



The green bullwhip effect, the diffusion of green supply chain practices, and institutional pressures: Evidence from the automotive sector



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ABSTRACT

This paper aims to understand and analyze how different institutional pressures created by stakeholders tend to promote the green bullwhip effect and the consequent adoption of green supply chain management (GSCM) practices across a supply chain. It examines GSCM practices adopted in the supply chain as a result of pressures from primary stakeholders, and how they exert environmental/institutional pressures. A case study methodology has been adopted to study a focal company (an automotive battery company located in Brazil) and its stakeholders, including customers, its supplier, and the government. The results, synthesized through eight propositions, highlight the effect that the institutional environment exercises on generating the green bullwhip effect in the supply chain.

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1. Introduction

In a search for sustainable production and consumption (Dubey et al., 2016; Wang and Hazen, 2015), green supply chain management (GSCM) has been greatly explored in the literature. Some recent studies on GSCM have explored the direct and indirect relationships between GSCM practices motivated by customers and by environmental and financial performance (Laari et al. 2016); others have identified critical factors related to GSCM (Wu and Chang, 2015); have discussed the introduction (Jabbour, 2015) and

diffusion (Hazen et al., 2011) of GSCM in organizations; have proposed new models for improving and selecting suppliers in GSCM (Liou et al., 2016); have proposed methodologies for managing investments in developing green suppliers (Bai et al., 2016); have affirmed that organizations that adopt environmental management systems more frequently implement GSCM practices (Darnall et al., 2008); and have developed systematic (Wong et al., 2015) and bibliometric reviews (Fahimnia et al., 2015) on the general topic of GSCM.

Several studies use stakeholder theory or institutional theory to analyze GSCM (Sarkis et al., 2011). For example, it is known that stakeholders exert great environmental/institutional pressures and influence the adoption of GSCM practices (Björklund, 2011; Mohanty and Prakash, 2014; Chien and Shih, 2007; Lee, 2008) and that the most important stakeholders when it comes to adopting GSCM practices are customers (Mohanty and Prakash, 2014; Chien and Shih, 2007; Lee, 2008). It is also known that specific institutional pressures can motivate companies to adopt specific GSCM practices (Hoejmose et al., 2014; Zhu et al., 2013; Prajogo et al., 2012). However, according to Zhu et al. (2016), it is still unclear how different institutional pressures are related to the adoption of various environmental management practices, which includes GSCM.

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Therefore, it is important to understand the circumstances regarding environmental pressure from stakeholders in the focal company in order to understand GSCM (Betts et al., 2015; Meixell and Luoma, 2015) and its enlargement along a supply chain (Laari et al., 2016). This may drive the adoption of GSCM practices, especially in tiers located downstream (Lee et al., 2014). In other words, it is important to understand the potential impacts of institutional pressure on the diffusion of adoption of GSCM practices in supply chains.

Moreover, this article contributes to the GSCM research field by:

- Uncovering evidence, within the same study, of how different stakeholders exert different types of institutional pressure that influences the adoption of GSCM practices. In general, articles have analyzed these two aspects separately, but more studies should focus on investigating whether companies make changes as a result of pressure (Meixell and Luoma, 2015);
- Analyzing institutional pressure from the viewpoint of the parties that create such pressure (Kauppi, 2013);
- Discussing the effects of the enlargement of environmental pressures along a supply chain in order to understand whether or not environmental pressures increase upstream supply chain (Lee et al., 2014). The traditional literature on the supply chain frequently discusses the bullwhip effect, which is related to inaccurate demand forecasts with consequences for increasing inventories upstream in the supply chain. The environmental management literature has identified a parallel between the idea of the amplification of demand from the traditional bullwhip effect and the increase of environmental pressures in the upstream supply chain. This article proposes to analyze this parallel further in order to shed light on the spread of GSCM practices across supply chains.

Additionally, there is also the need for more evidence as to whether different environmental pressures have different effects on companies that aim to develop environmental sustainability in their relationship with their suppliers (Sancha et al., 2015).

Therefore, the research question of this article is: how do different institutional pressures exerted by different stakeholders tend to promote the green bullwhip effect through the adoption of GSCM practices in the context of a supply chain located in Brazil?

This paper thus aims to understand and analyze how different institutional pressures created by different stakeholders tend to promote the green bullwhip effect and the consequent adoption of GSCM practices across a supply chain. A case study methodology (Yin, 2010) was used to analyze the relationship between a focal company in the automotive battery supply chain in Brazil, and its primary stakeholders. Few studies have examined stakeholders' pressure in sustainable supply chain management and relative subjects in South America (Meixell and Luoma, 2015) or emerging economies (Khor et al., 2016); and there is a need to understand the differences in dynamics of environmental issues in different countries (Laari et al., 2016; Lee et al., 2014). Consequently, Brazilian companies were selected for this study because Brazil is the leader in the production of motor vehicles (OICA, 2015) and is also the leader in the production and use of heavy metal lead (ILA, 2016) in South America. Additionally, this country has particular characteristics regarding the institutional environment of the automotive battery sector, which is relevant, according to Silvestre (2015), for analyzing the role of a focal company in terms of leading supply chains toward more sustainable business practices in developing and emerging economies. Data were analyzed using an approach founded on theory, as presented by Glaser and Strauss (2009). More specifically, institutional and stakeholder's theories were used, as these underscore the importance of the

position of organizations in the supply chain. Stakeholder theory was used to understand the relationship between these organizations, centering on a focal company in the supply chain, while institutional theory was used in the analysis of the environmental context in which these organizations operate, including institutional pressures.

The paper is structured as follows. In the next section, the theoretical background is presented. Then, the methodology and data collection details are provided. After that, the results are reported and discussed. Finally, the conclusions of the study, the study's limitations, and recommended future research directions are given.

2. Theoretical background

2.1. Stakeholders and green supply chain management

Aligned to the definition of supply chain management (Ketchen and Hult, 2007), GSCM is defined as the integration of environmental concerns within the inter-organizational practices of supply chain management (Sarkis et al., 2011). GSCM is evidenced by the adoption of practices such as internal environmental management, green purchasing, cooperation with customers, investment recovery, eco-design, and reverse logistics (Sarkis et al., 2011; Srivastava, 2007, 2008; Zhu et al., 2008a).

The importance of stakeholder theory was recognized in academia and by managers after the publication of "Strategic Management: A Stakeholder Approach" by Freeman (1984). Freeman (1984) defines stakeholders as any group or individual that affects or is affected by the achieving of a company's objectives. Stakeholders include suppliers, collaborators, environmentalists, governments, community, owners, consumer defenders, consumers, and competitors.

Several attempts have been made in the literature to classify stakeholders. The most common distinction is between primary and secondary stakeholders (Clarkson, 1995). Primary stakeholders are those whose participation and support is required if an organization is to survive. These include consumers, suppliers, and regulators. Secondary stakeholders can affect and be affected by the organization, but they have no direct transaction with it, which is why they are not essential for it to survive (Clarkson, 1995). They include media and nongovernmental organizations.

Stakeholders exert great influence on the adoption of GSCM practices, but the type of influence and stakeholder that exert it vary (Meixell and Luoma, 2015). This variation may occur according to the type of industry - i.e., static or dynamic (Betts et al., 2015) - the type of supply chain, the size of the organization, the level of internationalization, the position of an organization in the supply chain, the industrial sector, and the location of the organization (González-Benito and González-Benito, 2006a, 2010; Hojmosse et al., 2012; Zhu et al., 2008b). The mechanisms used by stakeholders to exert environmental pressures on organizations also vary; the most common include: audits, regulations, demand for green products, competition, contracts with specific clauses, and embargo (Björklund, 2011; Chien and Shih, 2007; Lee, 2008; Mohanty and Prakash, 2014). As a result, organizations tend to respond to pressure exerted by stakeholders through training and cooperation with them and by the adoption of environmental practices (González-Benito and González-Benito, 2006b; Sarkis et al., 2010).

In the literature, it is possible to identify four types of stakeholders that exert great environmental pressure: competitors, the community, government, and customers.

Competitors tend to motivate organizations indirectly to treat environmental issues strategically in order to achieve an

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