The role of supply chain leadership in the learning of sustainable practice:
Toward an integrated framework

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Abstract

Sustainable supply chain management (SSCM) is a topic that has become increasingly important in recent years. However, very few papers focus on studying SSCM from both leadership and learning perspectives. In this research, we carry out a content-based literature review on the intersections of Supply Chain leadership, Supply Chain Learning and SSCM; we propose a conceptual framework on how focal companies assuming a leadership role initiate and disseminate sustainable practices in their supply chains. Three types of sustainable supply chain management (SSCM) strategies (i.e., reactive, contributive and proactive) have been identified in this research based on four dimensions of SSCM governance, supply chain learning, supply chain leadership and SSCM performance. It is argued that two new constructs of supply chain learning and supply chain leadership are an integral part of the SSCM conceptual framework developed from the literature and have significant implication to our understanding of SSCM.

Keywords: sustainable supply chain management, supply chain learning, supply chain leadership, multinational corporations, content-based literature review

1. Introduction

Sustainable supply chain management (SSCM) has garnered much attention from academia and practitioners alike in the last ten years. The widely cited paper by

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Seuring and Muller (2008) is probably the first comprehensive review of this body of literature and identifies the triggers of SSCM to be reputational risk, which can be mitigated by applying strict supplier evaluation/assessment processes. A more recent review by Sarkis *et al.* (2011) categorizes and reviews green SCM literature under nine broad organizational theories, with special emphasis on investigating the adoption, diffusion and outcomes of green supply management practices. Winter and Knemeyer (2013) review the intersection of "sustainability" and "supply chain management (SCM)", finding little integration between the two literatures and, consequently, they propose a more holistic and integrated approach.

These reviews show that the existing SSCM literature is primarily focused on building the definitions of SSCM (Carter and Rogers, 2008; Seuring and Muller, 2008); implementation of SSCM practice (Lam, 2011; Walker and Jones, 2012); proposing strategic decisions incorporating SSCM (Harms *et al.*, 2013; Wu and Pagell, 2011); SSCM governance mechanisms (Gimenez and Sierra, 2013; Gimenez and Tachizawa, 2012); and sustainable supply chain analysis framework (Ny *et al.*, 2006; 2008). Based on these reviews, it is suspected that very few focus on studying SSCM from both leadership and learning perspectives (Vachon and Klassen, 2006; Van Hoof, 2014).

Smith *et al.* (2008) provide a case for the PVC industry, which in the late 1990s faced various pressures from stakeholders such as customers, NGOs (e.g., Greenpeace) and legislators who challenged the unsustainable production of PVC. Major PVC producer Hydro Polymers positively responded to these pressures by adopting a systematic approach, The Framework for Strategic Sustainable Development (FSSD; for references, see, e.g., Robèrt et al. 2013), to identify five internal and external challenges for the industry and later developed this into a white paper for fully sustainable PVC design and production. Hydro Polymers disseminated this framework through a semi-distance course delivered by Blekinge Institute of Technology, Karlskrona, Sweden. The key suppliers and customers were trained through this course in which attendees received 7.5 university credits. Based on the shared mental model for systematic planning that this training led to, a cascading

effect of actions and business developments occurred across the supply chain, leading to a 10-year sector agreement: the companies have agreed to embark on a joint venture to eventually comply with the FSSD sustainability principles together.

This case example demonstrates vividly how a company taking an initiative assumes a leadership role in the value chain, disseminating sustainable PVC design and production best practice through the online training as well as other mechanisms e.g., supplier conferences, and eventually creates a new industry standard.

In practice, major Western-based Multi-national Corporations (MNCs) respond proactively to the constraints of scarce resources and environmental degradation, usually claim to integrate sustainability as part of their strategy and tend to assume a Leadership role in their supply chains in order to implement various practices aiming at improved sustainability along with quality, price and reliability (Lam, 2011).

However, among the main streams of SSCM research, it is surprising (due to its prevalence in practice) that the leadership role of MNCs in their supply chain has been ignored by researchers, i.e., the relationship between SC leadership and SSCM practice, with just a few exceptions (e.g., Defee, 2009a). For example, Lai and Wong (2012) found that Green Logistics Management (GLM) success requires the leadership of OEMs, and claim that this is worthy of future investigation. Carter and Rogers (2008) may be the first to call for research to investigate the role of supply chain learning in achieving sustainability i.e., the relationship between SC learning and SSCM. Even less is known on how MNC's leadership in their supply chain has facilitated the supply chain members (both customers and suppliers) to learn and adopt sustainability practice i.e., the relationship between SC leadership and SC learning in the context of SSCM.

The idea that a supply chain competes with other supply chains is not new and there is an increasing body of literature on SSCM. These emerging 'sustainable' practices involve dissemination or learning or knowledge transfer of new ideas throughout a supply chain, and thereby influencing wider networks. For example, Ivarsson and Alvstam (2009) provide a case that Volvo works with its first tier supplier's and disseminate quality management and SSCM practice to sub-tier

Chinese suppliers which benefited all members of the chain. Often, this process is initiated by multinational corporations (MNCs) seeking to apply global standards (see Dyer and Nobeoka, 2000). The purposes of the paper is to develop a framework integrating supply chain leadership and supply chain learning perspectives and attempts to conceptually address the research question:

"How do MNCs assume leadership in how their supply chains learn and adopt sustainability practices?"

The reasons for selecting MNCs are two folds: first, supply chains tend to be global and MNCs have the ability to directly influence their suppliers through product and process specifications, and to impact their customers in both developed and emerging economy contexts through standards and branding, thus expanding their CSR standards and associated best practices to developing countries (Cote *et al.*, 2008). In this sense, global supply chains of MNCs provide a rich context to observe the different mechanisms and constructs e.g., supply chain leadership and supply chain learning. Second, MNCs or focal companies are considered more mature than companies in developing countries in not only SCM, but also corporate social responsibility (CSR) (Lam, 2011); therefore they are more likely to assume leadership in creating or adapting sustainable supply chain practices in a host country. For example, foreign enterprises are in leading positions in sustainability development especially in environmental sustainability and core value services (supply chain sustainability) compared with Chinese companies (A.T. Kearney, 2008).

In the rest of the paper, we intend to use MNCs and focal companies interchangeably. A focal company is defined as "companies that usually 1) rule or govern the supply chain; 2) provide the direct contact to the customer; and 3) design the product or service offered" (Seuring and Muller, 2008: 1699).

This paper will contribute to the investigation of the SSCM literature through new combined lenses of supply chain leadership and supply chain learning. In particular,

the conceptual framework we are proposing could contribute to the SSCM literature in the following ways:

First, it is the first attempt that applies both supply chain learning and supply chain leadership lenses to investigate SSCM, which could potentially generate interesting and fruitful findings. Second, since the supply chain learning research is still at an early stage (Jia and Lamming, 2013), this study could provide a conceptual model for the theoretical development of supply chain learning. Third, leadership of organisations is well researched and understood but there is surprisingly little on leadership of a system or network of organisations (Defee *et al.*, 2010). This research could potentially enrich our understanding of the role of organisational leadership in MNCs' SSCM. Fourth, the research proposes a causal model and three types of SSCM practice adopted by companies based on a content-based literature review and anecdotal case examples for future empirical testing.

This paper is arranged as follows: First, we present our literature review method; then we provide an overview of SSCM, supply chain learning and supply chain leadership and the interface of the three domains. Next we introduce a conceptual model to cover the discussed points; finally, we provide a conclusion to summarize the contribution and make suggestions for future research.

2. Literature review method

To address the research question, a content-based literature review method was performed, in line with Seuring and Gold's (2012) assessment of this as an effective method to examine research work in a systematic way. Content-based literature review applies content analysis tools and may be considered a branch of systematic literature reviews (Jia *et al.*, 2014). The dimensions and analytic categories can be deductive, based on theories, or inductive, based on reviewed material. Due to the limited number of papers on supply chain learning and supply chain leadership, this review mainly applied an inductive approach.

SSCM is the main theoretical debate we would like to engage with. However, considering the large quantity of SSCM research publications and the high quality and

comprehensiveness of SSCM literature reviews, we adopted a selective approach towards the SSCM literature by focusing on previous SSCM literature review papers (by searching "sustainable supply chain" and "literature review" jointly in SCOPUS and Google Scholar with 11 papers found) in order to identify current themes and future trends for SSCM.

The use of the selective approach of literature review is for two reasons: 1) each of these streams (SSCM, learning and leadership) of studies includes many more works than those identified here. A more extensive review for each would detract from the focus of the paper; 2) for each of these streams only the works considered most significant and relevant to the theoretical framework are reviewed.

The literature review on supply chain learning and supply chain leadership was carried out by searching the exact terms of "supply chain learning" and "supply chain leadership" in SCOPUS and Google Scholar initially to capture the most related papers. 12 papers were found for supply chain learning and 16 papers found for supply chain leadership. A number of themes were inductively derived from each. After reviewing these three domains, key words were identified and discussed with fellow researchers. Table 1 lists the key search streams.

Table 1 Literature review searching strings

A. Sustainable related	B. Supply Chain related	C. Learning related	D. Leadership related
sustainable	supply chain	supply chain learning	supply chain leadership
sustainability	supply	organizational learning	organizational leadership
environment	procurement	inter-organizational learning	transformational leadership
environmental	purchasing	inter-firm learning	transactional leadership
green	sourcing	inter-partner learning	supply chain followership
social	supply network	cross-cultural learning	transformational followership
responsibility			
CSR	transport	mutual learning	transactional followership
ethics	transportation	dyadic learning	group leadership
ethical	logistic	alliance learning	unit leadership
closed loop	value chain	joint learning	shared leadership
reverse		cross-border learning	co-leadership
recycling		relationship learning	focal firm leadership
social enterprise		second-order learning	network leadership
		first-order learning	entrepreneur leadership

			trade leadership
			collaborative leadership

Scopus was used to identify the interface papers; it has a broad coverage on management journals and has been used by Hassini *et al*. (2012) and Ahi and Searcy (2013) for SSCM literature reviews, with the results further limited to peer-reviewed articles published in English language journals. Interfaces between supply chain learning and supply chain leadership (i.e., research strings B&C&D), SSCM and Supply chain learning (i.e., A&B&C), SSCM and supply chain leadership (i.e., A&B&D), and SSCM, supply chain learning and supply chain leadership (i.e., A&B&C&D) are identified: the numbers are 1, 60, 16, 0 respectively.

With the limited number on the interface of supply chain learning and supply chain leadership, SSCM and supply chain leadership, and the interface of the three domains, we expanded the scope of the search to include more papers by searching learning and leadership (i.e., B&D), and supply chain leadership (i.e., C&D), which returned 30 and 50 respectively. Together with the previously identified 60 papers on SSCM and supply chain learning, this resulted in a total of 140 papers for review, to which the following 'inclusion' and 'exclusion' criteria were applied (Table 2). There were11 papers identified as relevant, of which six were captured by pervious steps. Finally, five papers were identified in this extended search.

Table 2 Literature review selection criteria

Inclusion Criteria	Exclusion Criteria
organizational learning	individual level learning
peer reviewed English journal articles	books, conference papers, magazines; other languages
management focus	technology, political focus

Eventually, there are 44 papers identified for final review (SSCM: 11 papers; SC learning: 12; SC leadership: 16; extended search: 5). With the 44 papers, we attempt to identify the key themes for each domain and overlapping of domains and at the same time identify the causal relationships between the constructs (i.e., SSCM strategy, SSCM governance, Supply chain leadership, Supply chain learning and

SSCM performance). Eventually, we develop a typology of SSCM strategies based on the four dimensions/constructs and a conceptual framework (i.e., causal relationships between them) for future empirical test.

3. Findings

3.1. Sustainable supply chain management

This section will present the results of the literature review on SSCM, from which four themes were identified: SSCM definitions, drivers and enablers for SSCM, SSCM strategies and SSCM governance mechanisms, and were adopted in this section.

3.1.1 Definitions of Sustainable supply chain management (SSCM)

As a starting point, sustainability was first defined in Brundtland Report as "using resources to meet the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sikdar (2003: 1928) define sustainability as "a wise balance among economic development, environmental stewardship, and social equity". Convergence of supply chains and sustainability is given consideration in recent years: the research areas include corporate social responsibility, sustainable supply chain network, green purchasing strategies, reverse logistics, life-cycle assessment and so on (Linton *et al*, 2007). Growing research interests have shown in the fields of sustainability and SCM with a substantial growth occurring from 2001 onwards (Ashby, 2012). Organizational approaches to sustainability in the SCM vary: some emphasis more on green and environmental issues while others focus more on social aspects according to Walker and Jones (2012).

Seuring and Muller (2008: 1700) integrate the triple bottom line approach of sustainability into SCM and define 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 customers and stakeholder requirements."

Carter and Rogers (2008: 368) emphasize the systematic coordination of the three elements of sustainability and define it as:

"The strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chain."

It can be seen that both definitions attempt to explain the relationship between sustainability and SCM and integrate them. Carter and Rogers's definition is more focused on focal company's perspective while Seuring and Muller one is from supply chain and stakeholder's perspectives. Seuring and Muller's (2008) definition is adopted in this paper.

3.1.2. Drivers and enablers for SSCM

Many papers have discussed the drivers and enablers for organizations implementing SSCM, distinguishing between those that are internal or external (Cheung *et al.*, 2009; Harms *et al.*, 2013; Gimenez and Tachizawa, 2012; Seuring and Muller, 2008; Walker *et al.*, 2008; Walker and Jones, 2012).

Seuring and Muller (2008) emphasize that different groups such as government, customers and other stakeholders have an impact on organizations' supply chain sustainability. The pressures and incentives frequently mentioned are legal demands/regulation, responses to stakeholders, competitive advantage, customer demands, reputation loss, and environmental and social pressure groups.

Among the previous analyses, Walker and Jones (2012) provide the most comprehensive list of factors by taking a literature review approach. Internal factors include people issues, strategic issues and functional issues. External factors include government, competitors, customers, suppliers etc. Based on this classification, four types of companies have been observed:

- "Internally focused" organizations, which are more influenced by internal factors such as level of management commitment and employee involvement.
- "Reserved players" that face more external enablers and internal barriers.
- "Agenda setters" are affected by internal enablers and external barriers.
- "External responders" face more external influences, such as government, customer and NGO pressure.

Among all these factors, the key enablers are customer requirements, reputational risks, internal factors and stakeholder involvement (Walker and Jones, 2012).

Gimenez and Tachizawa (2012) further distinguish drivers and enablers and claim that a driver is a factor that initiates and motivates firms to adopt SSCM, and an enabler is a factor that assists firms in achieving these sustainable practices. They conduct a review particularly of enablers and similar to Walker and Jones (2012) separate internal enablers and external enablers, based on firms' boundaries (Gimenez and Tachizawa, 2012). Internal enablers include a firm's environmental commitment, senior or top management support, the availability of resources, the strategic role of the purchasing function, the development of supply management capabilities of purchasing personnel, the role of the project leader and appropriate performance measurement systems. External enablers from a supply chain relationship perspective are trust, national culture, logistical and technological integration and clarity of objectives.

According to Seuring and Muller (2008) and Harms *et al.* (2013), these drivers and enablers influence organizations' sustainable supply chain strategies which we address in the following review.

3.1.3. SSCM strategies

Seuring and Muller (2008) identify the triggers for SSCM and propose two SSCM strategies: supplier management for risks and performance, and supply chain management for sustainable products. Harms *et al.* (2013) further develop these two SSCM strategies into risk-orientated strategy and opportunity-orientated strategy. Risk-orientated strategy is considered more reactive to pressures from stakeholders

and focuses on avoiding SSCM risks. On the contrary, opportunity-orientated strategy is more proactive to SSCM opportunities and aiming to be innovative and to develop sustainable products (Harms *et al.,* 2013).

Van Tulder *et al.* (2009) develop a classification of CSR approaches to identify four types of sustainable supply chain strategies on implementing codes of conduct: inactive, reactive, active and proactive. Inactive and reactive strategies have a low level of compliance of codes because these companies mainly focus on efficiency and primary stakeholders; active and proactive strategies have a high level of compliance of codes because they are driven by ethical values and virtues and the requirement of active stakeholder involvement (Van Tulder *et al.*, 2009).

Closs *et al.* (2011) distinguish three types of supply chain sustainability: reactor, contributor and innovator, each of which could be viewed as a SSCM positioning strategy. Reactor firms comply with laws and regulations, and make few efforts beyond compliance; contributor firms recognize SSCM as strategically important and take more proactive initiatives: they benchmark within or across industries to identify potential approaches and collaborate with suppliers and less frequently with customers. However, these initiatives are normally not their creation; innovator firms see SSCM as a strategic priority and a long-term investment, eagerly seeking best practices by innovation (Closs *et al.*, 2011).

3.1.4. SSCM governance mechanisms

Raynolds (2004: 728) defines governance as "the relations through which key actors create, maintain, and potentially transform network activities". Traditionally price, hierarchy and social mechanisms are used to describe SCM governance (Adler, 2001). 'Price' refers to utilizing competition between suppliers in the market to steer the relationship, 'hierarchy' refers to customer use of authority in the relationship and application of hierarchical structures and processes to the business relationship and 'social' refers to trust, open interaction and a feeling of a shared destiny (Kohtamaki, 2010).

Organizations have developed different governance mechanisms to draw suppliers

into sustainability-related practices (Gimenez and Tachizawa, 2012). In the SCM literature, these activities are also known as supplier development. Krause *et al.* (1998) list several different supplier development practices, including 1) supplier assessment; 2) providing suppliers with incentives to improve performance; 3) instigating competition among suppliers; and 4) working directly with them with training or other activities.

Rao (2002) points out that the extension of sustainability to suppliers is widely adopted by industries but the extent and mode of implementation differ significantly. Vachon and Klassen (2006) classify these practices into environmental monitoring (inspection and risk minimization) and environmental collaboration (mutual problem-solving). Gimenez and Tachizawa (2012) summarize them into assessment (evaluation of suppliers, such as assessment questionnaires, CSR audits, social impact assessments, site inspections/audits) and collaboration (working with suppliers directly, such as providing them with visits, training and joint efforts).

In a similar vein, Pagell and Wu (2009) summarize two best practices as certification and collaboration. Certification applies to a few practices which embrace social issues such as child labor and unsafe working conditions (Pagell and Wu, 2009). Collaboration with suppliers and customers is essential for driving environmentally sustainable practices (Carter and Carter, 1998; Zhu and Sarkis, 2004); incentives are needed to reduce suppliers' risks when adopting these collaborative processes (Goodman, 2000); so focal companies need to educate their suppliers and have their suppliers educate each other (Rao and Halt, 2005). In a SSCM context, Van Hoof and Thiell (2014) argue that collaboration theory highlights collective problem solving by means of innovation and aims at confronting complex problems that exceed the capacity of individual firms.

Elaborating in more details, Beske *et al.* (2014) propose that SSCM mechanisms are becoming more and more complex and summarize SSCM practices into five types: *strategic orientation* underpinned by SCM and triple bottom line; *supply chain continuity* (long-term relationship, partner development and partner selection); *collaboration* (joint development, technical integration, logistical integration and

enhanced communication); *risk management* (individual monitoring, pressure group management and standards and certification); and finally *pro-activity* for sustainability (learning from suppliers, stakeholder management, innovation and life cycle assessment). This five-fold typology thus identifies and usefully re-categorizes SSCM practices that can be linked to different constructs in SSCM literature. *Strategic orientation* toward sustainability is related to SSCM strategy. *Supply chain continuity* and *risk management* are used interchangeably in SC risk management literature and is closely related to Harms *et al.'s* (2013) risk avoidance orientated SSCM strategy. The detailed practices proposed under these two are not dissimilar to the governance mechanism of 'assessment'. *Collaboration* bears the same meaning and refers to practices often categorized as governance mechanisms. *Pro-activity* includes some collaboration and SSCM best practices and may be considered as outcomes of SSCM governance mechanisms.

Linking SSCM strategy to governance mechanisms, Gimenez and Sierra (2013) further propose that as SSCM strategy moves towards proactivity, the level of supply chain governance mechanisms (e.g., from supplier assessment to collaboration with suppliers) increases. So the higher the proactivity, the more likely organizations implement both mechanisms (assessment and collaboration) and the better the environmental performance.

3.2. Supply chain learning

To survive in fierce competition, organizations need to gain learning abilities (Hult *et al.*, 2000b). Most previous literature outputs on organizational learning focused on an individual or intra-firm level, while some authors pay attention to inter-firm and network levels (e.g., Bessant *et al.*, 2003). After defining supply chain learning, three themes emerged from the reviewed papers: supply chain learning processes; antecedents, enabling and constraining factors; and outcomes of supply chain learning, each of which are discussed.

3.2.1. Definitions of supply chain learning

Supply chain learning derives from inter-organizational leaning, which addresses how organizational members act jointly to create collective knowledge (Mariotti, 2012). It is a process through which network actors learn to collaborate and share and create knowledge (Mariotti, 2012), which suggests analysis at three levels: dyad, supply chain and network.

Bessant and Tsekouras (2001) are among the first to review learning at a network level. By learning network they mean "a network formally set up for the primary purpose of increasing knowledge" (Bessant and Tsekouras, 2001: 88). Such networks are formally established and defined in a way that they have a primary learning target; they are structured with boundaries; processes can be mapped on learning cycle (experience, reflection, concept formation and experimentation (Kolb and Fry, 1975)) and with measurement providing feedback for any future formal arrangements. Supply chain network is one of these networks (Bessant and Tsekouras, 2001).

Bessant *et al.* (2003) refer 'supply chain learning' to learning behaviours in an inter-organisational context, observing that, despite a growing interest in inter-organizational application of such principles, research literature had focused on intra-organizational learning. Later, Flint *et al.* (2008: 274) provide a formal and broad definition for supply chain learning: "Multiple supply chain partners engaged in interaction where learning occurs and is focused on supply chain issues and solutions." Comparing the two definitions, one can find that Bessant *et al.* (2003) focus on inter-organisational or dyadic learning of best practices from both buyer's and supplier's perspectives, while Flint *et al.* (2008) focus on supply chain partners learning of supply chain issues and solutions i.e., beyond dyads.

Building on Bessant *et al*. (2003) and Flint *et al*. (2008) definitions, adopting an Extended Resource Based View (ERBV) and providing empirical evidence from a China-West supply chain relationship context, Jia and Lamming (2013: 549) redefine inter-firm or dyadic learning within a supply chain context as: "A dyad of buyer-supplier engaged in interactions learning jointly or from each other about supply chain issues and solutions with the aim of increasing relational rents or inbound spillover rents or both."

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3.2.2. Processes of supply chain learning

According to Argyris and Schon (1996) organizational learning can be divided into single-loop learning and double-loop learning. Single-loop learning implies simple, adaptive responses that do not affect underlying values or structures which are called mental models by Senge (1994). Double-loop learning involves new ways of solving problems and new core values. In short, single-loop learning is within the existing framework while double-loop learning questions, challenges and changes the framework. Unlike some organisation-scale theories (e.g., Senge, 1994), the single/double loop learning construct can readily be applied to collective learning at any scale, including supply chains and networks.

Grounding their work in innovation literature, Bessant *et al.* (2003) divide supply chain learning into three phases. The first phase is 'set up' which is for establishing a set of procedures to promote supply chain learning. The second phase is 'running' or 'operating', to translate the procedures to routines and norms which govern the behaviour between and within firms. The final phase is 'sustain', dealing with management processes for the needs of continuous learning such as measurements and benchmarking.

3.2.3. Antecedents, enabling and constraining factors of supply chain learning

Spekman *et al.* (2002: 42) suggest that learning is a key component of supply chain competency, where a supply chain can be seen "as a vehicle for gathering knowledge and learning" and identify six factors influencing supply chain learning. The first is trust and commitment. "Trust is the belief that one's partner will act in a predictable manner, will keep his/her word, and will behave in a way that will not negatively affect the other" while "commitment is simply one partner's willingness to devote time, energy, and/or resources to the alliance" (Spekman *et al.*, 2002: 44). The second is communications in that the frequency, depth and content of information will impact the effect. The third factor is relationship type amongst supply chain members. When the relationship is more informal and people co-mingle, knowledge transfer tends to

be more frequent and deeper. The fourth factor is decision-making style: flexible, adaptive and open organizations are more conducive to learning. The fifth factor affecting partners' ability to learn is the company's culture, ideally open to continuous learning, encouraging questioning behaviors, rewarding those who work to improve quality and allowing transparency of information acquired through partners.

Hult *et al.* (2003: 544) and Thakkar *et al.* (2011: 318) summarise four antecedents for supply chain learning in a supply management context: team orientation; systems orientation; learning orientation and memory orientation: 1) Team orientation is defined as the degree to which the members of the focal supply management unit stress collaboration and cooperation in performing supply management activities and in making supply management decisions; 2) Systems orientation is defined as the degree to which the members of the focal supply management unit stress the interconnectedness and mutual dependence of the activities in the supply management process; 3) Learning orientation is defined as the degree to which the members of the focal supply management unit stress the value of learning for the long-term benefit of the supply management system; and finally, 4) memory orientation is defined as the degree to which the members of the focal supply management unit stress the distribution and preservation of supply management knowledge."

Team orientation is similar to the team learning discipline of Senge's (1994) five disciplines, which indicates that it starts with dialogue, the capacity of members of a team to suspend assumptions and enter into genuine thinking together.

3.2.4. Outcomes of supply chain learning

Hult *et al.* (2003) argue that learning among supply chain members may be seen as a strategic resource which provides a bonding effect to enhance a supply chain's success. The four antecedents collectively contribute to the creation of a strategic resource which further leads to ten sub consequences in four categories consisting of *learning consequences* including information acquisition, knowledge distribution, information interpretation and organizational memory; *supply management consequences* including relationship commitment and customer orientation;

management consequences including innovativeness and entrepreneurship; and performance consequences including cycle time and overall performance (Hult *et al.*, 2003).

Lambrechts *et al.* (2012: 628) summarise five outcomes for in-depth joint supply chain learning which is defined as "building the capacity to create new knowledge and possibilities together through a process where actors can learn collectively how to rethink and renew their supply chain frame". The first outcome is interdependent system optimization and development, improving for example product quality; a second benefit is joint competence development which concerns in-depth joint learning and therefore allows the system to be more adaptable to external changes and complexity; a third benefit is the creation of unique mutual knowledge and expertise; a fourth outcome is whole system awareness concerning how members contribute to each other and foster more mutual understanding; and the last outcome is transforming the essence or identity of the chain, via new goals, policies, business models and norms (Lambrechts *et al.*, 2012).

It can be seen that both indicate supply chain learning can lead to mutual understanding, improved inter-organizational relationships, innovation and improvements in overall performance.

3.3. Supply chain leadership

Leadership has traditionally been studied with an emphasis on the characteristics and behaviours of individuals, and their effects on colleagues and organizations. Leadership is believed to be a key contributor to organizational success and a strategic source of competitive advantages (Bass, 1991; Waldman *et al.*, 2001). Building on individual leadership theory, research on organizational leadership under SCM frameworks has been developed.

Stevens (1989) and Cooper *et al.* (1997) identified leadership and power structure as a key component of SCM. Lambert *et al.* (1998) point out that unless one organization takes the leadership role for strategic supply chain decisions, risk will occur throughout the chain and lead to chaos. Supply chain leaders can be recognized

by their size, economic power, customer patronage, comprehensive trade franchise, or the ignition of the inter-firm relationships (Bowersox and Closs, 1996). This section first distinguish leadership and power in the supply chain, and then focus on other three themes: definitions of supply chain leadership; supply chain leadership styles; and outcomes of supply chain leadership.

3.3.1. Leadership and power in the supply chain

Existing literatures (Cooper *et al.*, 1997; Cox, 2001; Cox *et al.*, 2004; Stevens, 1989) tend not to distinguish power and leadership and sometimes use power as a proxy for leadership. For example, Hall (2000) claims that power can be applied by channel leaders to influence suppliers toward sustainability. Power has been introduced in market channel literatures to describe how any industry is probably dominated by two or three major competitors (Daugherty, 2011). The exercise of power or lack of power can affect the level of commitment of other channel members; however forced participation will encourage exit behavior if given the opportunity (Cooper *et al.*, 1997). Cox (2001) and Cox *et al.* (2004) discuss the different types of power relationships between buyers and suppliers.

However, Ahi and Searcy (2013) stress the voluntary character of SSCM and claim that power may not be able to fully explain proactive SSCM behaviors. Focal companies collaborate with suppliers on SSCM initiatives, in which suppliers may be driven by leader's sustainable vision, a characteristic of leadership (Ahi and Searcy, 2013). Echoing this, Defee *et al.* (2009a) argue that power should not be viewed as the sole source of supply chain leadership; other aspects of leadership should be taken into consideration. Thus, we will focus on leadership at an organizational level in the supply chain context.

3.3.2. Definitions of supply chain leadership

Defee *et al.* (2009b: 69) attempt to distinguish supply chain leadership and supply chain followership, are among the first to define supply chain leadership and may be the first significant empirical study devoted to this research area. Defee *et al.* (2010:

766) further develop the theory and propose a formal definition of supply chain leadership,

"[...] a relational concept involving the supply chain leader and one or more supply chain follower organizations that interact in a dynamic, co-influencing process. The supply chain leader is characterized as the organization that demonstrates higher levels of the four elements of leadership in relation to other member organizations (i.e. the organization capable of greater influence, readily identifiable by its behaviours, creator of the vision, and that establishes a relationship with other supply chain organizations)."

Lockstrom *et al*. (2010: 275) also provide a definition of supply chain leadership based on Northouse (1997) and Yukl (1998) but from individual leaders' perspective,

"[...] the ability to influence one's own organisation and the suppliers' organisations in order to establish and accomplish common goals and objectives."

This definition implies that individual leaders can not only influence their own company but also cross firm boundaries to the supply chain context.

'Supply chain leadership' is thus identified as potentially significant, but is yet to emerge as a distinct field of scholarly research. This is also indicated by the small number of publications and the time period in which the papers were published. Harland *et al*. (2007) concur that there is a dearth of publications and empirical studies devoted to leadership in supply chain domains. The possible explanation is that leadership is a mature subject but a contested discipline (Bolden *et al*., 2011); combined with the complex boundary issues of SCM this makes the research even more complex.

3.3.3. Supply chain leadership styles

Leadership has been variously described as a function of individual traits and behaviours, as a function of collective identity and unconscious needs, or as one of several relationship processes of ordering and influencing (Bolden *et al*., 2011; Grint,

2005). In the more limited literature on supply chain leadership, the majority of papers focus on a transactional and/or transformational leadership styles (Defee *et al*., 2009a, b, 2010; Hult and Nichols, 1999; Hult *et al*., 2000a, b).

Defee *et al.* (2009a, b, 2010) are among the first to apply leadership theory to supply chains, exploring transformational supply chain leadership and transactional supply chain leadership, and going further to distinguish transformational from transactional supply chain followership. Despite the empirical difficulties in distinguishing transactional and transformational behaviours in complex, multi-organisational interactions, Bolden *et al.* (2011) find the conceptual constructs to be useful in characterising some of these relations.

We concur with this assessment and adopt Defee's definition. In a supply chain context, Defee *et al.* (2009b) argue that both transactional and transformational leadership operate via contingent reward and management-by-exception, while transformational leadership more frequently exhibits inspiration, intellectual stimulation and individualized consideration. Contingent reward indicates that followers will be rewarded on their expected performance, management by exception implies that leaders point out followers' mistakes and take actions when needed (Bass and Avolio, 2000).

Defee *et al.* (2009a) explain inspirational behaviour as an articulation of a collective mission; a vision of desirable futures and the definition of the path to achieve the vision. Intellectual stimulation occurs where leaders call on followers to be more innovative and creative to provide better solutions to problems. Individualized consideration refers to a leader's ability to recognize each individual follower's unique skills and development needs. Transformational leaders focus on developing long-term relationships and do not seek to control followers' behaviour through the use of contingent rewards, but manage in a more holistic way (Avolio *et al.*, 1988; Bass, 1985).

3.3.4. Outcomes of supply chain leadership

Harland *et al.* (2007) argue that the fact that downstream larger businesses don't

assume supply chain leadership poses a barrier for SMEs adopting e-Business (information technology based business). Defee *et al.* (2009a) claim that transformational supply chain leadership moderates the relationship between sustainability drivers and closed-loop supply chain orientation. Transformational leadership is also found to positively influence organizational learning (Hult *et al.*, 2000b). There is also positive relationship between transformational leadership and organizational performance such as purchasing cycle time (Hult and Nichols, 1999; Hult *et al.*, 2000b), efficiency and effectiveness (Defee *et al.*, 2009b; 2010). Brown *et al.* (2008) apply a situational leadership model i.e., how empowered a workforce is and how expertise is distributed in a contingency model to inform the selection of different leadership styles which in turn determines continuous improvement strategies e.g., lean or six sigma for the medical devices/equipment sector.

3.4. Interfaces of the three domains

After reviewing the above three domains individually: SSCM, supply chain learning and supply chain leadership, this section will focus on the interfaces between them. Five papers discuss supply chain learning and supply chain leadership, four on SSCM and supply chain learning, two on SSCM and supply chain leadership and finally we found no paper on the overlapping of the three.

3.4.1. Interface of supply chain leadership and supply chain learning

Hult *et al.* (2000b) find that transformational leadership has a positive effect on organizational learning by corporate buyers and internal users in purchasing management, which further has a positive effect on information processing capability and the reduction of the cycle time of purchasing processes.

Bessant *et al.* (2003) also emphasize the importance of the leadership role, finding that even if the leader does not attend to detailed discussions, their appearance has a positive effort on other members in buyer-supplier interaction context. Leaders will be more positively assessed if they can learn from other members (mutual learning). However, the leadership role may change over time since at the 'sustain' stage of

supply chain learning, members may need to share the leadership role, e.g., be responsible for their own direction and alignment (Bessant *et al.*, 2003). Here, Bessant and colleagues highlight the dynamic nature of supply chain leadership in the supply chain learning process.

Lambrechts *et al.* (2012: 628) focus on in-depth joint supply chain learning and emphasise that even a strong single party cannot succeed in this without other parties' involvements and contribution. This kind of learning needs time, effort and discipline and in particular leadership. Learning will not occur by itself but needs careful designing and facilitating normally by a leading company in the supply chain. To be more effective, leadership may change over time from an 'up-front role' to a 'stand-back' role in which other members actively take part (Lambrechts *et al.*, 2012: 631). This is similar to Bessant *et al.*'s (2003) argument.

Dyer and Nobeoka's (2000) well known case of Toyota provides a notable study on supply chain learning and leadership. As the supply chain leader, Toyota initiates and facilitates the learning network and solves three learning dilemmas: how to motivate self-interested members to actively participate in the learning network; how to avoid 'free rider' problems (members enjoy the collective benefits without contribution); and how to maximize the efficiency of knowledge transfer. Toyota has done this by creating a strong network identity with rules for participation and entry into the network. Most importantly, production knowledge is viewed as the property of the network. Toyota's highly interconnected, strong tie network has established a variety of institutionalized routines that facilitate multidirectional knowledge flows among suppliers (Dyer and Nobeoka, 2000).

Biotto *et al.* (2012) provide a single case study of Illycaffe Group's coffee supply chain practice, which focused on quality management and gradually established a culture of quality along the supply chain. The shared culture of quality in turn minimized the coordination efforts and resource utilization through self-selection of suppliers for better quality coffee beans; self-alignment to quality standards by different actors e.g., suppliers, logistics operators and customers; and generative learning (the ability to step back and reframe the problem and generate new practices)

e.g., the emergent behaviour toward sustainability. Illy assumed a facilitative leadership role in the in-depth joint learning process.

The above five papers highlight the importance and possible dynamic nature of the leadership role. These findings should also be applicable for learning specifically focusing on sustainability; however further studies on supply chain leadership in supply chain learning are needed to address questions such as "who emerges as the facilitative leading role, when and how does the leadership develop over time" (Lambrechts *et al.*, 2012: 633).

3.4.2. Interface of SSCM and supply chain learning

Four papers discuss both SSCM and supply chain learning. Carter and Rogers (2008) suggest that learning concerning environmental and social activities between suppliers and buyers is difficult to replicate and can lead to competitive advantages. Vachon and Klassen (2008) find that supply chain learning is embedded in environmental collaboration with primary suppliers and major customers which can have a significant positive impact on both manufacturing and environmental performance. Kim and Han (2012) carry out a survey of 127 Korean logistics companies and find that high learning-oriented (double-loop learning compared to single-loop learning) logistics firms are more capable of adopting environmental practices which may be linked with the creation of sustainable competitive advantages.

Van Hoof (2014) applies organizational learning theory explaining the adoption of cleaner production (CP) projects and arguing that organisational learning is a critical factor of implementation of CP. The study examines projects launched by the Mexican Sustainable Supply Programme (MSSP, a NGO) aimed at disseminating CP among small-sized suppliers of large companies in Mexico. Suppliers were invited to participate by leading Mexican and multinational companies, received training on CP projects and were supervised by a focal company. Suppliers' learning levels are divided into four types: initial learning, single-loop learning, double-loop learning and double-loop learning plus (whether suppliers carry on with the program, propose CP projects, implement CP projects and generate new projects). It is found that a blended

learning method is conducive to implementation success of CP projects.

With a limited number of papers on SSCM and supply chain learning, more empirical research is needed.

3.4.3. Interface of SSCM and supply chain leadership

With a limited number of academic works in supply chain leadership, papers that discuss SSCM and supply chain leadership are also few: only two papers provide evidence for supply chain leadership in SSCM research.

Defee *et al.* (2009a) suggest that a supply chain is a complex organizational network which requires leadership from a supply chain leader organization to drive changes for the whole chain and conclude that transformational supply chain leadership can enhance the development of closed-loop supply chain orientation. Transformational leadership includes the behaviours of inspiration, intellectual stimulation and individual consideration, which they find to be more acceptable to members and more successful in making change happen (Defee *et al.*, 2009a).

Based on the analysis of 100 CSR reports and 18 interviews with senior managers responsible for sustainability of sampled Canadian companies, Morali and Searcy (2013) find that supplier development on SSCM depends upon focal company leadership, which is responsible for educating suppliers to understand and implement what is expected of them.

These two papers indicate the importance of leadership in SSCM; however, with the limited numbers, more empirical research is needed on supply chain leadership in SSCM.

Based on the foregoing review of the interfaces between our main research areas, we can conclude that supply chain leadership, supply chain learning and SSCM are seemingly distinct areas of research in the literature and the overlaps between them are sparsely researched. It is not difficult to understand the reasons for this: supply chain learning and supply chain leadership are both under-developed areas themselves, let alone their relationship with SSCM. However, the literature suggests that there are relationships between them and it is valid to link the three bodies of literature together

for the purpose of explaining SSCM practice of MNCs.

4. Development of an integrated conceptual model

Based on the literature review, it seems that there is a casual chain of relationships between the constructs discussed here. Various internal and external SSCM drivers and enablers have been discussed by researchers (Gimenez and Tachizawa, 2012; Seuring and Muller, 2008; Walker and Jones, 2012), which have an impact on SSCM strategies (Harms *et al.*, 2013; Seuring and Muller, 2008).

Van Tulder *et al.* (2009) propose that implementing codes of conduct was a 'trendy' SSCM strategy five or six years ago, but nowadays it is generally a minimum requirement and has become an industry standard approach (Gimenez and Sierra, 2013). After Van Tulder, Close *et al.* (2011) classify firms adopting SSCM into reactor, contributor and innovator and Harms *et al.* (2013) classify SSCM strategy into risk-orientated or opportunity-orientated; however both classifications mainly focus on a focal company perspective.

In this research we propose a new classification of reactive, contributive and proactive SSCM strategies from both buyer and supplier's perspectives, building on previous works (Close *et al.*, 2011; Van Tulder *et al.*, 2009). Focal companies implementing a reactive strategy focus on efficiency and primary stakeholders mainly by setting up a low level of the code of conduct to which suppliers are required to comply, but make few efforts beyond compliance.

Going one step ahead, focal firms adopting a contributive SSCM strategy recognize SSCM as strategically important and take more proactive initiative by benchmarking within or cross industry to identify potential approaches and collaborate with suppliers. However these initiatives are normally not their own creation. Active SSCM strategy requires focal companies to initiate SSCM projects with their existing knowledge and then actively involve, train and develop selected suppliers or the whole supply chain.

Going even further, focal firms adopting a proactive SSCM strategy consider SSCM a strategic priority and a long-term investment, eagerly seeking best practices

by innovation. Proactive SSCM strategy emphasizes the deep and close collaboration between focal companies and specific suppliers with the aim of jointly innovating sustainable products, processes or business modes.

According to Gimenez and Sierra (2013), SSCM strategies are highly related to SSCM governance mechanisms. SSCM literature generally divides governance into two types: supplier evaluation/assessment/certification and supplier development/collaboration (Gimenez and Tachizawa, 2012; Harms *et al.*, 2013; Pagell and Wu, 2009). This basic distinction, between assessing and developing, also underlies our proposed classification.

Gimenez and Sierra (2013) also propose measuring collaboration with customers along three scales: 'visit', 'training' and 'joint efforts'. We consider that 'joint efforts' is significantly different from 'visit' and 'training' in terms of the aims of collaboration and resources needed. There may therefore be a need to further break down collaboration type.

Based on Gimenez and Sierra (2013) and Beske *et al.* (2014), we propose a new classification of SSCM governance mechanisms of assessment, involvement and collaboration stipulating that assessment mainly involves supplier assessment such as supplier selection, evaluation, certification, audit, visit and code of conduct related training corresponding to the reactive SSCM strategy. 'Involvement' or single sided collaboration indicates sustainable initiatives beyond code of conducts compliance initiated by focal companies and requires the involvement of suppliers corresponding to an active, contributive SSCM strategy. This includes such practices as technical integration, logistics integration and enhanced communication (Beske *et al*., 2014).

Finally proactive SSCM strategy mainly requires and emphasizes joint efforts or collaboration from both parties which include joint sustainable innovation. Collaboration theory highlights collective problem solving of complex issues by means of innovation and aims at confronting complex problems that exceed the capacity of individual firms (Van Hoof and Thiell, 2014). Taking a multiple stakeholder perspective, collaboration is not confined to supply chain members but also includes non-traditional members such as NGOs, regulators, competitors and

members of the community (Pagell and Wu, 2009; Van Hoof and Thiell, 2014).

The difference between assessment and involvement is that the former is focused on a relatively low level of supplier compliance with codes of conduct and the latter is focused on initiatives beyond codes of conduct. The difference between involvement and collaboration is that for the former, the sustainable initiatives were initiated by focal firms and participated by or involve suppliers where suppliers assume a more reactive role and results in continuous improvements; for the latter, the initiatives are actively participated in by both parties and result in emergent practices.

These three types of governance mechanisms lead to different levels of learning activities in the supply chain, evidence for which is to be found especially in collaboration which leads to double-loop learning (Vachon and Klassen, 2008). A related model of organizational learning posits a dynamic knowledge creation process involving the socialization and internalization of tacit and explicit knowledge (Nonaka and Takeuchi, 1995). This suggests that double-loop learning, via processes of exploration, questioning and challenging existing knowledge, can eventually lead to new knowledge creation (Phan and Peridis, 2000; Rubenstein-Montano *et al.*, 2001).

We suggest that an evaluation/assessment/certification type of SSCM governance mechanism mainly involves explicit knowledge transfer of a focal company's sustainability code of conduct; involvement or single sided collaboration may, however, include tacit knowledge transfer; finally, joint efforts or collaboration by both parties mainly involves tacit knowledge transfer as well as new knowledge creation, which is indeed related to double-loop learning or knowledge creation routines. Assessment and involvement operate mainly under a predefined framework while joint efforts may change the existing framework and lead to innovation. Hence, the former two require single-loop learning, simple and adaptive responses that don't affect underlying values, and the latter requires to double-loop learning, new ways of solving problems and new core values (Argyris and Schon, 1996).

To reflect the difference between assessment and involvement and to describe the correspondence to the involvement type of governance, we tentatively define a new

level of organizational learning between single-loop and double-loop learning: single-loop learning plus, which is inspired by Van Hoof's (2014) double-loop learning plus. Here single-loop learning plus means learning remains within the existing framework, however focal companies and suppliers will take a more active attitude of learning instead of merely adapting to the environment and complying with low level codes of conduct. In this case, both focal company and suppliers will make contributions in the learning process.

Linking learning to SSCM performance (Kim and Han, 2012; Vachon and Klassen, 2008; Van Hoof, 2014), we propose single-loop learning leads to the compliance of codes of conduct by suppliers. Single-loop learning plus may help a supply chain to achieve results beyond compliance by identifying potential continuous improvement opportunities within the existing frameworks. Finally double-loop learning involves joint efforts towards new knowledge creation and may lead to SSCM innovation through sustainable products, processes or organizational innovation i.e., sustainable supply chain configuration (Klewitz and Hansen, 2014).

Among this chain of causal relationships, supply chain leadership is an ignored factor. Flint *et al.* (2008: 274) raise a critical question: "Who should be involved and at what time in the learning exercises? What are the best ways to motivate a continuous and healthy supply chain learning environment?". According to anecdotal evidence and our experience of researching MNCs in China, supply chain leader organizations seem to play a critical role in supply chain learning. According to Bessant *et al*. (2003) and Lambrechts *et al.* (2012), the leadership role may change over time since at the 'sustain' stage of supply chain learning, members may need to share the leadership role.

Linking with the conceptual model, we suggest that both transactional leadership and transformational leadership play a mediating role between SSCM governance mechanisms and supply chain learning; and that more relational theories of leadership may provide valuable directions for further enquiry.

Defee *et al.* (2009a) suggest transactional supply chain leadership exhibits contingent reward and management-by-exception behavior while transformational

supply chain leadership more often exhibits inspiration, intellectual stimulation and individual consideration. Through supplier assessment, suppliers will either get incentives or sanctions leading to and enhancing single-loop learning (Peters, 2010). Through collaboration or joint efforts, supply chain leading organization may create a mutual strategy or mission for the relationship, encourage suppliers to be more innovative and eventually develop new ways to solve problems i.e., double-loop leaning by recognizing each supplier's unique needs, spotting new opportunities and developing their skills appropriately. In between, a focal company may use both transactional leadership and transformational leadership to encourage suppliers to be sustainable, both by following their instructions and thinking of new approaches.

Hence, if we consider a continuum between transactional and transformational leadership and between assessment and collaboration types of governance, we may develop the following proposition:

Proposition 1: Supply chain leadership style affects the relationship between SSCM governance and supply chain learning such that the more a leading organization adopts a transformational leadership style, the stronger the relationship between collaboration governance and supply chain learning.

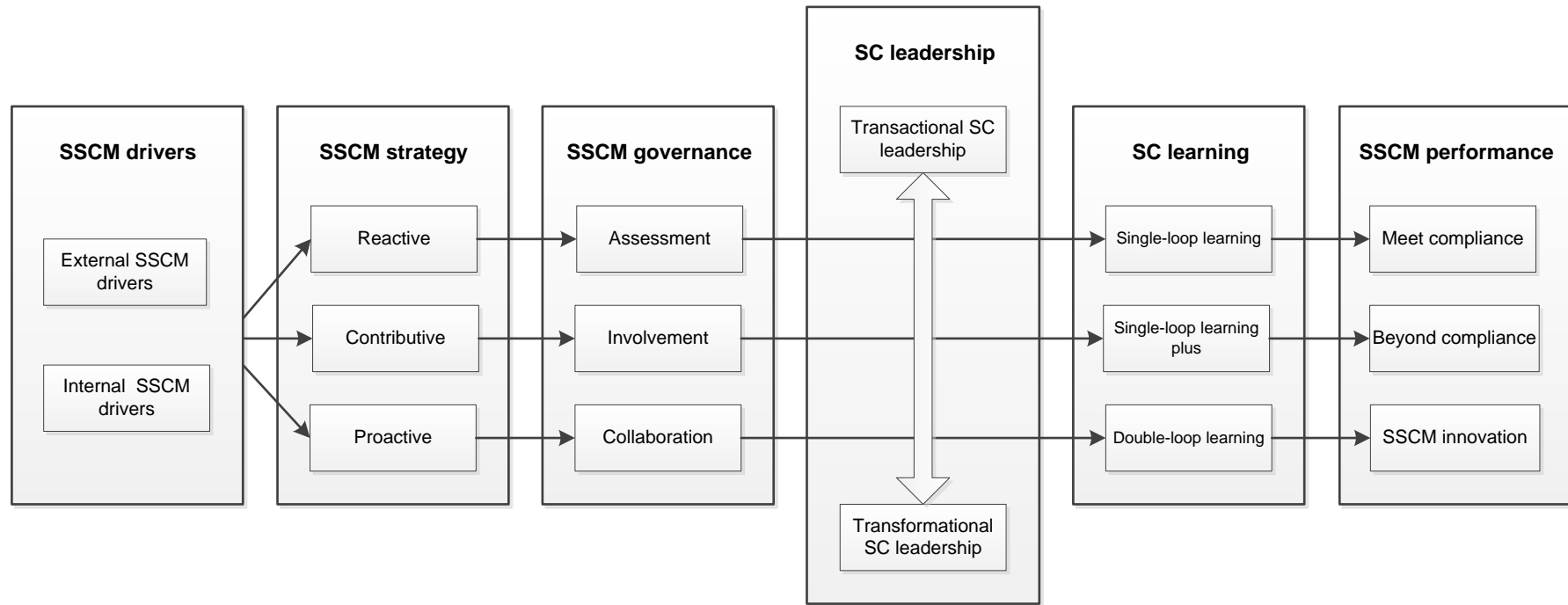Finally we build a conceptual model as in Figure 1.

Figure 1: A conceptual model on SSCM strategy typology

(Note: SSCM is short for sustainable supply chain management; SC is short for supply chain.)

We use a case example to illustrate each of the three types of SSCM strategy. Reactive SSCM strategy is mainly achieved by implementation of sustainability codes of conduct with a focal company using assessment to measure the results. Single-loop learning is embedded in the process which finally leads to the compliance of sustainability codes of conduct. Transactional supply chain leadership moderates the relationship between assessment and single-loop learning. The stronger a transaction supply chain leadership style is, the stronger the likelihood that assessment leads to single-loop learning.

One example of this type is IKEA's code of conduct 'IWAY', which is short for "the IKEA way on purchasing home furnishing products". IKEA tier 1 suppliers are required to follow these standards and extend them to upstream (tiers 2 and 3) suppliers. IKEA will then audit suppliers and provide feedback. Suppliers need to support the audit and respond with detailed adjustment plans, after which suppliers will be awarded a certificate and re-audited at least every two years.

Contributive SSCM strategy involves the involvement of both focal company and suppliers, with activities beyond codes of conduct, such as training and developing suppliers in sustainability initiatives by focal companies. The initiatives can be provided by the focal company or a supplier, or by other organizations such as industry regulators or NGOs. However the focal company leads the process, with the involvement or participation of suppliers together to create a sustainable supply chain. Single-loop learning plus is embedded in the process and leads to beyond compliance sustainable performance and continuous improvements. Both transactional and transformational supply chain leadership i.e., a hybrid may be used in this process.

An example of this type is given by one of WWF's climate savers[2] companies, SKF (a Swedish bearing manufacturer) which implemented a pallet re-use and recycling project in China. Suppliers were encouraged to use recycled pallets and

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[2] WWF climate saver programme is WWF's global platform to engage business and industry on climate and energy. The programme aims to inspire a change in thinking about climate solutions in companies and encourage them to transform themselves in low-carbon leaders, acting as agents of change within their sphere of influence.

required to pay deposits by SKF China to compensate any damage to them. SKF China implemented this practice successfully in China by involving and motivating and providing training to Chinese suppliers and customers. The learning by suppliers and customers was within the existing framework, a recycling practice implemented in Europe for a long time, but the mechanisms e.g., cost benefits incurred from recycling and reuse and paying a deposit made SKF customers and supplier actively participate in the project. Here, SKF uses a hybrid leadership style. Suppliers and customers are encouraged to join the project, but also needed to obey the predefined rules. Training and frequent dialogue is found to ensure the success of the project, which depends on active involvement of suppliers and customers to achieve a 'beyond compliance' performance target and continuous improvements in pallet reuse and recycling rates.

A proactive SSCM strategy involves collaboration or joint efforts between focal companies and suppliers and between focal companies and customers. Double-loop learning is embedded in the process and leads to new practices or SSCM innovation. It is suggested that focal companies take a transformational leadership approach in influencing their suppliers in a way that the stronger a transformational supply chain leadership style is, the stronger the likelihood that collaboration leads to double-loop learning.

One example of this type is Wal-Mart's 'environmental friendly packaging' projects. Since 2008, Wal-Mart China held annual forums and related trainings for suppliers to promote their green packaging philosophy and technology. Together with Coca-Cola, Wal-Mart invented a light-weight packaging for pure water, reducing bottle weight by 30%, CO_2 emission by 35% and recycling space by 70%; with P&G, they redesigned some cosmetic packaging, reducing 40% of cardboard and half of packaging weight in 2010. Success was enabled by the deep collaboration between Wal-Mart and Coca-Cola and between Wal-Mart and P&G, thanks to a strategic sustainable vision, continuous training, knowledge sharing and encouragement amongst the three companies. We suggest that these activities enhance the quality of collaboration in ways that are consonant with transformational leadership. Evidence of this is the

suppliers' (such as Coca-Cola and P&G) active participation and investment in innovations that finally led to the launch of new sustainable packaging products, which have significant positive environmental impact.

It should be noted that the clear distinction we have drawn between the three types of SSCM strategies is for purposes of theory development. In reality, MNCs employ a range of different approaches that transcend the three alternatives suggested. For instance, Wal-Mart uses standard reactive SSCM strategies to enforce their basic code of conduct.

In 3.1.1, we claim the adoption of the SSCM definition by Seuring and Muller (2008) in this paper, which is focused on in achieving three goals of economic, environment and social derived from stakeholders' requirements. In our view, all the three types of SSCM strategy can be considered achieving the three SSCM goals but at different degrees. The reactive strategy aims to comply with basic code of conduct meeting minimum requirements from all the stakeholders; contributive strategy tends to be more proactive and attempts to improve SSCM performance within the existing framework to delight stakeholders; finally proactive strategy is the most proactive of the three and intends to surprise and even educate stakeholders and achieve the goals beyond their expectations.

Linking back to the literature, Hult *et al*. (2000b) conclude a positive effect of transformational leadership on organizational learning; Defee *et al.* (2009a) identify the positive causal relationship between transformational leadership and development of closed-loop supply chain i.e., SSCM performance; Biotto *et al*. (2012) emphasize that the shared culture leads to the generative learning and emergent behavior toward sustainability; Bessant *et al*. (2003) and Lambrechts *et al*. (2012) find that leadership may change over time from 'up-front role' to a 'stand-back role corresponding the transactional and transformational leadership styles at the 'sustain stage' of supply chain learning. Based on above discussion and anecdotal evidence, the following propositions may be developed.

Propositions 2a: The adoption of appropriate leadership style by MNCs is conductive to the learning of sustainable practice and improving the overall SSCM

performance in the supply chain;

Proposition 2b: The supply chain leadership style of MNCs tends to change from more transactional at the beginning, to more transformational when a culture of sustainability is built in the supply chain.

5. Conclusion

At the beginning of the paper, we set out to answer a question: *How do MNCs assume leadership in how their supply chains learn and adopt sustainability practices?"*

To answer the question, we have reviewed the literatures on SSCM, supply chain learning and supply chain leadership respectively and then the overlap between them. As a result, a conceptual framework i.e., a causal chain of relationships, was proposed linking driver, SSCM strategy, supply chain governance, supply chain learning, supply chain leadership and SSCM performance. The causal relationships have been deducted from findings of existing empirical studies except for the relationships related to supply chain leadership construct in which the empirical studies are limited. The causal relationship related to supply chain leadership are developed based on anecdotal evidence, our research experience with MNCs and the limited empirical studies on this topic.

Based on the model, three types of supply chain strategies were also proposed. The two new constructs of supply chain learning and supply chain leadership were integrated in the model and present a core contribution of the paper. Another contribution is that we have proposed a causal model and three detailed SSCM strategies determined by the four dimensions of supply chain governance mechanism, supply chain learning, supply chain leadership and SSCM performance. Third, the introduction of the two constructs may have implications for improving our understanding of the SSCM concept in a fundamental way. Existing definitions simply integrate the triple bottom lines or three dimensions and supply chain processes without explaining the mechanisms of achieving SSCM. For example, the strategic and transparent integration of social, environmental and economic goals in

the supply chain process (Carter and Rogers, 2008) imply the adoption of supply chain leadership and promote supply chain learning. A new definition may be developed in a future empirical study. Finally, we develop a measurement of SSCM performance as compliance, beyond compliance and SSCM innovation.

Our model also has practical implications. We propose and emphasize importance of the leadership role in the supply chain. There is also a need to change leadership style where appropriate during the learning process. Companies should pay attention to the dynamic nature of leadership styles. Companies adopting a reactive SSCM strategy may rely on transactional leadership to push suppliers to achieve standards; companies adopting a contributive SSCM strategy should use both types of leadership to develop suppliers and to better implement sustainability initiatives; finally for companies to adopt a proactive SSCM strategy, they should create a learning environment and turn to transformational leadership to encourage partners be more innovative.

The paper is not without limitation. We adopted a selective approach of content based literature review that allows us to focus on the key contributions to the research topic. However this may have obscured some key papers in SSCM hindering a more comprehensive discussion. Our model is developed from existing literature and anecdotal case examples. It is always challenging to capture the complexities of reality in a conceptual model, and there may be many other factors affecting the selection of SSCM strategy beyond those we have proposed. For example, the location of suppliers, power relationship between buyers and suppliers, tax and other incentives are amongst the factors that may affect the selection of SSCM strategy. It should also be noted that a company may adopt more than one SSCM strategy for different products/projects. Future research should take these factors into consideration and empirically refine and test the model.

Another future research direction could be linking the product type to SSCM strategies. The reactive strategy may be applicable to what Fisher (1997) terms functional products/service and suppliers; whereas a proactive strategy may be more applicable to innovative products/service and requires only a small number of

suppliers who have the innovative capabilities to collaborate with focal companies. Finally, future research may bring the suppliers' followership into the equation and integrate it into the conceptual model.

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