integrated in the following section.

### 3.5 Integrating the three dimensions

Summing up the conceptualization so far, a multi-tier SC as an institutional field is defined as:

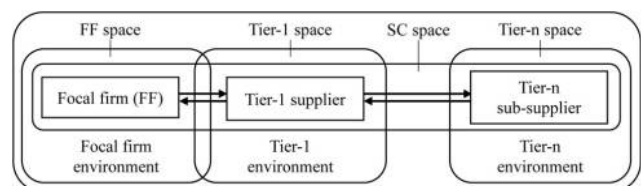
[...] a composition of multiple relational spaces, i.e.: (1) the "SC space" covering the firms in the stream of material, capital and information; and (2) individual "firm spaces" encompassing the firm in the SC and its direct environment. There are as many firm spaces as SC tiers, and their environments may overlap, depending on geographical or cultural distance. The single spaces come into existence by means of the interaction of space members, and institutional pressures are exerted in the individual spaces. The institutional pressures coming from the spaces thus overlap at the actors. Actors that do not know each other can neither be part of the same space nor pressure each other directly. In effect, the relational spaces are essential for exerting institutional pressure and reducing SC uncertainty, as they limit the influence of the FF and build up competing demands on the sub-supplier.

Figure 1 depicts the contents of the definition. It further underlines that MT-SCM issues, such as the visible horizon (Carter et al., 2015), play a critical role in the definition of an institutional field, as well as the reach of institutional pressures, such as (S)SCM actions. The definition is a step toward a more theory-driven understanding of the mostly empirically derived concepts in MT-(S)SCM, such as the "transitional" and the "closed" multi-tier SC structures identified by Mena et al. (2013, p. 62) that are established when actors "stretch out to each other and begin building a link"

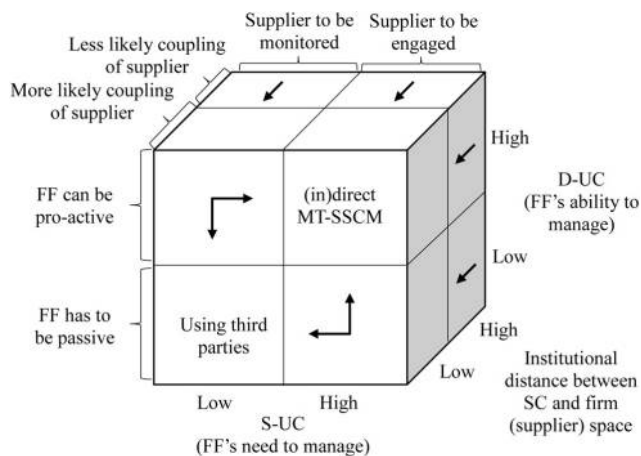
To identify the right MT-SSCM practice, the SC has to be seen as a relational space in which the S-UC of the FF and D-UC of the supplier can be reduced via this relationship. To evaluate this comprehensively, the two uncertainties that define the ability and need of the FF to manage the supplier are integrated with the institutional distance between the SC space and the firm space of the supplier. To integrate the three dimensions, building a three-dimensional cube, as is done in Figure 2, is straightforward. It depicts the dimensions and the characteristics at its edges on an ordinal scale divided into high and low. This splits the cube in half for each dimension and delivers the implications shown behind the brackets, which are based on the theoretical arguments in Sections 3.2 to 3.4.

As argued above, a low institutional distance between both relational spaces that pressure the supplier, i.e. the SC and the supplier's direct environment, facilitates the compliance of and cooperation with the supplier (Adebanjo et al., 2013). This

Figure 1 Conceptualizing a multi-tier SC as an institutional field





**Figure 2** Three-dimensional framework for MT-SSCM

relationship can occur irrespective of the chosen MT-SSCM practices, as a supplier in contexts of high institutional distance related to the SC space would have to invest to conform to SC requirements. This extra effort would not be appreciated by the supplier's stakeholders or industry peers. Instead, the supplier might raise its costs over the local industry benchmark, thereby exposing itself to the threat of being uncompetitive. Contrastingly, low institutional distance will likely support the supplier in its quest for sustainability, as the supplier could gain legitimacy in its direct environment and the SC space (Suchman, 1995). The resulting boost in the likelihood of compliant supplier behavior, i.e. its coupling to SC requirements, is indicated in Figure 2. As a result, the front half of the cube is favorable in terms of compliance.

This front level of the cube combines the considerations regarding the S-UC and D-UC, i.e. the FF's need and ability to manage the supplier. Their intersection can be addressed by the norm strategies on SSCM implementation formulated by Seuring and Müller (2008) and the norm strategies on resource allocation to SC relations proposed by Williamson (2008). Both indicate a risk- and effort-minimizing approach in case of low D-UC and low S-UC, thereby leading to a passive management and monitoring approach. Contrastingly, an output-maximizing approach is derived from both sources in case of high D-UC and high S-UC, leading to a pro-active supplier engagement approach. The best matches can be found in those cells that combine the low or the high uncertainties, while the mixed cells encompass some shortcomings.

In effect, the *work with third parties* practice is best suited for sub-supplier management if both the need and the ability to manage the supplier indicate a minimizing approach. *Work with third parties*, for example, covers the sharing of monitoring efforts among competitors (Tachizawa and Wong, 2014). Furthermore, it accumulates the D-UC induced by the individual alliance partners that rely on the third party to exceed a critical value and, thus, achieves an impact, in cases in which a single FF might be too weak (Tachizawa and Wong, 2014; Tate et al., 2011).

The *indirect* and *direct* MT-SSCM practices cover the investment of higher management efforts, which can, in turn, yield higher sustainability enhancements. This is best applied

when the FF has a high ability to manage the supplier. Following Williamson's (2008) arguments, the relatively higher investment required by these practices is best justified against the mitigation of a high S-UC, i.e. a high need to manage the supplier. This matches best with the maximizing cell.

The mixed cells, however, encompass a lack of required inputs in case of low D-UC controlled by the FF or a lack of potential for sustainability enhancement in case of a low S-UC and, thus, a low need to manage the supplier. This renders all practices ineffective, and the arrows in Figure 2 thus indicate a move away from the mixed cells. How these moves can be realized is outlined in the following section.

### 3.6 Adaptation scenarios: changing the focal firm's position in the framework

The moves away from the suboptimal mixed cells are best described by analyzing the three dimensions that build the framework.

First, changing the S-UC (need to manage the supplier) means shifting sourcing volumes among suppliers by means of SC partner selection and SC partner development (Adebanjo et al., 2013; Beske and Seuring, 2014; Schaltegger and Burritt, 2014). A reduction of the S-UC can be achieved by recycling critical materials, thus, generating secondary supplies (Brix-Asala et al., 2018; Cucchiella et al., 2014; Sauer and Seuring, 2017) or by substituting critical materials that cause sustainability issues by means of joint development and innovation practices with the existing supplier (Beske and Seuring, 2014; Schaltegger and Burritt, 2014). Adopting Williamson's (2008) arguments, the FF should increase the impact of the suppliers over which it has power, and vice versa. However, such measures are limited by the degree of substitutability of the materials, as well as the availability of the resources and knowledge on the side of the FF (Grimm et al., 2014; Tachizawa and Wong, 2014). In effect, such actions require a minimum of power or investment in a third party to manage the change. This is again facilitated by the supplier's willingness to cooperate, as well as resulting joint actions, such as knowledge sharing (Soosay and Hyland, 2015).

Second, shifting the D-UC (the FF's ability to manage the supplier) can also be achieved by centralizing supplies according to FF power. Extending the *indirect* approach, i.e. drawing on tier-1 suppliers, the FF might also partner with a more distant but equally sustainability-oriented firm that has power over the supplier or its competitors, as suggested in the *cascaded* MT-SSCM approach proposed by Sauer and Seuring (2018). The "upstream focal firm" (Sauer and Seuring, 2018) is positioned multiple tiers further upstream the SC. Thus, it suffers from less physical and cultural distance related to the sub-supplier, thereby giving it greater influence over the sub-supplier (Carter et al., 2015).

Third, the FF can also invest in building better SSCM capabilities by enhancing relationships with extant suppliers, building internal knowledge and allocating resources (Grimm et al., 2014; Wilhelm et al., 2016a, 2016b). This is again facilitated by supplier cooperation (Soosay and Hyland, 2015) and, thus, low institutional distance.

Finally, the institutional distance between SC and firm space is difficult to change. Adopting traditional SCM arguments for sourcing inputs with the lowest prices and the least risk (Ashby

*et al.*, 2012; Williamson, 2008), FFs should not source from environments that do not share their objectives owing to the risk of supplier decoupling (Busse *et al.*, 2016; Jia *et al.*, 2018). However, such cases often occur in developing countries, in which a potential imbalance of sustainability goals is accepted so as to spur the country's development (Brix-Asala *et al.*, 2018; Busse *et al.*, 2016; Silvestre, 2015). This encompasses, for example, low standards for working conditions, which enable low labor costs and attract investment by labor-intensive industries. Terminating supplier relationships to such contexts owing to the short-term risks of being associated with misconduct would safeguard the SC but jeopardize local development (Brix-Asala *et al.*, 2018; Busse *et al.*, 2016). This dilemma can be addressed via a paradox approach (Hahn *et al.*, 2017), which accepts current shortcomings to resolve a greater issue in the long run. Although the inclusion of the paradox approach remains outside the scope of this study, it leads over to the discussion and future research avenues that are outlined in the following section.

#### 4. Discussion

The paper's central contribution is the incorporation of the supplier's direct environment into MT-SSCM. This is based on institutional theory arguments and structuring a FF-sub-supplier relationship based on the uncertainties in this relationship, as called for by Miemczyk *et al.* (2012) and Kauppi (2013). These uncertainties are then used to build a multilevel framework for assessing the suitability of the MT-SSCM practices proposed by Tachizawa and Wong (2014). In particular, the conceptual densification of variables along the two aspects of uncertainty and the institutional distance between the relational spaces facilitate the identification of efficient relational space–practice combinations. This offers a step toward a more practitioner-oriented and tangible theory base in (MT-)SSCM, as called for by Ashby *et al.* (2012). Moreover, it helps to build a more complete and theory-driven understanding of the pressures exerted in (multi-tier) SCs and the resulting interrelationships to enhance sustainability performance, which are at the core of SSCM (Kauppi, 2013; Seuring and Müller, 2008; Wilhelm *et al.*, 2016b; Wu and Jia, 2018).

Compared to the extant (S)SSCM research, the study at hand presents a more nuanced definition of the (multi-tier) SC as the unit of analysis, as called for by Miemczyk *et al.* (2012), as well as the SC as the institutional field. It views the SC as a relational space that includes a common meaning system (Scott, 1999; Wooten and Hoffman, 2013). This definition allows for the integration of competing relational spaces, i.e. the suppliers' direct environment, which might counteract the creation of a common meaning system in the SC or the implementation of the strategic values or operational practices required for a successful SSCM (Beske and Seuring, 2014; Pagell and Wu, 2009). This extends the current discourse in (S)SSCM, which either defines the SC as the sole institutional field, while dismissing the supplier's stakeholders (Wu and Jia, 2018), or focuses on the country level (Busse *et al.*, 2016; Wilhelm *et al.*, 2016a).

Moreover, the study at hand builds on the conceptual synthesis of theoretical arguments to show that the supplier's

stakeholders drive the risk of a supplier decoupling (see also Jia *et al.*, 2018; Simpson *et al.*, 2012). It is important to understand and investigate this further as it represents a major risk in sustainable SCs (Hartmann and Moeller, 2014; Seuring and Müller, 2008). Despite the impact of the supplier's environment (Adebanjo *et al.*, 2013; Miemczyk *et al.*, 2012), there is a lack of research on the critical role of institutional factors regarding the supplier (Busse *et al.*, 2016; Wu and Jia, 2018). To date, this has been discussed only rarely and has focused, for the most part, on tier-1 suppliers and their role in diffusing FFs' sustainability criteria (Grimm *et al.*, 2014, 2016; Mena *et al.*, 2013; Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016b). The extension of the dyadic SSCM concept into MT-SSCM has already yielded rich research implications (Choi and Wu, 2009; Miemczyk *et al.*, 2012). However, SSCM research is still criticized for lacking practicability and managerial implications (Ashby *et al.*, 2012), which are discussed next in this study.

##### 4.1 Managerial implications

Institutional theory can be seen as “an overly theoretical lens of how organizations behave” (Kauppi, 2013, p. 1340), but its practical value lies in the acknowledgment of competing drivers of the adoption of practices and structures, which brings it closer to reality than the assumption of a purely rational choice (Ashby *et al.*, 2012; Autry *et al.*, 2014; Busse *et al.*, 2016; Kauppi, 2013). The given framework enables the FF to evaluate its relationship to a certain supplier and the supplier's direct environment to position itself on the cube. The arrows indicate the proposed action implied by the framework, i.e. lowering the institutional distance and matching the FF's need and ability to manage the supplier.

The central messages derived from the framework are that FFs must identify the criticality of sub-suppliers and match their MT-SSCM practices to the S-UC and their power in the respective SCs (based on D-UC).

Moreover, the effectiveness of the chosen MT-SSCM practice is not a given. It is critically influenced by the supplier's environment, which can either support or hinder the supplier's compliance with the SC objectives. The reliance on limited knowledge of one's SC is shortsighted and may end with reputational and supply risks (Carter *et al.*, 2015; Hofmann *et al.*, 2018), as well as inefficient SSCM processes owing to ill-managed uncertainties (Simangunsong *et al.*, 2012; van der Vorst and Beulens, 2002).

This move to a three-dimensional evaluation of the relationship enables a more precise assessment of the situation and, thus, reduces SC uncertainty as it addresses three of the five sources of SC uncertainty proposed by van der Vorst and Beulens (2002).

##### 4.2 Limitations and future research

This research has three major limitations. First, it is conceptual and the arguments build on theoretical considerations. The individual concepts are taken from well-established, peer-reviewed literature. However, further empirical validation of the given propositions and implications is required (Meredith, 1993). Still, this validation and the application of the framework to managerial praxis are again hindered by the complexities of MT-SSCM. Although the multi-tier

perspective is one of the most fruitful for SSCM (Soosay and Hyland, 2015), there is a need to conduct in-depth case studies of multi-tier SCs (Miemczyk *et al.*, 2012). However, the complexity of such SCs impedes the ability of both practitioners and researchers to fully map and understand all the relationships in the chain. In turn, this lack of SC visibility limits the applicability of the proposed framework to those suppliers that are within the visible horizon of the FF and are, thus, known. To drive the visible horizon further up the chain and enable an investigation of the dynamics in real-life multi-tier SCs, our field is in need of more sophisticated research methods and data collection procedures (Autry *et al.*, 2014; Choi and Liker, 2002), as “moving beyond the dyadic relationship is not just about replicating what has worked well for two partners” (Kembro *et al.*, 2017, p. 83). To bypass the potential limitation of the FF by its visible horizon, SSCM scholars have proposed partnerships with “nontraditional members” of the SC, such as voluntary standards, NGOs, or trade groups (Pagell and Wu, 2009; Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016b). This is also relevant for enhancing the applicability of the proposed framework, as it enables the identification of suppliers and the evaluation of the single dimension of the cube.

These dimensions represent the second limitation as all dimensions are investigated on a two-level ordinal scale (high and low), which is difficult to operationalize and limits the practical applicability of the developed framework in its current form. To dive deeper into the single dimensions, one could rely on the sources of uncertainty in SCs, which have been identified and investigated by Simangunsong *et al.* (2012, 2016). Additionally, institutional distance can be evaluated based on the three pillars of cognitive, regulative and normative institutions, which characterize the relevant organizational fields (Busse *et al.*, 2016; Phillips *et al.*, 2009). These more nuanced sub-constructs pave the way to a more tangible investigation of the single dimensions by providing a better operationalization of the framework dimensions than the one used in this study. Still, not all sub-constructs might be relevant in all contexts. Identifying the context-dependent drivers of institutional distance, as well as S- and D-UC, is one of the future research directions that can enable the validation and application of the framework. This might be informed by contingency theory, which holds that different contexts can be distinguished and grouped along a set of contingency factors and that each group of contexts requires an individual organizational design or response (Sousa and Voss, 2008). This theory has recently gained substantial traction in operations management and SCM research (Sousa and Voss, 2008) and has informed a number of studies on SC uncertainty (Simangunsong *et al.*, 2012, 2016), as well as MT-SSCM (Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016a, 2016b).

Third, the authors looked at the topic from a developed country perspective, which biases the understanding of sustainability, as well as institutions and institutional pressures (Busse *et al.*, 2016; Jia *et al.*, 2018; Wu and Jia, 2018). This bias is common in (S)SCM research, but there is a need for more research from developing and emerging countries as the perceptions of the core constructs of institutional theory and SSCM have been found to differ (Adebanjo *et al.*, 2013; Petljak *et al.*, 2018; Silvestre, 2015; Yawar and Kauppi, 2018) while

being essential to the impact of SSCM research and praxis (Busse *et al.*, 2016; Khalid *et al.*, 2015). This limitation is also relevant to the application of the framework as one must pay attention to the potential differences in SC members' interpretations of uncertainties and institutions. Again, this points to the use of contingency theory to support the institutional theory used here and to understand the similarities and differences between the application contexts of the framework.

Further interesting research avenues lie in the assumptions of the framework. These avenues are outlined in the following bullet points:

- How is the innovation of SSCM practices perceived by the supplier's direct environment? Adopting institutional theory arguments, there should be an increase of institutional voids (Wu and Jia, 2018) and, consequently, a negative impact on legitimacy, if local norms are contrasted (Busse *et al.*, 2016; Meyer and Rowan, 1977; Deephouse, 1996). Does this relationship also hold true in light of sustainability and its promise for a better future for the sub-supplier's environment?
- This study partially adopts Kauppi's (2013) research directions on using uncertainty constructs in (S)SCM research based on institutional theory. Besides the S- and D-UC used here, she proposes investigating technology and process uncertainty as drivers of isomorphism in SCs (Kauppi, 2013). The study at hand did not include these two uncertainties, as they have an intraorganizational or intra-industry focus (Chen and Paulraj, 2004), which contrasts with the study's research focus on multi-tier SCs. Still, these uncertainties are related to an industry and the supplier's or FF's direct environment and are, thus, a relevant and more detailed perspective to investigate. They can also contribute to diving deeper into the institutional dynamics at the industry level, as called for by Wu and Jia (2018).
- Long-term relationships, joint actions and information sharing are core drivers of (S)SCM success (Ashby *et al.*, 2012; Beske *et al.*, 2014; Kembro and Selviaridis, 2015; Tate *et al.*, 2011), but this finding is strongly grounded in the largely dyadic (S)SCM research (Choi and Wu, 2009; Miemczyk *et al.*, 2012; Soosay and Hyland, 2015). Is this finding also true in multi-tier SCs, in which relational spaces and, thus, meaning systems overlap, or do the challenges and uncertainties associated with multi-tier information sharing (Kembro *et al.*, 2017), such as a misinterpretation of demand information by a distant supplier (Kembro and Selviaridis, 2015), rule out the benefits and favor rather low-effort third-party managed relationships?
- Yawar and Kauppi (2018) call for the comparative use of the economic and social variant of institutional theory in SSCM. In doing so, they researched local dairy SCs in India, i.e. a clearly defined and rather homogeneous institutional field that encompasses both the buyer and the supplier in one country. Looking at the previously outlined difficulties in defining the competing institutional fields in MT-SSCM, this study enlarges their call for comparative studies to determine an answer to the following question: What explanatory value does the



economic variant of institutional theory offer in a MT-SSCM context?

## 5. Conclusions

This paper revealed the critical role of the supplier's direct environment, which can either drive or hinder the supplier's compliance with SC sustainability aims. Moreover, it provides a multidimensional framework for understanding the environmental uncertainties in a FF-sub-supplier relationship and the identification of the most suitable MT-SSCM practices. By doing so, this study expands the research agenda in SSCM by integrating the supplier's environment and related pressures for sustainability into the current discussion. This advances our understanding of the supplier's motivation for compliance and of how a FF can align its MT-SSCM practices accordingly. The developed definition of a multi-tier SC as an institutional field and the proposed framework are seen as a valuable starting point for a more nuanced evaluation of MT-SSCM practices and their effective implementation. This evaluation needs to change from a purely rationalistic perspective to the integration of social factors (Ashby *et al.*, 2012; Autry *et al.*, 2014), which are at the core of SSCM, such as long-term relationships and trust (Beske and Seuring, 2014; Pagell and Wu, 2009).

From a managerial perspective, this paper gives advice on selecting MT-SSCM practices and the FF's approach to managing a specific (sub-)supplier to reduce mutual uncertainties and achieve a more efficient SC. This extension of the understanding of MT-SSCM is grounded in institutional theory and advances the theoretical basis of MT-SSCM, which is seen as the paper's most prominent theoretical contribution.

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