

Supply chain management: an integrative review from the agency theory perspective

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Abstract

Purpose – The purpose of the article is to demonstrate how agency theory has been used to address the dynamics involved in supply chain management. It is also dedicated to suggesting an agenda for future research.

Design/methodology/approach – We performed an integrative literature review, based on the process detailed by Botelho *et al.* (2011), with search filters. The articles were obtained from the Scopus and Web of Science databases using the keywords “supply chain” and “agency theory”, with a subsequent analytical filter for “management”. The search initially identified 205 articles. After two screenings, 56 articles were selected for analysis.

Findings – Despite attempts to infer the importance of research on agency theory in supply chain management, its application to the discipline is scarce. Clearly, agency theory provides valuable insights into the relationships in the supply chain. In the studies analyzed, the dynamics of performance, risk, sustainability, dyadic and inter-firm relationships, and supplier management are predominant.

Originality/value – When considering unwanted behaviors throughout the supply chain, agency theory fills the explanatory gaps for these facts. It also proves to be a useful tool to answer mainly the dilemmas of underlying theories, such as transaction cost theory, resource-based view and network theory. Rare are the studies that examine the current state of the application of agency theory in the supply chain literature in the management field.

Keywords Agency theory, Supply chain management, Relationship management, Integrative review

Paper type Literature review

1. Introduction

Throughout the development of scientific literature, agency theory has become one of the most influential theories in the social sciences and has been applied to various forms of relationship (Abländer, Roloff, & Nay, 2016). The theory proved to be adequate to illustrate supply chain relationships and points out implications for companies, it is also capable of providing information to companies on how to implement and design supply chain relationships (Wiese & Toporowski, 2013). Therefore, theorists and practitioners assume that suppliers always tend to circumvent buyers' requirements regarding environmental and social standards, especially if they impose additional costs on the supplier (Abländer *et al.*, 2016).

Agency theory is a useful tool for managers to diagnose and segregate their relationship portfolios, understanding and mitigating behavioral uncertainty (Fayezi, O'Loughlin, & Zutshi, 2012). Both the principal(s) and the agent(s) tend to maximize their individual benefits. The development of this principal-agent relationship was derived from economic scholars through

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limited rationality, personal interest and the agent's risk aversion (Fitri, Elmanizar, Nugraha, Yakub, & Cahyono, 2019). Relationships involving one company that delegates authority to another are common in the supply chain, for example, the principal-agent relationship exists in the case of supplier-managed inventory or long-term purchase contracts with automatic stock replenishment (Kros & Nadler, 2010). Control is a fundamental principle of transport management in logistics (Miller, Saldanha, Hunt, & Mello, 2013), in addition to the need for information, control and incentive mechanisms regarding moral hazard issues in contractual relationships of low- and high-performing responsive employees. Appropriate control mechanisms can prevent hidden actions and information (Kudla & Klaas-Wissing, 2012).

Greater demand for sustainable behavior is also linked to adverse selection agency problems and moral hazards in dyadic relationships. The adverse selection problem identified in relation to people with poor responsive performance indicates a demand for evaluation and selection criteria for suitable partners (Kudla & Klaas-Wissing, 2012). On the other hand, when outsourcing is involved, it brings information asymmetries in the development of initial contracts, which can lead to worse performance than initially expected. In this case, by applying agency theory, performance can be improved in the long run through the effective design of well-constructed contractual relationships (Sayed, Hendry, & Zorzini Bell, 2020). With respect to traditional forms of financial performance (e.g. revenue, profit), these goals tend to lead to horizontal agency problems, for example in networks distributed throughout a franchise. In chains that use corporate-owned stores, vertical branch issues can become the main factor of non-compliance (Massimino & Lawrence, 2019).

The theoretical lenses that agency theory provides can support managerial decision-making and strategy formulation, specifically with respect to relationships with suppliers and customers (Fayezi *et al.*, 2012). Supply improvement initiatives lead to more collaborative relationships between buyer and supplier, thus lowering barriers to behavior-based approaches to managing supplier sustainability practices as prescribed by agency theory (Shafiq, Johnson, Klassen, & Awaysheh, 2017). Monitoring can help buyers deal with an agent's opportunism as an integral part of relationship management (Heide, Wathne, & Rokkan, 2007). However, in a contract manufacturing environment, neither severe external penalties nor frequent audits are able to fully align the quality interests of the parties (Handley & Gray, 2013).

Aiming to raise new reflections, discussions and research, this review intends to answer the following research question: What are the absences and incipencies of international scientific production in supply chain management from the agency theory perspective?

Among the types of systematic literature reviews, this one fits as an integrative review, i.e. a literature review method that aims to carry out various analyzes to expose the knowledge already raised by previous research (Botelho *et al.*, 2011). Therefore, the number of published articles, number of citations, main authors and journals, for example, are analyzed. Based on the type of review used, motivation and contribution go together, that is, integrating the different opinions, concepts, results, ideas of the selected articles. This study also allows the evaluation of studies from the most diverse methodologies, either quantitative or qualitative. The bases of articles, whenever possible, were exported directly from the bases and inserted in the treatment software, avoiding possible errors due to incomplete information in the collection. Finally, the biggest challenge lies in presenting the discussion of results and suggesting future research in which the analysis and synthesis of the most diverse sources, themes and methods require compilation through extensive work.

Only two other articles sought to review the supply chain management literature that uses agency theory. While Fayezi *et al.* (2012) restrict their search to relationships within the supply chain, which analyzed 19 articles, Liu, Feng, Zhu, & Sarkis (2018) focused on identifying the theories used in studies on green chain management and circular economy. As result, 12 theories emerged from the exploratory investigative study. Therefore, this research can be considered broader and unprecedented, since it carries out research without thematic

limitation and without focusing only on theories or methods. It sheds light on international scientific production on supply chain management from the perspective of agency theory. The purpose is to unveil the publications and their characteristics and, above all, point out potential future research. 43 articles were identified, which primarily contribute to the understanding of the field. Agency theory can help managers to consider social, economic, political and behavioral aspects when making decisions about their contracts, through mechanisms of incentive, information sharing and goal congruence (Fayezi *et al.*, 2012). A still latent challenge for supply chain managers interested in controlling sustainability risk is where and when to invest in behavior-oriented approaches to suppliers (Shafiq *et al.*, 2017).

The next section addresses a literature review of the proposed theme. The following sections describe the methodological aspects, results, and conclusions, and research agenda proposed by the study.

2. Supply chain management and agency theory

Agency theory is largely dependent on two significant areas of inquiry, namely, positive agency theory and principal-agent theory. The first, as a descriptive theory, for understanding behaviors in the real world. The second, derived from economic scholars through limited rationality, individual interest and the agent's risk aversion. (Fitri, Elmanizar, Yakub, & Cahyono, 2019). The final definition of the agent changes and may be linked to institutional differences of ownership within a supply chain. The agent is dynamic and will likely be the caretaker, and at the same time there is potential for the traditional definition of the agent to be challenged (Byrne & Power, 2014).

Studying supply chain management phenomena can be enriched by providing theories from other related fields (Gligor, Bozkurt, Russo, & Omar, 2019). Investigating sustainable strategy implementation from an internal agency relationship angle seems to be a good starting point. Amazon was exposed to massive negative headlines due to the unethical and illegal labor standards of its supplier, Foxconn. Adidas and Nike were exposed due to a Chinese textile supplier accused of dumping toxins into a river. In many organizations, there are demands beyond their direct control (Juttner, Windler, Podleisek, Gander, & Meldau, 2020). The purchasing and supplier teams in firms should consider establishing a socially sustainable supply chain (Cole & Aitken, 2019). On the other hand, monitoring the supplier's sustainability practices also has a positive effect on the performance of the focal company (Shafiq *et al.*, 2017).

Due to the complexity of some supply chains, downstream companies can only monitor the relationship with their direct suppliers, but not the suppliers' suppliers (Wiese & Toporowski, 2013). From the retailers' perspective, they have a right to be suspicious when engaging in category management relationships with focal suppliers. Monitoring and the ability to punish opportunistic behavior do not necessarily act as effective safeguards. The opportunistic behavior of a focal supplier provokes responses from other suppliers, in addition to having a direct negative impact on the retailer's performance. These dynamics also occur in other industries, such as electronics and automotive (Morgan, Kaleka, & Gooner, 2007). The threat of opportunism can cause companies to withhold certain inside information when sharing chain risk information with partners (Ciliberti, De Haan, De Groot, & Pontrandolfo, 2011).

In the same scenario, the content of the contract mechanism and its implementation (such as benefits, problems and success factors) were described and discussed using an alignment of incentives and agency theory framework. Assumptions include information asymmetry, different goals and opportunism that should not be neglected. In order to solve agency and risk-sharing problems in principal-agent relationships, agency theory prescribes two formal (and ideal) types of management mechanisms to govern these relationships (Rungtusanatham, Rabinovich, Ashenbaum, & Wallin, 2007). One is the results-based

management mechanism. On this, tops reward agents based on measured performance results (Ekanayake, 2004), regardless of how agents reach them (Choi & Liker, 1995). The other, management mechanism is behavior-based. Principals use behavior controls to monitor the behavior and activities of agents that are unknown to principals (Zu & Kaynak, 2012).

Two service providers (acting as agents for the customer from a contractual point of view) are also the main ones for the customer and the customer’s business partners when it comes to service delivery, as the customer requires certain inputs to ensure performance achievement (Selviaridis & Norrman, 2014). The role of what we call a “double agency” encompasses the first-tier supplier’s responsibility to act as an agent for the lead company by implementing sustainability in their own operations (e.g. the lead agency function) and acting as an agent to disseminate sustainability standards for its suppliers’ operations (e.g. secondary agency function). That is, incentives are effective at both agency levels, but the importance of information transparency is greater at the secondary agency level (Wilhelm, Blome, Bhakoo, & Paulraj, 2016).

3. Method

The literature review received different terms in the literature. This is an integrative review, belonging to systematic literature review studies (Whittemore & Knafl, 2005). The integrative review process detailed by Botelho *et al.* (2011) was used, which mention that the method allows making summaries of the state of the art, in addition to understanding the increasing amount and complexity of information on a given subject. This study analyzes the international literature on the use of agency theory in supply chain management articles. The two search terms were: “supply chain” and “agency theory”. The terms were included in the study derived from reading numerous articles, but only those that explicitly mentioned the two words were used.

The research originated from articles from the Scopus and Web of Science databases and examined all the years available in the databases. In summary, Table 1 presents the general characteristics of the research, this allows other researchers to replicate the study. When entering the query for the search terms, a total of 205 articles were found. With Microsoft Excel software, records were organized and selected according to the following filters: the two search terms in the abstract, in title or the keywords; journal articles and review articles and only journals on (1) management, business, and accounting, (2) economics and finance, (3) operations and (4) decision science, reaching 124 articles. In a final analysis, with the reading of the title, abstract and keywords to validate the relevance to the study subject, supply chain management and removal of duplicate articles between the bases, 56 relevant articles were selected and will be used for analysis. The list of articles and their authors is available in Appendix. A cocitation analysis was also performed, created using the VOSviewer version

Search terms	“supply chain” AND “agency theory”
Development date	June 2021
Sources	Scopus e Web of Science
Filters	Scopus: 1960 to 2021 (June) Web of Science: 1945 to 2021 (June) Only words contained in the title, abstract or keywords Articles or review articles only Only in journals of 1) management, business and accounting, 2) economics and finance, 3) operations and 4) decision science

Table 1.
Features of integrative review

1.6.16 software. Data were originated from the two research bases (Scopus and WOS), without any manipulation. Therefore, with the articles found in the databases, an analysis of the co-citation network of authors was performed, using as a criterion author with at least 25 citations. The relationship diagram of terms presents in the title and abstract of selected articles was also developed. For this analysis, terms with the occurrence of 10 times or more were reported.

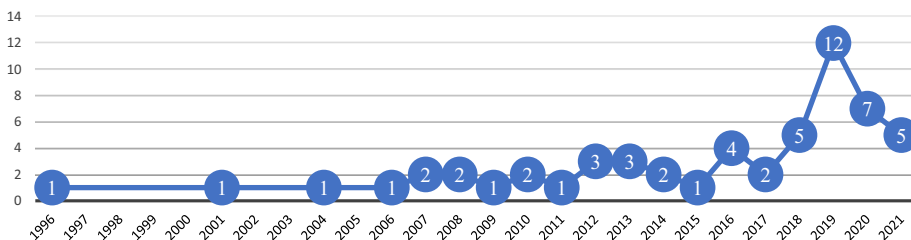
The next chapter deals with the analysis and presentation of the findings from the methods used. The following analyzes are related: (1) evolution of research over the years, (2) journals that published research on the topic, (3) authors that published the most, (4) co-citation network of the respective authors, (5) analysis of the affiliation of authors, (6) analysis of the keywords adopted by the authors in their articles, (7) the theories used by the authors, (8) the chosen themes, (9) relationship diagram of the terms of the title and abstract of the articles, (10) analysis of the method used by the authors and statistical analyses, for quantitative articles, (11) the geographic location of the empirical field of the articles and, finally, (12) description of the five most cited articles, regarding the research question, findings and research gaps.

4. Analysis and findings

This research started with the description of the characteristics of the dataset of 57 articles. An upward trend of publications in supply chain management from the agency theory perspective only happened from the year 2019, losing strength in 2020, which may indicate that this is an atypical year. However, more than 50% of the articles were published in the last five years between 2016 and 2021 (June). **Figure 1** shows the historical evolution of the records of published articles. It is possible to notice that, despite being timid, there is a propensity for the evolution of research publication, when observing the period from 1996 (first publication) to 2019. However, in the last two years, there has been a decline in research on the theme.

Table 2 shows the articles categorized by the respective publishing journals, with two or more articles published. There are a total of 12 journals classified according to the criteria described. The International Journal of Supply Chain Management has the largest number of articles, with five publications, the same number as the Supply Chain Management journal. The highlight to be given in this section is because, together, the 11 journals have only 25% of the total articles selected for research analysis. That is, there is no unanimity of scientific journal for submission and a consequent approval of the article that is chosen by the authors of articles on supply chain management using the agency theory.

In the analysis of authors who publish on the topic, among those who have two or more articles published, the author who has published the most on supply chain management, using the agency theory, is Jason W. Miller, with four publications (**Table 3**). Three are as a first author and one as a third author. Miller is an Associate Professor in the Department of Supply Chain Management at the Broad College of Business at Michigan State University.



Source(s): Research data

Figure 1.
Articles timeline

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# Articles	Journal
5	International Journal of Supply Chain Management Supply Chain Management
4	International Journal of Operations & Production Management International Journal of Production Economics Journal of Business Logistics
3	Journal of Operations Management International Journal of Physical Distribution & Logistics Management Production Planning and Control
2	Journal of Enterprise Information Management Journal of Purchasing and Supply Management Supply Chain Management: An International Journal
Source(s): Research data	

180

Table 2.
Journals with more
published articles

# Articles	Author
4	Miller, J. W.
3	Norrman, A.
2	Anwar, A. Ellram, L. M. Razimi, M. S. A.
Source(s): Research data	

Table 3.
Authors with the
highest number of
publications

With four publications, Miller has 20 citations in his most cited article (Miller, 2017). The second author with more publications is Andreas Norrman, from Lund University, with three articles, being two articles as first author and the third as second author. Following, in the same quantity, of two articles published, are: Asep Anwar, from Widyatama University, both publications as third author; Mohd S. B. A. Razimi, Northern University of Malaysia, both publications as fourth author and Lisa M. Ellram of Miami University, one publication as first author and the other as second author. The point that deserves to be highlighted is that, even if the publications among authors with more than two articles published (nine articles) are added together, this corresponds to only approximately 20% of the total number of publications on the subject. Evidence points to a dispersion of research among authors and, when considering the years with publications (Table 3), a moment of seeking consolidation of themes.

Figure 2 shows the cocitation network of the authors of the articles in the analysis. Three clusters were obtained, for the parameter of at least 25 citations of each author. A total of nine authors are listed. Lisa M. Ellram (from Miami University) has 62 citations and leads. While, with 61 citations, is Kathleen M. Eisenhardt (of Stanford University). With the same number of citations, in third place, are Thomas Y. Choi (from Arizona State University) and George A. Zsidisin (from the University of Missouri), with 33 citations.

Cluster one is indicated by red. Kathleen M. Eisenhardt is at the center of this cluster, which is cited by eight other researchers. Despite Eisenhardt's unanimity, the other members of the cluster (Jan B. Heide (26), from the University of Wisconsin-Madison, Thomas M. Corsi (26), from the University of Maryland College Park and John T. Mentzer (25) from the University of Tennessee) are predominantly related to research involving transport and logistics, inter-firm relationships and supply chain risk.

Cluster two is represented by green. This is composed by researcher Lisa M. Ellram, who has the highest number of citations. The congruent factor in this group, which also comprises

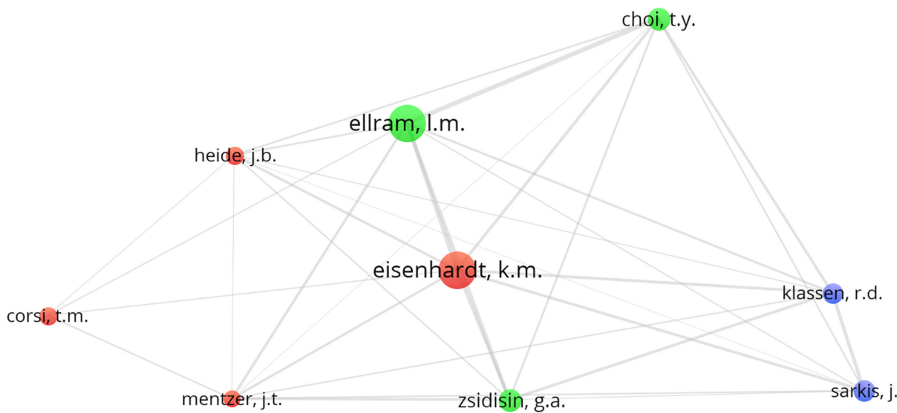


Figure 2. Author cocitation network (minimum 25 citations)

Source(s): Prepared by the author, using VOSviewer 1.6.16

Thomas Y. Choi and George A. Zsidisin, is supply chain management strategies and the study of methods used by researchers in the field. There is also a predominance of the case study method in the publications of the two researchers.

Cluster three, indicated by blue, is composed of two researchers. Robert D. Klassen (30) of Western University and Joseph Sarkis (31) of Worcester Polytechnic Institute. The congruence between the authors lies in the theme of sustainability and the study of green supply chain management.

When analyzing the geographic sample of affiliation of the authors of the articles (Figure 3), it is possible to observe a strong predominance of affiliated researchers in institutions in the United States of America (USA), with 42 researchers. Second, with a 45% smaller presence, researchers from the United Kingdom (23) and third researchers from Malaysia (16).

Table 4 shows the most cited keywords, with two or more appearances, in the original form presented in the articles, that is, those chosen by the authors. A total of 158 keywords were collected. The most found keyword is “agency theory”, in more than half of the articles

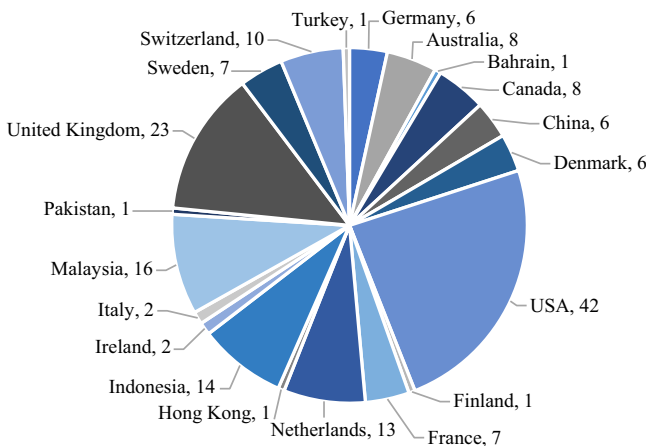


Figure 3. Geographical description of the authors' affiliation

Source(s): Research data

Qty	Keyword
25	Agency theory
22	Supply chain management
5	Indonesia; Sustainability
4	Case studies; Sustainable supply chain management
3	Collaboration; Purchases; Relationship with suppliers; Outsourcing
2	Agency theory perspective; Agent; Buyer-supplier relationship; Communications; Compliance; Corporate social responsibility; Europe; Goal congruence; Incentive alignment; Integration; Literature review; Logistic service industry; Motor carrier; Multi-tier supply chains; Network theory; Purchasing; Quality management; Risk assessment; Risk management; Safety; Service triads; SME; Supplier monitoring

Table 4.
Most used keywords

Source(s): Research data

(51.16%). The second with the highest number of appearances is “supply chain management”, which appeared 20 times (46.51%). Although there is a filter for keywords that occurred at least twice, from the third most frequent keyword there was a drastic drop, with the Indonesia keyword being the one that appeared in third place, in only five articles (11.63%). With that said, it is possible to infer that there is a great dispersion of alternative themes in the construction of research on agency theory in supply chain management.

The results also contribute by revealing a theoretical and multidisciplinary diversity of studies, with the number of appearances of theories underlying the agency theory, as shown in Table 5. Considering theories with two or more appearances, with seven appearances, the transaction cost theory is the theory that most closely follows agency theory, with more than 16% of all studies. The second, the resource-based view, with four appearances. The third is network theory. Finally, with two appearances, another six theories were registered. The salient point is that, together, these underlying theories occurred in approximately 37% of the selected articles. In other words, there is no predominance of theories underlying agency theory in supply chain management research.

When considering the low occurrence of a secondary theoretical construct, it was also decided to classify the articles by thematic (Table 6), presenting those with two or more

Qty	Theory
7	Transaction cost theory
4	Resource-based view
3	Network theory
2	Collaborative approach; Institutional theory; Principal agency theory (PAT); Resource dependency theory; SCM; Sociological agency theory

Table 5.
Most used subjacent theories

Source(s): Research data

Qty	Theme
8	Performance
5	Risk in supply chain; Sustainability
4	Dyadic relationships; Inter-firm relationships; Supplier management
3	Supply chain quality management; Supply chain relationship
2	Service supply chains; Socially responsible

Table 6.
The most used themes

Source(s): Research data

appearances. This makes it even clearer, due to the dispersion presented above, about which of the themes are the most used by authors when they decide to use agency theory in supply chain management. The most common theme is performance, but in only eight articles (14.29%). The second theme “risk in supply chain” and “sustainability” has the same number of articles (five, 8.93%) among the 56 in the sample. In third place, with four appearances (7.14%) each, are the themes: dyadic relationships, inter-firm relationships and supplier management. Analytically, it is possible to say that, predominantly, research in supply chain management that uses the agency theory, as a base theory, is related to performance (which can be, financial, sustainable, safety, operational, logistics or from the chain).

To support the findings, an analysis using the term identification function, both in the title and in the abstract of the articles, was performed using the VOSviewer software. The databases originated from Scopus and WOS were exported and did not have any intervention. After being inserted in the software, as a result, the term relationship diagram was built (Figure 4). The terms with the occurrence of 10 times or more are reported, with the most present terms being study (90), relationship (71) e-supply chain (66). Thus, in the diagram, three distinct clusters could be obtained. The first cluster (red) deals with themes of supply chain management, which involves the managers, the data collected through them and some theory for the explanation. In the second cluster (green), there is the thematic relationship in the supply chain, which involves buyer, supplier and the result. Finally, the third cluster (blue), dealing with the supply chain with the firm’s risk and sustainability aspects.

Regarding the methods used by the authors of the articles in the sample (Table 7), they were separated into quantitative (using secondary data) and qualitative (and their approaches). The most used is quantitative, appearing in 25 articles, that is, less than half of the 56 total (44.64%). Furthermore, one article in the sample used a multimethod.

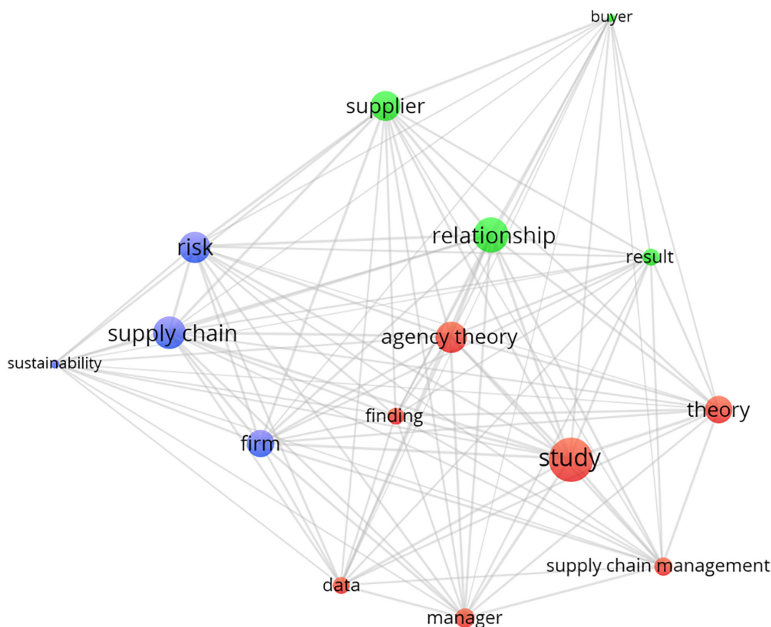


Figure 4.
Terms relationship diagram (title and summary)

Source(s): Prepared by the author, using VOSviewer 1.6.16

When looking at the qualitative method, only 4 (7.14% of the total sample). However, when qualitative approaches were observed, the case study method was used in 18 articles (60%). Still with two percentage digits (20%), within the qualitative approaches, the theoretical essay appears with six publications. The findings of the methods used corroborate the themes of the articles, as, usually, studies related to performance are built using the quantitative method. Thus, the thematic performance, as it was the most found, may have been the main responsible for boosting the quantitative method to be the most registered in the analysis of the articles in the sample.

Considering the predominance of quantitative research, the data analysis techniques used by the authors were detailed. The most used technique is structural equation modeling, which is used in 13 of the 25 quantitative articles. Second, the regression, in six articles. And in third place, the regression with panel data with two articles. Likewise, using the rationale of the most frequent theme (performance) evidenced in the sample articles, and by the method that occurs most frequently (quantitative), it is found that the authors analyze statistically, predominantly, through structural equation modeling and panel data regression and regression to explain performance in supply chain management articles that use agency theory. The results are consistent with performance studies, as they seek to causally explain the variables that explain the variation in firm performance. Therefore, the techniques found are those commonly used for this purpose (see Table 8).

One of the highlights of this study is the analysis performed to identify the geographic identity of each of the articles in the sample, shown in Figure 5. There is a large predominance of surveys with data from the United States (13), followed by data from Indonesia (6) and after the European continent (5). The point in emphasis is that there were no studies that used Brazilian data.

Finally, Table 9 identifies the five most cited articles, which can also be called the five most influential articles. The research question, findings and research gaps are presented, respectively. By observing the research questions, the most cited article and the third one can

Table 7.
The methods used

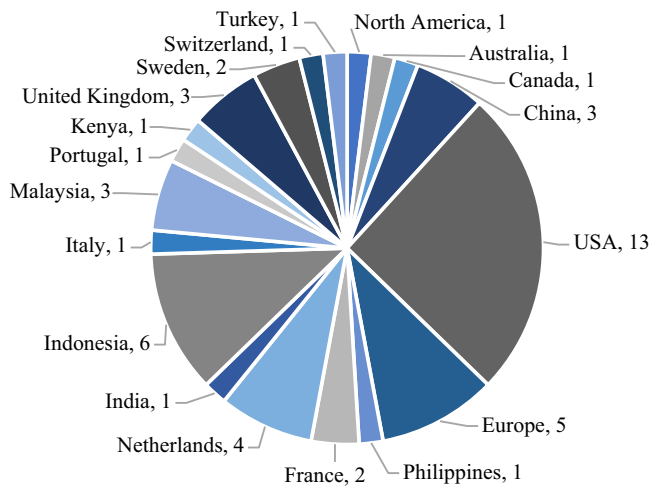
Type	Qty	%	Type	Qty	%
<i>Quantitative</i>	25	96.15	<i>Qualitative</i>	4	13.33
Multimethod	1	3.85	- Case study	18	60
			- Theoretical essay	6	20
			- Literature review	2	6.67
<i>Total</i>	26	100	<i>Total</i>	30	100

Source(s): Research data

Table 8.
Statistical analysis techniques used

Type	Qty	%
Structural equation modeling	13	52
Regression	6	24
Panel data	2	8
Diff-in-diff	1	4
Path analysis	1	4
ANOVA/MANOVA	1	4
<i>T</i> -test	1	4
<i>Total</i>	25	100

Source(s): Research data



Source(s): Research data

Figure 5.
Geographical description of the sample of articles

be grouped within the supply chain risk theme. The second most cited, in sustainability, and the fourth and fifth most cited, in the theme of supply chain relationships. Looking at the research gaps, it is noteworthy that the most cited article uses a cross-sectional analysis, without being able to analyze longitudinally, which, in fact, could verify the effect of supply risk on performance. The same gap is observed in the third most cited, using longitudinal research to test causal relationships. Something similar is also observed in the second most cited, where it indicates the need for research in more than one layer of the supply chain. From the latter, the fourth most cited article exposes that further exploration is needed of the impact of relationships with a supplier and how much this relationship has an influence on relationships with other suppliers. The fifth most cited article is more provocative, intended to instigate research on the premises of supply chain relationships.

5. Discussion of the results

Based on the results obtained, it is important to compile what is being repeated and what is still incipient. Therefore, clearly, from the sample articles, while some studies tend to focus on discussing the antecedents and consequences of agency problems, others tend to identify practices for managing agency problems. In this perspective, this article contributes by summarizing and unifying the contributions and limitations (potential future research) to clarify and be a platform for further research. As seen in the evolution of research on the subject, the field has recently declined and, therefore, it is essential that additional tools to those of researchers motivated by their personal convictions can be presented and used, to facilitate and promulgate studies on the agency theory in the supply chain, especially regarding management.

Two main challenges decision-makers face in managing intermediaries: (1) objective incongruence, where the agent and principal may have widely divergent priorities and (2) incomplete or asymmetric information, where the principal has limited intelligence about the activities of the agent (Figure 6) (Eisenhardt, 1989).

The first question for both challenges: are agents capable of doing what they say they are going to do? Here the problem of alignment arises (Wallace, Johnson, & Umesh, 2009) or the information asymmetry, as a source of the perceptual distance between the collaborating parties (van der Krift, van Weele, & Gevers, 2021). In this case, to increase the efficiency of

Table 9.
The five most cited
articles

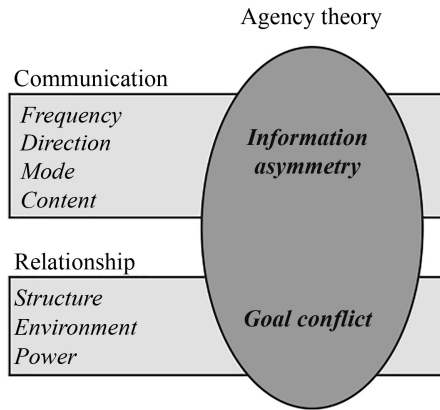
#	Article	Citations	Research question	Findings	Research gaps
1	Zsidoisin, ElIram, Carter, & Cavinato (2004)	337	Explore, analyze, and derive common themes in supply risk assessment techniques	Purchasing organizations can assess supply risk with techniques that focus on resolving supplier quality issues, improving supplier processes, and reducing the likelihood of supply disruptions. These techniques make it easier for purchasing organizations to obtain information to verify the supplier's behavior, promoting the congruence of goals between the purchasing and sales companies and reducing the uncertainty of the result associated with internal supply. Several contingency factors influence the coupling of the secondary agency role of the first-level provider. These factors include the availability of resources in the top-tier supplier company, the lead company's focus on the triple bottom line (environmental or social) dimension, the lead company's energy use, and the lead company's internal alignment of sustainability and the role of purchase.	Longitudinal research can be conducted to determine whether sourcing risk assessment and proactive sourcing management have a significant effect on organizational performance. This type of research would analyze when and what steps organizations take when a supply risk is discovered (a priori) and collect this data over time to gain insights into how the supply risk is best addressed
2	Wilhelm <i>et al.</i> (2016)	200	Distinguish the conditions under which the first-tier supplier acts as an agent to fulfill the sustainability requirements of the leading company and implement them in its suppliers' operations	The risk information sharing and risk sharing mechanism improve financial performance, and the effectiveness of the former is strengthened by the duration of the relationship and the trust of the supplier, while the latter is strengthened by a shared understanding of supply chain risk management (SCRM)	Large-scale research investigating the behavioral dimension at the multilayer level would be helpful. Another opportunity is the investigation of dual agencies in exercises that represent the structure of multi-layered supply chains that manipulate motivation
3	Li, Fan, Lee, & Cheng (2015)	116	Identify supplier opportunism as a key construct in understanding retailer-supplier category management relationships and develop a model of important antecedents and consequences of focal supplier opportunism at the category level		Examine the effectiveness of risk identification, forecasting, and warning. There may be other collaborative relationship characteristics (e.g. relationship investment and interdependence) that can moderate the effectiveness of joint SCRM practices. Future research can still collect longitudinal data to test causal relationships more rigorously or employ other relevant theories (such as transaction cost theory and resource-based view) to identify different joint practices and their corresponding moderating factors

(continued)

# Article	Citations	Research question	Findings	Research gaps
4 <i>Morgan et al. (2007)</i>	110	Identify supplier opportunism as a key construct in understanding retailer-supplier category management relationships and develop a model of important antecedents and consequences of focal supplier opportunism at the category level	In the supply chain management scenario where a buyer's relationship with a focal supplier allows the supplier to directly influence the buyer's relationships with competing suppliers who continue to supply the buyer with products. In such situations, the opportunistic behavior of a focal supplier provokes responses from other suppliers, in addition to having a direct negative impact on the retailer's performance	Identify: The important components of supplier monitoring systems that cover multiple supply chain participants simultaneously; the degree of customization to individual suppliers required in monitoring systems to make them an effective safeguard against opportunism; monitoring the costs of multiple suppliers in a supply chain simultaneously. Furthermore, to explore the impact of retailers' relationships with one supplier on their relationships with other suppliers
5 <i>Fayezi et al. (2012)</i>	91	How can agency theory be used to inform our understanding of the dynamics around supply chain behaviors and relationships?	Despite the prevailing descriptive and predictive qualities of agency theory, its application to the discipline of SCM is lacking. Agency theory provides valuable insights for relationship engineering in supply chains where social, political, legal, and behavioral dynamics dominate	Study issues such as: information sharing, risk/reward sharing, and establishing/maintaining inter-organizational relationships (as opposed to the dyadic investigations prevalent in the literature). Also, investigate the assumptions underlying agency relationships in supply chains

Table 9.

Figure 6.
Challenges of agency
theory in the
supply chain



Source(s): Forslund, Björklund and Ülgen
(2021, p. 5)

behavioral practices, that is, risk and reward sharing, companies must have a low level of information asymmetry in the supply chain (Tse, Zhang, & Jia, 2018). As companies become more transparent and accountable, it reduces information asymmetries (Gong, Gao, Koh, Sutcliffe, & Cullen, 2019). However, if each function holds its own information and goals, it is easy to hide information from other functions, especially if they are operating in a high uncertainty environment (Ellram, Tate, & Choi, 2020). In other words, an aligned supply chain needs the exchange of relevant information and, therefore, long-term relationships and trust with partners (Wandfluh, Hofmann, & Schoensleben, 2016).

On the other hand, in an ex-post setting, the second challenge: did agents do what they said they would? Here arises the moral problem (Wallace *et al.*, 2009). Agency uncertainties (e.g. supply risks) can be mitigated by adopting the behavior-based method, promoting supplier information, integrity (trust) and quality assurance, in order to reduce the likelihood of partner opportunism (Azmi, Musa, Chew, & Jagiripu, 2021).

From the following paragraph, the themes found are listed and the most important aspects for the study topic are exposed, based on the analyzed articles.

Dyads: Agency theory can shed light on dyadic inter-firm relationships (Cragg & McNamara, 2018). While agency theory seeks to address a multitude of different professional, social, political and economic circumstances, one thing unanimous about all principal-agent relationships, without hesitation, is that there will be problems (Shapiro, 2005).

Giving a volume commitment can be a way to signal confidence in the forecast itself, as well as in a long-term relationship; which can increase trust and improve the relationship, which may result in the supplier providing guaranteed supply in allocation situations, as well as lower unit prices (Norrman, 2008). Many supply chains are not linear when it comes to contracts: there can be multiple formalized relationships between and over layers, making them very complex. A business cycle perspective could be incorporated into the contract (Norrman, 2008). While previous research on tracking capabilities has focused on bilateral relationships between a buyer and a single supplier, many retailers sell products that come from multiple suppliers. Therefore, there is still a lot of discoveries to be made about how monitoring capabilities work in a supplier network context (Morgan *et al.*, 2007). However, monitoring is associated with negative effects on supplier behavior and there is an implication of costs (Uenk & Telgen, 2019), which is in agreement with the result found from the transaction costs theory as the main theory underlying the agency theory.

When the context is small- and medium-sized companies, the asymmetric nature of their relationships (importing firms) with international suppliers, generate agency problems – putting them at a disadvantage (Cragg & McNamara, 2018). A large proportion of data from small- and medium-sized companies resulted in limited information content, which only reflects performance in a particular small group. In contrast to small- and medium-sized companies, companies that have more resources can more easily attract their supplier companies to be involved in the initial manufacturing process and lead the task scheduling (Tse *et al.*, 2018). As a resolution, the use of partnerships and consortia together with better design contracting and greater information sharing can mitigate the asymmetry of power in the relationship (Cragg & McNamara, 2018).

Triads: Agency problems can occur in service triads due to incongruity of goals between principals and agents arising from assumptions about human nature (self-interest, limited rationality, risk aversion) (Unk & Telgen, 2019). Studies typically conclude that buyers need to monitor performance and implement the type of contracts (Tate, Ellram, Bals, Hartmann, & van der Valk, 2010; Van der Valk & Van Iwaarden, 2011). The once in a while service triads employ a maintenance partner (third party), who is in frequent contact with the end customer and who therefore has a significant role in influencing the service output of the main provider (Heaslip & Kovács, 2019).

In several contexts, studies confirm the need to monitor supplier performance in service triads (Tate *et al.*, 2010; Zhang, Lawrence, & Anderson, 2015). Monitoring can be directed to any supplier outcome or supplier behavior (Unk & Telgen, 2019).

Sustainability: The application of agency theory resulted in a deeper analysis of sustainability approaches beyond dyads (Abländer *et al.*, 2016; Kudla & Klaas-Wissing, 2012). When the motivation of sustainability initiatives is to meet personal goals, a more transparent environment should reduce sustainability and sustainable supply chain management (SSCM), as the company will not be willing to disclose these activities. However, if the motivation is to gain a competitive advantage, a more transparent way will encourage sustainability (Gong *et al.*, 2019).

Agency theory helps to identify dual roles, that is, an agent who reports to the principal and collaborates with other agents to meet the requirements (Forsslund, Björklund, & Ülgen, 2021) and to understand and explore how companies within an eco-industrial park establish relationships (agent) with a third party, contracting services such as logistics or sewage collection (Liu, Feng, Zhu, & Sarkis, 2018). Also within the theme, the so-called double agency makes the agent responsible for achieving goals in two ways: (1) to implement sustainability internally (main) and ii) to expand sustainability standards to its suppliers (secondary agency) (Wilhelm *et al.*, 2016). In the context, the agency's vision is used to create barriers so that sustainable practices financed by managerial income are not diverted by executives, who may choose to divert such revenues to social and environmental initiatives of their personal interest (Gong *et al.*, 2019).

Distribution channels: A strategic imperative across the industry, multichannel distribution is related to agency theory where channel alignment problems occur in the form of incomplete information and goal incongruity (Wallace *et al.*, 2009).

Managers can increase their company's market coverage, either through delivery performance or profitability through multi-channel strategies, but these benefits run the risk of serious agency problems – which can at least be improved with channel tracking (Wallace *et al.*, 2009).

Risks: Common principal-agent relationship problems, such as opportunism, differences in objectives and risks, and information asymmetry, can compromise the effectiveness of risk mitigation practices in the supply chain. Differences in risk goals and attitudes make it difficult for supply chain partners to reach consensus on methods for sharing roles to mitigate chain risks and, most importantly, address the consequences of these. (Li *et al.*, 2015).

The study by [Miller et al. \(2013\)](#) demonstrated as complementary the agency theory, operant conditioning theory, and psychological reactance theory, in order to provide an integrated perspective on the use of formal controls to influence the behavior of drivers and thus improve operational performance. According [Wilhelm et al. \(2016\)](#) integrating a behavioral perspective would enrich understanding of the root causes of vendors violating their dual agency role. Moreover, the crucial role of supplier management in regional subsidiaries points to the need for a cultural and behavioral change in the purchasing function ([Juttner et al., 2020](#)).

Agency theory instruments can help avoid risks or failure to mitigate them in supply chains ([Wiese & Toporowski, 2013](#)) as well as improvements in the operational processes of the supply chain can reduce the asymmetry of information and reduce the propensity for moral hazard ([Shafiq et al., 2017](#)). It is a fact that the successful implementation of supply chain processes and activities can be provided by meeting the agent's specific conditions through a dynamic contractual relationship ([Fayezi et al., 2012](#)). An in-depth analysis of strategic collaboration alliances was also noted ([Lechler, Canzaniello, & Hartmann, 2019](#)), while risk reduction techniques are considered behavior-based management efforts to protect the principal from destructive events ([Shafiq et al., 2017](#)).

Quality: The greater the increase in supply risk, the greater the agency effort in managing traceability ([Azmi et al., 2021](#)). Supplier involvement allows buyers to clarify the capability, role and performance of their suppliers; thus, purchasing companies can more easily design and implement effective risk sharing with their suppliers. Therefore, it likewise occurs when the buyer shares the benefits and rewards of product quality improvement with the supplier, an alignment of goals occurs so that the supplier shares the buyer's goal of sustaining product quality. ([Tse et al., 2018](#)).

Reward sharing can be an effective practice to solve agency problems in buyer–supplier relationships ([Zu & Kaynak, 2012](#)). Allowing customers (end customers) to choose their supplier (of service) and facilitating the exchange of providers can offer a completely different, but strong, mechanism to avoid supplier opportunism and improve or maintain service quality levels ([Unk & Telgen, 2019](#)).

Third sector: The power that NGOs and certification bodies wield is not static; rather, they change with the role of buyer regulations and mandates ([Wilhelm et al., 2016](#)). The problem of hidden intentions requires a more detailed analysis ([Wiese & Toporowski, 2013](#)) as well as an investigation of entry barriers for strategic alliances ([Lechler et al., 2019](#)). However, the idea that estimated trust can be developed and controlled through goal alignment suggests the potential for a deeper understanding of the mechanisms that underpin the principal-agent relationship ([Byrne & Power, 2014](#)).

6. Conclusion and future research

Agency problems were considered less serious when dealing with upstream partners ([Cragg & McNamara, 2018](#)). On the other hand, effective management of agency relationships in the downstream channel is critical to ensure strategic and performance results ([Wallace et al., 2009](#)). Future research may focus on explaining how weak ties can offer new ways to gain access to resources beyond triad boundaries and how triad actors institutionalize structural, relational and cognitive embeddedness ([Vlachos & Dyra, 2020](#)). Therefore, information and power are at the heart of agency theory. The inclusion of institutional differences in agency theory would create a more comprehensive theory, better able to explain some of the nuances that exist in supply chain relationships and principal-agent relationships ([Byrne & Power, 2014](#)).

The tension between voluntary compliance (e.g. specialized training regimes or additional corporate support for small franchised establishments) and mandatory compliance is an

interesting trade-off and provides an interesting topic for future work (Massimino & Lawrence, 2019), such as the investigation of the impact of the electronic point at the industry level in relation to carrier producer prices, driver turnover rates, changes in employment, average spot market rates, among others (Miller, Bolumole, & Schwieterman, 2020). No studies have examined how control regimes influence driver-level outcomes, considering the different levels of professionalism and bonding strength between vehicle operators in different ways (Miller *et al.*, 2013).

As noted earlier, in the geographic description, there is no empirical data about Brazil in the articles analyzed. This makes clear a future opportunity for investigations that contemplate data from Brazilian companies in supply chain management studies that use agency theory. Future research may also include geopolitical and product factors, along with supply factors, to present an assessment of environmental factors that favor supply risk (Shafiq *et al.*, 2017). New investigations could collect longitudinal data (Wilhelm *et al.*, 2016) for the purpose to test the causal relationships in the hypotheses (Li *et al.*, 2015), and increase confidence in the causal nature of relationships (Morgan *et al.*, 2007). Longitudinal research can also be conducted to analyze when and what steps organizations take when a supply risk is discovered (the above) and how the supply risk is best addressed (Zsidisin *et al.*, 2004). An in-depth investigation into the broader consequences of supply risk, such as its effect on sustainability and supply chain practices, is still needed (Shafiq *et al.*, 2017). Contexts of developed markets, highly resolved in terms of sustainability are already known, therefore, research on sustainability in another geographic context will generate different and interesting results (Forslund *et al.*, 2021). Still regarding methods, it is relevant to carry out investigations of the action research type, where the proposals are actually implemented and a real performance measurement is carried out, especially if there is a quantification of the real performance changes due to the implementation of communication technology and information (Cragg & McNamara, 2018).

In the macro environment, purchasing has a potential agency problem in the form of incongruity between the goal of new product development and its responsibility for continuous cost reduction (Ellram *et al.*, 2020). It is opportune to conduct studies with companies in border and emerging countries as buyers (Wandfluh *et al.*, 2016). Different countries also have alternate views on the practice of risk management, which affects the outcome (Tse *et al.*, 2018). Reducing to the dynamic business environment, the integration of business processes (as in the supply chain and in the form of extended business collaboration) can be difficult to maintain, and stakeholder analysis is important in defining the company's strategic position in a network of business (Trienekens & Beulens, 2001). The use of coercive power creates a relationship based on compliance rather than collaboration, which indicates the need for research to specifically target instances of coercive power in strategic alliances, to identify their impact on inter-organizational relationships (Byrne & Power, 2014). Clearly, the extensions of stakeholder concerns to the context of the inter-organizational supply chain still need to be researched (Juttner *et al.*, 2020).

On the other hand, the effectiveness of new organizational forms, such as the establishment of sustainability development teams with regional business unit managers and selected suppliers, can be investigated (Juttner *et al.*, 2020). Policy makers can support the development of sustainability incentives in dyadic relationships, assisting cooperation, shippers and logistics service providers and creating awareness of end consumer sustainability (Kudla & Klaas-Wissing, 2012). Therefore, in transport supply chains, it is important to point out that there are not only drivers but also small self-employed workers, who can be added as agents and make the relationships between the chains even more complex. Changing roles – an agent becoming a principal – would be highly relevant for further study, especially in a longitudinal manner (Forslund *et al.*, 2021).

With regard to the third sector, it is still necessary to understand whether the involvement of NGOs has an impact on the development of trust and commitment in relationships

upstream of the supply chain (Wilhelm *et al.*, 2016). Risk and gain sharing mechanisms imply a new culture for buyers, previously used only to push risk to suppliers (Norrman, 2008). Beyond monitoring practices in service triads, addressing the effectiveness and outcome of the mechanism, further investigations are expected to identify which procurement approach in service triads leads to the best-acquired quality, relevant to service buyers, to increase understanding of the service triads (Uenk & Telgen, 2019).

Finally, a challenge both for the alignment of supply chain incentives and for the congruence of internal goals is external and internal integration and the impact of incentives (Norrman & Naslund, 2019). The integration of agency theory with other organizational theories, such as TCE and relational exchange, offers the promise of potentially compensating for its limitations (Fayezi *et al.*, 2012). To explain why some buyer–supplier relationships are effective in promoting better performance at various levels, the stewardship theory may be more appropriate (Abländer *et al.*, 2016). Given the complexity of supply chain relationships, investigation of industry-specific chains can increase the conceptual discussion (Fayezi *et al.*, 2012). Equally, to what extent the services provided act in an opportunistic way due to the management instruments (monitoring) applied (Uenk & Telgen, 2019).

This research has, therefore, multiple implications. First, a state-of-the-art synthesis of the agency theory literature in supply chain management is offered. Analyzes were also performed to understand the results found through descriptive analysis, cocitation network, word cloud and discussion of the main themes. Finally, an extensive agenda for future research, based on gaps or incipient problems, was presented. Second, the research supports that agency theory has more than necessary application when it comes to supply chain management. Either through the mediation of the chain's relationships or as a protector of the principal's interests before the agent, whether in dyads or triads, in manufacturing, or services. Although the absence in some areas and incipience in others is evident, the use of agency theory to study the management of the supply chain is the main argument of the research, and it serves as an incentive and starting point for future studies.

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