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Green supply chain practices and environmental performance in Brazil: Survey, case studies, and implications for B2B

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ABSTRACT

This article examines whether or not customers cooperate in organisations' environmental performance, in what circumstances it happens; and how customers can collaborate with organisations in order to they improve their environmental performance. This research uses both the Ecological Modernisation (EM) and the Resource Dependence Theory (RDT) to analyse the effects of external Green Supply Chain Management (GSCM) practices, namely, 'Cooperation with Customers' (CC) and 'Green Purchasing' (GP) on the Environmental Performance (EP) of organisations. A multi-method research is used, combining a survey and multiple-case studies of Brazilian organisations. The main results and contributions of this research include: (a) the Brazilian setting, in the context of EM, provides incentives for adopting GSCM practices, especially CC practices; (b) Brazilian organisations depend more on customers than on suppliers to improve EP; and (c) an original matrix for a better understanding of the roles of suppliers and customers to achieve a better EP through a GSCM approach is proposed. This paper provides an extension to EM and RDT theories applied to green operations management by showing that external GSCM can improve EP and such process depends more on CC than GP. Implications for B2B are highlighted.

1. Introduction

National Geographic and global research consultancy GlobeScan developed an index to measure sustainable consumption behaviour (National Geographic, 2016). According to the latest survey, which was conducted in 18 countries in 2014, it was found that concern for environmental issues has increased since 2012 and developing countries are more likely to pursue sustainable consumption habits. India, China, South Korea, and Brazil are examples of some countries at the top of the list of more sustainable consumers.

The literature highlights that environmental pressure from stakeholders has increased, especially due to the awareness of customers. In general, the literature informs both influences from end customers' (clients) environmental preferences on organisations' environmental initiatives (Coskun, Ozgur, Polat, & Gungor, 2016; Kim, Park, & Swink, 2014; Nouira, Hammami, Frein, & Temponi, 2016) and the impact of customers as institutional pressure to induce organisations to improve their environmental performance (Gualandris & Kalchschmidt, 2014;

Lai, Wong, & Cheng, 2012). Conversely, the academic literature overwhelmingly focuses on green supplier selection practice (e.g. Arimura, Darnall, & Katayama, 2011; Bhattacharya et al., 2014; Darnall, Jolley, & Handfield, 2008; Hsu & Hu, 2008; Nawrocka, Brorson, & Lindhqvist, 2009; Tate, Ellram, & Dooley, 2014), or on co-operation in supply chains, focusing particularly on suppliers' co-operation (e.g. Ramanathan, Bentley, & Pang, 2014; Woo, Kim, Chung, & Rho, 2016); whereas research on collaboration with customers is scarce.

Thus, since sustainable consumption behaviour has arisen, a reasonable hypothesis is that customers would be more willing to cooperate with organisations in terms of green operations, for instance, green packaging. Accordingly, it would be interesting to examine whether or not customers cooperate in organisations' environmental performance, in which circumstances it flourishes, and how customers could collaborate with organisations in order for them to improve their environmental performance.

It was decided to study organisations located in Brazil in order to

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understand the role of customers in cooperation in organisations' environmental performance. Beyond the findings of National Geographic, Brazil has an institutional environment that makes it an interesting focus of investigation. Brazil stands out in the context of Latin America for its political commitment to Ecological Modernisation (EM) (Jabbour & Jabbour, 2014), which indicates the coexistence of economic and environmental development (York & Rosa, 2003). In 2010, an important environmental institutional milestone toward green growth was launched, the National Policy on Solid Waste (NPSW). This law establishes extended responsibility for the management of residues from manufacturers, importers, distributors, retailers, end customers and those in charge of urban solid residue management in reverse logistics of post-consumption residues and packaging (Brasil. Ministry of Environment, 2014).

Because of such a new institutional setting, organisations are likely to seek operational practices that are more appropriate environmentally. Since environmental responsibility will be required from various tiers of a productive chain, Green Supply Chain Management (GSCM) practices emerge as an opportunity to improve competitiveness and the environmental performance of organisations in the context of EM driven policy (Sarkis, Zhu, & Lai, 2011).

External GSCM practices – green purchasing and cooperation with customers – may catalyse the response of organisations to EM. Schoenherr, Modi, Talluri, and Hult (2014) claim that green purchasing is related to a superior environmental performance and it can be considered as strategic resource. On the other hand, there is a dearth of empirical studies investigating whether similar claims might be made about cooperation with customers, notwithstanding a potentially crucial role of customers to promote green concepts in supply chains (Kumar, Luthra, & Haleem, 2014).

In order to address the research purpose, this article draws on GSCM literature but also on EM literature and Resource Dependence Theory (RDT). Considering that the external environment of the companies established in Brazil is embedded in an EM context, because of the NPSW, and that RDT tries to explain the behaviour of companies based on context interdependencies (Wolf, 2014) and that sustainability management is such a new resource dependence between focal firms and their supply chain partners (Schnitzfeld & Busch, 2015), then such traditional theories can enhance comprehension of the relationship that exists between the adoption of external GSCM practices and environmental performance. This theoretical framing responds to a gap pointed out by Sarkis et al. (2011), in terms of lack of research associating GSCM-EM to GSCM-RDT. To develop the research, a two stage methodology was used: a survey of ISO14001-certified companies in Brazil in order to verify whether external GSCM practices (green purchasing and cooperation with customers) influence environmental performance; and multiple-case studies with four large, ISO-certified Brazilian companies to obtain a deeper understanding of the roles of green suppliers and customers in a GSCM context.

The paper contributes to overcome gaps in current GSCM literature in the following aspects: it presents empirical results supporting the relationship between GSCM and environmental performance, thus contributing to filling the gap pointed out by Sarkis et al. (2011); it advances GSCM studies by extending the literature on RDT to discuss the relevance of cooperation with customers and green purchasing as significant resources for businesses, contributing to filling another gap pointed out by Sarkis et al. (2011); it focuses on cooperation with customers in the GSCM context, an aspect that has been little explored so far according to Junquera, del Brío, and Fernández (2012); it presents an original matrix proposal for understanding the relationship between the roles of green suppliers and customers for achieving higher environmental performance in a GSCM context, thus addressing a knowledge gap on the role of customer integration in the extended responsibility-performance link, as highlighted by Lai, Wong, and Venus Lun (2014).

2. Theoretical framework and research hypotheses

2.1. GSCM and environmental performance

Considering that sustainable consumption habits are growing, environmental responsibility will be required not only from companies, but from various tiers of productive chains, consequently, GSCM practices emerge as an opportunity to improve competitiveness and the environmental performance of organisations. GSCM is a strategy that manages the flow of materials along the value chain through different stages such as acquisition, production and distribution with the purpose of protecting the environment by safeguarding natural resources and reducing global warming and carbon emissions (Ageron, Gunasekaran, & Spalanzani, 2012).

GSCM practices may be understood, according to Vachon and Klassen (2006), as a series of inter-organisational activities arising from two options to improve environmental management: mutual problem solving and risk minimization. GSCM practices may be classified as internal and external. Internal GSCM practices correspond to the activities that are performed without the direct involvement of suppliers and customers such as internal environmental management, ecodesign and investment recovery. External GSCM practices include activities that involve transactions with suppliers and customers such as green purchasing and cooperation with customers (Zhu et al., 2008).

As stated by Zhu, Sarkis, and Lai (2012) the scarcity of empirical findings supporting a clear relationship between the adoption of GSCM and the improvement of environmental performance has become a barrier for manufacturing organisations that try to justify the implementation of GSCM practices. Research results on this subject remain inconclusive in terms of the influence of external GSCM. The results are mixed, and although a majority of studies support that external GSCM practices affect environmental performance, other studies have failed to find a significant relationship or found a weak one (i.e., Zailani, Jeyaraman, Vengadasan, & Premkumar, 2012). In addition, most of the studies address the GSCM practices or external GSCM practices in an aggregate manner, in other words, they do not discuss the individual relationship between green purchasing (GP) and environmental performance and between cooperation with customers (CC) and environmental performance (Chien & Shih, 2007; De Giovanni, 2012; De Giovanni & Esposito Vinzi, 2012; Diabat, Khodaverdi, & Olfat, 2013; Yang, Lu, Haider, & Marlow, 2013; Zhu & Sarkis, 2004; Zhu, Sarkis, & Geng, 2005).

Table 1 indicates the main studies that have addressed the relationship between each external GSCM practice and environmental performance in detail.

Usually, according to Table 1, authors that study the particulars of each external GSCM practice and their relationships to EP indicate that CC and GP have a tendency to positively affect the EP of organisations. However, only one study shows that both GP and CC are significant (Yang et al., 2013). So, it is possible to affirm the first hypothesis of the research.

H₁: *The adoption of external GSCM practices positively influences the EP of organisations.*

This hypothesis is broader than other hypotheses of this work, due to the fact that it is used to confirm a general assumption of this research, which is, somehow, either cooperation with suppliers (through GP), or with customers, influences environmental performance.

The focus of most of the studies in Table 1 is the role and participation of suppliers in the GSCM process (e.g., Arimura et al., 2011; Bhattacharya et al., 2014; Darnall et al., 2008; Handfield, Sroufe, & Walton, 2005; Hsu & Hu, 2008; Nawrocka, 2008; Nawrocka et al., 2009; Tate et al., 2014). According to GSCM literature GP increases EP because it reduces transaction costs (Mitra & Datta, 2014) and therefore facilitates access to new greener technologies. Thus, the second hypothesis of this research is:

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