



RAM. Revista de Administração  
Mackenzie

ISSN: 1518-6776

revista.adm@mackenzie.com.br

Universidade Presbiteriana Mackenzie  
Brasil

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RAM. Revista de Administração Mackenzie, vol. 18, núm. 3, mayo-junio, 2017, pp. 117-  
146

Universidade Presbiteriana Mackenzie  
São Paulo, Brasil

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# CORPORATE PROFILE, PERFORMANCE AND GREEN SUPPLY CHAIN MANAGEMENT: A RESEARCH AGENDA



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## ABSTRACT

**Purpose:** To evaluate the universe of published articles that propose frameworks about the relationship between green supply chain management (GSCM) and performance in the period from 1995 to 2014, in order to propose a conceptual model that can be applied to future studies, considering the green profile besides the practices of GSCM and performance.

**Originality/gap/relevance/implications:** The investigation revealed a lack of relationship among the organizations' profile, its environmental, economic and operational performance and GSCM practices.

**Key methodological aspects:** The relationship among constructs was established through bibliometric analysis obtained in the models/frameworks of GSCM practices and performance extracted from the databases "ProQuest", "EBSCO", "JSTOR", "Web of Science" and "Scopus". Further, the content analysis and network analysis were then performed.

**Summary of key results:** GSCM internal and external practices, environmental performance, economic performance and operational performance were revealed as main topics addressed in GSCM. Moreover, it was noted that studies on internal practices prevailed over those addressed to other practices.

**Key considerations/conclusions:** The models studied did not consider whether the corporate green profile could improve the performance of the organization. Therefore, they did not simultaneously measure environmental, economic and operational performance. It was concluded that the addition of the green profile in conjunction with GSCM practices and performance allows for a more in-depth analysis of the degree of a company's involvement with GSCM, as well as its intended objectives and results achieved in the future.

## KEYWORDS

Bibliometric Analysis. Framework. Green Profile. Green Supply Chain Management. Performance.

## 1. INTRODUCTION

The effectiveness of the productive sector has been due to the implementation of several tools such as total quality management, process management and reengineering, which has led organizations to a significant increase in the quality of their products and services. The traditional supply chain is based on total cost and profitability.

The environmental impact of previously neglected operations, such as the environmental problems caused by global warming and environmental degradation, has affected the population's survival conditions (Wang & Gupta, 2011). Moreover, stringent legislation has been enacted, such as Brazilian law 12305/2010 of the National Policy on Solid Waste (Brazil, 2010).

One of the consequences of the publication of this law was the requirement to predict the need for the implementation of reverse logistics (Brazil, 2010). There was intensification of research on the adoption of GSCM practices due to Brazilian environmental legislation and international directives (Jabbour, Azevedo, Arantes & Jabbour, 2013).

GSCM includes loss reduction, recycling, supplier development, buyer performance, reward and risk sharing, adoption of cleaner technologies, adjustments to legislation, reuse of materials, water and energy economy, use of environmentally friendly inputs, lean production processes, environmental commitment of participants in the supply chain and reverse logistics (Zhu, Tian & Sarkis, 2012).

The GSCM theme is still embryonic in Brazil. Pimenta, Gouvinhas and Evans (2012) presented a generic model related to eco-efficiency strategies for mapping environmental impacts and economic evaluation in the manufacturers, importers, distributors and dealers of agrochemicals, batteries, lubricants, fluorescent lamps and electronic products. Larentis, Giovanella and Cislighi (2013) developed a conceptual model that addressed the relationship between clusters and sustainability without focusing on any specific segment.

Thus, the aim of this research was to evaluate articles that proposed models/frameworks of the relationship between GSCM and performance as well as propose a conceptual model that could be applied for future studies, considering not only the practices of GSCM and performance but also the green profiles of companies.

Therefore, in addition to this introduction, the paper presents four other sections: theoretical backgrounds, methodological procedures, results and discussion and concluding remarks.

## 2. THEORETICAL BACKGROUNDS

This section shows the theoretical reference on green supply chain management and practices as well as economic, financial and operational performances and corporate profiles.

### 2.1. GREEN SUPPLY CHAIN MANAGEMENT (GSCM)

Supply chain management (SCM) consists of coordinating traditional business strategies and functions among companies in order to optimize the performance of the entire chain, according to Mentzer *et al.* (2001).

Large scale production has been associated with environmental degradation and scarce resources (Fiksel, 1996). Therefore, stakeholders aiming the company's development have forced the companies to engage in environmentally responsible activities (Zhu, Sarkis, & Lai, 2013).

In the concept proposed by Srivastava (2007), GSCM is understood as the incorporation of environmental aspects into all SCM dimensions and interfaces, including development and manufacturing of the product, outsourcing of services, transportation and delivery of the product to the final customer, and product management after the end of the product's useful life.

The main differences between SCM and GSCM, highlighted by Ho, Shalishali, Tseng and Ang (2009), refer to the objective, type of interaction with the environment, supplier selection criteria, cost and price pressure, and chain speed and flexibility. SCM is economically focused, has a high impact on the environment, selects its suppliers based on costs, which generates pressure among the players for low prices, and brings great flexibility and volatility to the chain. However, GSCM divides its focus between economic and environmental performance, proposes to cause low impacts to the environment and establishes long term relationships among the actors based on environmental commitment.

Environmental practices contribute to the improvement of quality, according to Zhu and Sarkis (2004). Environmental activities in supply chain management related to the reduction of consumption of resources and raw materials, prevention of pollution, recycling and adequate disposal of waste, were considered GSCM practices (Vanchon & Klassen, 2006).

GSCM is divided into internal practices, or intra-organizational categories, when the direct control is with the organization and involves internal stakeholders, and GSCM external practices, or inter-organizational categories, when they involve operations with external stakeholders (Zhu, Sarkis, & Lai, 2008).

Several aspects of GSCM require further elucidation, such as the imbalance between the adoption of internal and external practices and the conflicting results associated with GSCM practices (Zhu *et al.*, 2005). Moreover, the fact of having insufficient evidence between the implementation of GSCM and the environmental, economic or operational performance (Zhu *et al.*, 2005) constitutes a barrier to the implementation of GSCM.

## 2.2. PERFORMANCE

Economic performance is a priority for top management, which justifies the implementation of GSCM practices since the benefits derived from the economic performance of organizations, such as increased trust and cooperation, have been the object of study (Hernandez, Marins, & Castro, 2012; Jamishidi, Ghomi, & Karimi, 2012; Porter & Van der Linde, 1995; Rao & Holt, 2005; Seuring & Müller, 2008; Srivastava, 2007; Zhu, Sarkis, & Lai, 2012).

The environmental performance of an organization includes the results obtained with the management of its environmental aspects, measured by indicators such as compliance with legal and customer requirements and costs associated with environmental compliance (ABNT, 2004, 2005; Chan, He, Chan, & Wang, 2012; Olugu, Wong, & Shaharoun, 2011; Sawadogo & Anciaux, 2011).

Regarding operational performance, the influence of GSCM is considered to extend from the monitoring of legislation to the implementation of practices, such as increasing the quantity of goods delivered on time, reducing inventory levels, reducing the scrap rate, increasing product quality, increasing productivity, and improving capacity, environmental management systems, pollution control, reduction of resource consumption, and reuse and recycling of products (Dou, Zhu, & Sarkis, 2014; Jabbour, Jabbour, Govindan, Kannan, & Arantes, 2014; Larentis *et al.*, 2013; Srivastava, 2007; Wu, 2013; Zhu, Sarkis, & Lai, 2007).

## 2.3. CORPORATE PROFILE

Organizations' attitudes and commitments to environmental management are influenced by economic and market aspects, especially regarding the rational use of resources, eco-efficient production processes, conscious consumption and adequate waste destination (Shibao, 2011).

Self-regulation or corporate pro-activity is a position that emerges from the general administration area towards several specific sectors. Moreover, in relation to environmental management, it is supposed to obtain a competitive advantage by incorporating environmental issues into business strategies at all decision levels, since planning to product execution with the inclusion of monitoring and prevention metrics, in anticipation of the regulations and trends (Ninlawan, Seksan, Tossapol, & Pilada, 2010; Porter & Van der Linde, 1995; Shibao, 2011; Singh, Murty, Gupta, & Dikshit, 2008; Zhu & Sarkis, 2004; Zhu, Geng, Fujita, & Hashimoto, 2010).

From this perspective, operational management supported by the efficiency of environmental performance contributes to reduction of financial risk; besides, it proposes to organizations promising economic scenarios (Hoffman, 2000).

However, the model of environmental reactivity or compliance is developed in order to comply with applicable environmental legislation with the aim of protecting the organization's reputation, which indicates a greater concern to avoid costs arising from sanctions and fines than to implement consistent environmental policies regarding the interests of society (Lau & Ragothaman, 1997; Lee, 2008; Lee & Klassen, 2008).

## 3. METHODOLOGICAL PROCEDURES

The research method consisted of bibliometric analysis to quantify the scientific production of the existing models and framework, which deal with the relationship among GSCM, green profiles and performance (Cooper & Lindsay, 1998). The bibliometric analysis is relevant to indicate directions and strategies for future research, according to Leite Filho (2006).

The constructs presented in Figure 1 directed this study with the intention to understand how they were related in the sampled works and, from these results, to draw a conceptual model for a future research agenda.



(Figure 1)  
CONSTRUCTS

Constructs	References
GSCM	Lin (2013); Zhu and Sarkis (2004); Zhu <i>et al.</i> (2008); Zhu <i>et al.</i> (2013)
Internal GSCM practices	Lee, Kim and Choi (2012); Mirhedayatian, Azadi and Saen (2014)
External GSCM practices	Koh, Gunasekaran, and Tseng (2012); Lee and Klassen (2008)
Green Investments	Green, Zelbst, Meacham, and Bhadauria (2012); Mitra and Datta (2014)
Eco-design	Green, Zelbst, Bhadauria, and Meacham (2012); Pimenta <i>et al.</i> , (2012)
Reverse logistics	Büyükožkan and Çifçi (2012); Felice <i>et al.</i> (2012)
Environmental performance	Chan <i>et al.</i> (2012); Olugu <i>et al.</i> (2011); Sawadogo and Anciaux (2011)
Economic performance	Hernandez <i>et al.</i> (2012); Jamshidi <i>et al.</i> (2012); Seuring and Müller (2008)
Operational performance	Dou <i>et al.</i> (2014); Larentis <i>et al.</i> (2013); Srivastava (2007); Wu (2013)
Proactive profile	Ninlawan <i>et al.</i> (2010); Singh <i>et al.</i> (2008); Zhu and Sarkis (2004)
Reactive profile	Lee (2008), Lee and Klassen (2008)

Source: Elaborated by the authors.

### 3.1. DATA COLLECTION

The databases searched were “ProQuest”, “EBSCO”, “JSTOR”, “Web of Science” and “Scopus” with the keywords (“model” AND “green supply chain” AND “performance”) and (“framework” AND “green supply chain” AND “performance”) when they were in the title, keywords or abstract in the article. This initial survey resulted in 63 articles, considering the period from 1995 until 2014. Only 43 articles proposed models/frameworks of the relationship between GSCM and performance. The research consisted of verifying whether or not the constructs of the model were derived from theory and later tested in the field. Moreover, theoretical tests were carried out. Verification of the 63 articles was carried out and checked by two researchers independently to minimize errors (Hayes & Krippendorff, 2007) and resulted in the 43 papers that will be further analyzed and discussed.

The sample was processed through content analysis to identify the constructs addressed, the methodologies used and the countries surveyed. The content analysis performed in this work was of documentary origin, which



aimed, through a set of operations (coding and categorization), to represent the content of articles for knowledge inference (Bardin, 1986).

### 3.2. DATA ANALYSIS

The categorization of data extracted from the articles was established by lexical means, in which the words were classified according to their meaning, with pairing and grouping, after data coding (Bardin, 1986). The variables analyzed in the existing models were as follows: authors, methodology, constructs and variables of the model, which allowed to performing social network analysis through the UCINET-DRAW software to generate indicators and to establish graphs (Borgatti, 2002).

Thus, it was possible to develop two graphs. One elucidates the relationship between authors and methodology and another shows the relationships between authors and constructs.

The bibliometric indicators of the social networks used were as follows: 1. Degree of Centrality (DC), which aimed to evaluate the number of loops an element has in relation to the others in the network (Wasserman & Faust, 1994). If an element presented a greater number of connections, it was more centralized (Scott, 2000). 2. The measure of cohesion was aimed to identify the strongest links in relation to the research universe (De Nooy *et al.*, 2005).

The aspects of GSCM and the performance variables studied in these works are presented in the following sections. Moreover, the so-called “green profile” variables are also presented, which are shown under two perspectives: reactive and proactive. In the reactive approach, companies allocate the minimum resources for environmental management and some initiatives to reduce environmental impact on production (Jabbour *et al.*, 2013; Lee, 2008; Lee & Klassen, 2008; Lin, 2013; Mitra & Datta, 2014). In the proactive approach, companies begin to anticipate new environmental laws, for example, by allocating resources for recycling (Singh *et al.*, 2008).

## 4. RESULTS AND DISCUSSION

The total relationships of the constructs as well as authors and methodologies addressed by the respective authors can be seen in Table 1. The total relations measure the number of connections between the nodes

of the network, whereas the individual relations quantify the number of published articles.

**(Table 1)**

**TOTAL AND INDIVIDUAL RELATIONSHIPS OF THE CONSTRUCTS,  
METHODOLOGIES AND AUTHORS**

	Total Relationships	Degree of Centrality Total Relationships	Relationships Individuals	Degree of Centrality Individuals
<b>Degree of Centrality of the constructs</b>				
GSCM internal practices	39.000	11.017	–	–
Environmental performance	32.000	9.040	–	–
GSCM external practices	24.000	6.780	–	–
Economic performance	20.000	5.650	–	–
Operational performance	10.000	2.825	–	–
Reverse logistic	9.000	2.542	–	–
Green investments	7.000	1.977	–	–
Eco-design	6.000	1.695	–	–
Corporate reactivity	5.000	1.412	–	–
Corporate proactivity	1.000	0.282	–	–
<b>Methodologies</b>				
Survey	13.000	3.672	–	–
Math simulation	10.000	2.825	–	–
Case study	10.000	2.825	–	–
Multiply cases	6.000	1.695	–	–
Theoretical descriptive research	4.000	1.130	–	–
<b>Authors who most published</b>				
Zhu	18.000	5.085	3	0.847
Sarkis	6.000	1.695	3	0.847
Green	17.000	4.802	2	0.565
Chan	11.000	3.107	2	0.565

(continue)

**(Table 1 (Conclusion))****TOTAL AND INDIVIDUAL RELATIONSHIPS OF THE CONSTRUCTS,  
METHODOLOGIES AND AUTHORS**

	Total Relationships	Degree of Centrality Total Relationships	Relationships Individuals	Degree of Centrality Individuals
<b>Authors who most published</b>				
Felice	11.000	3.107	2	0.565
Chiou	8.000	2.260	2	0.565
Bhadauria	6.000	1.695	2	0.565
Meacham	6.000	1.695	2	0.565
Lettice	5.000	1.412	2	0.565
Zelbst	6.000	1.695	2	0.565
Petrillo	4.000	1.130	2	0.565

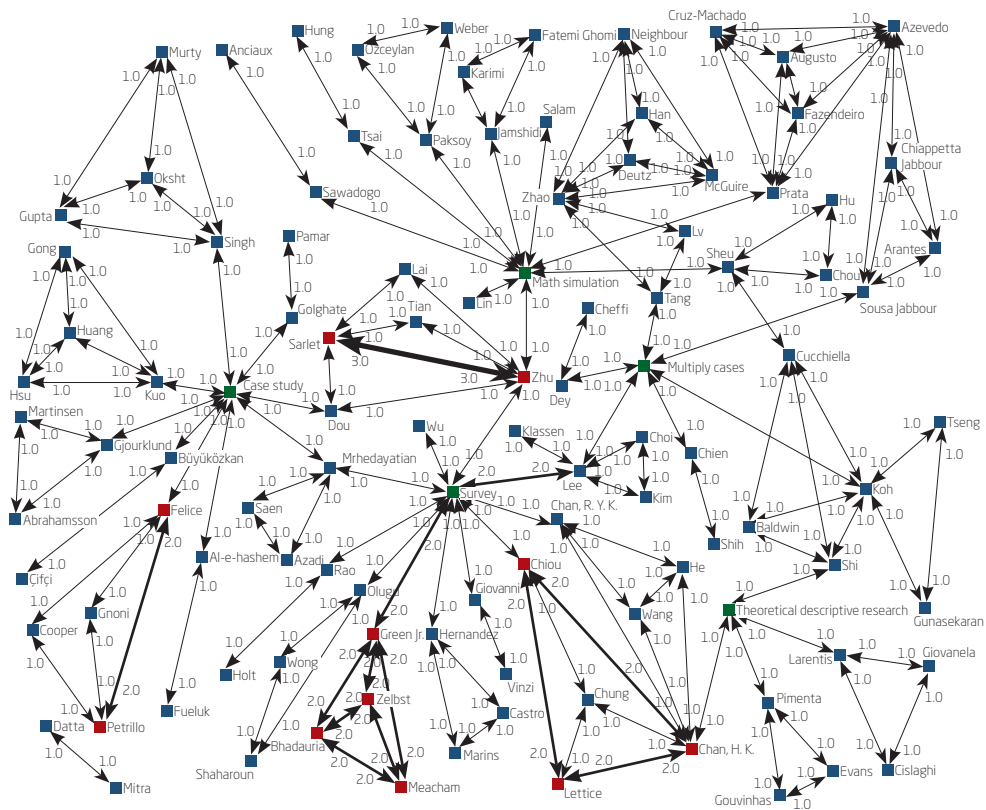
Source: Elaborated by the authors.

The authors' network in relation to the research methodologies is elucidated in Figure 1. It is possible to notice that the methodologies most used by the authors to develop and/or test the models were as follows: Survey (13 ties and DC 3.672), Math simulation (10 ties and DC 2.825) and Case study (10 ties and DC: 2.825). It was also possible to notice that the less used methodologies were as follows: Multiply cases (six ties and DC: 1.695) and Theoretical descriptive research (four ties and DC: 1.130), according to Table 1.

This result shows in most of the studies that the model was developed based on theory and later tested through survey, mathematical simulation and case study, denoting an adequate construction and test of the models in the field. However, it has been pointed out that there is little descriptive theoretical research because the theme is closely associated with practice.

The authors who developed the most models/frameworks were as follows: Zhu and Sarkis with three articles each, as well as Green, Chan, Felice, Chiou, Bhadauria, Meacham, Lettice, Zelbst and Petrillo, with two publications.

## AUTHORS' NETWORK IN RELATION TO RESEARCH METHODOLOGIES



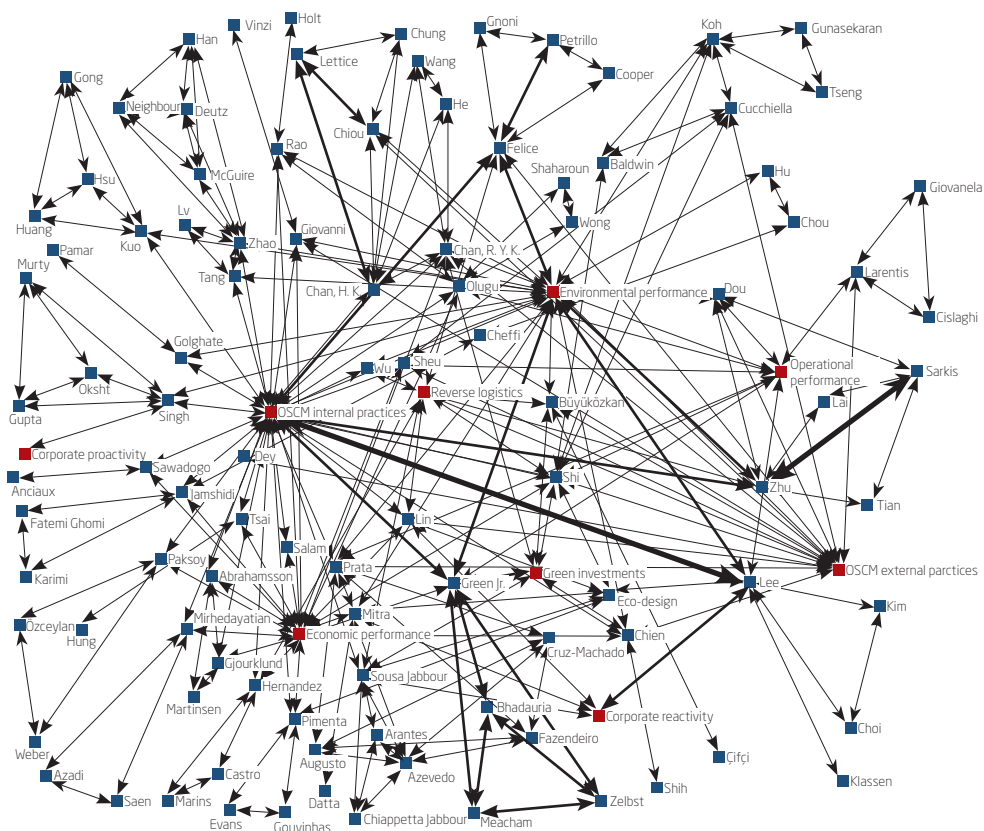
**Source:** Elaborated by the authors.

The relationships among authors and constructs addressed in the existing GSCM models are presented in Table 1 and Figure 2. In the analysis, it was possible to verify the constructs most used by the authors: GSCM internal practices (39 ties and DC: 11.017), Environmental performance (32 ties and DC: 9.040), GSCM external practices (24 ties and DC: 6.780), Economic performance (20 ties and DC: 5.650), Operational performance (10 ties and DC: 2.825) as well as the least used constructs: Reverse logistics (nine ties and DC: 2.542), Green investments (seven ties and DC: 1.977), Eco-design (six ties and DC: 1.695), Corporate reactivity (five ties and DC: 1.412) and Corporate proactivity (one tie and DC: 0.282).

A proposition of the conceptual model is made with three hypotheses allowing for the possibility to study the relations of GSCM for performance

The aspects of GSCM, performance variables and profile variables of the companies addressed in the analyzed works on models and frameworks, are presented in Figure 3.

**(Figure 3)**



**Source:** Elaborated by the authors.

The indicators that measure GSCM internal and external practices were the most studied by authors that developed models/frameworks, in conjunction with the indicators of environmental and economic performance, while the green profile indicators of the companies were little studied, according to Figure 3.

#### 4.1. GSCM VARIABLES CONSIDERED IN THE FRAMEWORKS

Five important aspects of GSCM were observed in the analyzed works: GSCM internal and external practices, green investments, eco-design and reverse logistics. GSCM internal practices are related to the internal process of the management and manufacturing company. GSCM external practices are related to the “greening” of suppliers and participation of customers as well as the government in the decisions necessary for the operation of GSCM (Lin, 2013; Zhu *et al.*, 2013). Green investments are the investments that may be needed right away to participate in GSCM. Eco-design is related to the “definition” from the process and product in the design phase when the raw materials are selected and define their performance (Zhu *et al.*, 2013). Reverse logistics are related to the correct arrangement of the post-use product (Lin, 2013).

Thirty-nine models/frameworks that address GSCM internal practices have been observed: senior management commitment, support for mid-level managers and cross-functional cooperation for environmental improvement (Chan *et al.*, 2012b; Dey & Cheffi, 2012; Hernandez *et al.*, 2012; Lee *et al.*, 2012; Mitra & Datta, 2014; Prata *et al.*, 2013; Sheu *et al.*, 2005; Zhu, Sarkis, & Lai, 2012), total quality environmental management (Chan *et al.*, 2012b; Giovanni & Vinzi, 2012; Jabbour *et al.*, 2013; Mirhedayatian *et al.*, 2014; Mitra & Datta, 2014; Tsai & Hung, 2009), environmental compliance (Büyüközkan & Çifçi, 2012; Felice *et al.*, 2013; Hernandez *et al.*, 2012; Kuo *et al.*, 2013; Lee & Klassen, 2008; Mirzapour Al-e-hashem & Rekik, 2013; Olugu *et al.*, 2011; Prata *et al.*, 2013; Rao & Holt, 2005; Salam, 2011; Shi *et al.*, 2012; Tang *et al.*, 2012), audit programmes (Jabbour *et al.*, 2013; Mirhedayatian *et al.*, 2014; Mitra & Datta, 2014; Singh *et al.*, 2008), ISO 14001 certification (Jabbour *et al.*, 2013; Mirhedayatian *et al.*, 2014; Singh *et al.*, 2008), existing environmental management systems (Giovanni & Vinzi, 2012; Green *et al.*, 2012b; Jabbour *et al.*, 2013; Wu, 2013), green manufacturing practice (Chien & Shih, 2007; Dey & Cheffi, 2012; Felice *et al.*, 2012; Golghate & Pawar, 2012; Green *et al.*, 2012a; Mirhedayatian *et al.*, 2014; Mitra & Datta, 2014; Prata *et al.*, 2013; Singh *et al.*, 2008; Zhu *et al.*, 2013), green purchases (Büyüközkan & Çifçi, 2012; Chan *et al.*, 2012a; Chan *et al.*, 2012b; Chien & Shih, 2007; Felice *et al.*, 2012; Green *et al.*, 2012a; Jabbour *et al.*, 2013; Jamshidi *et al.*, 2012; Lee, 2008; Lin, 2013; Mirzapour Al-e-hashem & Rekik, 2013; Salam, 2011; Tsai & Hung, 2009; Zhu *et al.*, 2013) and reduction of emissions in transport (Bjorklund *et al.*, 2012; Jamshidi *et al.*, 2012; Mirhedayatian *et al.*, 2014; Paksoy *et al.*, 2011; Sawadogo & Anciaux, 2011; Zhao *et al.*, 2012).



Twenty-four models/frameworks that used GSCM external practices have been found: provision of design specifications for suppliers (Chiou *et al.*, 2011; Dey & Cheffi, 2012; Dou *et al.*, 2014; Felice *et al.*, 2012; Green *et al.*, 2012b; Lee & Klassen, 2008; Mitra & Datta, 2014; Wu, 2013), cooperation with suppliers for environmental objectives (Chiou *et al.*, 2011; Dey & Cheffi, 2012; Felice *et al.*, 2012; Green *et al.*, 2012b; Koh *et al.*, 2012; Larentis *et al.*, 2013; Lee, 2008; Lee *et al.*, 2012; Lin, 2013; Prata *et al.*, 2013; Rao & Holt, 2005; Shi *et al.*, 2012; Wu, 2013; Zhu, Sarkis & Lai, 2012), audit of environmental management in suppliers (Green *et al.*, 2012b), requirement of ISO 14001 certification of suppliers (Dou *et al.*, 2014; Green *et al.*, 2012b; Mitra & Datta, 2014), cooperation with customers for eco-design (Chan *et al.*, 2012a; Chien & Shih, 2007; Felice *et al.*, 2012; Green *et al.*, 2012a; Koh *et al.*, 2012; Lin, 2013; Olugu *et al.*, 2011; Prata *et al.*, 2013; Shi *et al.*, 2012; Wu, 2013; Zhu, Sarkis & Lai, 2012; Zhu *et al.*, 2013), cooperation with customers and suppliers to implement cleaner production (Chien & Shih, 2007; Giovanni & Vinzi, 2012; Lin, 2013; Mitra & Datta, 2014; Shi *et al.*, 2012), environmentally correct packaging (Büyüközkan & Çifçi, 2012; Felice *et al.*, 2012; Giovanni & Vinzi, 2012) and government participation (Lee, 2008; Lee, & Klassen, 2008; Mitra & Datta, 2014; Sheu *et al.*, 2005; Zhu *et al.*, 2013).

There were seven models/frameworks which addressed green investments, which is investment in equipment that reduces consumption of electricity, water and raw materials (Chien & Shih, 2007; Green *et al.*, 2012a; Shi *et al.*, 2012; Wu, 2013) as well as activities that recover investments such as the sale of excess inventories of materials, scrap and used materials or depreciated equipment (Büyüközkan & Çifçi, 2012; Chan *et al.*, 2012a; Green *et al.*, 2012a; Jabbour *et al.*, 2013; Zhu *et al.*, 2013).

Four models/frameworks were identified which deal with eco-design and reverse logistics together (Jabbour *et al.*, 2013; Lin, 2013; Shi *et al.*, 2012; Zhu *et al.*, 2013), only two models used the eco-design construct alone (Green *et al.*, 2012a; Pimenta *et al.*, 2012) and five models used the reverse logistics construct alone (Büyüközkan & Çifçi, 2012; Felice *et al.*, 2012; Hernandez *et al.*, 2012; Olugu *et al.*, 2011; Sheu *et al.*, 2005). For this study, it was decided to use eco-design and reverse logistics jointly: when the company invests in less aggressive raw materials to the environment, develops the design of its products to reduce the consumption of material and energy (Jabbour *et al.*, 2013; Lin, 2013; Shi *et al.*, 2012; Zhu *et al.*, 2013), avoids the use of hazardous materials to the environment (Lin, 2013; Shi *et al.*, 2012), acts together with its customers in the implementation of recycling, elimination of packaging and reduction of waste, and provides reverse logistics



in the design of its products (Jabbour *et al.*, 2013; Lin, 2013; Shi *et al.*, 2012; Zhu *et al.*, 2013).

## 4.2. PERFORMANCE VARIABLES CONSIDERED IN THE FRAMEWORK

Three aspects of performance have been considered in the articles surveyed: environmental, economic and operational.

Thirty-two models/frameworks which emphasized environmental performance have been identified: the companies which adopted GSCM reduced emissions of pollutants, use of waste water, solid waste and frequency of environmental accidents (Büyüközkan & Çifçi, 2012; Chan *et al.*, 2012b; Chien & Shih, 2007; Chiou *et al.*, 2011; Felice *et al.*, 2012; Golghate & Pawar, 2012; Jamshidi *et al.*, 2012; Koh *et al.*, 2012; Lin, 2013; Mitra & Datta, 2014; Olugu *et al.*, 2011; Sawadogo & Anciaux, 2011; Sheu *et al.*, 2005; Singh *et al.*, 2008; Zhao *et al.*, 2012) and improvement operating activities (Chan *et al.*, 2012a; Chiou *et al.*, 2011; Dey & Cheffi, 2012; Dou *et al.*, 2014; Felice *et al.*, 2012; Felice *et al.*, 2013; Giovanni & Vinzi, 2012; Golghate & Pawar, 2012; Green *et al.*, 2012a; Green *et al.*, 2012b; Kuo *et al.*, 2014; Lee, 2008; Lee & Klassen, 2008; Olugu *et al.*, 2011; Prata *et al.*, 2013; Rao & Holt, 2005; Sheu *et al.*, 2005; Shi *et al.*, 2012; Tang *et al.*, 2012; Wu, 2013; Zhu, Sarkis & Lai, 2012; Zhu *et al.*, 2013).

Twenty models/frameworks have been found that address economic performance, in which positive and negative results were considered; that is, positive if the company, when participating in GSCM, reduced the cost of energy and water consumption (Sawadogo & Anciaux, 2011), decreased the rate of waste treatment and rate of waste discharge, increased reuse and recycling, decreased disposal of products and packaging (Hernandez *et al.*, 2012; Jamshidi *et al.*, 2012) and improved the profit margin (Bjourklund *et al.*, 2012; Chan *et al.*, 2012a; Chien & Shih, 2007; Green *et al.*, 2012a; Mirhedayatian *et al.*, 2014; Mirzapour Al-e-hashem & Rekik, 2013; Mitra & Datta, 2014; Paksoy *et al.*, 2011; Pimenta *et al.*, 2012; Prata *et al.*, 2013; Salam, 2011; Sheu *et al.*, 2005; Tsai & Hung, 2009). However, in relation to negative economic performance, the company increased investments to manufacture and market environmentally friendly products (Lin, 2013), operating costs increased (Olugu *et al.*, 2011), cost of employee training increased to properly manage GSCM, costs rose due to the purchase of environmentally friendly materials, and spending on environmental awareness of customers, suppliers and society increased (Giovanni & Vinzi, 2012; Rao & Holt, 2005).

Ten models/frameworks that emphasized operational performance have been pointed out: by participating in GSCM, companies decreased the scrap rate, improved the quality of marketed products and services, improved the use of productive resources (Chan *et al.*, 2012a; Dou *et al.*, 2014; Green *et al.*, 2012a; Larentis *et al.*, 2013; Olugu *et al.*, 2011; Prata *et al.*, 2013; Zhu *et al.*, 2013), achieved goals to minimize and eliminate product nonconformities (Green *et al.*, 2012b; Lee *et al.*, 2012; Sheu *et al.*, 2005) and companies have improved the quality of customer complaint records, analysis and solutions (Chan *et al.*, 2012a; Green *et al.*, 2012a, b; Olugu *et al.*, 2011).

#### **4.3. GREEN PROFILE VARIABLES CONSIDERED IN THE FRAMEWORKS**

Five models/frameworks which used corporate reactivity have been identified: environmental management is conditioned by the pressure of regulations, search for a better reputation (Lee, 2008; Lee & Klassen, 2008) and pressure from shareholders, investors and banks so that companies reduce their environmental risk (Jabbour *et al.*, 2013; Lin, 2013; Mitra & Datta, 2014).

Only one model/framework that was addressed to corporate proactivity has been found: the environment must be considered in all decision making operations, and also if proactive companies have a capacity for prevention which includes planning, monitoring and anticipation, with systems to monitor and respond to internal and external environmental issues (Singh *et al.*, 2008).

The GSCM internal practices (39 models/frameworks) have been the most observed in the models because companies always start environmental management by implanting the GSCM internal practices within the organizations and later extend control beyond the borders of the company as in, for example, suppliers demanding ISO 14001 certification and/or performing environmental auditing and the adoption of GSCM external practices (24 models/frameworks).

The green investments construct (seven models/frameworks) and eco-design and reverse logistics (four models/frameworks) are usually implanted in the later stages when the relations in GSCM are already more consolidated and the operations are run in a more rational way.

Economic performance is important, however, if it has been perceived that by improving operational performance (10 models/frameworks) such as reducing scrap and reducing waste, it is possible to simultaneously impro-

ve both environmental (32 models/frameworks) and economic performance (20 models/frameworks).

#### 4.4. PROPOSAL OF CONCEPTUAL MODEL WITH HYPOTHESES

The majority of the articles observed addressed the adoption of GSCM practices and performances, concluding that GSCM good practices positively affect performance. However, no evaluated article studied the influence of the company's green profile (reactive or proactive) in such a relationship. In addition, the vast majority of the work did not simultaneously address the three performance aspects (environmental, economic and operational).

The six models/frameworks have not made it clear whether companies that have a large green profile perform better than companies with only a reactive profile. Therefore, a wide field of future studies is open, and for this reason, indicators for the green profile construct are suggested as follows: 1. corporate reactivity: ensuring compliance with legislation (Ninlawan *et al.*, 2010; Zhu & Sarkis, 2004), minimizing the creation of environmental liabilities (Ninlawan *et al.*, 2010) and increasing the environmental pressure of stakeholders (Zhu & Sarkis, 2004); and 2. corporate proactivity: anticipating competitors in environmental issues (Porter & Van der Linde, 1995), indicating the dedication of employees in environmental activities (Lau & Ragothaman, 1997) and senior management giving high priority to environmental issues (Zhu & Sarkis, 2004).

Based on these results, Hypothesis 1 (H1) is proposed: there is a significant positive relationship between the adoption of GSCM practices and their performance (environmental, economic and operational).

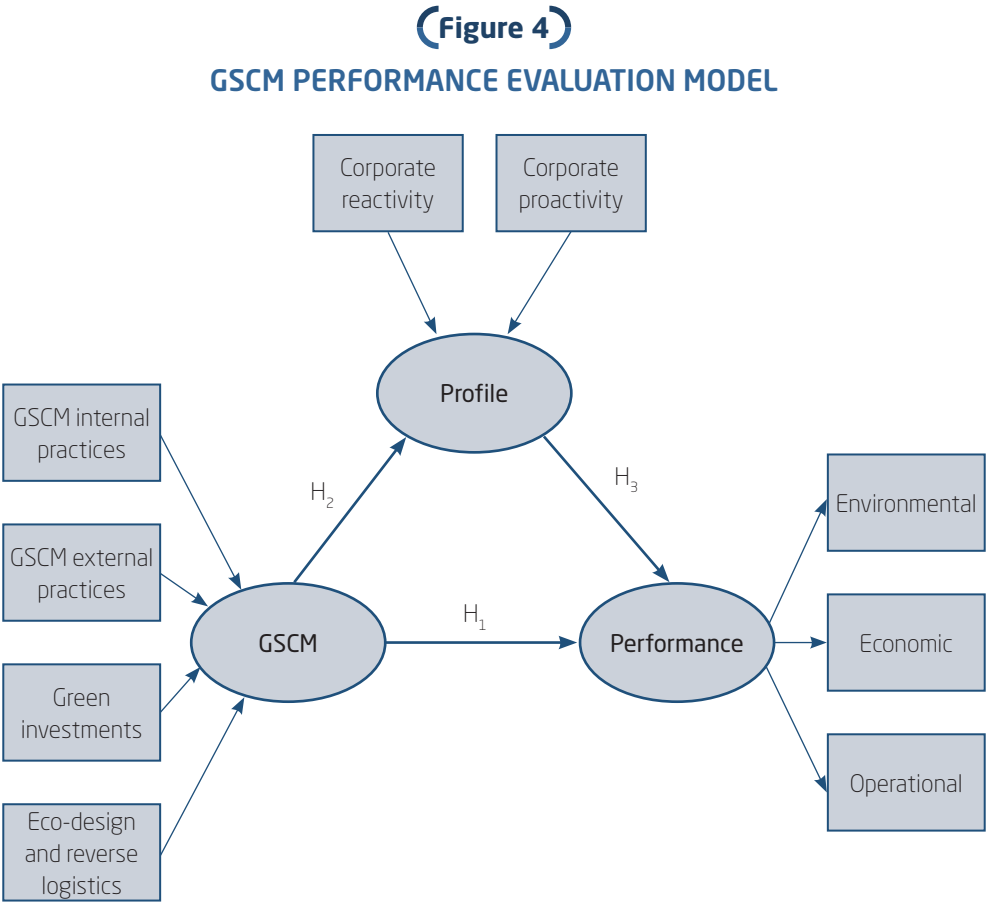
In addition to these results, the possible applications of the GSCM concept in the operations of companies are many and range from reactive reasons to regulations until the proactive strategies to obtain competitive advantage reasons, depending on the company's green profile (Sarkis, 1999). This initiative is distinct from environmental initiatives in which companies commit to improving their own environmental performance, respect, competitive advantage etc., and also, it happens due to the fact that stakeholders do not always draw a line between the focus of the company and its suppliers (Rao, 2002), making concern about suppliers' environmental performance characteristic of responsible business practice.

Thus, Hypothesis 2 (H2) has been considered: there is a significant relationship between the company that performs proper management of the green supply chain and its green profile.

The proactive approach of the corporate environment promotes the development of capabilities which, over time, helps to develop a better understanding of the problem and possible solutions needed to implement environmental solutions in operations and improve the channels of corporate communication with stakeholders (Sharma & Vredenburg, 1998).

Therefore, Hypothesis 3 (H3) emerges: There is a significant relationship between the company's green profile on environmental issues and its performance (environmental, economic and operational).

Based on the review of the content in the existing models/frameworks, three hypotheses emerged in the conceptual model, according to Figure 4.



Source: Elaborated by the authors.

## 5. CONCLUDING REMARKS

This paper aims to analyze the articles which have suggested models and frameworks of the relationship between GSCM and performance, as well as identify the constructs studied in the models and recommend a broad conceptual model that can be applied in future studies.

The results have revealed five important aspects of GSCM: GSCM internal and external practices, green investments, eco-design and reverse logistics. Most of the models which linked the eco-design and reverse logistics themes understood that when designing a product, the company should also consider the correct post-use destination of that product.

In the majority of the sampled articles, the internal practices of GSCM prevailed over the external ones. Green investments, eco-design and reverse logistics are still little studied; therefore, they represent a vast field of future research.

The models studied did not consider whether a corporate profile can improve the performance of an organization; therefore, they did not simultaneously measure environmental, economic and operational performance. They emphasized only one of the performances or in pairs. It has been concluded that the addition of the green profile variable together with GSCM practices and performance allows for a deeper analysis on the degree of commitment of the companies with GSCM, as well as their objectives and results to be achieved.

Finally, it was found that the models studied did not consider whether the corporate profile (reactive or proactive) could improve the performance of the organization.

Moreover, another finding of this work was that emerging economies, including that of Brazil, are economies which are trying to act within GSCM (Alberton & Minatti, 2012a; 2012b; Chan *et al.*, 2012a; 2012b; Felice, Petrillo, & Cooper, 2013) in order to improve business performance.

The limitation of this article was the conception of a broad conceptual model that has not yet been tested in practice through a survey, to confirm or adjust the model. Another limitation is that the model was developed based on research published until the year 2014. Suggested for future study are the analysis of existing research up to the current year and the development of a research instrument that can measure the constructs raised, as well as observing if the three hypotheses proposed can be confirmed.

## PERFIL CORPORATIVO, DESEMPENHO E *GREEN SUPPLY CHAIN MANAGEMENT*: UMA AGENDA DE PESQUISA

### RESUMO

**Objetivo:** Avaliar o universo de artigos publicados que propuseram *frameworks* da relação entre *green supply chain management* (GSCM) e desempenho no período de 1995 à 2014, de modo a propor um modelo conceitual que possa ser aplicado para futuros estudos, considerando o perfil verde além das práticas de GSCM e desempenho.

**Originalidade/lacuna/relevância/implicações:** A investigação revelou a falta de relação entre o perfil verde das organizações, seu desempenho ambiental, econômico e operacional e as práticas de GSCM.

**Principais aspectos metodológicos:** A relação entre os constructos foi estabelecida por meio da análise bibliométrica nas bases de dados “ProQuest”, “EBSCO”, “JSTOR”, “Web of Science” e “Scopus” sobre modelos/*frameworks* de práticas de GSCM e desempenho, análise de conteúdo e análise de redes.

**Síntese dos principais resultados:** Práticas internas e externas de GSCM, desempenho ambiental, desempenho econômico e desempenho operacional se revelaram como os principais temas abordados em GSCM, notou-se ainda que os estudos sobre práticas internas prevaleceram sobre aqueles que abordaram as demais práticas.

**Principais considerações/conclusões:** Os modelos estudados não consideraram se o perfil verde corporativo pode melhorar o desempenho da organização, tão pouco mensuraram simultaneamente o desempenho ambiental, econômico e operacional. Concluiu-se que o acréscimo da variável perfil verde das empresas em conjunto com as práticas de GSCM e desempenho permite uma análise em maior profundidade sobre o grau de envolvimento das empresas com a GSCM, bem como seus objetivos pretendidos e resultados a serem alcançados no futuro.

### PALAVRAS-CHAVE

Bibliometria. Desempenho. Gestão da Cadeia de Suprimentos Verde. Modelo Conceitual. Perfil Verde.



# PERFIL CORPORATIVO, EL RENDIMIENTO Y LA GESTIÓN DE LA CADENA DE SUMINISTRO VERDE: UN PROGRAMA DE INVESTIGACIÓN

## RESUMEN

**Objetivo:** Evaluar el universo de artículos publicados que proponían los marcos de la relación entre la gestión de la cadena de abastecimiento verde (GSCM) y el desempeño de 1995 a 2014 con el fin de proponer un modelo conceptual que se puede aplicar a los estudios futuros, teniendo en cuenta el perfil verde, así GSCM y el desempeño de la práctica.

**Originalidad/laguna/relevancia/implicaciones:** la investigación ha demostrado la falta de relación entre el perfil verde de las organizaciones, su desempeño ambiental, económica y operacional y las prácticas de GSCM.

**Principales aspectos metodológicos:** la relación entre los constructos se estableció mediante el análisis bibliométrico en las bases de datos “ProQuest”, “EBSCO”, “JSTOR”, “Web of Science” y “Scopus” en los modelos/frameworks GSCM prácticas y desempeño, análisis de contenido y análisis de redes.

**Síntesis de los principales resultados:** prácticas internas de GSCM, prácticas externas de GSCM, desempeño ambiental, desempeño económico y desempeño operativo demostrado que los principales temas tratados en GSCM, se observó que más estudios sobre las prácticas internas prevalecieron sobre los que se acercaban otras prácticas.

**Principales consideraciones/conclusiones:** los modelos estudiados no consideró si el perfil de color verde corporativo puede mejorar el rendimiento de la organización, tan poca medido simultáneamente el desempeño ambiental, económico y operativo. Se concluyó que la adición de la variable de perfil verde de las empresas, junto con las prácticas GSCM y de rendimiento permite un análisis en profundidad sobre el grado de implicación de las empresas con GSCM y sus objetivos y resultados que se pretende obtener en el futuro.

## PALABRAS CLAVE

Bibliometría. Desempeño. Gestión de la cadena de suministro verde. Modelo Conceptual. Perfil verde.



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