



Understanding Sustainable Supply Chain Coordination: a review of publications in Brazilian journals

Entendendo a Coordenação da Cadeia de Suprimentos Sustentável: uma revisão de publicações em periódicos brasileiros

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Abstract

Supply chain coordination is focused on managing the activities of the partners involved in the relationship. The introduction of sustainability in supply chains introduces more complexity to coordination. Thus sustainable supply chain coordination is the organization, integration and control of all supply chain activity and business aiming to achieve environmental, social and economic objectives. This study aims to analyze how sustainable supply chain coordination is addressed and understood in Brazilian publications. We conducted a bibliometric analysis and content analysis of national publications on the topics of supply chain, sustainability and coordination. Results pointed to a total of 61 papers that contribute to the understanding of sustainable supply chain coordination. According to paper analysis, sustainable supply chain coordination is understood as a control mechanism of the focal firm. In general, supply chain coordination is highlighted as a benefit for focal companies to maintain control of sustainable strategies and operations. Moreover we verified that most of the papers emphasized discussions about economic benefits of coordination mechanisms used by focal companies, even if these papers propose to discuss environmental and/or social issues. This study contributes to identify the evolution of Brazilian publications related to sustainable supply chain coordination, as well as to support Brazilian researchers to explore gaps and research opportunities.

Keywords: Sustainability; Supply Chain Coordination; Sustainable Supply Chain; Brazilian Journals.

Resumo

A coordenação da cadeia de suprimentos está focada no gerenciamento das atividades dos parceiros envolvidos no relacionamento. A introdução da sustentabilidade traz maior complexidade à coordenação. Nesse sentido, a coordenação da cadeia de suprimentos sustentável é a organização, integração e controle de toda a atividade e dos negócios da cadeia, visando alcançar objetivos ambientais, sociais e econômicos. Este estudo tem por objetivo analisar como a coordenação da cadeia de suprimentos sustentável vem sendo entendida e abordada em artigos publicados em revistas brasileiras. Para tanto, uma análise bibliométrica e análise de conteúdo de publicações nacionais sobre os temas de cadeia de suprimentos, sustentabilidade e coordenação foram realizadas. Resultados apontaram um total de 61 trabalhos que contribuem para a compreensão da coordenação da cadeia de suprimentos sustentável. De acordo com a análise dos artigos, a coordenação da cadeia de suprimento sustentável é entendida como um mecanismo de controle da empresa focal. De forma geral, a coordenação é destacada como um benefício para as empresas focais manterem o controle de estratégias e operações sustentáveis. Além disso, verificou-se que a maioria dos trabalhos enfatizou as discussões sobre os benefícios econômicos dos mecanismos de coordenação, ainda que a proposta dos artigos estivesse em discutir questões ambientais e/ou sociais. A contribuição deste estudo está na identificação da evolução das publicações brasileiras relacionadas à coordenação da cadeia de suprimentos sustentável, bem como no apoio a pesquisadores brasileiros na exploração de lacunas e oportunidades de pesquisa.

Palavras-chave: Sustentabilidade; Coordenação da Cadeia de Suprimentos; Cadeia de Suprimentos Sustentável; Periódicos Brasileiros.

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1 Introduction

Sustainability in supply chain is a research area that is continuously evolving (GOLD; SCHLEPER, 2017). The increase of discussions on this area in academic and non-academic environments (TOUBOULIC; WALKER, 2015; REEFKE; SUNDARAM, 2017; DUBEY et al., 2017) highlight that the area has become significant in Supply Chain Management (SCM) research. This significance is perceived since, according to Gold (2016), sustainability and supply chain research plays an outstanding role in informing and guiding businesses, government agencies, universities and research centers and other stakeholder groups.

Discussions related to sustainability and SCM focus mainly on Sustainable Supply Chain Management (SSCM) concept. SSCM involves the integration of environmental, social and economic goals in the supply chain routines, operations, strategies and decision making (PAGELL; WU, 2009). Carter and Rogers (2008) conceptualize SSCM as the transparent integration and achievement of social and environmental objectives (beyond economic objectives) by an organization in the systemic coordination of supply chain business. In this definition, the role of a specific organization is highlighted – the focal company, which is responsible for managing and coordinating the supply chain sustainability.

Management is fundamental to develop a sustainable supply chain, but we understand that sustainable supply chain coordination is also relevant. Traditionally, Supply Chain Coordination (SCC) involves maintaining control of companies' actions according to a common supply chain goal (ARSHINDER; DESHMUKH, 2008). Based on the SSC concept, Sustainable Supply Chain Coordination (SSCC) can be defined as the control of the impact of individual actions (for each supply chain member) to achieve sustainability objectives in supply chain. By coordinating the supply chain, the focal company manages the interdependence between members and, consequently, this company has influence over the stakeholders (REEFKE; SUNDARAM, 2017). Thus we emphasize the importance of sustainable supply chain coordination.

Even though studies about sustainability in supply chains are growing significantly (GOLD; SCHLEPER, 2017; DUBEY et al.), further research is still needed on the role played by other elements and actors (PAGELL; SHEVCHENKO, 2014). Winter and Knemeyer (2013) claim that future supply chain sustainability research should investigate the connection between elements in an effort to better understand how individual actions can influence the success or failure of supply chain sustainability. Touboulic and Walker (2015b) add that researchers must go further and investigate how supply chain members influence other supply chain organizations through organizational decisions. While sustainable supply chain management refers to the management of supply chain strategies, operations and actions aiming to create a sustainable supply chain; sustainable supply chain coordination refers to the influence of internal actions on sustainable supply chain. Therefore SSCM and SSCC appear as relevant aspects to reach supply chain sustainability. However, studies are generally based on the SSCM concept, and we must also focus on the understanding of sustainable supply chain coordination.

Thus this study aims to analyze how sustainable supply chain coordination is addressed and understood in Brazilian publications. We conducted a bibliometric analysis and content analysis of papers published in Brazilian journals on the topics 'supply chain', 'sustainability' and 'coordination'. Being the world's seventh largest economy and representing almost three percent of the global population, Brazil plays a major role in contributing towards sustainability. Brazil has also placed importance on sustainability management in the supply chain field (SILVA et al., 2015). In this context, we understand that it is important to investigate what has been done in Brazilian publications. Investigating the studies developed in Brazil, by considering a part of the Brazilian scientific production, contributes to the understanding of the behavior and the development of a specific area of knowledge (ARAÚJO; ALVARENGA, 2011).

According to Silva, Fritz and Nunes (2017), Brazilian publications have been following global SSCM discussions to a certain extent only. This fact creates a research gap and an opportunity for Brazilian researchers to contribute to the gradually developing field. Considering current sustainability challenges in Brazilian supply chains and the impact business and policy may exert, a research field on supply chain sustainability in Brazil can emerge as an important area of study. In addition, the authors recommend studies related to the meaning of sustainability in supply chains in Brazil and comparisons with other definitions (SILVA; FRITZ; NUNES, 2017). This paper is structured in four sections in addition to this introduction. First,

we present the theoretical background which supports this study, based on supply chain management and sustainability in supply chain. Second, we describe the methodological procedures used in this research. Third, we present the main results. Finally, we highlight the final considerations of this study.

2 Theoretical Background

Organizations are not an isolated island, since no organization is self-sufficient. The companies need relationships with other organizations to survive and grow (PARMIGIANI; RIVERA-SANTOS, 2011). There are different configurations that interorganizational relationships can establish – in this study we focus on supply chain. Assuming supply chain perspective is to move from a totally internal organizational focus to inter-companies relationships. The supply chain management and coordination are related move in this way from an individual perspective to interorganizational interactions. In this section, we first discuss the traditional supply chain, and then we present supply chain sustainability approach.

2.1 Supply Chain: management and coordination

According to Chopra and Meindl (2003), a supply chain consists of all parties directly or indirectly involved in meeting customer requirements, including manufacturers and suppliers, carriers, warehousing companies, retailers and consumers. The supply chain is composed by organizations that need to have some relationship to achieve performance objectives, especially those valued by costumers (CHRISTOPHER, 2005). Beamon (1999) states that supply chain is commonly defined as a linear path, which integrates the activities associated with the flow and transformation of goods, from the extraction of its raw materials to the end user, producing value to customers and creating competitive advantage. However, Maurer (2012) highlights that the supply chain should not be studied exclusively from a traditional linear perspective. The supply chain must be perceived as a structure in itself, with distinct forms, different work divisions and diverse coordination mechanisms.

Supply chain has emerged as an option for companies to compete in the market, create and deliver value to their customers (CHRISTOPHER, 2005). Therefore the supply chain started to play a key role in improving organizational performance (RAO; HOLT, 2005). Thus the supply chain must be properly managed to operate in the highly competitive market and to create and to deliver value to its customers. The success of managing a supply chain requires changes at the center of management, moving from a more individual perspective to the integration of interorganizational activities. The management of the supply chain involves adaptations and changes in the global network of organizations (PATHAK et al., 2007).

According to Lambert, Cooper and Pagh (1998), Global Supply Chain Forum understands Supply Chain Management (SCM) as an integration of key business processes, from end-users to original suppliers of goods, services and information. Mentzer et al. (2001) conceptualize SCM as a systemic and a strategic coordination of the traditional business functions in a supply chain, by a specific company, aiming to improve the long-term performance of each company and the supply chain as a whole. Managing the supply chain is the responsibility of a specific organization, such as the concept of Mentzer's et al. (2001) explicitly emphasize.

In general, the supply chain is formed by a focal firm and stakeholders that interact continuously. Focal companies are those organizations that usually manage and coordinate the supply chain, maintaining contact with the organizational client or the consumer, and designing the product and/or service delivered by the supply chain (SEURING; MÜLLER, 2008). The focal company is therefore responsible for supply chain operations in the market, and also for the monitoring of supply chain members. On the other hand, the other members of the supply chain are the stakeholders. Stakeholder is a term defined as any individual, group of individuals or organization that can influence or be influenced by the achievement of the supply chain goals. The term stakeholder includes investors, shareholders, company owners, employees, consumers, producers, suppliers, government agencies, nongovernmental organizations, media and communication companies, civil society, community and others (FREEMAN, 2004). Supply chain management and coordination depends on a number of factors, such as the size of the supply chain and the quantity and diversity of stakeholders.

We argue that the focal company is also usually responsible for the supply chain coordination. Furlanetto (2003) defines Supply Chain Coordination (SCC) as the management of individual actions (for each member) according to a common goal (supply chain goal), and consists of information transmission, incentive promotion

and control use in a system. Reefke and Sundaram (2017) affirm that SCC includes information flows and planning activities. Therefore several intersections between planning, execution and control should occur, in order to eliminate the asymmetry of information between supply chain members and to guarantee better results for the supply chain. Arshinder and Deshmukh (2008) argue that SCC involves maintaining control over all supply chain processes.

Based on this discussion, we understand that SCC and SCM are concepts that are related to each other and have similar meanings. However, we must go beyond this similarity to better understand the concepts that are being studied. SCC refers to the influence of the internal practices on supply chain; and, SCM refers to the management of supply chain strategies, operations and actions. The complementarity is precisely on the fact that SCM and the management practices of organizations are influenced by coordination mechanisms of the supply chain, while, at the same time, they influence these mechanisms.

The company uses coordination mechanisms to organize and to control organizations to achieve supply chain performance objectives. Such coordination mechanisms include information and technology sharing, incentive system, contracts, collaborative initiatives, risk management, and joint decision-making. In addition, issues related to the reputation and image of the stakeholders that are part of the supply chain are also included in the coordination (REEFKE; SOUDARAM, 2017; ARSHINDER; DESHMUKH, 2008). The success of the supply chain is strongly related to the integration of its different members and, consequently, to the efficiency of its coordination mechanisms in responding to market impositions. Due to the complementarity of SCM and SCC, it is important to understand how these concepts have been addressed in sustainability in supply chain research. In the next topic, we discuss sustainability in supply chain.

2.2 Sustainability in Supply Chain

The first debates integrating sustainability and SCM emerge from the integration of environmental management and supply chain management (SRIVASTAVA, 2007). Beske and Seuring (2014) affirm that the early links to environmental management were fueled by the desire to improve economic performance of the supply chain. Efforts to introduce environmental practices into supply chains have contributed to the emergence of Green Supply Chain Management (GSCM) concept. According to Srivastava (2007), GSCM can be conceptualized as environmental integration in the supply chain, as well the reduction of environmental impacts.

GSCM expanded the scope of supply chain management by including environmental aspects to the economic management criteria. However, expected contributions in the supply chain should not be limited to the reduction of environmental impacts. The supply chain business should also contribute to the generation of social benefits along the supply chain, especially in developing countries (CARVALHO; BARBIERI, 2013). Therefore advances in discussions on the subject reinforce the need to consider all the dimensions of Triple Bottom Line (TBL) (ELKINGTON, 1997) in supply chain approach.

Although environmental and economic dimensions are the focus of many publications on the topic (SILVA; FRITZ; NUNES, 2017), social issues also need to be considered in supply chains (SEURING, MÜLLER, 2008, PAGELL, WU, 2009, ASHBY, LEAT, HUDSON-SMITH, 2012, PAGELL, SHEVCHENKO, 2014, SILVA et al, 2015; MONTABON, PAGELL WU, 2016; SILVA; FRITZ; NUNES, 2017; GOLD, SCHLEPER, 2017). A broader concept must be considered, including the three dimensions of sustainability in supply chain. According to Montabon, Pagell and Wu (2016), sustainability is an inherently integrative concept. To achieve sustainable performance, the three dimensions of sustainability must be effectively addressed in supply chain decision-making, strategies and policies (PAGELL, WU, 2009). This is the context for the emergence of the sustainable supply chain management concept (SSCM). Different authors conceptualize SSCM – at least eleven definitions according to Ahi and Searcy's (2013) survey. Seuring and Müller (2008, p. 1700) defined SSCM as the “management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from TBL into accounts which are derived from customer and stakeholder requirements”. In turn, Carter and Rogers (2008) interpret SSCM as:

The strategic and transparent integration and achievement of an organization's social, environmental and economic objectives in the systemic coordination of the main

interorganizational business processes to improve the long-term economic performance of the individual company and its supply chains (CARTER; ROGERS, 2008, p.368).

According to the authors, this SSCM definition is based on TBL (ELKINGTON, 1997), as well as on four facets of sustainability support: risk management, transparency, strategy and culture. The SSCM concept proposed by Carter and Rogers (2008) is directly related to the focal company. This company is responsible for the sustainable supply chain management and coordination aiming to the achievement of social and environmental objectives, beyond economic goals (CARTER; ROGERS, 2008). Therefore, the focal company must to manage and to coordinate sustainability strategies e operations beyond its own organizational boundaries (REEFKE; SUNDARAM, 2017). The integration of the focal company and stakeholders and also stakeholders' engagement are important aspects for the introduction and dissemination of sustainability in supply chain (SEURING; MÜLLER, 2008; PAGELL; WU, 2009). Ashby, Leat and Hudson-Smith (2012) affirm that, in order to effectively introduce sustainable initiatives in supply chain, the focal company must define cooperation and communication strategies to better integrate the stakeholders.

In this context, we defined Sustainable Supply Chain Coordination (SSCC) as the control of the impact of individual actions (for each stakeholder) to achieve sustainability objectives in supply chain business. Since SCC and SCM are complementary concepts, SSCM and sustainable supply chain coordination are also complementary. SSCC refers to the influence of internal actions on sustainable supply chain; and SSCM refers to the management of supply chain strategies, operations and actions aiming at sustainability. Although the focal company role is fundamental to the supply chain sustainability, the SSCC is not exclusive to this company. In other words, a different stakeholder can assume the coordination role for sustainability.

SSCC demands internal controls, monitoring, integration, awareness, engagement and transparency, in order to reduce environmental damage and social problems throughout the supply chain. Therefore, sustainable supply chain coordination requires the coordination of issues related to sustainability in the internal and external scope, considering the stakeholders (REEFKE; SONDARAM, 2017). Companies must design and develop responsible and transparent coordination mechanisms for the relationship with stakeholders.

Research and practical application on sustainability in supply chain has been growing significantly over the past decade (BESKE; LAND; SEURING, 2014; DUBEY et al., 2017). However, sustainable supply chain research is usually conducted from the perspective of SSCM and, further studies are still needed. Reefke and Sundaram (2017) identified key issues (planning, implementation, coordination and collaboration) and research opportunities (governance, risk, performance management and sustainability dimensions categories) on sustainability in supply chain. According to the authors, the identified themes are essential for the management and the performance of sustainable supply chains. In this study, we focus on the understanding of the keys themes: coordination and sustainability. The next section presents literature reviews developed on this thematic.

2.2.1 Supply Chain Sustainability Studies: addressing literature reviews

Sustainability in supply chain management has been the focus of several special issues of national and international journals. The thematic is also the object of multiple theoretical and systematic literature reviews. These previous studies contribute to the knowledge on the thematic and to reinforce that there is significant progress in practice. In this section, we highlight some points identified through literature reviews, related to an integrated concept of supply chain sustainability, as well as theories e methods used in the studies. Additionally, we address the findings of literature reviews conducted from the Brazilian perspective on supply chain sustainability.

Pagell and Shevchenko (2014) argue that the current knowledge on the subject is not sufficient to explain or to create truly sustainable supply chains. According to Touboulic and Walker (2015), the main challenge of the relationship between sustainability and supply chains is to integrate these areas. In addition to the integration of economic, social and environmental dimensions of sustainability into supply chain strategies and operations, Ashby, Leat and Hudson-Smith (2012) affirm that sustainability and supply chain are areas that still require a more holistic approach.

Touboulic and Walker (2015) explain that papers published before the 2000s provide a supply chain definition and a description of environmental impacts as a separate variable. Studies should to consider sustainability in supply chain as an integrated concept. Following the same idea, Montabon, Pagell and

Wu (2016) argue that a significant number of studies use the term sustainability even though these studies investigate only the environmental and economic dimensions. In addition, Carter and Easton (2011) affirms that initially the terms sustainability and environment were misused as synonyms by researchers and managers. Therefore, according to the authors, it is necessary to use the terms correctly.

Moreover there is no unique theory to explain the supply chain (TOUBOULIC; WALKER, 2015; PARMIGIANI; RIVERA-SANTOS, 2011). In the context of sustainability, Touboulic and Walker (2015) argue that scholars generally use macro theories – resource-based view, stakeholder theory, institutional theory, and transaction cost theory – to analyze the sustainable supply chain. Thus, the authors encourage the use of other theories and other methods to build knowledge on the theme. More research is needed to study and to understand sustainability in the supply chain, using different methods (SILVA et al., 2015).

Finally, we highlight two literature reviews conducted from Brazilian publications. The findings of such literature reviews motivated this study, since there are research gaps to be studied. Silva et al. (2015) conducted a literature review on SSCM publications in 37 Brazilian journals selected over a period of 15 years – from 2000 to 2014. A limited number of papers published in Brazilian journals were identified in the 2000s: only seven related sustainability to the supply chain approach. According to the authors, results indicated that the understanding of the topic includes recurrent discussions with environmental or economic dimensions. However, a comprehensive definition of the concept is lacking. Only one of the identified papers presented a relationship between management, sustainability, and supply chain in relation to SSCM.

In turn, Silva, Fritz and Nunes (2017) identified that scientific publications on SSCM in Brazil focused on practical issues of collaboration with key stakeholders (aspect stakeholder inclusiveness), knowledge sharing (aspect knowledge management), effectiveness (aspect productivity), and risk management. The authors recommended as future studies the specificities of the country and how these specificities can serve research in other similar countries or regions; the analysis of sustainability considering the entire supply chains; the theoretical contributions regarding the meaning of sustainability in supply chain in Brazil and comparisons with other definitions.

Therefore, there are research gaps and opportunities for Brazilian researchers to contribute to the gradually developing field. Considering the necessity of comprehension of concepts, this study intends to understand how sustainable supply chain coordination concepts is addressed and understood in papers published in Brazilian journals. The next section describes the methodological procedures used in this research.

3 Method

This study is based on qualitative approach, aiming to analyze how sustainable supply chain coordination is addressed and understood in Brazilian publications. Since research purpose is related to the description of the literature on a specific topic (ARAÚJO, 2006), we conducted a bibliometric analysis. Bibliometry has a relevant role in the analysis of the scientific production, especially because its indicators can describe the behavior and the development of a thematic (ARAÚJO; ALVARENGA, 2011).

The study was developed in five steps. Figure 1 shows the steps used in this study.

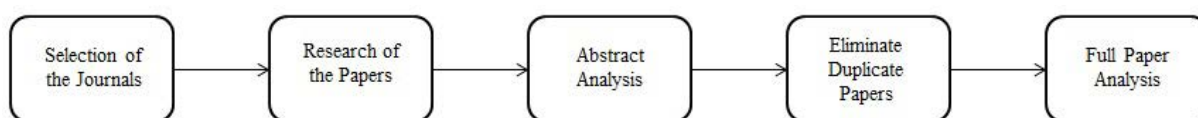


Figure 1 – Literature Review Steps

Firstly, we selected Brazilian journals to be analyzed. These journals were selected based on Qualis 2015 classification of Coordination for the Improvement of Higher Education Personnel (Capes – acronym in Portuguese). According to Capes’ classification, considering Management, Accounting and Tourism area, there are 517 journals in the groups that include more relevant publication (A1 and A2). We selected A1 and A2 groups, since these groups are at the top of the Capes classification, as a way to guarantee a certain level of quality – following Touboulic and Walker (2015) recommendations. In A1 (main) classification, no national journal was identified. In A2 classification, 30 national journals were identified (see Table 1).

Table 1 - List of selected Brazilian journals

BrazilianJournal	BrazilianJournal
Anais da Academia Brasileira de Ciências	Pesquisa Operacional
Bar. BrazilianAdministrationReview	Pesquisa Veterinária Brasileira
Brazilian Dental Journal	Rac. Revista de Administração Contemporânea
Brazilian Journal Of Biology	Rae. Revista de Administração de Empresas
Cadernos de Saúde Pública	Rap. Revista Brasileira de Administração Pública
Cadernos Ebape.Br	Rausp. Revista de Administração da Universidade de São Paulo
Ciência & Saúde Coletiva	Revista Brasileira de Ciência do Solo
Contabilidade Vista & Revista	Revista Brasileira de Gestão de Negócios
Dados - Revista de Ciências Sociais	Revista Brasileira de Zootecnia
Educação & Sociedade	Revista Contabilidade & Finanças
Engenharia Sanitária e Ambiental	Revista de Economia Política
Estudos Avançados	Revista de Saúde Pública
Journal of the Brazilian Chemical Society	Revista Latino-Americana de Enfermagem
Organizações & Sociedade	Revista Universo Contábil
Pesquisa Agropecuária Brasileira	Saúde e Sociedade

Secondly, we collected published papers. Data collection occurred in May 2017. Papers were directly collected from the website of each Brazilian journal according to the following keywords. We highlighted that the keywords were used for all sections of the papers, including title, keywords, abstract, and other sections. We defined the keywords to search according to the literature: 'sustainable supply chain coordination'; 'supply chain coordination'; 'sustainability in supply chain'; 'sustainable supply chain'; and, 'sustainable supply chain management'. After the first rounds of research, we decided to include three keywords – properly aligned with the research objective – to broaden the search for papers: 'coordination'; 'supply chain'; and, 'sustainability'. In total, 1195 papers were identified based on keywords used.

The third step involved the abstract analysis. This analysis focused on two criteria: (1) sustainability, as Triple Bottom Line, and (2) the supply chain coordination concept. Thus the question "does this study address the sustainable supply chain coordination concept?" guided the analysis. After reading the papers abstract, 129 articles were selected. Table 2 shows the number of papers selected for each keyword.

Table 2 - Number of Papers Selected According to the Keywords

Keyword	Papers Selected
Supply Chain	44
Sustainability	40
Coordination	33
Supply Chain Coordination	6
Sustainability in Supply Chain	2
SustainableSupply Chain	2
SustainableSupply Chain Management	2
SustainableSupply Chain Coordination	0

The fourth step involved the exclusion of duplicate articles. In this step, 23 papers were excluded. Finally, the fifth step involves the full paper analysis. After full paper analysis, 60 papers remained. To analyze data, a content analysis was performed (BARDIN, 2009). Each paper was read and analyzed according to the purpose of this research. Through this analysis, we seek to understand the interpretation and the contributions of Brazilian publications to the research topic.

4 Findings

The results are presented in two sessions: (a) descriptive analysis, and (b) discussion.

4.1 Descriptive Analysis

The review of Brazilian academic publications pointed to a total of 60 papers that contribute to the understanding of sustainable supply chain coordination – and also the supply chain coordination. Table 3 shows the papers selected.

Table 3 - Papers identified during the research

Journal	Paper	Purpose	Method	Year of Publication
Brazilian Administration Review (BAR)	Conduits of Innovation or Imitation? Assessing the Effect of Alliances on the Persistence of Profits in U.S. Firms	To examine the extent to which firms adopt a strategy to engage in alliances with other actors	Quantitative approach – Hierarchical Linear Modeling	2013
Brazilian Administration Review (BAR)	The Influence of Coordination Mechanisms on New Product Development in MNC Subsidiaries	To investigate the relationship between [MNC] coordination mechanisms and subsidiary new product development [NPD] activities	Quantitative approach – Structural Equations Modeling	2010
Brazilian Administration Review (BAR)	Determinants of Scale Efficiency in the Brazilian Third-Party Logistics Industry from 2001 to 2009	To determine which variables significantly impact 3PLs scale efficiency	Quantitative approach – DEA (Data Envelopment Analysis)	2012
Brazilian Administration Review (BAR)	The Role of Food Standards in International Trade: Assessing the Brazilian Beef Chain	To identify how Brazilian beef managers have responded to a rapid expansion and intensification of standards for beef exports	Qualitative approach – Case study	2006
Brazilian Administration Review (BAR)	Trust and Supplier-buyer Relationships: An Empirical Analysis	To investigate if regional differences are able to influence trust-based relationship with suppliers	Quantitative approach – Survey	2013
Brazilian Administration Review (BAR)	Hockey Stick Phenomenon: Supply Chain Management Challenge in Brazil	To investigate a phenomenon that occurs in Brazil, specifically the spike in demand at the end of the sales period, known as the hockey stick phenomenon	Quantitative approach – Simulation approach based on the system dynamics method	2014
Brazilian Administration Review (BAR)	Understanding Supply Networks from Complex Adaptive Systems	To discuss supply networks as complex adaptive systems	Theoretical study	2014
Brazilian Administration Review (BAR)	Value Added Elements According to Buyer Companies in a B2B Context	To analyze how buyer companies perceive the value added to products and services offered by their suppliers and to identify the predominant elements that affect the purchasing decisions and establishment of relationships between companies in a B2B context	Qualitative approach – Multiple case study	2015
Cadernos Ebape.BR	Da produção em massa à customização em massa: sustentando a liderança na fabricação de motores elétricos	To analyze how a market leader works with the production of both standardized and customized motors	Qualitative approach – Case study	2009
Ciência & Saúde Coletiva	Cooperação e integração regional em saúde na América do Sul: a contribuição da Unasul-Saúde	To discuss the process of integration of South America in the domain of health, from the constitution of the Union of South American Nations (Unasur), in May 2008, through to the emergence of the Unasur Council of Health, in 2009, and its ongoing development in the past year (2009-2010)	Qualitative approach – Case study	2011
Ciência & Saúde Coletiva	Descentralização e coordenação federativa: a experiência brasileira na saúde	To analyze the federative coordination of Brazilian health policy in the 1990s, focusing on the action of the Ministry of Health	Qualitative approach – Document Analysis	2009

Contabilidade Vista & Revista	Relações entre o número de indicadores de desempenho utilizados e fatores contingenciais: evidências do contexto de uma cadeia agroalimentar de suprimentos	To analyze the statistical significance of the relationships between the number of performance indicators used and contingent factors among individual agribusiness companies	Quantitative approach – Survey	2016
Contabilidade Vista & Revista	Mensuração dos Custos Logísticos: Estudo de Caso em uma Indústria Gráfica	To investigate how does the measurement of logistics costs in a printing industry that restructured its logistics	Qualitative approach – Case study	2016
Dados - Revista de Ciências Sociais	Cooperação e Coordenação na Implementação de Políticas Públicas: O Caso da Saúde	To analyze the degree of regionalization of health care in Brazil	Quantitative approach – Indicator construction	2016
Dados - Revista de Ciências Sociais	Coordenação intragovernamental para implementação da política externa brasileira: o caso do Fórum IBAS	To evaluate the organizational mechanisms and structures adopted by the Brazilian Ministry of Foreign Affairs (Itamaraty) to promote the coordination of domestic government actors for implementing the guidelines of the IBSA Forum	Qualitative approach – Document Analysis	2012
Organizações & Sociedade	Competição e Cooperação/Cooperação	To find a common axis based on the relationship between the competition and the cooperation in applied visions	Theoretical study	2008
Organizações & Sociedade	Small-Firm Networks: hybrid arrangement or organizational form?	To analyze organizational characteristics of small-firm networks (SFN)	Qualitative approach – Case study	2014
Revista de Administração Contemporânea (RAC)	O Impacto das Características do Negócio nas Decisões Logísticas e na Organização do Fluxo de Produtos: um Estudo Exploratório em Seis Setores Econômicos	To evaluate the relationships among the characteristics of the product, the operation and the demand and the logistics decisions regarding Push/Pull, Centralization/Decentralization and Make to Order/Make to Stock	Quantitative approach – Document Analysis	2003
Revista de Administração Contemporânea (RAC)	Empreendedorismo Sustentável e Stakeholders Fornecedores: Criação de Valores para o Desenvolvimento Sustentável	To analyze how the interrelation between enterprises that meet criteria of sustainable entrepreneurship and their supplier stakeholders influence the creation of values that contribute to sustainable development	Qualitative approach – Multiple case study	2016
Revista de Administração Contemporânea (RAC)	Evaluating Supply Chain Management: A Methodology Based on a Theoretical Model	To propose a methodology for evaluating companies' degree of adherence to a SCM conceptual model	Qualitative approach – Development of the Evaluating Methodology and Conceptual Model	2015
Revista de Administração Contemporânea (RAC)	Gerenciamento da cadeia de abastecimento de hortifrutigranjeiros frescos: uma pesquisa exploratória no Reino Unido	To analyze the correlation between the empirical benefits and the level of investment made by the suppliers (capital and managerial time)	Quantitative approach – Survey	2006
Revista de Administração Contemporânea (RAC)	Um estudo da cadeia de valores com a utilização da análise fatorial	To evaluate the importance that companies give to all variables that create value chains as contributors to the competitive advantage of the companies and its relation with supply chain management	Quantitative approach – Survey	2006
Revista de Administração Contemporânea (RAC)	A análise de agrupamentos como instrumento de apoio à melhoria da qualidade dos serviços aos clientes	To apply the cluster analysis as an instrument for gathering key products with similar characteristics, emphasizing the quality of services offered to the customers.	Qualitative approach – Case study	2002
Revista de Administração Contemporânea (RAC)	Evolução da cadeia de suprimentos da indústria automobilística no Brasil	To describe, to characterize and to analyze the effects of the transnational companies' global strategies on the evolution of the automotive industry's supply chain	Quantitative approach – Document Analysis	2001

Revista de Administração Contemporânea (RAC)	Desenvolvimento de produtos no contexto das cadeias de suprimentos do setor automobilístico	To compare the degree of technological autonomy conquered by the engine assemblers installed in Brazil	Qualitative approach – Case study	2008
Revista de Administração Contemporânea (RAC)	Importância dos fatores não-tecnológicos na implementação do CPFR	To identify the so-called non-technological factors involved in CPFR reported in the literature and to analyze them in real situations	Qualitative approach – Multiple case study	2010
Revista de Administração Contemporânea (RAC)	Gerenciamento de cadeias de suprimento: novas formas de organização na cadeia da carne bovina do Rio Grande do Sul	To study new organizational and coordination configurations that are being formed in the beef supply chain of Rio Grande do Sul	Qualitative approach – Multiple case study	2002
Revista de Administração Contemporânea (RAC)	Information technology investments and supply chain governance	To propose a model that relates information technology (IT) investments, supply chain governance (SCG) and performance together	Qualitative and quantitative approaches – Survey	2014
Revista de Administração de Empresas (RAE)	Green Supply Chain: protagonista ou coadjuvante no Brasil?	To analyze the diffusion of the GSCM concept and practices in the Brazilian scenario	Qualitative approach	2014
Revista de Administração de Empresas (RAE)	Agregando valores a las cadenas de valor	To presents a matrix of factors to prioritize agricultural value chains targeted for public-private initiatives intended to foster their further development	Qualitative approach – Document Analysis	2014
Revista de Administração de Empresas (RAE)	Gestão e práticas socialmente responsáveis na cooperação agrícola	To highlight the management mechanisms that contribute to the emergence of socially responsible decisions within the cooperation sector, particularly in the agricultural field	Qualitative approach – Multiple case study	2012
Revista de Administração de Empresas (RAE)	Logística reversa: como as empresas comunicam o descarte de baterias e celulares?	To analyze, based on the principles of Integrated Marketing Communication, Reverse Logistics Programs communication at mobile phones manufacturers operating in Brazil	Quantitative approach – Survey	2012
Revista de Administração de Empresas (RAE)	Percepção sobre atributos de sustentabilidade em um varejo supermercadista	To clarify the real perception of consumers when they come across a sustainable product	Quantitative approach – Survey	2011
Revista de Administração de Empresas (RAE)	Inovação e Sustentabilidade: Novos Modelos e Proposições	To analyze the relation between sustainability and innovation, taking as reference the institutional theory	Theoretical study	2010
Revista de Administração de Empresas (RAE)	Vantagem Competitiva na Gestão Sustentável da Cadeia de Suprimentos: um MetaEstudo	To investigate whether the social environmental strategies applied to the supply chain converge for stakeholder management and the development of dynamic capabilities and, finally, whether they represent a source of competitive advantage for the companies investigate	Qualitative approach – Literature Review	2010
Revista de Administração de Empresas (RAE)	Métodos colaborativos na gestão de cadeias de suprimentos: desafios de implementação	To investigate the collaborative methods concerning the coordination of SC and analyze their characteristics and implementation difficulties	Qualitative approach – Literature Review	2015
Revista de Administração de Empresas (RAE)	Supply chain resilience analysis: a Brazilian automotive case	To analyze the main lack of flexibilities in three Brazilian automotive SCs that limit their resilience and therefore their capacity to better support and meet the demand changes in the marketplace	Qualitative approach – Multiple case study	2015
Revista de Administração de Empresas (RAE)	Relacionamentos colaborativos e desempenho competitivo de empresas brasileiras	To describe the nature of the relationship between supply chain collaboration and competitive performance, evaluating the effect of information systems and technology as moderators of the relationship between collaboration and performance	Quantitative approach – Structural Equations Modeling	2015

Revista de Administração de Empresas (RAE)	Imersão social na cadeia de suprimentos e seu efeito paradoxal no desempenho operacional	To analyze structural and relationalembdedness effects in operational performancein terms of productivity and quality gains	Quantitative approach – Survey	2014
Revista de Administração de Empresas (RAE)	Cadeia reversa do óleo de cozinha: coordenação, estrutura e aspectos relacionais	To analyze how a reverse supply chain of the collection of used cooking oil is structured and coordinated	Qualitative approach	2013
Revista de Administração de Empresas (RAE)	Antecedentes da Gestão da Cadeia de Suprimentos: Eles Realmente Existem? Estudo Empírico no Brasil	To test the impact of three antecedents (trust, internal relationships and support fromsenior management) on supply chain management	Quantitative approach – Structural Equations Modeling	2010
Revista de Administração de Empresas (RAE)	Gestão da Informação Interorganizacional na Cadeia de Suprimentos Automotiva	To analyze how interorganizational information is managed (IOIM) in theautomotive supply chain	Qualitative approach – Multiple case study	2009
Revista de Administração de Empresas (RAE)	Antecedentes do relacionamento e da performance em empresas da cadeia de suprimentos: estruturação e aplicação de modelos de equações estruturais	To structure and test models that link aspects of this nature with performance and the purchaser-supplier relationship inthe supply chain	Quantitative approach – Structural Equations Modeling	2009
Revista de Administração de Empresas (RAE)	Calçado do Vale: Imersão Social e Redes Interorganizacionais	To investigatehow the structural embeddedness influenced the economic action of the sector	Qualitative approach – Case study, Longitudinal approach, Historical analysis	2006
Revista de Administração de Empresas (RAE)	Sincronismo Entre Clientes e Fornecedores	To identify the synchrony between customers’ expectations and managerial practices adopted by suppliers usingthe supply chain model	Quantitative approach – Survey	2005
Revista de Administração de Empresas (RAE)	Gerenciando Relacionamentos Colaborativos com Fornecedores	To discuss the importance of trust and the effect of specific assets investments over collaborative relationships with suppliers	Quantitative approach – Survey	2004
Revista de Administração de Empresas (RAE)	Relacionamentos Colaborativos em Redes de Suprimentos	To present a theoretical discussion on the problem of coordination of logistics processes and tangible and intangible resources in the value chain.	Theoreticalstudy	2004
Revista de Administração de Empresas (RAE)	Redes de Aprendizado em Sistemas Complexos de Produção	To demonstrate that, due to its characteristics, the Complex Production Systems (CopS) have in the network of firms their typical interorganizational arrangement	Theoreticalstudy	2002
Revista de Administração de Empresas (RAE)	Manufacturing Strategies and Work Organization in An Engine Supply Chain	To discuss the relationshipbetween Manufacturing Strategies (MSs) and forms of Work Organization (WOs) adopted by an engineassembler and nine of its suppliers, examining how the specific decisions of the assembly plant affectthe decisions of those suppliers	Qualitative approach	2002
Revista de Administração de Empresas (RAE)	Projeto da Cadeia de Suprimento: uma Visão Dinâmica da Decisão Fazer Versus Comprar	To analyze to what extent the classic “what to do, what to buy” decision models are appropriate in dynamic and complex environments	Theoreticalstudy	2001
Revista de Administração de Empresas (RAE)	Avanços Logísticos no Varejo Nacional: o Caso das Redes de Farmácias	To describe recent logistics developments observed in retail operations of pharmaceutical productsin Brazil	Qualitative approach	1998
Revista de Administração de Empresas (RAE)	Transferência Internacional de Conhecimento na Multinacional: Quando o Jogo Competitivo Multimercado Se Sobrepe aos Mecanismos Internos de Coordenação	To explain how subsidiaries may not always cooperate; to explore some implications of this difference for knowledge transfers to occur; to examine cooperative and competitive relations among subsidiaries of a MNE	Theoreticalstudy	2010

Revista de Administração de Empresas (RAE)	Alianças Estratégicas Internacionais: Formação e Estruturação em Indústrias Manufatureiras	To analyze the creation and structuring of strategic alliances between Latin American manufacturing companies and foreign industries	Quantitative approach – Survey	1997
Revista Brasileira de Administração Pública (RAP)	Gestão da cadeia de suprimentos integrada à tecnologia da informação	To analyze the main IT tools that determine improvement in creating and maintaining the efficiency of the supply chain management.	Qualitative approach – Case study	2006
Revista Brasileira de Administração Pública (RAP)	A Rede Brasileira de Produção Pública de Medicamentos na perspectiva da gestão de cadeias de suprimentos: o papel das TIC	To investigate the use by Brazilian Official Pharmaceutical Laboratories of contributions derived from the Information and Communication Technologies (ICT), towards the integration of RBPPM's supply chain	Quantitative and qualitative approaches	2015
Revista Brasileira de Administração Pública (RAP)	A contribuição da logística integrada às decisões de gestão das políticas públicas no Brasil	To identify and to classify the logistics aspects of the management of public policies, examining how logistics decisions are essential to improve the state organizations and public services performance	Qualitative approach	2011
Revista Contabilidade & Finanças	O suporte informacional da controladoria para o processo decisório da distribuição física de produtos	To examine the informational support provided by Controllershship to the Logistics' decision-making process	Qualitative approach	2003
Revista Contabilidade & Finanças	Considerações sobre a influência da análise das demonstrações no ciclo do pedido logístico: análise do caso Atofina Brasil	To identify the influence of financial statement analysis, used in the process of establishing customer credit limits, as a part of the logistic order cycle.	Qualitative approach – Case study	2003
Revista Contabilidade & Finanças	A logística: custo total, processo decisório e tendência futura	To discuss logistics, and the relationship of the concept with logistical costs and decision making	Theoretical study	2002
Revista de Saúde Pública	Gestão comunicativa para redes cooperativas de ciência, tecnologia e inovação em saúde	To propose a model of communication management of networks for the Health Innovation System in Brazil	Theoretical study	2012

According to Table 3, our review included 60 papers related to sustainability and supply chain coordination. The papers were published in 11 different journals. The scopes of the journals are mostly aligned with Management and Business area –with the exception of *Ciência & Saúde Coletiva* and *Revista de Saúde Pública*. The journals with the largest number of publications are *Revista de Administração de Empresas (RAE)* (25), *Revista de Administração Contemporânea (RAC)* (11) and *Brazilian Administration Review (BAR)* (8). Together, these journals published approximately 70% of the articles analyzed.

Considering the year of publication, The articles were published over a period of nineteen years, from 1997 to 2016. The years with the highest number of publications are 2014 (7), 2010 (6) and 2015 (6). These three years represent around 30% of the analyzed articles. Results indicate a growth in the number of studies on sustainability in supply chain, published mainly from 2010. This result may indicate that interest in the topic is increasing, especially by academics who publish in international journals. Moreover this growth can be explained by the fact that seminars papers related to supply chain sustainability were published in 2008 and 2009 (see Seuring and Müller, 2008; Carter and Rogers, 2008; Pagell and Wu, 2009).

The papers have a qualitative approach in their majority. Among them, case studies (10); multiple case studies (7); theoretical studies (6); based on documental analysis (3); and literature reviews (2) are methodologies used in these studies. Most of the papers have a descriptive character, describing and investigating the case and/or solutions for the case. There are also articles that do not explicitly describe the methodological procedures used in the research.

We verified the theories used in each paper. We perceived that the authors do not explain in general the theories used as a support to understand the behavior of the organizations in the supply chain. The theoretical background is based on supply chain approach. This finding is aligned with the results found by Silva et al. (2015). Considering the theories used to support control mechanisms, most of the papers address control

mechanisms or supply chain coordination as a strategy to reduce transaction costs (considering limited rationality, complexity, uncertainty, opportunism and asset specificity) or to manage resourcedependence between organizations (considering limited rationality, heterogeneity of resources and immobility of resources). However, the paper majority of authors do not make explicit the theories that they used to support their arguments.

In addition, we verified that most of the studied papers are associated only with economic-financial aspects of the supply chain. This fact can be supported through the purposes of the studies, presented in table 3. Thus it is important to highlight that traditional 'supply chain' was the keyword with the highest number of related papers. This result may also be associated with the fact that the discussions on sustainability in supply chain are more recent, starting from debates about the environmental dimension in supply chains to the sustainable supply chain concept. Our finding is aligned with Silva et al. (2015). According to the authors, the most significant studies in Brazil have only emerged after 2010. Srivastava (2007) claims that approaches that address sustainability in supply chain have their roots in integrating environmental management and supply chain management.

In this context, we analyzed a difference between Brazilian and international discussions about concepts related to sustainability in supply chains. According to the articles analyzed, we found that the papers have been published in their majority in the last six years. The papers that were published before 2010 focus, in general, only on the economic dimension of sustainability, with little mention of environmental concerns.

Given this descriptive analysis, we advance to the analysis and discussion of the concept of sustainable supply chain coordination. Thus the next topic presents a discussion of the articles aligned with the purpose of this study.

4.2 Discussion

In the discussing of the findings, we highlight two relevant points. The first is related to the purpose of this study: how sustainability is being addressed and understood in Brazilian publications? According to the full paper analysis, the term 'sustainable supply chain coordination' was not considered by any of the articles. However, its meaning is mainly addressed on the scope of the sustainable supply chain management concept. As already mentioned, discussions related to supply chain sustainability are generally focused on SSCM concept. Silva et al (2015) affirm that the study of supply chain sustainability requires a clear understanding of some theoretical issues, such as sustainability, supply chains, management and coordination – the focus of our study. Future research should focus on a better understanding of the concepts, highlighting similarities and differences.

Even though the SSCC term has not been clearly addressed, we verified that the sustainable supply chain coordination has been approached in studies mainly associated to control mechanisms, to achieve the sustainability goals. This control mechanism is governed mainly by the focal company, as discussed in the articles analyzed. According to Reefke and Soudaram (2017) and Arshinder and Deshmuck (2008), coordination mechanisms include information and technology sharing, incentive systems, contracts, collaborative initiatives, risk management, joint decision-making, issues related to the reputation and image. All these mechanisms are addressed in the articles analyzed. Additionally, we can include stakeholder management and stakeholder partnership, which can be used as control mechanisms. Therefore, the sustainable supply chain coordination and, consequently, the sustainable supply chain coordination are specifically related to governance of the relationship between partners toward a more sustainable supply chain.

In addition, sustainable supply chain coordination is highlighted as a benefit for focal companies to maintain control of supply chain strategies and operations toward sustainability. In other words, the control mechanisms seem to be understood as contributive elements for supply chain sustainability. Analyzing the control mechanisms and how they are used by firms seems to be a good direction to understand sustainable supply chain coordination in future studies. Given its practical importance, once control mechanisms appear in the papers analyzed, future studies should also focus on the theoretical relevance of the SSCC.

Related to the first point, the second point is associated with the lack of clarity with the meaning of the concepts. For example, there seems to be no consensus on the meaning of coordination and management.

Some authors understand supply chain coordination as the management, while others understand supply chain management as the coordination. We identified that most authors used the term 'management' to deal with supply chain management and including supply chain coordination. This fact contributes to this lack of consensus on the meaning of the terms studied.

However, according to the full paper analysis, the supply chain concept seems to be better understood by the authors when compared to the other terms, such as sustainability or coordination. Supply chain has become an established area of research, which explains why the supply chain concept seems to be understood by the authors. Thus there is a research gap related to the meaning of important concepts in the supply chain approach.

There seems to be also a confusion related to the sustainability concept. We verified that most of the papers emphasize discussions about economic benefits of coordination mechanisms used by focal companies, even if these papers propose to discuss environmental and/or social issues. Our result is aligned with Montabon, Pagell, and Wu (2016). The authors argue that academic studies evidence economic performance even if the theme is related to sustainability in the supply chain. We highlight the paper developed by Brito and Berardi (Competitive advantage and sustainable supply chain management: a meta-analysis – published in Portuguese) published in *Revista de Administração de Empresas*, in 2010. This paper discusses supply chain sustainability from a competitive advantage perspective, considering the three dimensions of sustainability as a whole. Additionally, most of the studies focus only on the environmental dimension – and not sustainability. This is also a definition and meaning problem. Carter and Easton (2011) discussed the permanent confusion between the environmental dimension and sustainability in general. The authors state that initially the terms "sustainability" and "environment" were misused as synonyms by researchers and managers.

Therefore, SSCC must have its importance recognized. Even though the terms are similar, it is important to understand SSCC and SSCM. We understand that the importance of supply chain coordination concept. The contribution of our paper is in the emergence of the SSCC concept, which should be better studied in future researchers. Future research should focus on a better understanding of the sustainable supply chain coordination concept. Additionally, future research should also address the difference between management and supply chain coordination, in the context of sustainability, since the concepts are similar but have different meanings.

5 Final Considerations

This study aimed to analyze how sustainable supply chain coordination is addressed and understood in Brazilian publications. Thus, we conducted a bibliometric analysis and content analysis of national publications on the topics of supply chain, sustainability and coordination. After the five research steps, we analyzed 60 papers aligned with the topics.

According to the descriptive analysis, the journals with the largest number of publications are *Revista de Administração de Empresas* (RAE), *Revista de Administração Contemporânea* (RAC) and *Brazilian Administration Review* (BAR). In addition, the articles were published over a period of nineteen years, from 1997 to 2016. The years with the highest number of publications are 2014, 2010 and 2015. The papers have a qualitative approach in their majority. Considering the theory analysis, we investigate that the authors do not explain in general the theories used as a support to understand the behavior of the organizations in the supply chain. The theoretical background is based on supply chain approach.

Results indicated that sustainable supply chain coordination is understood as a control mechanism toward sustainability. In this way, the supply chain coordination is highlighted as a benefit for the companies, to maintain control of the supply chain activities. The supply chain coordination and, consequently, the sustainable supply chain coordination are specifically related to governance of the relationship between partners. Moreover, we identified that there is confusion about the concepts SSCC, SSCM e sustainability in different papers. Most of these studies focus only on the environmental dimension – and not sustainability. These issues can encourage academics to do research related to the topics, aiming to contribute to the consolidation of concepts.

Theoretically, this study contributes with the emergence of sustainable supply chain coordination. Future research should focus on a better understanding of the sustainable supply chain coordination concept. The practical implications are related to the control mechanisms identified in the articles analyzed. This study contributes to identify the evolution of Brazilian publications, as well as to support Brazilian researchers to explore gaps and research opportunities. We understand that further discussions are necessary and we hope that our discussion will stimulate further studies in the area.

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