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How do collaborative culture and capability improve sustainability?

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Abstract

Achieving competitive advantages from a resource-based view is hardly sustainable in today's operational environment. This study emphasizes the need to build partnering capabilities and improve sustainability in the supply chain by coping with the fast-changing business environment. This research underlines the crucial roles of relation- and resource-sharing based collaboration, capabilities, and commitment in developing sustainable supply chain performance. This is the first study to empirically test the theory of developing triple bottom line-based sustainability involving dynamic capabilities and collaboration. Dynamic capability enables firms to create, modify, and reconfigure their available resources to compete in the fast-changing market environment, while collaboration is to work together to achieve a better performance and helps building dynamic capability. Results show that collaboration and commitment play a crucial role in building capabilities, which, in turn, allow firms to achieve sustainable supply chain performance. Collaboration, representing resource sharing and collaborative culture, influences sustainability directly and is mediated by capabilities and commitment. For effective capabilities and sustainability, both upstream and downstream collaboration are required. Culture- and commitment-related traits are strong for downstream collaborating firms.

Keywords: Sustainability; Supply chain performance; Collaboration; Collaborative culture; Commitment; Dynamic capability

1. Introduction

Sustainability cannot be achieved if a firm is compliant with its environmental and social commitments, but its supply chain members take decisions without community concerns. Hence, for sustainable supply chain (SSC) management, collaboration with supply chain members is required (Chen and Hung, 2014; Srivastava *et al.*, 2017; Vachon and Klassen, 2008; Wilhelm *et al.*, 2016). Further, to cope with today's ever-changing environment and to overcome limitations of resources mobilized in collaboration, dynamic capability (DC) needs to be developed to achieve a sustained competitive advantage (Beske 2012, Meinlschmidt et al. 2016, Teece 2007, Vanpoucke et al. 2014).

McDonald's has recently announced that it will start offering fresh beef in burgers in some US cities. The move is in response to competitors' pressure (new competitors, including burger chains, such as Shake Shack, which have become a bigger part of the fast-food market, using fresh ingredients) and to the customers' pressure, as well as the commitment to improving quality and healthiness of its food. However, to ensure the service speed, which is the most critical part of its business, McDonald's had to make changes in its operations, such as suppliers and kitchen crew (BBC News, March 6, 2018): to react quickly to increasing pressure from competitors and customers, companies must be able to rapidly reconfigure their processes.

As economic, environmental, and societal issues—known as a triple bottom line (TBL)—naturally relate to the whole supply chain, a focal firm with or without significant negotiation power cannot achieve sustainable performance alone, which makes collaboration crucial for sustainability (Albino *et al.*, 2012; Dao *et al.*, 2011; Gimenez and Sierra, 2013; Large and Thomsen, 2011). Apart from environmental performance, most SSC literature deals with either economic or firm/corporate social responsibility (CSR) performance. Environmental and CSR performance do not truly capture whether other supply chain members are environmentally and socially compliant. A focal firm may be doing good in terms of TBL performance, but if its supply chain partners are not TBL compliant, such an arrangement can't be sustainable. Therefore, in this study, TBL or sustainable supply chain

performance (SSCP) implies supply chain performance (SCP), supply chain environment performance (SCEP), and supply chain social performance (SCSP). Recently, few studies (Ahi and Searcy, 2015; Biswas *et al.*, 2018; Martins *et al.*, 2019) modeled the TBL-based supply chain mathematically. However, these studies ignored the role of collaboration to improve SSCP.

Collaboration is also required as small and medium-sized enterprises (SMEs) or other firms may not have enough resources to achieve TBL performance (Lee and Klassen, 2008). Additionally, collaboration based on relationship governance infuses culture, which guides partner firms on the "basis of trust and continuance" and largely eliminates transactional cost (Galpin *et al.*, 2015; Paulraj *et al.*, 2014). Culture draws from relational view (RV), that establishes relationships among dependent business partners will bring competitive advantage. Few studies discussed the importance of trust and commitment in collaboration, but such attributes, as an inseparable part of the collaborative culture (CC), are the results of mutual engagement (such as resource sharing, mutual learning, joint planning, etc.) over the long run (Kumar *et al.*, 2016). The CC may be instrumental in reducing opportunistic behavior and transactional cost. The CC as a relational rent will also be more effective in developing DC and SSC through fearless interaction, sharing and creating precious knowledge, and promoting commitment to sustainability. The CC as a proactive stance also needs to implant and nurture strong commitment to sustainability. Lack of CC, poor supplier commitment, and hence unwillingness to share information are considerable barriers to sustainability. Although resource sharing as a measure of collaboration has been widely studied in the extant literature, hardly any work analyzed CC in collaboration and SSC. This represents a first limitation identified in the current literature.

A second limitation emerges from the literature (Blome *et al.*, 2014; Dao *et al.*, 2011; Ortas *et al.*, 2014; Vachon and Klassen, 2008), where collaboration for driving sustainability mainly draws on the resource-based view (RBV) (Barney, 1991). However, firms in today's dynamic and global environment have the same access to materials, suppliers, and workforce, and different resource configurations can yield the same value, making the RBV vulnerable to imitation and therefore not sufficient for sustainability (Beske 2012, Meinlschmidt et al. 2016, Su et al. 2014, Teece 2007). Previous studies have emphasized the need for different types of capabilities, including DC, to transform knowledge and utilize resources to achieve sustainability (Beske, 2012; Beske and Seuring,

2014; Vachon and Klassen, 2008). To remain competitive in the fast-changing business environment, firms require DC. DC, as originally defined by Teece *et al.* (1997), is the "firms' ability to integrate, build, and reconfigure internal and external resources in creating the higher-order capabilities that are embedded in their social, structural, and cultural context". In today's fast-changing market demand, customer taste, social and environmental responsibility, DC can bring firms the ability to reconfigure internal and external resources to effectively respond to the fast-changing market environment. A lack of DC will essentially make firms static, which may not be sufficient to remain competitive in the market. Despite the importance of collaboration and DC for SSC, DC and SSC are still lacking a comprehensive approach that combines recurring characteristics, such as collaboration (Beske, 2012). Further, Touboulic and Walker (2015) find that theory development through DC in SSC is an important area that is lagging behind, and Meinlschmidt *et al.* (2016) suggest exploration of learning and knowledge diffusion to develop sustainable capabilities. Therefore, along with relation-based collaboration and its culture, firms require DC to reconfigure resources and adapt and excel in changing markets to achieve sustainability.

Walmart is known for its supply chain and innovation, but even this retail giant is compelled to continually innovate its supply chain. The multinational leader in FMCG, Hindustan Unilever (HUL), rapidly lost its market share to young and fast-growing FMCG company, Patanjali. Recently, Patanjali secured the 13th spot in overall brand trust and topped among FMCG brands (Business Standard, 2018). The company was founded on the philosophy of bringing people closer to nature and helping them to live a healthy and happy life. Patanjali deployed doctors, free-of-charge or at minimal cost, opened free schools to serve economically poor classes, and provided help to the disabled. It was possible to do this on a large scale because people were giving their service voluntarily to serve society. Then, it came up with products promising quality with pure, natural, and uncontaminated materials. Replying to a question, SK Patra, President and CEO of Patanjali, said that "we have not corporatized social responsibility; our psyche is to renounce and give back to society" (Indiacsr, 2012). Apart from gaining word-of-mouth publicity, Patanjali's products are advertised by its founder, thereby building more profound trust in potential customers for the company (Jain, 2016). Patanjali's growth and success is a story of how a socially connected and responsible company can sense and respond to market

requirements that can bring a competitive advantage in today's market. This is even more important when social dimensions and their implications are largely unaddressed in the literature (Beske, 2012). Hence, the third limitation to the literature we highlight here is the social capital that is mostly ignored in previous works and is underutilized.

Further, collaboration with supplier or customer or both may mobilize different types of resources and knowledge with varying importance that would create different capabilities and, therefore, may yield different results for SSCP. Similarly, as the manufacturing industry is more resource-intensive while the service industry is more information-intensive, collaboration-capability-sustainability dynamics may reveal different behaviors. Therefore, it would be more prudent to analyze the impact of collaboration types and industry in creating DC and sustainability.

The above discussion and cases highlight four points: (i) collaboration, joint planning and resource sharing (JPRS) and CC are a must for SSC; (ii) DC is crucial in enabling SSC to respond to the changing business environment; (iii) social rapport has immense potential for setting firms apart in the market; and (iv) collaboration and industry types may reveal different paths to achieve SSCP. However, beyond management support and integration, the literature does not provide much direction in terms of specific activities to focus on when moving from commitment to outcomes in collaborative sustainability (Pagell and Wu, 2009). Some studies called for more research on DC and sustainability; nonetheless hardly any empirical research in this regard currently exists. More specifically, literature has paid little attention to DC for sustainability. Moreover, the crucial role of collaboration (i.e., joint resource sharing and culture) and commitment in developing DC is not known. Many studies (e.g., Kumar *et al.,* 2018; Reuter *et al.,* 2010) have investigated sustainability with economic and environmental performance as two disjoint constructs; however, sustainability is a balance of economic, environmental, and social performance. Therefore, studying sustainability as a three-dimensional construct is more appropriate. Hence, this research inquires the following questions:

(1) How are collaboration (resource sharing and culture) and DC interlinked in creating long-term SSCP?

(2) Does DC mediate the relationship of collaboration (resource sharing and culture) and commitment to sustainability?

(3) Does CC mediate the relationship of resource sharing to DC?

(4) Does collaboration with suppliers and/or customers result in similar behavior of the relationship between CC, DC, commitment, and SSCP? Do these relationships hold for both the manufacturing and the service sector?

To address these research questions, our work integrates RBV and RV by conceptualizing the preconditions needed in a collaborative arrangement to build DC and explores if they significantly contribute to improving SSCP. This research devises collaboration in two components, i.e., JPRS and CC (Kumar and Banerjee, 2012, 2014). These components, along with a commitment to TBL's goal, are modelled as antecedents of DC. The effect of each dimension of collaboration on sustainability and the mediating effect of commitment and DC are analyzed to understand the development path of SSCP. SSCP and the effect of TBL are studied as a three-dimensional second-order formative construct. We further analyze whether supply chain partners, manufacturing industry, and service industry present any different characteristics in developing sustainability through collaboration, DC, and commitment. In this way, we respond to the calls of the literature for more practical research involving collaboration and DC for sustainability (Beske, 2012; Beske *et al.*, 2014; Kumar *et al.*, 2018; Liboni *et al.*, 2017) and culture for sustainability (Galpin *et al.*, 2015; Kumar *et al.*, 2018).

This paper is organized as follows. First, we briefly review the relevant literature in Section 2, followed by our work's theoretical basis and hypotheses development in Section 3. Methodology and results are then presented in Sections 4 and 5, respectively. Next, we discuss the results and their implications in Section 6. Finally, we draw conclusions, highlight key contributions, and discuss future scopes for research in Section 7.

2. Literature review

It is widely accepted that sustainability consists of three dimensions—economic, environmental, and social (Carter and Rogers, 2008; Chen *et al.*, 2017; Gimenez and Sierra, 2013; Machado *et al.*, 2017). Environmental performance relates to recycling and reusing products and minimizing emissions, natural resources, waste, water and energy use, etc. Social performance implies avoiding underage workers, underpayment, giving untrue information to customers and promoting employee and social welfare,

work safety, society-oriented products, etc. Economic performance focuses on profit and efficiency. As supply chain performance captures multiple supply chain partners' performance, this study focuses on supply chain performance rather than economic performance, which is more firm-centric. It has been suggested that firms need to balance investment across the three dimensions (Carter and Rogers, 2008; Elkington, 1994); however, literature (Pagell and Shevchenko, 2014) also argues that investment in the environment and social operations are required, even though they initially compromise economic outcomes. When a supply chain achieves better performance across all the three dimensions, the performance is called SSCP. In line with Carter and Rogers (2008), Figure 1 shows single and joint impressions of the three dimensions of SSCP. The SSCP is the intersection of social, environmental, and SCP. In other words, when activities of a supply chain achieve better performance across all the three dimensions, the supply chain can be said to be achieving SSCP. A significant amount of research is devoted to discussing green supply chain practices and their performance implications (Albino *et al.*, 2012; Dao *et al.*, 2011; Golicic and Smith, 2013; Lee and Klassen, 2008; Vachon and Klassen, 2008; Zhu *et al.*, 2008).

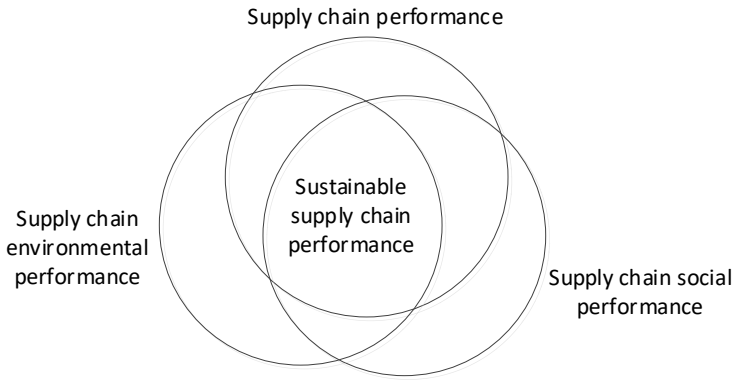


Figure 1: Single and joint impressions of the three dimensions of sustainability (adapted from Carter and Rogers, 2008)

2.1 Collaboration

As all SC members add value by making and delivering products and services, collaboration is crucial to achieving SSCP (Dao *et al.*, 2011; Gimenez and Sierra, 2013). Collaboration is working together within a (collaborative) culture by using shared information, skills, and resources to achieve common goals. It has also been considered a source of competitive advantage (Beske and Seuring, 2014; Huang

et al., 2013; Kumar *et al.*, 2016) based on relationships (Chakkol *et al.*, 2018) that reduce cost and risks (Carter and Rogers, 2008). In order to achieve sustainability, focal firms collaborate with their suppliers on various key operational processes, such as supplier development (Beske and Seuring, 2014; De Giovanni, 2012; Gimenez and Sierra, 2013; Vachon and Klassen, 2008), supplier integration/ collaboration (Albino *et al.*, 2012; Beske and Seuring, 2014; Gimenez and Tachizawa, 2012), logistical and technological integration (Beske and Seuring, 2014; Carter and Rogers, 2008; Dao *et al.*, 2011), and risk management (Beske and Seuring, 2014; Ganguly and Kumar, 2019). A set of literature has explored sustainability (environmental/economic) as outcomes of collaboration (De Giovanni, 2012; Gimenez and Tachizawa, 2012; Vachon and Klassen, 2008). Only few studies (Lu *et al.*, 2009; Paulraj *et al.*, 2014) explored the social aspect. Previous research, however, is mainly focused on the economic and environmental aspect, while there is hardly any literature exploring achieving social outcomes and TBL-based sustainability (Beske and Seuring, 2014; Carter and Rogers, 2008; Chen *et al.*, 2017) from collaboration (Chen *et al.*, 2017) and its culture.

2.2 Culture

Sustainable collaboration has been seen through the lenses of RBV, stakeholder theory, and relational view (Chen *et al.*, 2017; Vachon and Klassen, 2008). It requires a culture to be fostered in the organization (Galpin *et al.*, 2015), which can promote openness and communication, skill and knowledge sharing, learning, collective responsibility, trust, and so on. Such culture evolves when partner firms work together and leadership gently enforces the working style (Galpin *et al.*, 2015; Kumar *et al.*, 2016), collective responsibility, and win-win outcomes. Research has found that top visionary companies outperform because they primarily target the creation of organization-wide values and culture (Collins and Porras, 1996). As individuals and organizations are characterized as selfish, trying to maximize their own payoff by acting opportunistically, it is hard to sustain resource sharing in the long run without having a collaborative culture. However, little or no attention is paid on capitalizing collaborative culture, which is a social and relational rent. It is yet to be explored how culture, fundamental to a collaborative arrangement (Kumar *et al.*, 2016; Paulraj *et al.*, 2014), explains sustainability and creates a capability that is hard to replicate.

2.3 Dynamic capability

DC represents sensing a changing business environment, seizing opportunities, and reconfiguring resources to maintain and enhance competitive capabilities. It is also understood in terms of absorptive and cognitive capacity. Absorptive capacity is a knowledge-based DC, that identifies, acquires, assimilates, transforms, and exploits external knowledge to reconfigure internal resources to produce competitive outputs that integrate both internal and external routines (Lewin *et al.*, 2011). It is also explorative learning, allowing firms to experiment with new alternatives. In order to achieve long-term sustainability, DC is required to be built in a way that exploits RBV. Learning ability is the most important part of DC, which brings innovation and creates cognitive mechanisms that can respond to market changes. As today's local and global materials and suppliers are accessible to all, and different resource configurations can create the same set of values, relying only on RBV and RV poses severe threats to competitive advantage (Beske, 2012; Kumar *et al.*, 2018; Wang and Ahmed, 2007), which compromises the goal of long-term sustainability. Here, capabilities can be created to integrate supply chain, product development (Beske and Seuring, 2014; Golicic and Smith, 2013; Vachon and Klassen, 2008), and reconfiguration of resource-based routines of operations to reduce risks in the future. Organizational routine executes operational procedures to generate revenue and is the foundation of static capabilities (Huang *et al.*, 2013; Teece, 2007). In a rapidly changing environment, dynamic capabilities are created by collecting search routines that bring desired changes in operations and develop new ones to create sustained competitive advantages (Eisenhardt and Martin, 2000; Helfat and Winter, 2011; Huang *et al.*, 2013). Despite the critical role of collaboration and DC in sustainable development, the path to developing sustainability through DC is completely absent. Previous studies (Albino *et al.*, 2012; Gimenez and Sierra, 2013; Vachon and Klassen, 2008) pulled together different aspects of collaboration, mostly supply-side alliance, to better achieve environmental performance, hence offering limited implications. As collaboration brings benefits of both RBV and RV, the literature needs to explore its importance (Kumar *et al.*, 2016) for DC and sustainability as an "effect of TBL". Kumar *et al.* (2018) explored the implications on DC and TBL performance when JPRS and CC deviate from the ideal profile. However, a three-dimensional construct (as depicted in Figure 1) requires to be studied for more clarity and better understanding of how JPRS, CC, and commitment can influence DC

and how these constructs can improve SSCP. Thus, developing and explaining sustainability through collaboration and DC is warranted.

2.4 Commitment

Commitment means having a clear policy with specific measures and deploying resources to achieve improved performance on those measures. To produce effective outcomes, commitment to the relationship (Krause *et al.*, 2007) and sustainability (Pagell and Wu, 2009) is crucial. Buyer commitment and social capital accumulation with suppliers improve buyer's performance (Krause *et al.*, 2007), and environmental commitment is one of the critical enablers of sustainability (Gimenez and Tachizawa, 2012; Large and Thomsen, 2011). Commitment to sustainability drives collaboration and supplier assessment (Large and Thomsen, 2011). Literature finds the purchasing department's capabilities mediate its impact on collaboration (Gimenez and Tachizawa, 2012; Large and Thomsen, 2011). Firms' proactive stances in deploying resources and developing capability need to be backed by a commitment to sustainability (Galpin *et al.*, 2015; Gimenez and Tachizawa, 2012; Large and Thomsen, 2011; Pagell and Wu, 2009). However, the role of commitment on the path to building DC and sustainability is not conceptualized clearly; hence further exploration is needed.

Table 1 summarizes the relevant literature review. Only those works that studied one or more constructs of our interest are included. Literature that does not deal with DC and sustainability directly is omitted. Most studies didn't analyze all dimensions of TBL, and some of them (Kumar *et al.*, 2018; Reuter *et al.*, 2010) studied all the three dimensions of sustainability as three disjoint constructs. Few studies (Beske, 2012; Beske *et al.*, 2014; Liboni *et al.*, 2017) conceptually highlighted the importance of DC for sustainability and called for more research on DC and sustainability, but empirical validation of how collaboration, culture, and commitment can influence and develop DC for better SSCP is largely not known. Therefore, this research examines the interplay of collaboration, commitment, and DC to develop and improve SSCP. Collaboration is operationalized by resource sharing and the work culture of the collaborative alliance.

Table 1: Summary of the relevant literature

Research	Types	Independent constructs	Dependent constructs	DC studied?	CC studied?	(a) SSCP as multidimensional construct or (b) disjoint TBL construct?
Albino *et al.* (2012)	Empirical	Collaboration with different stakeholders	Environmental impact	No	No	(b) environmental impact
Beske (2012)	Conceptual	Developed a framework of SSCM incorporating DC			No	SSCM was discussed
Beske et al. (2014); Liboni et al. (2017)	Literature review	DC for sustainability		Yes	No	(b)
Chen et al. (2017)	Literature review	Collaboration for sustainability		No	No	(b)
Galpin et al. (2015)	Conceptual	Guide for future research into the relationship between organizational culture and sustainability		No	Yes	(a) but considering environmental, social, and economic performance together
Gimenez and Sierra (2013)	Empirical	Collaboration	Environmental performance	No	No	(b) but not all dimensions of TBL
Huang et al. (2013)	Empirical	Learning, new product development, and integration capability	Business performance	Indirectly	No	×
Kumar et al. (2018)	Empirical/ survey	JPRS misalign, CC misalign, DC	DC, supply chain, economic, social performance	Yes	Yes	(b)
Large and Thomsen (2011)	Empirical	Environmental commitment, collaboration	Supplier assessment; environmental performance	No	No	(b) but not all dimensions of TBL
Paulraj et al. (2014)	Empirical/ survey	Environmental collaboration	Environmental and social performance	No	No	(b) disjoint environmental and social performance
Reuter et al. (2010)	Case studies	DC's role in managing supplier management and achieving competitive advantage		No	No	(a) but the combination of environmental, social, and economic performance
Vachon and Klassen (2008)	Empirical	Environmental collaboration	Environmental and operational performance	No	No	(b) but not all dimensions of TBL

3. Theories and hypotheses

Figure 2 shows the cycle diagram of the main constructs related to collaboration and DC, which would improve SSCP. The figure shows that stakeholders' pressure motivates firms to improve SSCP (Reuter *et al.*, 2010) and firms become more committed towards society and the environment (Large and Thomsen, 2011). To improve SSCP, firms collaborate with supply chain partners by practicing JPRS and Culture. CC is also a consequence of JPRS activities (Kumar *et al.*, 2016). The JPRS, CC, and commitment help in developing DC. Finally, the JPRS, DC (Beske, 2012), and commitment improve SSCP. The SSCP is the common attributes shared by the three dimensions (environmental performance, social performance, and supply chain performance). In other words, SSCP is a result that balances the performance of the environment, society, and supply chain. The SSCP does not come in the way of environmental performance, social performance, and supply chain performance. An improved SSCP will bring competitive advantage (Dao *et al.*, 2011; Reuter *et al.*, 2010) in terms of social capital (customer loyalty, improved trust to the company), value for the customers (Beske, 2012; Lee, 2015), increased sales, and increased productivity. The competitive advantage will further motivate firms to maintain and improve SSCP. This study attempts to investigate major paths related to collaboration, DC, commitment, and SSCP. Figure 3 shows the conceptual model and related paths, which are further investigated below.

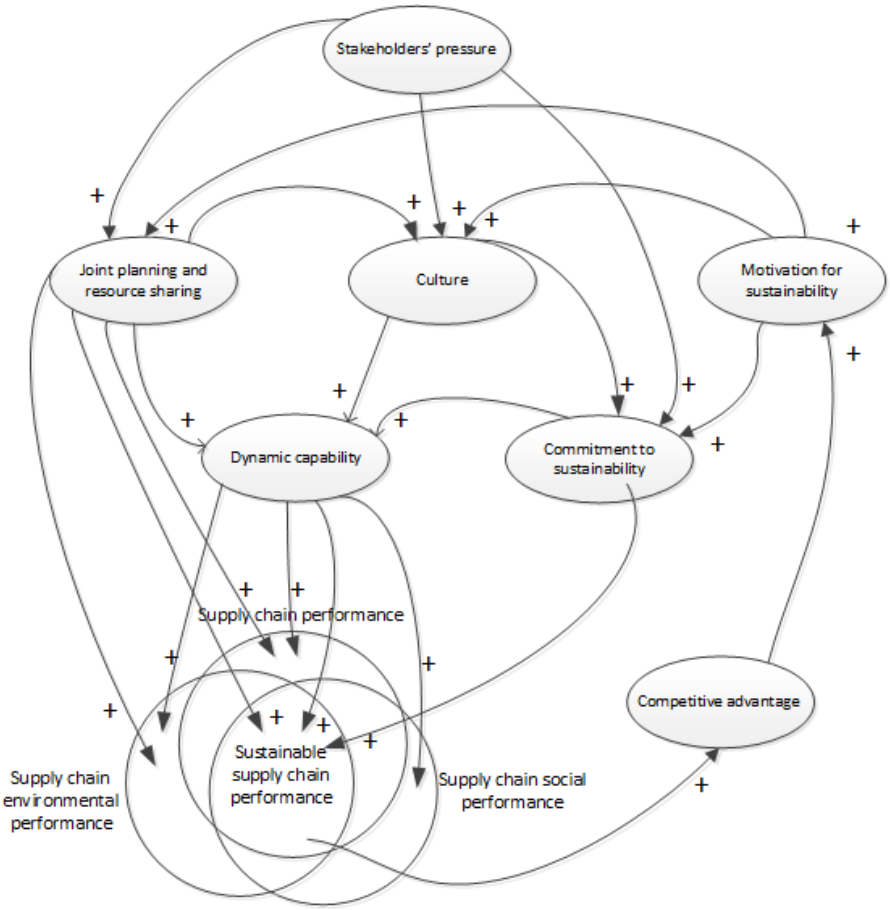
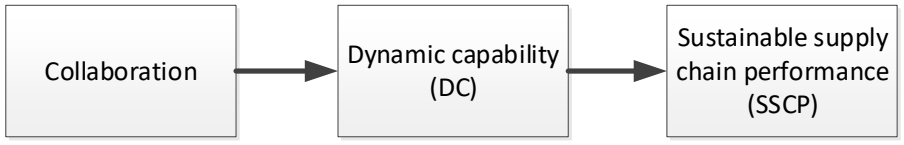
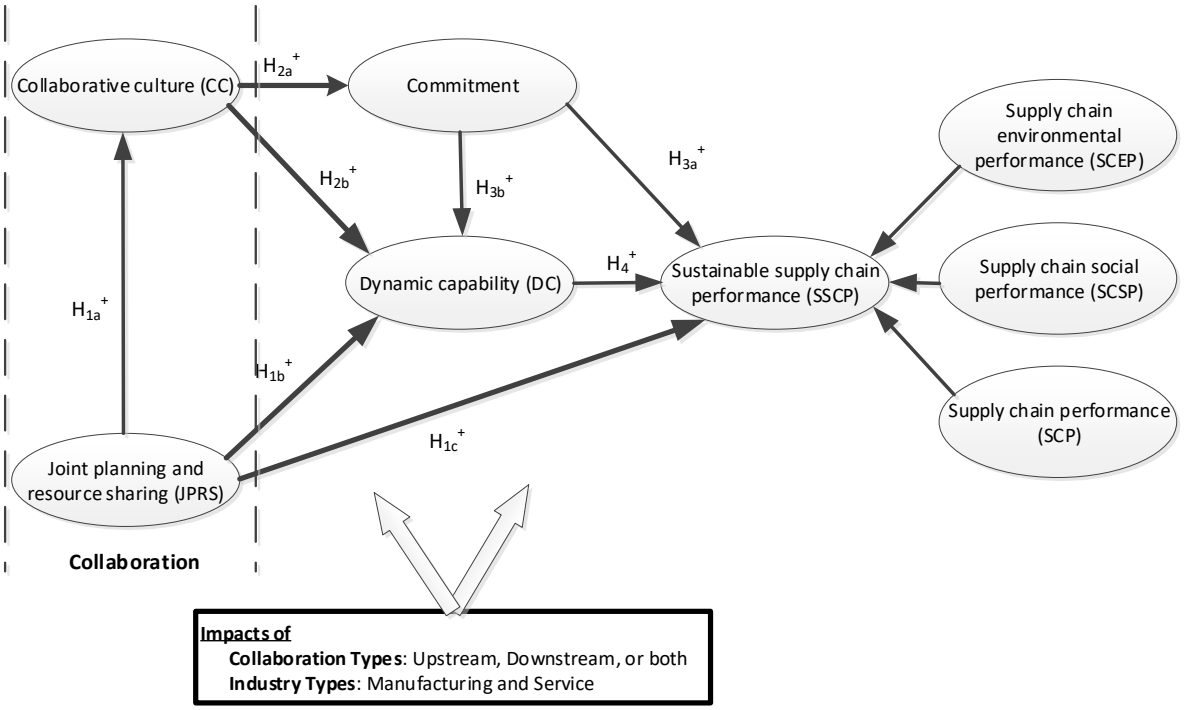


Figure 2: Cycle diagram of collaboration, DC, commitment, and sustainability ("+" sign indicates positive relationship)

RBV focuses on bundles of heterogeneous resources, which are valuable, rare, inimitable, and non-substitutable, hence, giving competitive advantages (Barney, 1991). Collaboration creates value from RBV. However, two or more sets of resources may create the same value. In a dynamic environment, having valuable and inimitable resources and operating statically may not be consistently enough, and, therefore, may not bring sustainable performance. Toyota, IBM, Philips, and others seem to follow the resource-based strategy of acquiring technologies and taking competitive advantages (Teece *et al.*, 1997), but they also have capabilities beyond internal resources to stay relevant against competitors. Figure 3(a) shows the steps in theory building for collaboration to help develop SSCP through DC.



(a) Path to sustainability through dynamic capabilities (in summary)



(b) Path to sustainability through dynamic capability

Figure 3: Conceptual model

Sustainability needs learning, knowledge diffusion, and positioning internal resources to absorb the external dynamic environment (Beske, 2012; Meinlschmidt *et al.*, 2016). Therefore, firms continuously need to adapt and reconfigure resources to fit changing markets. Sustainability enables firms to sense changes and requirements of the business environment and have the desire and ability to reconfigure themselves to stay relevant (Teece *et al.*, 1997; Vanpoucke *et al.*, 2014). This ability drives creation (product and processes), evolution (improvement), and recombination of resources into new sources of competitive advantage (Vanpoucke *et al.*, 2014). Though some capabilities can be both operational and dynamic, the line between operational capabilities and DC is unavoidably blurred (Helfat and Winter, 2011). The difference between the two lies in short and long-term changes and non-

radical and radical changes. Based on these views, our model in Figure 3(b) integrates RBV and DC by hypothesizing resources and culture to help build DC, which in turn drives SSCP.

The underlying idea behind sustainability is the following: if society and environment are not improving due to firms' operations, to what extent can firms be thought to be doing well? If the external environment of the firm's operations (environment and society) deteriorates, firms cannot remain insulated and their economic performances will also suffer. On the other hand, if the environmental and social performances are pursued, imitation will be more difficult (Carter and Rogers, 2008; Dao *et al.*, 2011; Elkington, 1994, 2004). So, the goal of a supply chain is to balance and excel on all these three dimensions. This study mainly captures operational aspects of sustainability management, which is "a set of skills and concepts that seeks to create and/or modify daily practices and decision-making models based on the economic, environmental and social dimensions" (Machado *et al.*, 2017). The SSCP is formed from these three characteristics and each characteristic uniquely contributes to the totality of firms' performances and configurations.

3.1. Joint planning and resource sharing (JPRS)

Based on RBV, JPRS reflects valuable, rare, and inimitable resources that provide competitive advantages, and is an integral part of the collaboration. Most literature considers resource sharing as synonymous with collaboration. Partner firms share real-time information and resources to create and deliver better value and customer satisfaction. Resource commitment is required to enhance reverse logistics performance, and innovation makes it more effective. Resource sharing with suppliers overcomes shortcomings, reduces sustainability-related risks (Large and Thomsen, 2011) and increases performance. The emergence of global operations and technological progress drives rapid change in the industrial environment, making capabilities increasingly vital (Liao *et al.*, 2017). Today's new technologies such as the internet of things (IoT), business intelligence tools, cloud computing, blockchain, etc., can integrate supply chain partners and facilitate real-time, high-quality data usage through standardized interfaces (Gottge *et al.*, 2020). Planning and sharing information through these technologies boost trust and reduce opportunistic behaviors and, therefore, improve relationships through better culture. As technologies enable information capturing, sharing it with different

stakeholders in real-time and processing it to derive meaningful information, it is vital in fostering relationships (or CC) and developing capabilities to address TBL issues (Dao *et al.*, 2011). A well-integrated supply chain through technology facilitates information and knowledge sharing and can act as a feedback loop that makes firms aware of their partner firms' social and environmental performance. If required, firms can take quick action to align current sustainability performance with sustainability goals. In this way, technologies enable interaction based culture and DC, that further help achieving sustainability goals. Previous studies (Chen and Hung, 2014; Dao *et al.*, 2011; Vachon and Klassen, 2008) emphasize that a bundle of shared resources and information among partners develops capabilities, which results in competitive advantages for SSCP. When a relationship is maintained by sharing information and resources for a long time, a culture develops (Beske, 2012), where trusting partners, open and frequent communication, sharing knowledge and ideas without any fear, and shared values for sustainability are prevalent.

When firms interact and align their goals through shared resources and commitment, a culture develops over time (Beske, 2012; Kumar *et al.*, 2016). Such interactions generate shared benefits, mutual learning, trust, loyalty, and responsibility toward the environment and society. The level of trust, which is an integral attribute of CC, is directly linked to the quality of knowledge sharing (Beske, 2012). Better practices of JPRS will lead to enhanced trust and CC. The more the supply chain partners are equipped with and interact through resources, the greater their capabilities to develop culture. If the quality of sharing knowledge and resources is good, supply chain partners can efficiently adapt to a changing environment and can improve SSCP. Therefore, we hypothesize:

H_{1a}^{+}: JPRS has a positive effect on CC.

H_{1b}^{+}: JPRS has a positive effect on DC.

H_{1c}^{+}: JPRS has a positive effect on SSCP.

3.2. Collaborative culture

Culture, from top management to operational practices, drives firms' core and non-core activities. Based on RV, relational complexity makes culture valuable, rare, difficult to imitate, and non-substitutable, which is vital for collaboration. Culture represents the way firms share resources, interact with each

other, develop and retain knowledge, learn, trust partners and deploy reward systems, and it plays a vital role in achieving long-term goals (Beske and Seuring, 2014; Kumar *et al.*, 2016; Kumar and Banerjee, 2012). Culture infuses loyalty and commitment between partners and, as a result, it safeguards against their opportunistic behavior. Working together, sharing resources, and having constructive and almost all-encompassing goals make culture evolve over a period of time (Kumar *et al.*, 2016). In the long-term, maintained relationships develop greater trust, transparency, commitment, and better culture, which impact the functioning of DC (Beske, 2012). DC requires supplier integration, which is sustained by trust and commitment (Huang *et al.*, 2013) and hence also by culture. The integration of DC with sustainability is enabled by IT platforms and culture that encourage the collaborative use of technology (Dao *et al.*, 2011). To create, store, and share knowledge, technology plays an important role. Technologies enable firms and their employees to have open and frequent communication and hence enabling effective collaboration to make informed and well-calculated decisions. If firms frequently share resources and views with an open mind (with or without technologies), trust and commitment to sustainability increase.

Culture brings attention to human decisions, interactions toward sustainability (Touboulic and Walker, 2015), and develops commitment. Collins and Porras (1996), while analyzing visionary companies, found that their primary objective is not profit maximization; rather, those companies have core values and culture beyond the economic bottom line. When a firm's mission, values and strategy are aligned with its culture, it gives a signal to internal and external stakeholders about its goals and direction (Galpin *et al.*, 2015). The integration of this value-based culture into human resource (HR) practices, hiring, and training develops employees and firms' commitment toward sustainability (Dessler, 1999; Galpin *et al.*, 2015). Through learning, resource sharing, interaction, and commitment to the goal (sustainability), firms acquire the ability and desire to change for improved effectiveness. A culture of cooperative and shared values can make firms more adaptable, which leads to stronger DC. Hence, we can say that:

H_{2a}^{+}: CC has a positive effect on commitment.

H_{2b}^{+}: CC has a positive effect on DC.

3.3. Commitment

To realize sustained performance, firms need to be committed to their goal and mission for the environmental and social responsibility. “To create an effective envisioned future requires a certain level of unreasonable confidence and commitment” (Collins and Porras, 1996). When setting up a goal, the commitment to it is important. Suitable employees and culture of a firm directed towards achieving goals, which enhances the level of commitment (Collins and Porras, 1996; Galpin *et al.*, 2015), will, indeed, increase productivity and performance. Sustainability commitment can be a source of competitive advantage and sustainable development (Large and Thomsen, 2011). Stakeholders’ pressure, regulatory and contractual compliance to improve social perception and to enhance competitive advantage, and awareness of the importance of environment and society help develop firms’ commitment to sustainability. A firm’s commitment to sustainability would make it more proactive in assessing suppliers, measuring sustainable performance (Gimenez and Tachizawa, 2012; Large and Thomsen, 2011), and identifying scopes and opportunities for greater attention. Being alert and proactive toward performance will ascertain the positive impact on SSCP and capabilities. A suitable culture inculcated in HR policies increases the commitment of employees through longer job tenure, better attendance (Dessler, 1999), learning, enhanced productivity, skills acquisition, and so on. The literature (Large and Thomsen, 2011; Luzzini *et al.*, 2015; Su *et al.*, 2014) highlighted that commitment influences different capabilities. These commitment-driven benefits make firms more adaptable to change and, thereby, enhance DC. Therefore, we hypothesize:

H_{3a}^{+}: Commitment has a positive effect on SSCP.

H_{3b}^{+}: Commitment has a positive effect on DC.

3.4. Dynamic Capability

DC equips firms with the desire and ability to change in pursuit of improved effectiveness. Firms that can demonstrate timely responsiveness, rapid and flexible product innovation, along with the management capabilities to coordinate and redeploy competencies, can stay relevant in today’s global marketplace (Teece *et al.*, 1997) by enhancing sustainable performance. “Dynamic” signifies the ability to renew over time, while capability highlights the role of management to adapt, integrate, and

reconfigure internal and external resources to cope with and match the external business environment. DC can sense rapid changes in the environmental, social, and operational requirements and can innovate and reconfigure shared resources and knowledge to meet the internal and external demand. In such business environments, firms need to learn and diffuse knowledge to create sustainable capabilities (Huang *et al.*, 2013; Meinlschmidt *et al.*, 2016). DC is captured by the ability to learn, innovate, and understand the impact of the environment on demand and supply (Chowdhury and Quaddus, 2017; Huang *et al.*, 2013; Lewin *et al.*, 2011) and effectively use IT in different situations (Chowdhury and Quaddus, 2017). Supply chain structures are constantly copied and replicated by competitors conveying the needs of having DC to reconfigure the structure (Vanpoucke *et al.*, 2014). Researchers suggested that firms need to develop DC to achieve sustainable competitive advantages and performance (Beske, 2012; Dao *et al.*, 2011; Su *et al.*, 2014; Teece *et al.*, 1997; Vanpoucke *et al.*, 2014). Hence, we hypothesize:

H_4^+: DC has a positive effect on SSCP.

3.5 Mediation effects

As discussed above and shown in Figure 3(b), DC, CC, and commitment may act as mediators in achieving SSCP and DC. By facilitating resources, knowledge, and skills, JPRS can improve SSCP. Simultaneously, shared resources, knowledge, and skills boost firms' DC by enabling firms to adapt and reconfigure their resources, which enhances SSCP. So, if DC is embedded in business operations, the effectiveness of JPRS in achieving SSCP is enhanced. Hence,

H_{5a}^+: DC mediates the relationship of JPRS to SSCP.

When firms are committed to achieve sustainability, their outcomes through proper operations are sustainability compliant. The commitment also motivates them to acquire TBL-oriented market information, to build TBL-oriented operations, and to innovate and produce environmental and socially friendly products at low cost, which builds DC. DC further impacts SSCP positively. Hence, we propose:

H_{5b}^+: DC mediates the relationship of commitment to SSCP.

The JPRS mobilizes the required resources and skills. When firms share resources and skills, an instinct of trust, commitment, learning attitude, i.e., a culture, develops. In turn, that can boost the ability to sense market requirements, create and share precious knowledge, and reconfigure existing operations and resources. So, JPRS also influences DC through CC. Hence,

H_6^+: CC mediates the relationship of JPRS to DC.

As described above, CC influences DC positively. Further, CC infuses collaboration with trust, risk and reward sharing, learnings, collective responsibility to environment and society that build confidence in collaborative firms. This, in turn, increases commitment to sustainability. To achieve better SSCP, committed firms can use shared resources, knowledge, and skills actively and more carefully. This will help to capture market and government requirements in time and to reconfigure shared resources and knowledge to meet the requirements, which enhances DC. Therefore, we can hypothesize:

H_7^+: Commitment mediates the relationship of CC to DC.

4. Research method

To validate the conceptual model, we used a survey to collect data. Based on the relevant literature review and experts' opinion, pool of items was identified to measure each construct. Items were measured on a five-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (5). For example, to find out about a firm’s policy reflecting the commitment to sustainability, the following question was asked:

We are committed towards environment and society because:

We have clear policy for the betterment of environment and society 1 ○ 2 ○ 3 ○ 4 ○ 5 ○

Table 2 shows the constructs, their measurement items and their quality measures (discussed later). Figure 4 shows the procedures followed in the research method.

Table 2: Constructs and their measurement items

Constructs/ observable variables	Loading	Cronbach's Alpha	AVE	Composite reliability	R^2
Supply chain environmental performance (SCEP)					
We achieved waste reduction	0.909	0.895	0.762	0.927	
We reached compliance with laws	0.890				
We increased recycling practices	0.776				
We achieved overall environmental performance	0.910				
Supply chain performance (SCP)					
We achieved shorter lead time	0.839	0.861	0.706	0.906	
We increased quality	0.871				
We achieved higher profit	0.800				
We enhanced reputation with customer satisfaction	0.850				
Supply chain social performance (SCSP)					
We provided safe and good for health products	0.898	0.905	0.778	0.933	
We provided better working condition	0.868				
We contributed and helped the society (e.g., donation)	0.891				
We always provided true information	0.870				
Dynamic capability (DC)					
We can make recyclable parts (reconfiguring)	0.655	0.823	0.658	0.884	0.758
We understand markets and people through the effective use of technology (sensing and seizing)	0.839				
We understand how the business environment affects supply and demand (sensing and seizing)	0.889				
We have learning ability and innovation (reconfiguring)	0.842				
Commitment					
We always abide national and international standard to clean and protect the environment	0.887	0.892	0.822	0.933	0.438
We have a clear policy for the betterment of the environment and society	0.932				
Working for the environment is a part of our value systems	0.900				
Collaborative Culture (CC)					
We are open in communication and interaction	0.832	0.924	0.685	0.938	0.416
We share skills and knowledge	0.830				
We share risks and rewards	0.796				
We have tendency to learn from each other	0.817				
We had a good level of trust	0.865				
We stick to our collaborative principles (of being loyal)	0.846				
We have environmental awareness and social responsibility	0.807				
Joint planning and resource sharing (JPRS)					
We engage in eco-friendly product development	0.787	0.903	0.632	0.923	
We engage in material requirement planning combined with recycled materials	0.781				
We engage in purchasing with green supplier assessment	0.854				
We engage in reduce, reuse, and recycle (3R) practices	0.773				
We engage in end-user's environment-oriented demands	0.835				
We engage in technology and machinery sharing	0.760				
We engage in inventory related information	0.770				

The questionnaire was also reviewed for ambiguity, readability, and clarity. Measurement items of SCP, CC and JPRS have literature support from Kumar et al. (2016) and Kumar and Banerjee (2012); environmental performance and commitment items from Large and Thomsen (2011) and Paulraj *et al.* (2014); social performance items from Paulraj *et al.* (2014); DC items from Meinlschmidt *et al.* (2016).

As shown in Table 1, DCs are captured by items representing sensing, seizing, and reconfiguring. Some items are added and modified to capture the intended concept. As items are based on the literature and are refined by experts, the validity of the content is assured. The survey questionnaire asked for a demographic profile, one question for each measurement item and, in the end, we allowed respondents to give their opinion on the subject. The email carrying the survey link briefly mentioned the purpose of the survey, confidentiality of data, and promised a complimentary research report. To obtain better generalizability, the email carrying details of the survey and the link to the questionnaire was sent to potential respondents in industries in India.

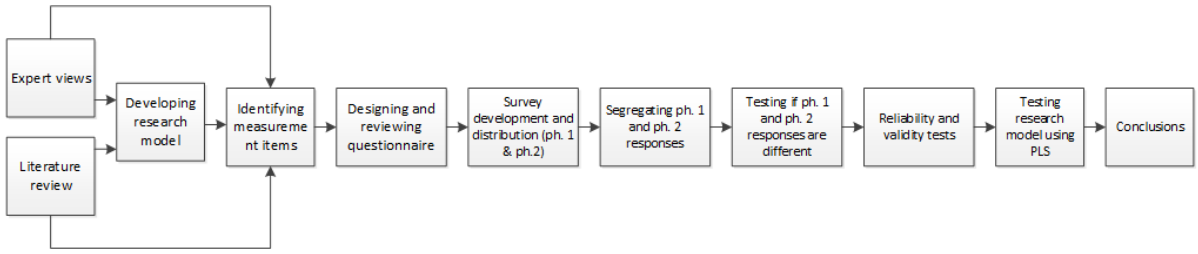


Figure 4: Research method

We were unbiased in selecting potential respondents and sending them the survey link. We adopted convenient sampling to receive a reasonable sample size, including those respondents who were approached through direct or indirect contact to facilitate response. The survey was conducted in two phases: after removing four samples with excess missing values, 119 responses in the first phase, and 52 in the second phase, totaling 171 usable responses remained for analysis. A Chi-square test revealed no significant difference ($p>0.05$) for all variables conveying responses in two phases that do not differ significantly. The demographic profile reveals that our respondents were managers, consultants/ analysts, directors, vice-chancellors, among others. Of these, 57.9% of respondents were less than or equal to 30 years old, 38% were between 30 and 50 years old, and 3.5% were above 50 years old. Sixty-four percent of respondents' firms had more than 1,000 employees, 23% between 500 and 1,000, and the rest had less than 500 employees. We received 46.6% and 53.4% of responses from the manufacturing and service industry, respectively. Among those respondents, 57.3% collaborated with

both suppliers and customers, 29.8% collaborated with only downstream or customers, while the rest of them collaborated either only with suppliers or service providers, manufacturers, or wholesalers. Here, it is important to mention that this study is part of a larger study and includes only relevant information. Researchers (Diamantopoulos and Winklhofer, 2001; Lowry and Gaskin, 2014; Petter *et al.*, 2007) argue that a construct must be reflective or formative based on its theoretical meaning. For two main reasons (Diamantopoulos and Winklhofer, 2001; Jarvis *et al.*, 2003; Petter *et al.*, 2007), this study models SSCP as a formative construct: (1) economic or SCP, SCEP, and SCSP cause SSCP, and these three dimensions are "distinct," "not interchangeable," and "essential" to the SSCP (Kumar and Goswami, 2019). The SSCP will lose its meaning and nature if any of its dimensions is omitted; (2) A change in any of its dimensions will result in a change in SSCP. We model first-order constructs—SCP, SCSP, and SCEP—as reflective because the measurement items of these constructs can be interchangeable and, in different circumstances and contexts, they can be tailored. This implies that these first-order constructs' measurement items will have a high correlation, and latent constructs (SCP, SCSP or SCEP) manifest their indicators and, hence, can be replaced. For example, "better working conditions" and "health and safety" of SCSP will depict high correlation and can be interchanged/replaced. If required, such modeling is flexible to absorb more measurement items in different contexts and, at the same time, the meaning/nature of SSCP will remain intact. Hence, SSCP is modelled as a second-order formative construct and its three first-order dimensions as reflective constructs. In order to analyze the model, the partial least squares (PLS) (Chin, 1998) method, using the SmartPls package, was employed. The PLS is structural equation modelling (SEM), which captures complete causal relationships among latent variables. As our model involves higher-order constructs, and the aim of this exploratory research is to develop theory, PLS is preferred over covariance-based SEM.

5. Analyses and results

The method of repeated items (Kumar and Banerjee, 2012) is used to model SSCP as a second-order formative construct. In this method, all items of all first-order constructs are loaded onto the second-order construct. This method works well if the second-order construct is either reflective or only

exogenous. However, when the second-order construct is formative and endogenous, as in our case, 100% variance of the second-order construct is predicted by its first-order construct. As a result, the effects of all the other predictors on second-order constructs are swamped out. To resolve this issue, the model is analyzed in two steps: (1) full model, including second-order and its first-order constructs, and (2) the score of SSCP computed in step 1 is used as a single item construct, SSCP; the structural model is evaluated in this step. Table 1 shows loading, composite reliability (CR), Cronbach's alpha, as measurement quality of all constructs.

Reliability and validity of reflective constructs: All CRs are well above the recommended cut-off of 0.7 (Fornell and Larcker, 1981), indicating our measure is consistent and stable over time. As all loadings and CRs are more than 0.70 ($p<0.001$), the convergent validity of reflective constructs is present. To check the discriminant validity, item loading on its theoretical construct and cross-loading on all other constructs have been examined. Results showed that the loading of items is higher than the cross-loading of all items, suggesting discriminant validity. Further, the AVE test shows that the square root of the AVE of the constructs is greater than all correlations of that construct to all other constructs. Except the square root of AVE of JPRS (0.79), which is slightly less than the correlation (0.80) between JPRS and DC, these two tests convey that discriminant validity is acceptable.

Reliability and validity of formative construct: Though no single method is universally accepted for validating formative constructs, Petter et al. (2007)'s approach is regarded as promising. For reliability, the nonexistence of excessive multicollinearity is examined. VIF measures of all items are between 1.8 to 3.8, where all VIF are below the threshold of 10 (Hair *et al.*, 2007), and most are below another stringent threshold of 3.3 (Petter *et al.*, 2007), suggesting reliability is satisfactory. For validity, first, PLS was used to calculate the weights of each item of formative constructs. Weighted scores were created by multiplying weight and original item values. Then, a composite score was calculated by summing all of the weighted scores of a construct. Finally, correlations among weighted scores and the composite score were derived. It has been observed that items within a construct are highly correlated to their own construct, conveying convergent validity. We also observed that the correlation of items to

their own construct is higher than the correlations with other constructs, supporting divergent validity. Another measure to assess validity is the examination of the weight of measurement items and their significance. We found weights of 9 out of 12 items are significant ($p<0.05$). However, researchers (Lowry and Gaskin, 2014; Petter *et al.*, 2007) suggest not to drop insignificant items at the expense of content validity and theoretical meanings of the constructs. Therefore, those three insignificant items were retained to represent the intended meaning of the construct, SSCP. The above multiple tests convey that formative constructs and their items are reliable and valid. Further, according to Liang et al. (2007), common method bias (CMB) is not a problem.

5.1. Test of Hypotheses

Weights of all three of the first-order constructs are significant ($p<0.001$) unto the second order SSCP construct (SCEP=>SSCP, 0.428***; SCSP->SSCP, 0.356***; SCP->SSCP, 0.287***). Hence, statistical evidence of SSCP being the second-order, three-dimensional formative construct is present. We further found that hypotheses, H_{1a} (0.645, $p<0.001$), H_{1b} (0.487, $p<0.001$), H_{1c} (0.417, $p<0.001$), H_{2a} (0.662, $p<0.001$), H_{2b} (0.226, $p<0.001$), H_{3a} (0.325, $p<0.001$), H_{3b} (0.280, $p<0.001$), and H_4 (0.188, $p<0.05$), are supported as their path coefficients are positive and significant. The seventy-percent variance of SSCP is explained by this model.

To test the mediation effect, we followed the guidelines given by Baron and Kenny (1986). A variable fully mediates the relationship between two variables when the direct link is insignificant. When both direct and indirect paths are significant, it is known as partial mediation. Results showed that DC partially mediates JPRS to SSCP (H_{5a} supported) and commitment to SSCP (H_{5b} supported). CC partially mediates between JPRS and DC (H_6 supported); commitment partially mediates the relationship between CC and DC (H_7 supported).

Table 1 conveys that all predictors in our model explain the very high variance (R^2) of its dependent constructs. A substantial value of R^2 and high path coefficients show that our model has very good predictive power.

5.2. Types of collaboration and SSCP

This study further examines the effect of collaborative partners and industry types on DC and sustainable performance. The dataset has been split into the three collaborative arrangements: (1) firm collaborating with both supplier and customer, (2) firms collaborating with only customer, and (3) firms collaborating with only supplier or other members (such as manufacturers, service providers, and wholesalers); and two industry types: manufacturing and service. These datasets and Chin (2000)'s proposed formula were used to confirm if any of the two arrangements are statistically different on a relationship. Table 2 shows which relationship differs from one type of collaborative partner or industry to another. It is found that firms that collaborated with both suppliers and customers differed significantly from firms collaborating with only customers on two relationships: commitment to SSCP and CC to DC. The relationships, CC to DC, and DC to SSCP are not significant for the service industry.

Table 2: Statistical test of causal relationships among various groups

Causal relationships among various collaborative arrangements						
	Commitment => SSCP		CC => DC		CC => Commitment	
Partners	Upstream and downstream	Downstream	Upstream and downstream	Downstream	Upstream and downstream	Upstream
Reg. weight	0.214**	0.504**	0.106*	0.322**	0.663	0.185
p-value (2-tailed)	0.039		0.08		0.011	
	Commitment => DC		JPRS => DC		CC => Commitment	
Partners	Upstream and downstream	Upstream	Upstream	Downstream	Upstream	Downstream
Reg. weight	0.351***	0.073	0.738***	0.349**	0.184	0.754***
p-value (2-tailed)	0.003		0.001		0.002	
Causal relationships among different industries						
	CC => DC		DC => SSCP			
Industry	Manufacturing	Service	Manufacturing	Service		
Reg. weight	0.328	0.166	0.379	0.106		
p-value (2-tailed)	0.001		0.024			

6. Discussion and managerial implications

In response to the need for building SSC, this research examines the heterogeneity effect of relational capital, i.e., collaboration, in developing SSC. Built on RBV, RV, and the theory of DC, this study develops a conceptual model and analyzes the interplay of collaboration (JPRS and CC), DC, and SSCP. The main argument of this research is that collaboration helps develop DC and commitment, which, in turn, build SSC. Further, the impact of collaboration and industry types on DC and SSCP are analyzed.

The proposed hypotheses describe possible linkages between collaboration, DC, commitment, and SSCP. All these hypotheses were found to be positive and significant and, therefore, supported in favor of the conceptualized model. Now, it is pertinent to understand that a collaborative relationship not only positively influences SSCP, but also builds DC, which, in turn, becomes crucial in developing and maintaining SSC. Our finding that collaboration (i.e., JPRS) directly impacts SSCP complements the extant literature (Dao et al., 2011; Gimenez and Tachizawa, 2012; Sarkis et al., 2011; Vachon and Klassen, 2006) by highlighting the fact that collaboration with suppliers improves social and environmental performance. To cope with today's ever-changing markets, customer preferences, social behaviors, and environmental needs, DCs built on relational capital are of the utmost importance for any organization. Complex in nature, DC built on RBV and RV brings competitive advantages in today's rapidly changing business environment.

Both JPRS and CC play a role in building DC, and DC alone explains 58.5% of the variance of SSCP without direct influence from JPRS, CC, and commitment. When JPRS, CC, and commitment were tested for influencing SSCP directly, the model explained almost 70% of the variance of SSCP. It reveals that collaboration influences SSCP, both directly and through DC and commitment. In the absence of commitment, the link between DC and SSCP is weak, while it becomes significant in the presence of commitment. Therefore, CC alone is not enough to influence DC and SSCP, but it necessarily requires the presence of commitment. It conveys that DC and commitment mediate the relationship between CC and SSCP. JPRS plays a crucial role in influencing CC, DC, and SSCP. Trust and loyalty are crucial attributes of CC and require a considerable amount of time to be developed (Beske, 2012). Despite the complexity and time needed, CC can be changed by diligent top leadership and its efforts should be complemented by operational practices (Galpin *et al.*, 2015). Further, quality

and modes of communication, training, reward system, hiring objectives, and performance management processes all support the initiatives for developing a culture of sustainability (Galpin *et al.*, 2015). Trust and commitment, and therefore CC, can't easily be transferred and imitated by other organizations. Hence, the development of CC from the long-term practice of JPRS can provide a unique competitive advantage. As strong CC can't be realized or developed immediately, JPRS plays a significant role in evolving culture, hence corroborating Beske (2012)'s and Kumar et al. (2016)'s works. JPRS alone explains 41.6% of the variance of CC. Further, JPRS positively influences DC and SSCP directly, and also influences SSCP through DC. It further underlines the need of resource and information sharing in developing DC and realizing SSCP.

In general, we found that collaboration enhances DC and commitment, and these constructs are critical in supporting SSCP. However, these observations may not hold for different types of collaboration and industry. The resource-intensive manufacturing industry may reveal different behaviors. To settle this conjecture, we tested the impact of different partners and industries and verified whether links leading to DC and SSCP hold. We found that most relationships cutting across all types of supply chain partners did not significantly differ. This further strengthens our conceptual grounding that collaboration on resources and a healthy culture can help to develop DC, which, in turn, can lead to unique core competencies and SSCP. However, few linkages differ across different partnerships.

The linkages leading to DC differ on types of partners. The relationships "commitment to DC" and "CC to commitment" are stronger for the "supplier and customer" partnership as compared to the only upstream partnership. The relationships CC to DC and commitment to SSCP are stronger for those who collaborated with the customer as compared to the "supplier and customer" partnership. The relationship JPRS to DC is stronger for those who collaborated only with upstream (supplier) than those who collaborated with the customer. Results indicate that, to make resource sharing more effective and to strengthen DC, upstream/supplier side collaboration is more important than customer side collaboration. This corroborates the literature (Albino *et al.*, 2012; Gimenez and Tachizawa, 2012; Vanpoucke *et al.*, 2014), showing that collaboration with suppliers helps develop DC, competitiveness, and SSCP. The relationship between culture and commitment is stronger in downstream side collaboration than in upstream side collaboration. It implies that a stronger commitment to sustainability

results in downstream side collaboration. This may be because customers would be more concerned about the environment and society, as they are closely connected to end-users' society. Furthermore, collaborating with downstream partners (customers) helps to understand customers better and to monitor their changes in taste, needs, and so on. This turns into higher flexibility and speed to adapt to the changing market environment. Working together can develop a commitment to the environment and society. The results also add value to the study of Vachon and Klassen (2008), who found collaborating with suppliers and customers yields different sets of values. For the effective relationship of either CC to commitment or commitment to SSCP, downstream (or both upstream and downstream) side collaboration is more important than upstream side partnership.

We also studied the dynamics of relationships in developing SSCP across the manufacturing and service industries. Though most links were significant for both types of industry, we found that the links CC to DC and DC to SSCP did not yield results for the service industry. However, they were significant for the manufacturing industry. This may be because, in the service sector, intensive resource sharing, learning together, fast innovation, and building long-term trust may be less important, so a weak CC may not be able to bring DC. On the contrary, it is hard for the manufacturing industry to survive without working with shared resources, trust-building, fast innovation, and loyal partners. DC is observed translating into SSCP, which is a bit surprising. One plausible explanation may be that, as India's service industry has stronger competency than the manufacturing sector, offering a part of service outside the country does not mean facing stiff competition, as compared to the manufacturing sector. In the manufacturing sector, not only world-class companies are entering the Indian economy, but also cheap products from China give tough competition to the existing manufacturing industry. Hence, the service sector seems not to be focused on utilizing its DC to achieve more sustainable performance. On the contrary, apart from being compliant with laws and regulations, to become relevant in markets, the manufacturing sector has to build a robust link to society and a positive outlook toward the environment, which appears in utilizing DC into SSCP.

This research explores the process of building SSC and is built on the strength of RBV and RV, which alone are not enough to achieve SSCP and, therefore, DC needs to intervene. We showed how collaborative relationships and commitment build DC, which results in sustainable performance. More

specifically, deploying shared resources strengthens CC; both resources and culture in the presence of commitment nurture DC, which are reasonably complex and not easy to imitate. The structure of development processes creates competitive advantages, which drive SSCP. Clearly, this study draws on RBV and relational capital's strength and opens a new avenue of building capabilities to renew itself, if required. Thus, this theory deals with a prudent structure for developing SSCP.

This research offers understanding for developing SSCP and valuable insights for policy and decision-makers. For those firms that dream of staying and becoming leaders in their markets, it is very important to devise strategies that can deliver superior and consistent performance on economic, environmental, and social aspects in today's dynamic business environment. Our findings convey to managers that, to achieve SSCP, collaboration and commitment are required, which help to develop DC and, finally, to realize SSCP. Though DC can take different shapes, and it may not be possible to achieve everything, every time, commitment to a goal is a prerequisite for taking DC toward SSCP. Since there are different sheds of collaborative relationships (Barratt, 2004; Kumar and Banerjee, 2012), it is important to make decisions based on the dimensions that will effectively bring sustainability to business operations. JPRS and CC, the heart of collaboration, are vital in developing DC and SSCP. As this study deals with sustainable performance, findings will be useful for firms aiming at performing in the long run, as well as in the short term. Findings are beneficial for both the developed and developing economies; they may be more useful for countries that are at an early stage of developing sustainability and green initiatives, such as India, China, Indonesia, Malaysia, Vietnam, among others.

7. Conclusions and outlook

This research has several key contributions, which advance theories, knowledge, and understanding by extending SSC literature (Beske, 2012; Blome *et al.*, 2014; Dao *et al.*, 2011; Gimenez and Sierra, 2013; Meinlschmidt *et al.*, 2016; Paulraj *et al.*, 2014; Su *et al.*, 2014; Vachon and Klassen, 2008), especially in collaboration and DC-based sustainability development. First, this research empirically responds to the explicit call of Beske (2012) and Meinlschmidt *et al.* (2016) by giving a prudent theory of sustainability governance, which examines the interplay between collaboration (JPRS and CC), DC, commitment, and SSCP. This is the first study to stress that collaboration helps developing SSCP

through DC and commitment where SSCP is modelled as a second-order formative construct, rather than three or two disjoint constructs. Integrating RBV and RV, this study suggests building DC in developing sustainability.

Second, we captured collaboration practice from resource sharing and culture, that is more specific and relevant to practice than literature, which hardly pays attention to culture as relational capital, thereby, complementing and corroborating Galpin *et al.* (2015)'s work. Third, we showed DC mediates the relationships of JPRS and commitment to SSCP; CC mediates between JPRS and DC; commitment to sustainability mediates between CC and DC. Fourth, we also tested whether the relationships differed across types of supply chain partners and industries, and contested results with the existing literature. Fifth, while most studies on sustainability focused on developed countries (Fahimnia *et al.*, 2015), our study, though generic in nature, unraveled collaboration-based sustainability mediated by DC and commitment in India, a rapidly emerging economy.

In order to achieve DC and then SSCP, firms must collaborate with their supply chain partners. However, as our study reveals, CC alone is not enough to achieve sustainable performance, but it needs to be fully integrated with a mission for environmental and social responsibility. "People can't change what they don't understand" (Harvard Business Review, 2017): this means that everyone in the supply chain needs to be engaged and aligned with the strategy; that is, everyone should be committed to the final goal.

In today's rapidly changing environment, it is imperative to achieve DC because firms need to adapt as quickly as possible to the continuously changing market's needs. This highlights the importance for a firm to tighten relationships, not only with upstream partners, but also with customers. Only through closer collaboration with customers, firms can respond better and faster to customers' needs: "[A]dapting a business to profound change is a difficult job made easier if we stay close to the change" (Philip Clarke, former CEO of Tesco; The Telegraph, 2013).

These results become even stronger if we consider how digitalization will force companies to be more customer-centric and to adapt incredibly fast to their changing needs: businesses born in the internet era are contributing to a dynamic competitive environment, requiring rapid response and higher standard of customer service from incumbent businesses (Capgemini 2015). In other words, supply

chains, through collaboration and commitment, need to acquire DC, in order to gain competitive advantages and sustain them over the long run.

We open future research avenues in several ways. As we modeled SSCP to capture the true instinct of TBL, it would be interesting to understand how different the established linkages in previous studies came to be. It is necessary to shed light on how the development of DC and SSCP unfolds in the presence of barriers and "measurement and problem solving," which is a collaborative construct (Kumar and Banerjee, 2014). We acknowledge the existence of multiple variables (Teece, 2007; Wang and Ahmed, 2007) for DC; we have chosen a few relevant and important items in our context. Incorporating more or different items in different situations will add value to our work. It would be enlightening to analyze the interactions between dimensions of collaboration and each facet of DC—adaptive, absorptive, and innovation—separately. Integrating agile manufacturing (Goswami and Kumar, 2018) with the proposed model will bring valuable insights. Last but not least, our findings emerged from data collected from India; our theory related to DC would be more generic if tested in an individual industry in other parts of the globe.

References

Ahi, P. and Searcy, C. (2015), "Assessing sustainability in the supply chain: A triple bottom line approach", *Applied Mathematical Modelling*, Vol. 39 No. 10–11, pp. 2882–2896.

Albino, V., Dangelico, R.M. and Pontrandolfo, P. (2012), "Do inter-organizational collaborations enhance a firm's environmental performance? a study of the largest U.S. companies", *Journal of Cleaner Production*, Vol. 37, pp. 304–315.

Barney, J. (1991), "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99–120.

Baron, R.M. and Kenny, D.A. (1986), "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations.", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, p. 1173.

Barratt, M. (2004), "Understanding the meaning of collaboration in the supply chain", *Supply Chain Management: An International Journal*, Vol. 9 No. 1, pp. 30–42.

Beske, P. (2012), "Dynamic capabilities and sustainable supply chain management", *International Journal of Physical Distribution & Logistics Management*, Vol. 42 No. 4, pp. 372–387.

Beske, P., Land, A. and Seuring, S. (2014), "Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature", *International Journal of Production Economics*, Vol. 152, pp. 131–143.

Beske, P. and Seuring, S. (2014), "Putting sustainability into supply chain management", edited by Stefan Schaltegger, Prof Roger Burr, D.*Supply Chain Management: An International Journal*, Vol. 19 No. 3, pp. 322–331.

Biswas, I., Raj, A. and Srivastava, S.K. (2018), "Supply chain channel coordination with triple bottom line approach", *Transportation Research Part E: Logistics and Transportation Review*, Vol. 115, pp. 213–226.

Blome, C., Paulraj, A. and Schuetz, K. (2014), "Supply chain collaboration and sustainability: a profile deviation analysis", edited by Helen Walker, Professor Stefan Seur, P.*International Journal of Operations & Production Management*, Vol. 34 No. 5, pp. 639–663.

Business Standard. (2018), "Samsung most trusted brand in India, Patanjali tops FMCG: Report", *Business Standard India*, 17 April, available at: https://www.business-standard.com/article/companies/samsung-most-trusted-brand-in-india-patanjali-tops-fmcg-report-118041701367_1.html (accessed 3 September 2019).

Carter, C.R. and Rogers, D.S. (2008), "A framework of sustainable supply chain management: moving toward new theory", *International Journal of Physical Distribution & Logistics Management*, Vol. 38 No. 5, pp. 360–387.

Chakkol, M., Selviaridis, K., Finne, M. and Finne, M. (2018), "The governance of collaboration in complex projects", *International Journal of Operations & Production Management*, Vol. 38 No. 4, pp. 997–1019.

Chen, L., Zhao, X., Tang, O., Price, L., Zhang, S. and Zhu, W. (2017), "Supply chain collaboration for sustainability: A literature review and future research agenda", *International Journal of Production Economics*, available at:https://doi.org/10.1016/j.ijpe.2017.04.005.

Chen, P.-C. and Hung, S.-W. (2014), "Collaborative green innovation in emerging countries: a social capital perspective", *International Journal of Operations & Production Management*, Vol. 34 No. 3, pp. 347–363.

Chin, W.W. (1998), "The partial least squares approach for structural equation modeling", *Modern Methods for Business Research*, Lawrence Erlbaum Associates Publishers, Mahwah, NJ, US, pp. 295–336.

Chin, W.W. (2000), "Frequently Asked Questions – Partial Least Squares & PLS-Graph", available at: http://disc-nt.cba.uh.edu/chin/plsfaq.htm (accessed 3 June 2017).

Chowdhury, M.M.H. and Quaddus, M. (2017), "Supply chain resilience: Conceptualization and scale development using dynamic capability theory", *International Journal of Production Economics*, Vol. 188, pp. 185–204.

Collins, J.C. and Porras, J.I. (1996), "Building your company's vision", *Harvard Business Review*, Vol. 74 No. 5, p. 65.

Dao, V., Langella, I. and Carbo, J. (2011), "From green to sustainability: Information Technology and an integrated sustainability framework", *The Journal of Strategic Information Systems*, Vol. 20 No. 1, pp. 63–79.

De Giovanni, P. (2012), "Do internal and external environmental management contribute to the triple bottom line?", *International Journal of Operations & Production Management*, Vol. 32 No. 3, pp. 265–290.

Dessler, G. (1999), "How to Earn Your Employees' Commitment", *The Academy of Management Executive (1993-2005)*, Vol. 13 No. 2, pp. 58–67.

Diamantopoulos, A. and Winklhofer, H.M. (2001), "Index Construction with Formative Indicators: An Alternative to Scale Development", *Journal of Marketing Research*, Vol. 38 No. 2, pp. 269–277.

Eisenhardt, K.M. and Martin, J.A. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21 No. 10–11, pp. 1105–1121.

Elkington, J. (1994), "Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development", *California Management Review*, Vol. 36 No. 2, pp. 90–100.

Elkington, J. (2004), "Enter the triple bottom line", *The Triple Bottom Line: Does It All Add Up*, Vol. 11 No. 12, pp. 1–16.

Fahimnia, B., Sarkis, J. and Davarzani, H. (2015), "Green supply chain management: A review and bibliometric analysis", *International Journal of Production Economics*, Vol. 162, pp. 101–114.

Fornell, C. and Larcker, D.F. (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", *Journal of Marketing Research*, Vol. 18 No. 1, p. 39.

Galpin, T., Whitttington, J.L. and Bell, G. (2015), "Is your sustainability strategy sustainable? Creating a culture of sustainability", *Corporate Governance: The International Journal of Business in Society*, Vol. 15 No. 1, pp. 1–17.

Ganguly, K. and Kumar, G. (2019), "Supply Chain Risk Assessment: a fuzzy AHP approach", *Operations and Supply Chain Management: An International Journal*, pp. 1–13.

Gimenez, C. and Sierra, V. (2013), "Sustainable Supply Chains: Governance Mechanisms to Greening Suppliers", *Journal of Business Ethics*, Vol. 116 No. 1, pp. 189–203.

Gimenez, C. and Tachizawa, E.M. (2012), "Extending sustainability to suppliers: a systematic literature review", edited by Wilding, R.*Supply Chain Management: An International Journal*, Vol. 17 No. 5, pp. 531–543.

Golicic, S.L. and Smith, C.D. (2013), "A Meta-Analysis of Environmentally Sustainable Supply Chain Management Practices and Firm Performance", *Journal of Supply Chain Management*, Vol. 49 No. 2, pp. 78–95.

Goswami, M. and Kumar, G. (2018), "An investigation of agile manufacturing enablers in Indian automotive SMEs using structural equation model", *Measuring Business Excellence*, Vol. 22 No. 3, pp. 276–291.

Gottge, S., Menzel, T. and Forslund, H. (2020), "Industry 4.0 technologies in the purchasing process", *Industrial Management & Data Systems*, Emerald Publishing Limited, Vol. 120 No. 4, pp. 730–748.

Hair, J.F.J., Black, W.C., Babin, B.J. and Anderson, R.E. (2007), *Multivariate Data Analysis*, 7 edition., Pearson, Upper Saddle River, NJ.

Helfat, C.E. and Winter, S.G. (2011), "Untangling Dynamic and Operational Capabilities: Strategy for the (N)ever-Changing World", *Strategic Management Journal*, Vol. 32 No. 11, pp. 1243–1250.

Huang, T.-T. (Andrew), Chen, L., Stewart, R.A. and Panuwatwanich, K. (2013), "Leveraging power of learning capability upon manufacturing operations", *International Journal of Production Economics*, Vol. 145 No. 1, pp. 233–252.

Indiacsr. (2012), "Corporate Must Involve Population at Large & Make Balance Between Mechanization & Labour Engagements – India CSR News Network", available at: http://indiacsr.in/corporate-must-involve-population-at-large-make-balance-between-mechanization-labour-engagements/ (accessed 17 June 2017).

Jain, V. (2016), "9 business management principles of Baba Ramdev", *YourStory.Com*, 22 June, available at: https://yourstory.com/2016/06/9-business-management-principles-baba-ramdev/ (accessed 17 June 2017).

Jarvis, C.B., MacKenzie, S.B. and Podsakoff, P.M. (2003), "A critical review of construct indicators and measurement model misspecification in marketing and consumer research", *Journal of Consumer Research*, Vol. 30 No. 2, pp. 199–218.

Krause, D.R., Handfield, R.B. and Tyler, B.B. (2007), "The relationships between supplier development, commitment, social capital accumulation and performance improvement", *Journal of Operations Management*, Vol. 25 No. 2, pp. 528–545.

Kumar, G. and Banerjee, R.N. (2012), "Collaboration in supply chain: An assessment of hierarchical model using partial least squares (PLS)", *International Journal of Productivity and Performance Management*, Vol. 61 No. 8, pp. 897–918.

Kumar, G. and Banerjee, R.N. (2014), "Supply chain collaboration index: an instrument to measure the depth of collaboration", *Benchmarking: An International Journal*, Vol. 21 No. 2, pp. 184–204.

Kumar, G., Banerjee, R.N., Meena, P.L. and Ganguly, K. (2016), "Collaborative culture and relationship strength roles in collaborative relationships: a supply chain perspective", *Journal of Business & Industrial Marketing*, Vol. 31 No. 5, pp. 587–599.

Kumar, G. and Goswami, M. (2019), "Sustainable supply chain performance, its practice and impact on barriers to collaboration", *International Journal of Productivity and Performance Management*, available at:https://doi.org/10.1108/IJPPM-12-2018-0425.

Kumar, G., Subramanian, N. and Maria Arputham, R. (2018), "Missing link between sustainability collaborative strategy and supply chain performance: Role of dynamic capability", *International Journal of Production Economics*, Vol. 203, pp. 96–109.

Large, R.O. and Thomsen, C.G. (2011), "Drivers of green supply management performance: Evidence from Germany", *Journal of Purchasing and Supply Management*, Vol. 17 No. 3, pp. 176–184.

Lee, S.-Y. (2015), "The effects of green supply chain management on the supplier's performance through social capital accumulation", *Supply Chain Management: An International Journal*, Vol. 20 No. 1, pp. 42–55.

Lee, S.-Y. and Klassen, R.D. (2008), "Drivers and Enablers That Foster Environmental Management Capabilities in Small- and Medium-Sized Suppliers in Supply Chains", *Production and Operations Management*, Vol. 17 No. 6, pp. 573–586.

Lewin, A.Y., Massini, S. and Peeters, C. (2011), "Microfoundations of Internal and External Absorptive Capacity Routines", *Organization Science*, Vol. 22 No. 1, pp. 81–98.

Liang, H., Saraf, N., Hu, Q. and Xue, Y. (2007), "Assimilation of enterprise systems: the effect of institutional pressures and the mediating role of top management", *MIS Quarterly*, pp. 59–87.

Liao, S.-H., Hu, D.-C. and Ding, L.-W. (2017), "Assessing the influence of supply chain collaboration value innovation, supply chain capability and competitive advantage in Taiwan's networking communication industry", *International Journal of Production Economics*, Vol. 191, pp. 143–153.

Liboni, L.B., Jabbour, C.J.C., Jabbour, A. and Devika, K. (2017), "Sustainability as a dynamic organizational capability: a systematic review and a future agenda toward a sustainable transition", *Journal of Cleaner Production*, Vol. 142, Part 1, pp. 308–322.

Lowry, P.B. and Gaskin, J. (2014), "Partial Least Squares (PLS) Structural Equation Modeling (SEM) for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It", *IEEE Transactions on Professional Communication*, Vol. 57 No. 2, pp. 123–146.

Lu, C.-S., Lin, C.-C. and Tu, C.-J. (2009), "Corporate social responsibility and organisational performance in container shipping", *International Journal of Logistics Research and Applications*, Vol. 12 No. 2, pp. 119–132.

Luzzini, D., Brandon-Jones, E., Brandon-Jones, A. and Spina, G. (2015), "From sustainability commitment to performance: The role of intra- and inter-firm collaborative capabilities in the upstream supply chain", *International Journal of Production Economics*, Vol. 165, pp. 51–63.

Machado, C.G., Pinheiro de Lima, E., Gouvea da Costa, S.E., Angelis, J.J. and Mattioda, R.A. (2017), "Framing maturity based on sustainable operations management principles", *International Journal of Production Economics*, Vol. 190, pp. 3–21.

Martins, C.L., Melo, M.T. and Pato, M.V. (2019), "Redesigning a food bank supply chain network in a triple bottom line context", *International Journal of Production Economics*, Vol. 214, pp. 234–247.

Meinlschmidt, J., Foerstl, K. and Kirchoff, J.F. (2016), "The role of absorptive and desorptive capacity (ACDC) in sustainable supply management: A longitudinal analysis", *International Journal of Physical Distribution & Logistics Management*, Vol. 46 No. 2, pp. 177–211.

Ortas, E., M. Moneva, J. and Álvarez, I. (2014), "Sustainable supply chain and company performance: A global examination", edited by Dr Stefan Schaltegger, Prof Roger Burr*Supply Chain Management: An International Journal*, Vol. 19 No. 3, pp. 332–350.

Pagell, M. and Shevchenko, A. (2014), "Why Research in Sustainable Supply Chain Management Should Have no Future", *Journal of Supply Chain Management*, Vol. 50 No. 1, pp. 44–55.

Pagell, M. and Wu, Z. (2009), "Building a More Complete Theory of Sustainable Supply Chain Management Using Case Studies of 10 Exemplars", *Journal of Supply Chain Management*, Vol. 45 No. 2, pp. 37–56.

Paulraj, A., Jayaraman, V. and Blome, C. (2014), "Complementarity effect of governance mechanisms on environmental collaboration: does it exist?", *International Journal of Production Research*, Vol. 52 No. 23, pp. 6989–7006.

Petter, S., Straub, D. and Rai, A. (2007), "Specifying Formative Constructs in Information Systems Research", *MIS Quarterly*, Vol. 31 No. 4, pp. 623–656.

Reuter, C., Foerstl, K.A.I., Hartmann, E.V.I. and Blome, C. (2010), "Sustainable global supplier management: the role of dynamic capabilities in achieving competitive advantage", *Journal of Supply Chain Management*, Vol. 46 No. 2, pp. 45–63.

Sarkis, J., Zhu, Q. and Lai, K. (2011), "An organizational theoretic review of green supply chain management literature", *International Journal of Production Economics*, Vol. 130 No. 1, pp. 1–15.

Simatupang, T.M. and Sridharan, R. (2004), "Benchmarking supply chain collaboration: An empirical study", *Benchmarking: An International Journal*, Vol. 11 No. 5, pp. 484–503.

Srivastava, P., Iyer, K.N.S. and Rawwas, M.Y.A. (2017), "Performance impact of supply chain partnership strategy-environment co-alignment", *International Journal of Operations & Production Management*, Vol. 37 No. 7, pp. 927–949.

Su, H.-C., Linderman, K., Schroeder, R.G. and Van de Ven, A.H. (2014), "A comparative case study of sustaining quality as a competitive advantage", *Journal of Operations Management*, Vol. 32 No. 7–8, pp. 429–445.

Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319–1350.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509–533.

Touboulic, A. and Walker, H. (2015), "Theories in sustainable supply chain management: a structured literature review", *International Journal of Physical Distribution & Logistics Management*, Vol. 45 No. 1/2, pp. 16–42.

Vachon, S. and Klassen, R.D. (2006), "Extending green practices across the supply chain: The impact of upstream and downstream integration", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 795–821.

Vachon, S. and Klassen, R.D. (2008), "Environmental management and manufacturing performance: The role of collaboration in the supply chain", *International Journal of Production Economics*, Vol. 111 No. 2, pp. 299–315.

Vanpoucke, E., Vereecke, A. and Wetzels, M. (2014), "Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach", *Journal of Operations Management*, Vol. 32 No. 7–8, pp. 446–461.

Wang, C.L. and Ahmed, P.K. (2007), "Dynamic capabilities: A review and research agenda", *International Journal of Management Reviews*, Vol. 9 No. 1, pp. 31–51.

Wilhelm, M., Blome, C., Wieck, E. and Xiao, C.Y. (2016), "Implementing sustainability in multi-tier supply chains: Strategies and contingencies in managing sub-suppliers", *International Journal of Production Economics*, Vol. 182, pp. 196–212.

Youn, S., Yang, M.G. (Mark) and Jungbae Roh, J. (2012), "Extending the efficient and responsive supply chains framework to the green context", edited by Hong, P. *Benchmarking: An International Journal*, Vol. 19 No. 4/5, pp. 463–480.

Zhu, Q., Sarkis, J. and Lai, K. (2008), "Confirmation of a measurement model for green supply chain management practices implementation", *International Journal of Production Economics*, Vol. 111 No. 2, pp. 261–273.

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