

The impact on organizational performance of linking green supply chain management with supply-chain integration: a conceptual model

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Abstract

This study proposes that supply chain integration (SCI) has the key relational capability to support the strategic employment of green supply chain management (GSCM) practices. This conceptual paper will further the understanding of the employment of GSCM practices and SCI mechanisms, in addition to providing a comprehensive review of the literature on the interdependent relationship of GSCM practices and SCI with respect to organizational performance. Manufacturing firms are expected to benefit from learning of a helpful approach to applying GSCM practices, which will improve their overall organizational performance.

Keywords: Supply chain integration, green supply management

Introduction

In recent years, studies in field have paid increasing attention to the integration of environmental movements and organizational performance. Environmental pollution, the exhaustion of natural resources, and climate change are the key catalysts to efforts made by the international community towards the greening of organizations and the whole supply chain (Lee et al., 2012). Organizations are obliged to provide a balance between the economic, social, and environmental aspects of their performance. This is especially so for those with community, competitive, and regulatory pressures (Ayuso et al., 2014). Given the rising awareness of global environmental protection, scholars and practitioners of operations and supply-chain management have increasingly begun to focus on green supply chain management (GSCM) systems (Geng et al., 2017). In fact, the compounding factor of the exhaustion of natural resources has made GSCM more important than ever. Therefore, GSCM is seen as a successful management tool, which encourages manufacturing organizations to enhance their sustainability performance (Zhu et al., 2012). Indeed, with this growing focus on environmental sustainability, manufacturers will need to implement strategies to reduce the environmental impact caused by their goods and services. Of course, the environmental problems of industrialized countries caused by serious environmental pollution, waste, and the growing consumption of natural

resources are huge (Abdullah et al., 2015). Single corporations or entire sectors are the reasons for these environmental pollution problems, leading to GSCM being taken more seriously as an effective management tool for the manufacturing sector in improving their own sustainability. Rather than focusing solely on the rectification of negative environmental impact, De Giovanni (2012) presented GSCM as a positive strategy which in itself brings constructive improvements to companies through better environmental performance and enhanced community welfare. In broader terms, a perusal of the literature reveals a lack of agreement on the overall effect of GSCM on performance outcomes, and varied results on the correlation between performance targets and environmental practices (Hsu et al., 2013; Laosirihongthong et al., 2013). It is true that several studies demonstrated that GSCM practices are able to have a positive effect on environmental performance (Geng et al., 2017), with what has become known as the “win win argument” being widely used in the justification of the implementation of GSCM. Nonetheless, this has certainly not been the case in all studies (Zhu et al., 2012), where the implementation of environmental practices should have had a positive impact, but did not (Jayashree et al., 2013). Some research indicates a positive correlation between environmental initiatives and economic achievements (Sarkis & Cordeiro 2001), while other studies have only disclosed negative effects (Hsu et al., 2013). Certainly, it can be said that this very uncertain connection between GSCM adoption and consequent performance outcomes merits further investigation; particularly the investigation of what other factors may be at play. Zhu et al. (2012) made the point that the lack of agreement in the research may in fact become an obstacle for organizations which have the intention of implementing GSCM. Based on a comprehensive reading of the literature, this paper suggests three plausible sources of inconsistency. Firstly, the contradictory findings may be caused by the influence of moderating variables, variables which may alter the impact of GSCM practices and performance (Abdullah et al., 2015). Secondly, the type of green supply chain practices initiated in organizations can have a varying effect on performance (Laosirihongthong et al., 2013). Lastly, the lack of standard performance measures compounds the complexity of the relationship between performance and environmental practices in an organization (Zhu et al., 2012). Considering these limitations, the impact of GSCM practices on the sustainability performance of organizations and the nature of the possible moderating variable which effects this relationship are vital questions. With regard to the moderating variable, this study will investigate the moderating effect of supply chain integration on the relationship between GSCM practices and organizational performance. For supply chain integration (SCI) has been given significant attention as a fundamental means of both creating material and knowledge flows and of controlling key competencies in a supply chain (Narasimhan et al., 2010). Scholars and practitioners have laid much emphasis on the capability of SCI to bring a competitive advantage and as a way of enhancing performance. The potential advantages of SCI are only achievable, however, if the firm is able to maintain robust supply chain networks and efficient internal operations (Olhager & Prajogo, 2012). Hence, organizations and their supply chain participants are likely to work closely to obtain extraordinary synergies and advantages through integration procedures such as mutual exchange of information with suppliers and precise identification of consumer demand (Allred et al., 2011). SCI is defined as the collaboration between an organization and its supply chain participants to deal with the intra- and inter-organizational environmental practices and is separated into external and internal integration (Abdullah et al. 2015; Wu, 2013). External integration includes co-operation between consumers and suppliers to mutually administer cross-firm environmental matters (Vachon & Klassen, 2008). Meanwhile, internal integration refers to the removal of cross-functional barriers, improvement of firm’s environmental capabilities, and firm’s action to motivate employees to gain knowledge about environmental initiatives (Wu et al., 2013). Performance of a firm is reported to have a significant improvement due to internal and external integration (Flynn et al., 2010). The reason behind such improvement is that each type of integration represents a fundamental part of supply chain integration. Hence, the impacts of each type of integration have to be holistically studied (Koufteros et al., 2005; Wong et al., 2012). Therefore, this paper seeks to develop a

conceptual framework to explore the impacts of GSCM practices on different dimensions of the organizational performance under the moderating effects of SCI. With this paper, manufacturing firms are expected to recognize a helpful approach in applying GSCM practices that improve organizational performance.

Practicing GSCM

GSCM practice is a multi-dimensional concept which can be measured from different perspectives. Different dimensions of GSCM practices have been highlighted in the past literature (Bowen et al., 2001). The disagreement on GSCM practices is because of the fact that GSCM is in the growth stage; also the theory in this area is in the rudimentary stage, as mentioned by Eltayeb and Zailani (2011). However, the GSCM can be viewed at multiple levels including external and internal GSCM dimensions (Zhu & Sarkis, 2004; Zhu et al., 2012) needed by manufacturing sectors to achieve enhanced sustainability performance (Thoo et al., 2014). In particular, this paper considers environmental management practices that need partial cooperation and transactions with suppliers and customers as external GSCM practices including green purchasing and reverse logistics (Zhu et al., 2013). Meanwhile, those activities without direct supplier or customer involvement including internal environmental management and eco-design are considered as internal GSCM practices which can be managed and implemented by an individual manufacturer (Zhu et al., 2012). These practices have been widely adopted and discussed from the previous literature (De Giovanni, 2012; Zhu et al., 2013). However, these two sets of inter-organizational green practices can be adopted by any member within the supply chain either on the upstream or downstream side of the chain, also it can lead to a sustainable competitive advantage (Sarkis, 2012). Concerning GSCM practices, previous literature has shown a positive impact on environmental performance (Lee et al., 2012; Zhu & Sarkis, 2004). For instance, Green et al. (2012) found that internal GSCM practices such as eco-design and internal environmental management resulted in the improved environmental performance of the manufacturing industries from a US context. Diabat et al. (2013) and Green et al. (2012) found that a positive relationship existed between green purchasing, reverse logistics, and cooperation with customers; all relationships which are part of external GSCM practices and environmental performance. More recently, many empirical studies have found a positive relationship between GSCM practices and economic performance that have led to competitive advantages (Rao & Holt, 2005). For example, Koh et al. (2012) found that eco-design, which is a part of internal GSCM practices, implies the reduction of waste and efficient use of materials, leading to cost savings which positively affect the economic performance of the firm. Holt and Ghobadian (2009) discovered that external GSCM practices such as green purchasing resulted in better economic performance (cost savings, an increase in profit, sales, and market share). In spite of empirical studies on the relationship between GSCM practices and social performance being limited in the literature (De Giovanni, 2012), the available empirical evidence does show that eco-friendly practices, in general, have a considerable effect on social performance, such as customer loyalty (De Giovanni, 2012), as well as enhancing the corporate image (Eltayeb & Zailani, 2011). In terms of operational performance, many studies have found a positive relationship between GSCM practices and operational performance (Zhu et al., 2011). For instance, Lee et al. (2012) demonstrated that the implementation of GSCM practices can enhance the efficiency of the recycling process and decrease disposal waste. Furthermore, GSCM practices allow firms to improve product quality and reduce lead times, which ultimately result in improvements in operational performance. Previous studies have shown that economic performance and proactive environmental initiatives could be positively related (Sarkis & Cordeiro 2001) or vice versa (Hsu et al., 2013; Laosirihongthong et al. 2013). It can be seen then that it is important to further investigate other possible determinants which might affect the unclear relationship between GSCM implementation and a firm's performance. This paper, therefore, aims to explicitly investigate the comprehensive differences in green logistics results.

Internal (GSCM) practices

The internal GSCM practices addressed in this paper, namely eco-design and internal management systems, can be employed and administrated by a single manufacturer. Previous studies have shown that eco-design and internal management practices are, in fact, the most prominent dimensions of internal GSCM practices (Zhu et al., 2013). Eco-design can be defined as specifically, the activities carried out throughout the process of product development, which are aimed at minimizing the environmental impact of the product. It is suggested that these activities comprise: the procurement of material, manufacturing, consuming, and final disposal (Zhu & Liu, 2010). Eco-design is, of course, applied while making provision for other fundamental product criteria such as cost and performance. Eco-design is now considered one of the key supply chain proposals which combines different facets of the environment with the product design; a design which is ultimately friendly to the product supply chain (Hassan et al., 2016). Consideration of eco-design is now essential as it is known that the majority of environmental effects come from the production of goods, their consumption, and disposal; processes which must affect the decisions made during the crucial design phase. This phase includes the definition of service, product, or process function, and the choice of inputs, supplies, and process chemicals; essential in order to evaluate the energy used in production, as well as the production of waste (Eltayeb & Zailani, 2011). Internal environmental management is also defined as the processes and procedures which are put into place in order to espouse a firm's intra-organizational environmental goals. Encouragement from the top and middle management levels is required to achieve the aims and goals set by the organization for supply chain management (Mentzer et al., 2001). In fact, the internal environmental processes aim at enhancing sufficiency through synchronizing quality and engineering departments, and the whole supply chain as an extension of total quality management (Walton et al., 1998). Internal environmental management can, in fact, be considered from various angles, such as the department of environmental audits, ISO 14001 certification, and the eco-labeling of products (Bowen et al., 2001). Moreover, the effective employment of several GSCM practices such as eco-design, green purchasing, and reverse logistics is entirely contingent upon internal environmental management actions (Green et al., 2012).

External (GSCM) practices

External GSCM practices can be referred to as green purchasing and reverse logistics. In order to apply such practices, a certain level of cooperation between organizations and other stakeholders such as suppliers is required (Zhu et al., 2013). Previous studies have revealed how green purchasing and reverse logistics are the most relevant areas for external GSCM practices (Zhu et al., 2013). Green purchasing is defined as a practice of environmental purchasing that seeks to ensure the goods procured comply with the organization's environmental goals. These goals include minimizing or eradicating hazardous compounds and waste materials, and recycling and retrieving the purchased materials (Eltayeb et al., 2010). Green purchasing can also be described as the process whereby the procurement managers consider the sustainability of raw materials procurement and the delivery, cost and quality of goods (Carter et al., 1998). As a GSCM initiative, reverse logistics has a vital role in increasing the efficiency of the organization's operation, enhancing its competitiveness, and lowering the entire system costs (Hung & Wang, 2009). Reverse logistics emphasizes the return of products and inputs based on the perspective of supply chain consumption for recycling, reusing, remanufacturing, repairing, or disposing (Hassan et al., 2016). Although reverse logistics mainly focuses on product retrieval from the consumers, it also includes logistics services offered to consumers, such as transportation and inventory management (Carter & Ellram, 1998)

Supply Chain Integration

The function of supply chain integration is to eliminate communication barriers and to remove discrepancies with the support of coordination, monitoring and control processes (Swink et al., 2007; Walton et al., 1998). The key impetus for integration comes from global competition, demanding

consumers, demand-driven markets with innovative types of inter-organizational relationships, and from the information revolution. The key components of an integrated supply chain model are inventory management, information systems, and supply chain management (Olhager & Prajogo, 2012). The level of integration encapsulates the product design phase and any other phases which result in the sales of products. Some scholars assert that the integration level embraces all components of the product lifecycle, such as service, recycling, and reverse logistics (Wu, 2013). By integrating the supply chain, it is argued that the profit potential and competitive position of the firm can be improved. The reason behind integrating the supply chain lies in the added possibility of both greater profit and competitiveness, which can be as high as 60%-80% of the standard company cost structure, with a 10% reduction which provides 40-50% enhancements in pre-tax profits (Hassan et al., 2016). Integration is a dynamic concept, which requires that the supply chain functions as a corporate entity which is expressed in a virtual enterprise. This is removed from conventional definitions of a firm. Such integration is directly driven by consumer demand via electronic storefront access (Koufteros et al., 2005). This phenomenon has had a great impact on most firms, resulting in the increased utilization of outsourced services. Effective employment is conditional on how changes are proposed in the firm and how the process covers suppliers and customers (Wong et al., 2011). Some of the key benefits include reduced cost and reduced cycle time. In a previous study, Wood (1997) explored the importance of aligning objectives throughout functions through collaboration and cooperation. He asserted that the inadequate alignment of objectives between functions (i.e. manufacturing and sales) would lead to the need for superior alignment in order to enhance supply chain management practices. A relationship between sustainable supply management and sustainability performance is well documented by Paulraj (2011). On the other hand, SCI is recommended as a moderator of the relationship between the GSCM practices and sustainability (Abdullah et al., 2015). This is because the presence of SCI is expected to support GSCM practices and to ease the implementation of GSCM practices for companies which form collaborative relationships with suppliers. In this context, SCI as a main relational capability could be utilized to support the formulation and implementation of GSCM strategies (Chin et al., 2015).

Organizational Performance

Sustainability in business is defined as a dynamic condition resulting from a firm's action in developing perpetual stakeholders and nurturing the values of shareholders (Hassan et al., 2016). A fundamental aspect of sustainable values is that the organization which serves both society and the environment will serve its shareholders and customers better in comparison with the organization which does not (Abdullah et al., 2015). Naturally, any evaluation of industrial sustainability performance necessitates the development of appropriate framework criteria and the definition of germane indicators (Younis et al., 2016). Numerous current integrated frameworks which are now applied to evaluate global, national or firm level sustainability were revised to recognize the importance of industrial sustainability. Such frameworks can be broadly categorized into three main sustainability dimensions, as proposed by many researchers (Holt & Ghobadian, 2009; Laosirihongthong et al., 2013). These dimensions are: economic sustainability, environmental sustainability, and social sustainability. This paper adds another dimension; operational performance. 360-degree organizational performance is the impact resulting from implementing internal and external GSCM practices on these four different aspects of organizational performance, under an SCI moderating effect. Many researchers have recommended economic performance, environmental performance, social performance, and operational performance as important performance indicators (Geng et al., 2017; Younis et al., 2016).

Proposed Conceptual Model

Based on the above discussion of findings in the literature, a theoretical model is proposed here to explore the relationship between GSCM practices, SCI, and organizational performance. The

proposed model is shown in Figure. 1. The recommended conceptual model is primarily an example of resource dependence theory (RDT) proposed by Pfeffer and Salancik in 1978. According to RDT, supply chain members will depend on each other when the network possesses critical resources to deal with any environmental dynamics and uncertainties (Zhang & Huo, 2013). Hence, SCI turns into an important way to acquire resources. One of the fundamentals for RDT is that organizations are rarely entirely self-sufficient regarding their internal resources. Consequently they are usually dependent on other organizations (Hillman et al., 2009), and therefore make some effort to carefully structure their relationships with other organizations (Paulraj & Chen, 2007). As Connelly et al. (2011) reported, the ability of firms to incorporate sustainable practices into their workflow may be hampered by dependence on other companies. Furthermore, as argued by Carter and Rogers (2008), the nature of the relationships between the suppliers and customers is essential for reducing any uncertainty associated with the sustainable supply chain. Organizations should also actively seek out external cooperation from suppliers and customers in their supply chains if they are to successfully adopt GSCM practices; in particular, external GSC practices (Lee et al. 2012). These considerations naturally lead this study to propose that external GSCM practices may be analyzed in the light of RDT. For as RDT attempts to use context to analyze and define firms (Wolf, 2014), such traditional organizational theories lend support to the understanding of the connectivity between the adoption of GSCM practices (i.e., external and internal practices) and organizational performance. Sarkis et al. (2011) claim that there is a lack of research associating GSCM-environmental management with GSCM-RDT. This paper relates these conceptual perspectives and offers four propositions:

P1: There is a positive and significant relationship between External GSCM practices and organizational performance.

P2: There is a positive and significant relationship between Internal GSCM practices and organizational performance.

P3: There is a positive and significant moderating effect of SCI on the relationship between External GSCM practices and organizational performance.

P4: There is a positive and significant moderating effect of SCI on the relationship between Internal GSCM practices and organizational performance.

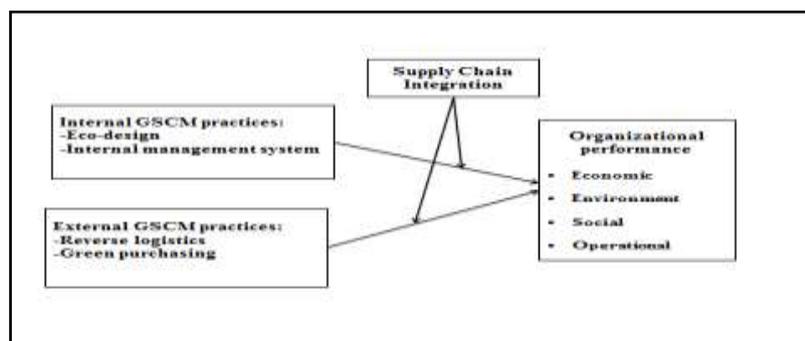


Figure 1- The proposed conceptual model

Discussion and conclusion

Previous literature has demonstrated that GSCM, SCI, and organizational performance are three vitally inter-connected SCM concepts. In fact, various studies have confirmed the significant relationship between these three constructs (Chin et al., 2015; Holt & Ghobadian 2009; Paulraj, 2011). Nonetheless, challenges have emerged such as the involvement of SCI in green product designs and the application of environmental practices in processes that are not fully understood. This paper therefore postulates that SCI has a moderating role in linking GSCM practices and organizational performance. It is proposed that with environmental collaboration, GSCM practices

could be supported and GSCM implementation could be improved. The conceptual model (Figure 1) is proposed with the foundation of RDT which was enunciated by Pfeffer and Salancik in 1978. RDT requires that the concept of the interdependence of one party is conditional upon the actions of another party to achieve a particular objective (Zhang & Huo, 2013). As for GSCM, the totality of the supply chain should include both upstream and downstream sides and internal processes (Vachon & Klassen, 2008; Yu et al., 2014). This inclusion is due to the fact that an organizations' overall performance can only be achieved when the implementation of green practices is supported by internal integration within an organization, as well as an external integration that involves consumers and suppliers (Yu et al., 2014). Since both consumers and suppliers are the backbone of any supply chain, an organization may obtain the scarce and precious resources that are beyond its control by depending on its supply chain members (Swink et al., 2007). RDT which attempts to analyze an organization's activities in terms of its own context (Wolf, 2014) has become a useful tool for comprehending the ways in which the manufacturing sector responds to environmental management actions via GSCM practices. Naturally, customers and suppliers are also vital to this understanding, as each supports in their own way the attempts of organizations to improve their own sustainability performance. Cooperation with customers, for instance, is very important, especially in the areas of packaging and post-consumption, since organizations rely upon customer satisfaction and for their products not to become the unwanted focus of international environmental law (de Sousa et al., 2015). While the focus of the literature has largely been on the role of suppliers to GSCM, this paper sheds light on the role of the customer from the perspective of the RDT for GSCM, within the specific context of environmental management. The theoretical contribution of this research, then, combines GSCM practices, organizational performance, environmental management, and RDT in a single research study. Finally, it can be claimed that GSCM practices and SCI have a significant opportunity to add value to the green development of manufacturing organizations, while also being an essential tool for motivating, inspiring, and stimulating employees to implement green practices for a greener system. Such improvements will ultimately lead to the enhancement of an organizations' overall performance.

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