**IMPLEMENTING SUSTAINABILITY IN MULTI-TIER SUPPLY CHAINS - ARCHETYPES OF MANAGING INDIRECT SUPPLIER RELATIONS**

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**ABSTRACT**

Buying firms have to put increased attention on sustainability issues in supply chains, as they are hold responsible for any non-sustainable actions in their supply chains by stakeholders. Yet, firms have to explore how they can most effectively accomplish sustainability implementation beyond the boundaries of their own firm. The complexity of supply chains in terms of geographical dispersion and the lack of direct contractual relations make it oftentimes impossible for the buying firm to manage all relationships, including second-tier suppliers and beyond directly. In order to explore this contemporary challenge, we build on the concept of multi-tier supply chains and investigate how buying firms manage indirect supplier relations with a particular focus on the implementation of sustainability strategies. To this end, we analyze 10 cases of international supply chains in the food, pharmaceutical, and apparel industry. We identify three archetypes of managing indirect supplier relations in the context of sustainability implementation, namely, full delegation, mixed delegation and zero delegation. We identify antecedents for each archetype and discuss implications for related practice and theory.

**Keywords:** Sustainability implementation, multi-tier supply chains, indirect supplier relations, governance

**INTRODUCTION**

Sustainability increasingly depends on the holistic implementation of practices beyond the boundaries of the buying firm, as the buying firm will be held responsible for any non-sustainable action in its vertically disintegrated and globally dispersed supply chain (Krause et al., 2009; Linton et al. 2007; Foerstl et al., 2010; Carter & Jennings, 2002; Reuter et al., 2010). Frequently, incidents of non-sustainable actions also involve lower tiers. In 2007, Mattel had to recall toys that were coated with toxic paint. Their source could be traced back to a subcontractor of Mattels’ first tier supplier Lee Der Industrial. More recently, the Brazilian government listed 52 charges against Inditex, Zara's parent company, accusing it for sweatshop like working conditions in subcontractor’s facilities of Zara’s main supplier AHA. Although Inditex argues that it cannot be made responsible for AHA’s unauthorized subcontracting, Brazilian authorities stated that Inditex’s major first tier supplier AHA is a logistical extension of its main client, Zara Brasil and since “(Zara’s) raison d'être is making clothes (…) it follows that it must know who is producing its garments." (www.guardian.co.uk, 2011). These incidents have resulted in high media attention and negative reputation effects for the respective firms.

In this paper we go beyond the general claim that “a firm is only as sustainable as its supply chain” (Krause, Vachon, & Klassen, 2009) and propose that a crucial key to the holistic implementation of sustainability is not only the management of direct suppliers but also indirect supplier relations, i.e., relations between the buyer and second-tier, as well as relations between first- tier (T1) and second-tier (T2) suppliers.

We particularly refer to sustainability as a context for managing indirect supplier relations as – unlike in TQM – relevant standards are not fully implemented in supply chains and networks, yet. We define sustainability rather broadly as the explicit consideration of social and environmental issues (Elkington, 1997; Dyllick & Hockerts, 2002; Bansal, 2005) that are implemented through standards and practices in the supply chain. Implementing sustainability practices at lower tiers of the supply chain is a challenging task as there is a) a lack of direct business relationships between the buyer and its indirect suppliers (T2 and beyond) which makes enforcement through contracts difficult, and b) the number of suppliers at the T2 level reaches unmanageable dimensions quickly and the buying firm only possesses a vague idea about their exact number (Choi, Dooley, & Rungtusanatham, 2001). Moreover, vertical disintegration and offshoring have led to highly fragmented and geographically dispersed supply chain structures, increased organizational, geographical and cultural distance and further augmented the challenge of managing such relations effectively (Carter & Carter, 1998; Awaysheh & Klassen, 2010; Gereffi et al., 2005).

It is the aim of the paper to investigate in which ways buying firms actually exert influence on their indirect supplier with the aim of managing sustainability in their supply chains. This naturally raises questions of governance (Hoetker & Mellewigt, 2009) at various levels of the supply chain and our research question thus reads: “Under which conditions and how can buying firms exert influence in multi-tier supply chains with respect to sustainability standards, including direct relations to indirect suppliers (i.e., buyer-T2) and the management of indirect supplier-supplier relations (T1-T2)?”

The paper is of an explorative nature with the aim of theory building (Eisenhardt, 1989). Towards this end, we studied sustainability in 10 supply chains of five buying firms from three different industries (i.e., food, apparel, pharmaceuticals) where the necessity to practice sustainability on the level of the whole supply chain is high and further rising. We identify three archetypes of managing indirect supplier relations and their antecedents.

Our findings contribute to general research on the governance in supply chains (e.g., Choi & Hong, 2002; Pilbeam, Alvarez, & Wilson, 2012). In particular, we extend the latest stream of research on supplier-supplier relations (e.g., Choi et al., 2002; Wu & Choi, 2005; Lazzarini, Miller, & Zenger, 2008; Wu et al., 2010; Wilhelm, 2011) from a horizontal level towards vertical supplier-supplier relations. Moreover, we contribute to the literature on sustainability in supply chains (e.g., Klassen & Whybark, 1999; Zsidisin & Siferd, 2001; Zhu & Sarkis, 2004; Vachon & Klassen, 2006; Linton, Klassen, & Jayaraman, 2007; Srivastava, 2007) by going beyond the traditions dyadic perspective and taking the notion of the supply *chain* seriously.

**THEORETICAL BACKGROUND**

**Strategies for Managing Sustainable Supply Chains**

A growing body of research suggests that companies should expand their sustainability strategies beyond the boundaries of their firm to the supply chain level (e.g., Carter & Jennings, 2002; Zhu & Sarkis, 2004; Kleindorfer, Singhal, & van Wassenhove, 2005; Vachon & Klassen, 2006; Linton, Klassen, & Jayaraman, 2007). A buying firm may possess greater interest in the implementation of sustainability standards in the supply chain as end consumers hold the buyer accountable for products that were not produced in a sustainable way (Bansal & Roth, 2000; Bansal, 2005; Thogersen, 2006; Amaeshi, Osuji, & Nnodim, 2010, Reuter et al., 2010).

It remains unclear, however, what the best way for a company is to implement sustainability standards and practices at its supplier base. A major discussion in the general area of implementing sustainability in supply chains has evolved around the question whether a “collaborative” or “assessment” form of governance is more effective in extending sustainable practices to suppliers (e.g. Klassen & Vachon, 2003; Vachon, 2007; Foerstl et al. 2010). Whereas, assessment includes “any activity related with evaluating suppliers (e.g. questionnaires and company visits), (…) collaboration refers to working directly with suppliers providing them with training, support or other activities (Gimenez & Tachizawa, 2012: 533). Some authors found a positive effect of an assessment approach (Murray 2000; Ciliberti et al. 2009) whereas others consider only a collaborative approach and find support for its positive impact on sustainability (Geffen & Rothenberg 2000; Vachon and Klassen 2008; Schliephake et al. 2009; Borchardt et al. 2011 ). A third group argues that assessment by itself does not help to translate customer requirements into supplier’s sustainable commitment and argue for a mixed approach (Simpson et al. 2007; Yu 2008; Lim & Phillips 2008; Strand, 2009; Carsten et al. 2010). It seems, in particular, that assessment is more efficient in the short-term whereas collaboration is more likely to lead to success in the long-term (Theyel, 2001). All studies in this field, however, have mainly focused on the governance of buyer-supplier relations so far and, thus, it remains unclear which strategies are applicable to the management of indirect suppliers. In the following, we propose that these two forms of supply chain governance can be extended from dyadic buyer-supplier relations to other relations in the supply chain. In particular, we are interested when and how these governance mechanisms come into play beyond the level of the first tier when implementing sustainability in the supply chain.

**Managing Indirect Suppliers in Sustainable Supply Chains**

Only few scholars have recently started to address the explicit management of indirect supplier relations. Choi and Linton (2011) warn that the extensive delegation of responsibilities to top tier suppliers has led to difficulties for end manufacturers to ensure that their suppliers are operating in a socially and environmentally sustainable fashion. They, thus, encourage buying firms to win back the control over their supply chains and manage selected indirect suppliers directly. Mena, Humphries & Choi (2013) conduct case study research in the UK food industry and observe that sustainability is not the only, but a salient reason for buying firms to start reaching out toward the supplier’s supplier. By explicitly incorporating the level of indirect suppliers, the authors come up with a “theory of multi-tier supply chains (MSC)”. Their theory builds on three MSC structures: the “open” MSC represents a traditional structure where information and product flows are linear and no direct connection exists between the buyer and the T2. The “closed” MSC occurs when the buyer and the T2 have established a mutual relationship that can be managed in a more formal (e.g. through contracts) or informal way (e.g. through regular interactions). A “transitional” MSC depicts a middle-ground between the open and closed structure and occurs when the buyer and the T2 “stretch out to each other and begin building a link and initiating a move toward a ‘Closed MSC’.” (ibid.: 62). This type of structure can be found, for example, in the practice of directed sourcing in the automotive industry (Choi & Hong, 2002) or the provision of assistance or training to the T2.

These initial contributions are important as they reflect the rising importance to connect to lower tiers in the supply chain that becomes particularly prevalent in the context of supply chain sustainability. There are some limitations, however, as Mena, Humphries & Choi’ study is restricted to regionally concentrated supply chains within one industry (food industry in the UK). Moreover, questions of governance (Hoetker & Mellewigt 2009; Gereffi, Humphrey & Sturgeon, 2005) are not really taken into account yet and there is more a general interest *whether* the buyer builds up relations with indirect suppliers but not *how* and *when* this occurs. In addition, besides analysing the dyadic relationships between buyer and T1, and T1 and T2 (Open MSC structure), and the relationship between buyer and T2 (Closed or Transitional MSC structure), we propose another option that would be the management of the T2 *through* the T1, that would take interactions between these levels (i.e., buyer-T1, T1-T2) much stronger into account. These could occur more in line with an assessment or collaboration form of governance. For example, instead of directly monitoring T2 compliance with certain sustainability standards, the buyer could instruct the T1 on how to monitor these standards. Likewise, instead of teaching the necessary sustainability practices directly to the T2, a buying firm could train its T1 supplier how to teach sustainability practices to T2 suppliers.

**METHODS**

As shown in the literature review, only little empirical evidence exists at present to what extent firms from different industries actively manage suppliers beyond the level of the first tier. Thus, the nature of our research is highly explorative and seeks to build novel theory rather than to test existing one (Eisenhardt 1989). We chose a case study approach, as it is especially suitable for theory development in supply chain management research (Meredith, 1998; Dubois & Araujo, 2007), as it allows for a much better understanding of the nature and complexity of the phenomenon (Benbasat, Goldstein, & Mead, 1987; Stuart et al., 2002).

**Theoretical sampling:** We began our case selection with a theoretical sampling approach by identifying industries which are characterized by a) high consumer awareness of environmental and social issues in manufacturers’ supply chains b) rising importance of supplier relations due to vertical disintegration. Particularly in the drug and consumer goods industry high pressures to implement network-wide sustainability is exerted through customers, NGOs and other stakeholders. We concentrated on a list of potential firms in those industries and ranked them according to their active involvement in several sustainability-related activities and listings, such as the UN Global Compact, the Dow Jones Sustainability Index (DJSI), the Fair Labor Association, the Carbon Footprint Disclosure Project, Forest Footprint Disclosure Project or the Global Reporting Initiative (GRI).

In order to increase comparability we focused our search on firms with similar size, headquarters in Europe (i.e., similar applying regulations) and global scope of their supply chains, particularly in emerging markets (i.e., similar challenges to implement holistic sustainability standards). A selection of similarly highly ranked companies was contacted. Through this process, we were able to gain the agreement of five firms from three different industries (i.e., pharmaceuticals, food and apparel) to participate in our study. All firms are large multinationals with an annual turnover of over 10 billion USD. When an agreement with a participating firm was reached, we selected two direct purchasing categories from each buying firm’s sourcing portfolio with the help of the head of purchasing. As a general criteria, categories must be significant in terms of spend and associated risk regarding sustainability, for example, if large parts of the production process are located in low cost countries. Together with the purchasing manager of the selected category we chose a key T1 supplier for that category. After the first tier was contacted and agreement over participation in the study was reached, we jointly identified one key T2 supplier for each category. The focus on highest risks prevented bias of firms naming only those suppliers whose sustainability performance was satisfactory or better. In all our cases, each extended supply chain consisted of the buying firm, the T1 and T2 supplier. In total we analyzed 10 extended supply chains (based on the supply categories of five buying firms) and thereby fell within the often-suggested sample size of four to ten cases (Eisenhardt, 1998).

**Data collection:** For every sampled case, semi-structured interviews with key informants (e.g., CPO, purchasing manager, sales manager or sustainability manager) from the buying firm, the T1 and, whenever possible, from the T2 supplier were conducted. As the T2 firms were often located in geographically distant countries such as Kenya and China with high language barriers, representatives could only be interviewed for 4 out of 5 buying firms. Since we were interested in supplier management practices regarding the implementation of sustainability, we adopted questions from previous research in the field of buyer-supplier relations and sustainable/green supply chain management (e.g., Chen & Paulraj, 2004; Zhu & Sarkis, 2004; Wu & Choi, 2005; Vachon & Klassen, 2006; Wu et al., 2010). The majority of interviews was conducted in English. The interviews were complemented by a survey, which was sent and filled out by the respondent before the interview. Given the sensitivity of the data provided, all contacts requested to not mention their company’s name or the supplied product. Thus, the case descriptions and table 1 display only anonymous information for the sampled firms and their supply base.

=== Insert Table 1 about here ===

Each interview generally lasted at least one hour and was either audiotaped and transcribed afterwards or accompanied by comprehensive note taking. In total, we conducted 46 interviews at different levels of the extended supply chains of the 5 buying firms. We triangulated the insights gained from the interviews with several alternative data sources: (1) corporate materials from all network partners such as annual reports, home pages and other internet sources, (2) – if available – corporate sustainability reports, publications regarding sustainability initiatives, (3) other documents provided from the interview partners, including audit templates and evaluation documents.

**Data analysis:** We began by writing up within case descriptions. We tried to generate internally consistent descriptions of each case, capturing all relevant information on the buying firm’s management of indirect ties with respect to sustainability. Next, we applied a pattern matching process (Eisenhardt, 1989) where we used empirical evidence from our interviews to refine our predefined concepts (i.e., cascading, intervention, contractual vs. relational governance). In four cases (i.e., “AP” and “CM” at “Starton” and “PFP” and “PM” at “Coincia”) we failed to find any indication for the management of indirect supplier relations either by the buyer or through the first tier and, thus, did not consider these cases further for our cross case analysis (these cases are still listed in table 2 for complete documentation). All four cases are from the pharmaceutical industry where the buyer only recently started to rollout sustainability beyond its firm boundaries, presumably because customer awareness for sustainability issues is not that strong.

Next, we traced causal mechanisms (Gerring, 2006) in the remaining six cases through a cross case analysis that link our refined theoretical concepts with possible outcomes regarding sustainability implementation in extended supply chains. We used excel tables to compare several possible constructs as supporting tool (Miles & Huberman, 1994). Based on our analysis, we grouped the cases into three archetypes of managing indirect supplier relations and formulated propositions. Subsequently, one member of the research team who was not involved in the initial data evaluation verified the patterns and themes identified. This procedure helped creating a commonly shared picture of the analysis.

In the following section, we present an overview of our within case and cross case analysis of the different supply chains for each buying firm.

**RESULTS**

**Within Case Analysis**

**Sequenzia:** Multinational brand companies like Sequenzia face special challenges of offering mass-produced products at affordable prices to a broad customer range while ensuring sustainability in their own as well as its suppliers’ production. Sequenzia has set up its own sustainability codes, particularly in the field of agricultural goods, but also collaborates with other companies in the industry to create a standardized approach for supplier assessments. The company has set itself the aim to source 70% of their agricultural raw material sustainably by 2015 and a 100% percent target for 2020.

For both supply chains we investigated, Sequenzia conducts relatively frequent meetings with T1 suppliers to evaluate the current state of supplier’s sustainability compliance. Deviations are made transparent and are jointly discussed. Sequenzia sets financial incentives for the implementation of sustainability standards by shifting purchasing volume to preferred T1 suppliers and builds strategic partnerships.

In the DP chain, products are sourced from about 20 large cooperatives plus another 40 privately owned firms that are largely based in Europe. As these firms and cooperatives source from about 100.000, mostly smaller farmers, Sequenzia highlights the fact that they cannot be in direct contact with all the farmers:

“(…) the average farm size in Europe is about 80 cows. It’s not one of these [huge] American farms with about 3000 cows. So, we source from quite a large number of farms with roughly that number of animals, we therefore have (…) to reach out to each and every one of them, and that’s the challenge, and we can only do that via our suppliers, via the dairies, and to get them on board and to convince them that this is the way to go and [ask them] whether they will join us on this journey.” (DP, Sequenzia, purchasing)

The T1 supplier is fully responsible for implementing and ensuring sustainability at the T2 level. Sequenzia does, however, train the T1 supplier’s farm advisors with regard to Sequenzia’s sustainable agricultural code. T1 suppliers are then responsible to audit the implementation of the code at the farmer’s level through so-called “self-assessments”:

“We are not doing the audit ourselves. What we do is that we initially work with the suppliers and their farm advisors. It is up to the suppliers to make sure that what they supply to us is sustainable. And we have trained them, or their farm advisors, regarding our code. (...) So once the benchmark is done and improvements are made, there are self-assessments, how we call it, (…) of the farms by the suppliers. So it is based on trust, you could say.” (DP, Sequenzia, purchasing)

 The cooperatives were already quite advanced in their own sustainability agenda and we found evidence for a high level of understanding of the sustainability requirements among Sequenzia’s T1 suppliers as they “translated” the buyer’s general guidelines into more operative, specific instructions for farmers (i.e., T2 suppliers). For instance, Sequenzia defines requirements for general animal husbandry in its agricultural code that include regulations on food and water provision for animals, animal health, and animal medication treatments. The T1 supplier, i.e. the dairy producer, further specifies these requirements for cow husbandry at its dairy supplying farms, including regular checks of cow alimentation, BSE, isolation of sick cows, and maintenance of the farm’s surrounding area.

=== Insert Figure 1 about here ===

The situation differed in TB where Sequenzia sources tea globally from traditional tea growing countries such as Indonesia, India, Sri Lanka, or Tanzania where the awareness for sustainability is still less developed at present. In the region of Kenya (the responsible geographic area of our interview partner), for example, tea is sourced from approx. 40 tea processing firms, agents, or auctions that source tea leaves from up to 600.000 small farmers. One of the T1 suppliers, however, is a tea agency that is in charge of 520.000 small holders. In some cases tea is sourced directly from larger tea estates so that the distinction between first and second tiers is blurred.

In the past years, Sequenzia has been shifting sourcing volume from tea auctions to directly purchasing tea from farmers or through their agents, cutting the middlemen out. Next to a higher transparency concerning the origin of the tea, a major reason for this strategic change is to offer economic incentives to implement sustainability practices.

“This helps to support our strategy on sustainable sourcing. It helps to demonstrate benefits to our suppliers who are becoming more sustainable and who are trying to achieve rainforest alliance certification.” (TB, Sequenzia Purchasing)

These practices were developed and written down in the company’s own agricultural code and benchmarked with a third party certifier that is also in charge for auditing the compliance of the codes.

In addition, collaboration with one major tea agency was strengthened to jointly develop and execute a training program for farmers. The agency employs its own sustainable agricultural team that is also in charge of the implementation of sustainable agricultural practices. Financial support for trainings is mainly provided by Sequenzia but also through other sources (although collaboration with competitors on trainings and certification has not been established, yet). The length of the training depends on how advanced the farmer actually is but ranges from “a 9-12 months process from not really understanding what sustainability really is to a position where you can get certified in Africa”. To date, half of the farmers are already trained. By the end of 2013 all farmers are expected to obtain third party certification.

=== Insert Figure 2 about here ===

**Educata:** Educata faces the same challenges of the food industry as Sequenzia. Besides a general code of conduct for suppliers, Educata established a sustainable agriculture farming system and issued guidelines for usage of recycled packaging material. The code of conduct together with the “Educata certification” plays a larger role for business awarding, more than other industry-wide certifications such as ISO 14000.

 The supply chain for VT was recently reduced from 15 to 10 T1 suppliers. The majority of suppliers are located in Southern Europe, a smaller fraction in the US and China. Each supplier sources raw vegetables from approx. 100 to 300 farmers. Next to consolidating purchasing volume, a major reason for cutting down the number of T1 suppliers is to gain more control over the supply chain. At the same time, there is also an ongoing consolidation at the farmer level. For VT, Educata applies high sustainability standards concerning the use of pesticides that go beyond formal EU requirements. In order to improve understanding on the product itself and its final manufacturing processes, Educata regularly invites its key suppliers (4-5) to its facilities and visits the fields of the top farmers with them. The aim is to encourage a holistic understanding of the origin of the products, their final processing and the particular importance of agricultural processes:

“(…) we and [Educata] are very aware of the importance of the field. When [Educata] came here last time, (…)[the CPO] came and the first thing with him was to go to the field. We went to the fields to see things there, to feel the field (…).” (VT, first tier, sales).

 Some activities directly involve the T2 level. Educata employs a team of agricultural specialists with some of them being especially dedicated to tomatoes. During the crop season, Educata’s buyers regularly visit the field to “not loose contact with the farmers”. If a sourcing decision for a new supplier has to be made, Educata audits the agricultural practices of the farmers directly. Educata also conducts regular meetings with their T1 suppliers where sustainability issues are discussed:

“(…) [sustainability] is part of our supplier performance management program with our key suppliers. So yes, it is discussed with them at least every three to four months (…).” (VT, Educata, purchasing)

“It’s quite common to have people from [Educata] in our factory working side by side with our technicians, doing tests and experiments during crop season (…), it’s also common to have them here, fine-tuning recipes and working on the packaging. But not only on this, as I said, logistics, for instance, has a big weight (…). We have a lot of [products] shipped from here from our factories to theirs in containers in ships and we find together a way to put one extra plastic bin in each container. That not only saves money but it means that less containers have to travel from Portugal to the UK (…). Ideas can come from our side or from our customers’ side and then we work together. (VT, first tier, sales)

Educata considers VT an already well-developed supply chain where the company benefits from the long experience with the implementation of sustainability standards:

“[VT] is probably a bit better on our portfolios, we’re really deep into the supply chain for [VT] so we know quite a lot about the [VT] supply chain (…) [even down to] our T2 supplier.” (VP, purchasing manager)

 A comprehensive field book documents T2 suppliers’ activities on sustainability indicators such as the type of seed or amount of water used. Audits for compliance with the field book are conducted by the T1 supplier for its own farmers 3-4 times a year as well as a soil and water analysis once a year. Educata only checks the field book in case of irregularities and the T1 supplier can be made accountable for incomplete or false information from the second tier.

=== Insert Figure 3 about here ===

Although the purchasing spend for metal cans is high within the packaging portfolio of Educata, the supply chain for MC is highly consolidated with 5 suppliers and approximately 10 T2 suppliers (i.e., metal foil). The reasons for this are the high requirements regarding specifications for the size, can ends, and thickness of the product that only few suppliers are able to fulfill. The supply base is now entirely located in Europe. Collaboration for improving sustainability mainly takes place between Educata and its T1 suppliers. For example, the R&D department of Educata involves direct suppliers to reduce the thickness of metal cans through different development projects.

Most of the T2 suppliers’ sustainability initiatives seemed to be triggered by customer requests (i.e., T1 supplier). For example, T1 suppliers conduct regular “life cycle analysis” together with the second tier for selected product categories. Although there is no direct interaction between the second tier and the buyer, the second tier was informed quite well about the sustainability requirements of the buyer through the metal processing firm (i.e., the first tier). As the supply chain is highly consolidated, the buyer knows the T2 supplier base well and any change of second tiers by the first tier needs official approval from Educata.

=== Insert Figure 4 about here ===

**Integris**: The apparel industry went through a substantial outsourcing wave that entailed offshoring parts of production to Asian and South American countries over the last decades while facing rising customer attention on environmental and particularly – at times inhuman – working conditions at production sites in emerging countries. Triggered by the latest incidents in the industry (such as the recently discovered sweat shop conditions at Zara’s Brazilian subcontractor Aha), Integris has raised its social requirements for suppliers as codified in the new version of its supplier code of conduct. Integris developed a comprehensive scorecard, which sets clear targets such as a 50% increase in the use of sustainable material by 2015. Integris explicitly follows sustainability targets that consist of measures for environmental friendly manufacturing and “social sustainability”.

In the CL supply chain, Integris sources fabrics from 70 suppliers of whom 12 are considered key suppliers with 10 of them located in emerging markets. The number of T2 suppliers is estimated to be as high as 28,000. The FW supply chain is slightly less complex with 20 T1 suppliers of whom 5 are considered key suppliers with all of them based in emerging markets. The number of second tiers is approximately 8,000.

Integris sets well-specified sustainability targets in both extended supply chains and there is a clear idea about the driving role of the buyer:

“I think the initiative has to come from us. We have to say exactly what we want. And this is the way it works in many areas of supplier management where we say, as the brand, what we expect from our suppliers. And suppliers should actually be thankful about this and act according to our expectations.” (FW, Integris, purchasing)

In FW, we found the resulting targets to be the most concrete, specifying, for example, KPIs on allowed energy consumption per produced item. To monitor compliance with these targets, Integris established a regular reporting structure:

“(...) we monthly track (…) three KPIs to which we particularly pay attention. Energy usage per produced shoe, that is kilo-watt hour per shoe, and then how much water has been used, that is liters per shoe and how much waste has been produced per shoe (…).” (FW, Integris, purchasing).

These KPIs were initially set-up for FW but subsequently also implemented in CL. Integris conducts frequent audits by checking the T1 supplier’s books and conducts confidential interviews with the T1 supplier’s employees about working conditions (CL, Integris, purchasing). However, auditing does not stop at the level of the first tier and involves also production sites of T2 suppliers, even though to a lesser extent. For FW, Integris conducts about 400 audits per year, covering about 40% of its T1, 20% of its T2, and 40% of its T3 suppliers in 2010. For CL,Integris had audited about 80% of their T1, 50% of their T2, and about 10% percent of their T3 suppliers. As a full auditing of all suppliers is not considered feasible, the company’s focus lies on major suppliers (in terms of purchasing volume) with whom long-term relations exist. An unfavorable audit of a supplier does not result in an immediate termination of the relationship but calls for rapid improvements on the part of the supplier:

„If a supplier gets a ‘B-‘rate from us, he will immediately receive a corrective-action list, and we allow him 3-6 months to work on it. Then we perform a re-audit and if we find out that not much has changed we will stop sourcing from that supplier. If we see significant improvements, then he will be upgraded from ‘B-‘ to ‘B+’ and we can continue our business relationship.“ (FW, Integris, purchasing)

Next to setting and monitoring concrete targets, Integris controls the extended supply chain by not only selecting T1, but also T2 suppliers directly.

These highly contractual forms of supplier governance are complemented by more relational ones. Integris’ purchasing managers recognize the importance of supplier training and the need to create a mutual understanding about the importance of sustainability. For example, Intergris offers trainings to its major T1 suppliers on topics such as waste reduction, energy efficiency or gender equality, and standardized reporting according to the GRI (Global Reporting Initiative) standard. As GRI is a worldwide recognized sustainability reporting standard which also includes aspects of the T1 supplier’s upstream supply chain. Integris ensures the implementation of similar reporting structures throughout its supply chain.

=== Insert Figure 5 about here ===

**Cross Case Analysis**

After having described the relevant characteristics of each case, we compare two levels of analysis between cases (i.e., direct relations between and T2, indirect relation between buyer and T2 through vertical supplier-supplier management). In line with our theoretical framework we use descriptors such as “collaboration” or “assessment” governance to capture the characteristics among partners within MSC, as summarized in table 2.

=== Insert Table 2 about here ===

**Buyer-T2 relationship:** Due to its indirect nature, the relationship between buyer and T2 is not as highly developed as the one between buyer and T1. The only direct form of direct interaction with the T2 we identified were the two apparel cases where Integris takes a full control approach by not only managing its T1 but also T2 directly. The approach taken by Integris can best be described as “assessment” as the buyer formulates specific KPIs at the level of the single product (e.g., water usage per item) for the T2. Such highly formalized sustainability targets are easier to implement and monitor as they do not require that the T2 possesses an in-depth understanding of sustainability in the overall production process. As the same time, they allow for only little flexibility and do not take the specifics of each supplier’s production context into account. Integris also directly selects and audits T2 suppliers.

**Buyer’s influence on the T1-T2 relationship:** Of particular interest to us was which role the buying firm assigned to the T1 supplier regarding sustainability management of the T2 supplier. In the case of Sequenzia DP and Educata MC, the buyer heavily relies on the T1 and fully delegates sustainability train and monitoring responsibilities. Next to a high level of trust between the buyer and T1, this approach requires a high level of “sustainability management capability” on the part of the T1 supplier. In the case of Sequenzia DP we observed that the T1 was able to “translate” agricultural codes (which the buyer can only formulate at a more general level for the whole supply chain) by specifying them for its T2. This requires that the T1 possesses a more in-depth understanding of the T2’s agricultura processes; buyer’s manufacturing processes as well as buyer’s sustainability targets. These cases can be more described as a “traditional” supply chain management approach (or Open MSC) where the buyer fully delegates responsibility for both sustainability teaching and monitoring to the T1 (without instructing the T1 on how to management the T2) and there is no interaction between buyer and T2 as a result.

In the Educata VT supply chain the T1 suppliers do not seem to be as advanced, yet, to teach sustainability standards independently to the farmers. Here, Educata undertakes great collaborative efforts to train their T1 suppliers with respect to sustainability by inviting them on-site, and, most importantly, visit the fields of the farmers (i.e., T2) together with them to analyze farmers’ processes.

Another interesting approach could be observed in the Sequenzia TB supply chain. Here the supply chain is highly fragmented with a vast number of very small T2 suppliers. In order to implement sustainability by certifying all farmers, Sequenzia has developed a collaboration approach with a selected T1 over time and provides it with the necessary knowledge and financial resources to carry out sustainability trainings for the T2. However, monitoring is done by an independent third party who will also grant certification. By splitting the responsibility for teaching and monitoring for sustainability, the buyer establishes a double-control mechanism.

**Archetypes of Managing Indirect Ties:** As a result of our cross case analysis, we came up with three archetypes of managing indirect ties in the context of sustainability implementation. One author identified an additional fourth archetype but after discussing it, we consensually decided that this is not a distinct but a variation of one of the other archetypes. Table 3 summarizes our results.

=== Insert Table 3 about here ===

**DISCUSSION**

A central insight that can be gained from our study is that the T1 supplier can and does indeed play a crucial role in promoting a buying firm’s sustainability standards at lower tiers of the supply chains. With growing complexity of the extended supply chain, and divergence of sustainability standards in developed and emerging countries (Jamali & Mirshak, 2007), delegation of sustainability responsibility to the T1 may in fact be the only viable strategy for buying firm’s with global value chains (Gereffi et al., 2005). Different to the “traditional” approach, however, where the buyer “blindly” delegates all responsibilities of managing lower tiers to the T1 and risks loosing control over the supply chain (Choi & Lintonn 2011), the *“full delegation*” archetype takes place in a highly instructed manner and requires collaborative governance between a buyer and the T1. Another important prerequisite for this archetype is, however, that the level of sustainability management capability of the T1 supplier is already highly developed so that he can be entrusted with these responsibilities. We can thus propose for our first archetype:

*P1: Through a full delegation archetype the buyer can implement sustainability in the multi-tier supply chain when there are high levels of trust and collaboration between buyer and T1 and a high level of sustainability management capability of the T1.*

Our second archetype, the *mixed delegation* archetype, is characterized by the delegation of sustainability teaching responsibilities to the T1 supplier which is, however, complemented by direct monitoring of T2 suppliers through the buyer or a third party. In the cases of TB and VT, T1-suppliers are partly located in developing countries and their capability for sustainability management seems to be generally lower. Even more than the full delegation archetype, the mixed delegation archetype requires a collaboration approach between buyer and T1, as the T1 requires more support and training before it can carry out sustainability implementation independently. A lower degree of sustainability management capability at the T1 level is most likely also the reason why the buyer does not (yet) assign auditing tasks to the T1 supplier. We, thus, propose:

*P2: A mixed delegation archetype requires higher levels of collaboration approach between buyer and T1 and will most likely occur when sustainability management capabilities of the T1 are less develop, yet.*

The third archetype, which we labeled *zero delegation,* occurs when case the buying firm maintains full responsibility for teaching and monitoring sustainability of its indirect tiers. It is foremost practiced for low cost country sourcing where sustainability maturity of the T1 suppliers is less developed and risks of non-compliant behavior of suppliers are high. In these cases the buyer directly implements and monitors sustainability practices at both the T1 and T2 level. The two cases (CL and FW) in our sample where we could observe this intense form of direct involvement at the T2 level seems to go in line with an assessment form of governance in both the buyer-T1 and the buyer-T2 relation.

*P3: A zero delegation archetype will be applied when sustainability management capability is low at the T1 level, risks of non-compliance is high, and when the buyer takes a strong assessment approach in the MSC:*

 It can be concluded that a zero delegation archetype is associated with the lowest loss of buyer’s control over the supply chain and can, thus, result in a high level of sustainability implementation along the extended supply chain if the buyer formulated well-specified and measurable targets that are regularly audited. This archetype will, however, result in high costs for the buyer and is less likely to improve sustainability management capability of the T1 suppliers in the long run. The mixed-delegation archetype might be more effective in building up T1’s sustainability management capability and might ultimately allow a shift to a full delegation archetype. The advantage of a full delegation approach can be seen in a higher flexibility in sustainability implementation. As T1 suppliers are in direct touch with the T2 they will be better able to specify sustainability targets for each context and detecting any irregularity in T2’s processes. It is important, however, that high level of trust and collaboration exist between buyer and T1 to avoid loss of supply chain control as in the traditional, Open MSC approach.

**CONCLUSION**

The topic of sustainability in supply chains has attracted many researchers (e.g., Linton, Klassen, & Jayaraman, 2007; Srivastava, 2007; Vachon & Klassen, 2006; Zhu & Sarkis, 2004; Zsidisin & Siferd, 2001) but its analysis in multi-tiersupply chains – involving also the management of indirect suppliers – is in a nascent stage. We contribute to this stream of literature by identifying three different archetypes of a buying firm’s management of indirect supplier relations in the context of sustainability implementation. In particular, our study contributes to theory building in this area by providing testable propositions on the relationship between these archetypes and their antecedents.

 Although our insights are derived from field work in the context of sustainability implementation, we also wish to make a contribution to the evolving concept of multi-tier supply chains (Mena et al. 2013; Christopher & Peck, 2004; Harland et al. 2005 ) by adding a stronger supply chain governance perspective (e.g., Choi & Hong, 2002; Pilbeam, Alvarez, & Wilson, 2012). Moreover, we seek to contribute to the discussion on triadic relations (e.g., Lazzarini, Miller, & Zenger, 2008) and horizontal supplier-supplier relations (e.g., Wu et al., 2010; Choi et al., 2002; Wu & Choi, 2005; Wilhelm, 2011), in particular, by emphasizing the need to also manage *vertical* supplier-supplier relations. Although our focus was on sustainability, our three archetypes can also be generalized to other areas where codes, norms and practices are sought be implemented in multi-tier supply chains. Particularly we think of mechanisms which incur a high level of uncertainty such as models of financial supply chain management or supply chain risk management which requires upstream suppliers to invest for benefits which might only emerge at a different stage of the supply chain.

Beyond these theoretical contributions, our study also bears some practical implications. Whereas purchasing managers very often possess a very clear idea of the number of first-tier suppliers, the number of second tiers is either unknown or can still only be roughly estimated. When the supplier base is located in geographically distant – and more often than not emerging – countries, the difficulties of managing these indirect supplier relations further increases. However, our case studies also showed that there are viable approaches for buying firms to deal with the complexity of their supply chains when they choose supply chain governance mechanisms that assign a more responsible role to the first tier. Even if sustainability maturity of the first tier is not sufficiently developed, yet, out cases show that buyers can systematically develop their T1 suppliers towards conducting implementation and auditing tasks. In this respect, the archetypes developed in our study can also be interpreted as a sequential development model of the process of sustainability implementation in the multi-tier supply chain. In cases of low sustainability management capabilities of T1 suppliers, a zero delegation model seems most appropriate as it allows for higher levels of supply chain control and requires lower investments in buyer-supplier relations. Buying firms should, however, try to build up collaborative relations with (selected) T1 suppliers to develop their sustainability management capabilities. Initially, this might be complemented by monitoring and training indirect tiers directly. At a more advanced stage, when the T1 supplier is capable of managing sustainability at its T2 on its own, the final step would be the move to a full delegation approach by also assigning monitoring tasks to the T1.

**Limitations and future research**

As every study, this study has a number of limitations to be noted. First, considering the newness of the topic, both in a theoretical and empirical sense, we have taken a strong explorative approach to identify different archetypes of managing indirect ties. For this purpose, we did not focus on a particular industry or geographical region but purposefully sampled Western MNEs from different industries with global value chains. However, practices related to sustainability are likely to differ between industries. First, industries can be exposed to different levels of consumer, government and NGO pressure regarding sustainability in their supply chains. For example, high customer awareness for sustainability and reputation risks of recent incidents have led to a tight control (i.e., zero delegation) approach whereas other industries such as pharmaceutical have only recently increased their sustainability efforts. In this study we have mainly focused on antecedents within the multi-tier supply chain but future studies should also take such external effects stronger into account.

Second, different “types” of sustainability might be relevant for an industry. Whereas the apparel industry is more concerned about labor conditions, and the social dimension of sustainability, the food industry might care more about environmental sustainability. Implementing and monitoring rules against the use of child labor might differ from improving guidelines for the use of pesticides in agriculture or carbon footprint, for example. Whereas the latter is more easily detectable (for example, by analyzing samples of the end product to detect pesticides misusage), non-compliance in labor regulations is only detectable in the process, not in the product itself. This might be another reason why buyers are less likely to give away control over their supply chain and entrust their T1 with more sustainability responsibility. In this study we have defined sustainability rather broadly and we did not take these differences into account a priori. We propose that future studies should take a more focused approach here and investigate whether an emphasis on social or environmental sustainability is likely to lead to different strategies in the management of indirect ties.

Finally, we focused our investigation on the buyer-T1, T1-T2, and buyer T2 level to explore our concept of extended supply chains. As such, our study constitutes a major advancement vis-à-vis previous research in this field that is empirically restricted to the dyadic buyer-T1 relation when, in fact, “supply chains” constituted the actual level of analysis (see also Gimenez & Tachizawa, 2012). However, incorporating the T2 level as we did in this study turned out to be an empirical challenge in terms of geographical and language barriers. However, a true investigation of multi-tier supply chains should nevertheless not shy away from such attempts and ideally also include third tier suppliers and beyond.

Another simplification we made use of in our study is that each investigation of a “multi-tier supply chain” was represented only by one firm at each level of the supply chain. In each of our cases, however, the buying firm is sourcing from more than one T1 and T2. It would thus be interesting to take the “overall” strategy for managing indirect suppliers for a certain product category more into account and investigate whether a mix of different archetypes occurs within one supply chain for a product category. We tried to overcome this limitation when we asked buyers explicitly to describe their approaches with all their suppliers. However, our data collection along the supply chain became increasingly narrower when we moved upstream. The explicit consideration of “portfolio” strategies of combining different archetypes of managing indirect suppliers might constitute another fruitful area for future studies.

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**TABLES**

**Table 1: Case overview**

**Table 2: Cross case comparison**

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**Table 3: Summary of extended supply chain archetypes**

|  |  |  |  |
| --- | --- | --- | --- |
| **Archetypes** | **Applicable cases**  | **Multi-tier supply chain management** | **Antecedents on buyer-T1 level** |
| Full delegation | Sequenzia DPEducata MC  | Both teaching of sustainability standards as well as monitoring tasks are delegated to T1. Almost no direct interaction between buyer and T2.  | Highly developed sustainability maturity of first-tier supplier. Buyer-T1 relationship most likely to collaborative. |
| Mixed delegation  | Educata VTSequenzia TB | Buyer teaches T1 and T2 in parallel, monitoring is delegated to T1 but conducted directly in case of irregularities or first time sourcing. | Moderate level (i.e., developing process) of sustainability maturity of first-tier suppliers.Buyer-T1 relationship most likely to be collaborative. |
| Zero delegation | Integris CLIntegris FW | Buyer teaches and monitors sustainability targets directly to both T1 and T2. | Low level of sustainability maturity of first-tier suppliers.Buyer-T1 relationships most likely to follow assessment approach.  |

**FIGURES**

**Figure 1: Management of indirect tiers of Sequenzia DP**



**Figure 2: Management of indirect tiers of Sequenzia TB**



**Figure 3: Management of indirect tiers of Educata VT**



**Figure 4: Management of indirect tiers of Educata MC**



**Figure 5: Management of indirect tiers of Integris CL/FW**

