



UNIVERSITAT DE BARCELONA
BUSINESS SCHOOL

MSc
Business Research

MASTER THESIS

Third-party logistics providers and strategic outsourcing in the context of supply chain disruptions: Peruvian agricultural case study.

MSc IN BUSINESS RESEARCH

University of Barcelona

Author: Manuel Diter Sánchez Tapia

Director: Paloma Miravittles Matamoros

Barcelona, 14th June 2022

TABLE OF CONTENTS

ABSTRACT	3
1. INTRODUCTION	4
2. THEORETICAL FRAMEWORK.....	7
2.1 LOGISTICS OUTSOURCING	7
2.2 FACTORS THAT INFLUENCE LOGISTICS OUTSOURCING	9
2.3 LOGISTICS OUTSOURCING THEORETICAL APPROACHES.....	11
2.4 SUPPLY CHAIN DISRUPTIONS.....	13
3. PROPOSITION DEVELOPMENT	16
3.1 PROPOSITION 1	16
3.2 PROPOSITION 2	17
3.3 PROPOSITION 3	17
3.4 PROPOSITION 4	18
3.5 PROPOSITION 5	19
4. METHODOLOGY.....	19
5. RESULTS.....	24
5.1 RESEARCH QUESTION 1.....	24
5.2 RESEARCH QUESTION 2.....	25
5.3 RESEARCH QUESTION 3.....	28
5.4 SUMMARY OF RESULTS	32
6. CONCLUSIONS	32
REFERENCES	36

ABSTRACT

Logistics outsourcing is a widely adopted practice by companies to reduce costs, focus on core operations and achieve competitive advantage. Logistics providers offer valuable resources to a firm, sometimes conforming a strategic outsourcing relationship where both parties obtain considerable benefits that go beyond basic operations. This study focuses on supply chain disruptions, one of the most common factors that disrupts supply chains around the world, especially in the current context of increasing natural disasters due to climate change, political instability due to war or conflicts, and other diverse intentional and unintentional factors that disrupt a supply chain. With the aid of a qualitative case study performed on the agricultural industry of Perú, this research set the objective of getting a better understanding on the landscape of the relationship between a company and its third-party logistics provider, and how this relationship develops in a situation of supply chain disruptions. By presenting five propositions based on a detailed literature review, this study reaches the following results: (a) Supply chain disruptions are a factor considered by companies when deciding to outsource logistics, aligning with previous literature on supply chain risk management. (b) Supply chain disruptions affect positively and negatively on the relationship of a company and its logistics provider, in accordance with the resource-based theory and the transaction cost theory. And (c), supply chain disruptions don't enhance the relationship of a company with its logistics provider by developing strategic outsourcing practices due to contextual factors. This contradicts previous findings, although the contextual factors identified fall under the classification of geographical differences, which have proven to be an influential factor for supply chain management in comparative studies across different geographical regions.

Keywords: Logistics outsourcing, Supply chain management, Supply chain disruptions, Third-party logistics.

JEL classification: M11, M16, Q17.

1. INTRODUCTION

When the El Niño-Southern Oscillation weather phenomena episode of 2015-2016 arrived on the south pacific coast, the whole region suffered consequences in several aspects; involving infrastructure, agricultural lands, and fishery among others. In the country of Peru, according to The United Nations (UN), not only 1,9 million people were affected but parallelly diverse supply chains were disrupted, with an estimated economic cost of USD 1100 millions. For example, one of the most important products for the country, fish flour, of which Peru is the main world supplier, dropped in production drastically due to focused intense impacts on the industry in geographical regions reached by the phenomena (Martínez et al., 2017). This example illustrates clearly how vulnerable are today's highly efficient global supply chains. Additionally, geopolitical tensions between major economies most probably will reflect on trade confrontations that will also affect supply chains. The Ukraine-Russia war is cataloged as the greatest supply chain challenge today, impacting alongside inflation millions of consumers worldwide (Noble, 2022). This conjunction of elements reflects a turbulent and uncertain environment where every company involved in global supply chains is highly susceptible to disruption events (Knemeyer et al., 2008).

In operations management literature one of the major risks that affect supply chain and management arise from disruptions to usual activities (Kleindorfer & Saad, 2009). Hence, this study will be focused on this category of risk, which includes natural disasters, strikes, economic disruptions, and acts of purposeful agents. A supply disruption is an unplanned and unanticipated event that disrupts the normal flow of goods and materials within a supply chain (Svensson, 2000; Hendricks & Singhal, 2003). Therefore, companies that participate in a supply chain are exposed to operational and financial risks (Stauffe, 2003), as well as to severe negative consequences on the financial, market and operational performance (Narasimhan & Talluri, 2009; Wagner & Bode, 2008).

Organizations around the world face unprecedented challenges to maintain profitability in a context where the globalization of businesses and consequent competitive pressures have made logistics emerge as a vital element and critical concern with strategic importance within the organization (Christopher, 1993; Hoon Hum, 2000). The role of logistics has

become increasingly significant for the operation of firms due to longer and increasingly complex supply chains (Christopher et al., 2011), therefore logistics services have gained relevance as an element of value creation (Gargasas & Mūgienė, 2018). Logistics has become one of the key areas outsourced while the company focuses efforts on developing its core competences (Lambert et al., 1999).

Logistics outsourcing involves the action of passing on logistics-related activities in part or whole to an external party to execute, which is called a third-party logistics (3PLs) provider, who has become an integral part of organizational supply chain processes (Etokudoh et al., 2017). In recent years, logistics outsourcing plays a predominant role and is currently used by many firms across virtually all industries worldwide (Jiang & Zhao, 2010). A key element of strategic advantage that companies search for when outsourcing logistics is the emphasis on time-based competition (Bhatnagar et al., 1999). The market demands custom-made products that are quickly manufactured and delivered; in response to that, organizations seek to gain these competitive advantages through the strategic management of their logistics operations, realizing that they lack the required competences, therefore they partner up with 3PLs providers (Hoon Hum, 2000; Sohail et al., 2004). 3PLs providers deliver valuable services to companies that outsource logistics, but also, they could become strategic partners in emergency situations, understood as supply chain disruptions, when they are required to mitigate negative effects on the supply chain (König & Spinler, 2016). Consequently, 3PLs providers have a predominant role in the supply chain management of several companies across every industry globally, providing a potential strategic advantage in fulfilling customer demands (Christopher et al., 2011), but parallelly leading to additional risks as well (Peck, 2006). Nevertheless, the relationship of a company and how it develops into a strategic partner under the influence of supply chain disruptions is still limited in academic literature so far.

Hence, in this context the present study aims to get a better understanding on the landscape of the relationship between a company and its 3PLs provider, and how this relationship develops in a situation of supply chain disruptions. To address this aim, the focus is set on how supply chain disruptions influence the relationship of a company and its 3PLs provider in becoming a strategic outsourcing partner. The process to accomplish this objective was

to conduct a case study using the Peruvian's logistics outsourcing scenario as the research context. The focus of this paper is located in the intersection of logistics outsourcing and supply chain risk management, specifically in supply chain disruptions, and overall, in supply chain management literature.

The following research questions were considered to guide this study:

Research Question 1: *Are supply chain disruptions a factor considered by companies when deciding to outsource logistics?*

Research Question 2: *Supply chain disruptions have a positive or negative effect on the relationship of a company and its Third-party logistics provider?*

Research Question 3: *How does the relationship of a company and its third-party logistics provider develop into a relationship of strategic outsourcing under the context of supply chain disruptions?*

Understanding how firms can manage supply chain disruptions has become an important topic for both academics and practitioners (Craighead et al., 2007; Blackhurst et al., 2011). The complexity of the business environment will probably make managers continue looking for relationships with 3PLs providers as a way of achieving competitive advantage (Qureshi et al., 2007; Lambert et al., 1999). Investigating how the relationship between a company and its logistics provider under the context of supply chain disruptions will benefit both organizations to improve efficiency, profitability, and customer service, especially for international firms. In the current landscape of increasing complexity of market demands, comprehend logistics outsourcing is a widely accepted way to improve customer services, reduce costs, and increase competitive advantages (Zhu et al., 2017). Expanding literature on logistics outsourcing under supply chain disruptions would be useful for enterprises on the decision-making process of assessing logistics outsourcing risks (Jiang & Zhao, 2010).

The present study is organized in six sections as follows. Next to this introduction where the research questions are described, a detailed theoretical framework divided into logistics outsourcing, factors that influence logistics outsourcing, logistics outsourcing theoretical approaches, and supply chain disruptions is included. After that, a section of propositions development is presented to address the three research questions that guide the study.

Then the methodology is specified. In the subsequent section, the results of the study are presented parallelly with the discussion of the findings. Finally, conclusions are drawn based on the results, as well as the implications and limitations.

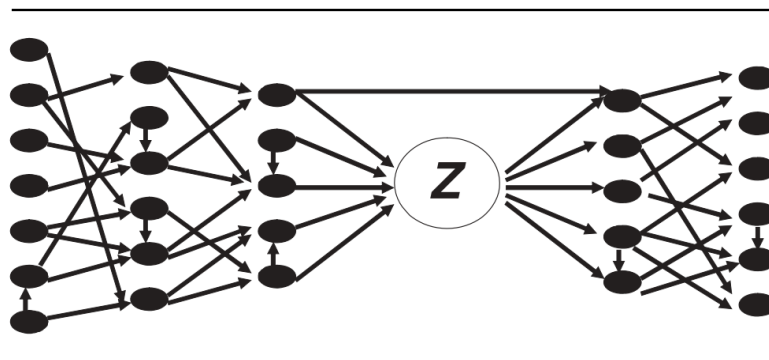
2. THEORETICAL FRAMEWORK

2.1 Logistics outsourcing

A supply chain is a network of companies or organizations that manufacture or deliver products or services from the source to the final customers. Supply chain management is the integration of material, information, and financial flows in such networks (Shao, 2013). A supply chain comprises different actors that share the connection to a physical flow of goods. Materials and components vary from a wide range of geographic locations, as well as the placement of product facilities; customers are also located around the world, conforming the elements of a supply chain structure (Stock et al., 2000). A supply chain or also called supply network, comprises different actors that connect with each other by the physical flow of materials. These actors are also referred to as nodes, and are involved in the conversion, logistics or the selling of materials. In the process of delivering the goods to the final consumer, the nodes behave as arcs and are illustrated as unidirectional or bidirectional, with arrows representing the flow of materials (Craighead et al., 2007). This relationship of nodes of a supply chain is illustrated in Fig. 1, where the various layers of suppliers of a fictitious manufacturer Z are shown.

Figure 1

Typical supply chain design for a manufacturer Z



Source: (Craighead et al., 2007)

In management literature, supply chain design started to gain considerable importance after the mid-1990s with the impulse of the complexity, cost, and uncertainty of supply chains due to an increase in product variety, as well as the growing number of companies integrating to international operations (Fawcett et al., 1993). Logistics outsourcing, also known as 3PLs outsourcing, is defined as the strategic use of external logistics service providers to accomplish logistics activities traditionally carried out in-house (McIvor, 2000). A 3PLs provider executes all or part of the organization's logistics operations (Bolumole, 2001). So, 3PLs refer to the activities carried out by a logistics service provider on behalf of a shipper, including at least management and execution of transportation and warehousing activities. Some other complementary activities can also be included as inventory management, tracking, tracing, and value-added activities such as secondary assembly and installation of products (van laarhoven et al., 2000). The need of companies to develop competitive advantage alongside focusing on core business, explains the evolution of logistics outsourcing (Razzaque & Sheng, 1998). During this development, practitioners and researchers have called logistics outsourcing and 3PLs providers with several terms, such as logistics alliances, contract logistics and contract distribution (Zailani et al., 2015).

Companies that are highly integrated into international supply chains with the objective of reducing costs and enhance competitiveness (Xiao, 2012), recognize that one of the most critical motivators to outsource logistics is the capability of logistics providers to offer firms with knowledge and experience that would be difficult, costly, and challenging to perform in-house (Langley & Caphemini, 2009). Some other benefits that companies search for when outsourcing logistics are resource optimization, investment, growth opportunities, and most importantly risk management (Lai et al., 2013). Additionally, to the reasons specified before, other motivators for companies to outsource logistics are handling a short-term shortfall in production capacity and dealing with the absence of scarcity of essential inputs. Nevertheless, if the process of outsourcing is understood as a strategic process, it implies for the company that they cannot excel at everything and partnering up with specialized 3PLs providers can offer a special set of capabilities and expertise in connection with a specific link of the value chain, while delivering a very high degree of specialization on a particular function (Núñez-Carballosa & Guitart-Tarrés, 2011).

From a legislative perspective, logistics outsourcing is defined as a process where the company and a logistics service provider reach an agreement for identified functions at defined costs within a defined period of time (La Londe & Cooper, 1988). A categorization of logistics outsourcing is presented in four levels, which involve execution activities in the first level, value-added activities in the second level, planning activities in the third level, and planning and execution activities in the fourth level (Hsiao et al., 2011). Furthermore, according to logistics outsourcing evolution, it is possible to separate three phases, starting with a first period where logistics outsourcing started developing traditional functions like transportation and warehousing; then, in the second period is identifiable the arrival of companies like DHL and TNT, who provided logistics services across diverse geographical locations; finally, the third period is characterized by the intervention of companies from the information technology, management consultancy and financial services, working alongside with logistics providers (Zailani et al., 2015).

2.2 Factors that influence logistics outsourcing

The management of logistics operations has become a very challenging duty for companies, taking into consideration the diverse range of logistics functions, complexity that carries product diversification, and involvement of large investment required for logistics operations. In this scenario companies can opt to carry out logistics operations using their own assets or decide to outsource a part or the total logistics operations to a specialized 3PLs provider, which translates into official responsibility and commitment to provide logistics services (Razzaque & Sheng, 1998). A recent study on the current state of 3PLs indicates that 93% of companies outsourcing logistics report that the relationship they have with their 3PLs providers has been generally successful (Langley, 2020). Therefore, there are many factors that influence the success of this relationship and consequently the decision to outsource logistics. Literature on logistics identifies and classifies the reasons why firms partner up with 3PLs providers. Those reasons fall under different classifications as control and physical aspects, human and physical assets, and basic and advanced logistics outsourcing activities.

The aspects that influence the decision to outsource logistics are classified into control aspects and physical aspects. Firstly, control aspects include requirements that are related to exclusivity of service, range of managerial activities, continuity of relationship, ability for performance measurement, cost control, financial security, and customer service. On the other hand, physical aspects include operational flexibility, ability to cope with a diverse range of physical activities, capacity to increment the level of service, geographical coverage for service, and specialization on a singular product (Gattorna et al., 1991). Other elements of importance when deciding to outsource logistics to get going a partnership are standardized and efficient procedures offered by the logistics provider; also, the volatility of warehouse utilization rates can be reduced by the usage of common facilities owned by the 3PLs provider, thus, generating economies of scale (Large et al., 2011).

Moreover, an important categorization to take into consideration is the type of asset classification in logistics outsourcing, which are human and physical assets. Human assets have the characteristic of being capable to provide skills, experience, and knowledge to the firm. Meanwhile, physical assets are characterized by the degree of capability of equipment and infrastructure required for logistics operations. Both human and physical types of assets are important factors that influence the decision of outsourcing logistics (Robertson & Gatignon, 1998). The two of them are comprehended as important factors of logistics outsourcing in this study, recognizing that both are key elements required by 3PLs providers in order to fulfill capability gaps of their clients, and offer them a superior logistics outsourcing service (Zailani et al., 2015).

Another set of important factors considered in logistics outsourcing are based on the type of activities outsourced, which are basic logistics outsourcing and advanced logistics outsourcing (Andersson & Norman, 2002). Basic logistics outsourcing refers to logistics activities that are traditionally facility-based, such as transportation and warehousing (Hsiao et al., 2011). Here we could find logistics services bought individually or bundled with other services in a simple model that 3PLs providers can easily offer at low prices to secure high employment of their capacity (Andersson & Norman, 2002; Yeung et al., 2012). In this type of contracts, the commitment is low, short-term oriented, and guided by the price as a predominant consideration (Halldórsson & Skjøtt-Larsen, 2004). On the other hand,

advanced logistics outsourcing contracts include functional and strategic activities with 3PLs providers. Functional activities refer to purchasing and order processing, while strategic activities refer to the design of logistics information system integration and optimization of supply chain processes (Andersson & Norman, 2002; Halldórsson & Skjøtt-Larsen, 2004). So advanced logistics outsourcing requires a high level of knowledge, complex design and integrative skills often implemented through packed logistic solutions (Halldórsson & Skjøtt-Larsen, 2004).

2.3 Logistics outsourcing theoretical approaches

Logistics outsourcing has been investigated from three major perspectives due to its multidisciplinary nature. The discussion on the subject in scientific literature is predominantly focused, among others, on the following three theoretical approaches: (a) Supply chain management theory, (b) Resource-based view, and (c) Transaction cost view (Hsiao et al., 2011).

The first approach is supply chain management theory. Initially used by Oliver and Webber in 1982, the term “supply chain management” was developed from a logistics point of view, to be later discussed in research from a supply chain management point of view. The development of supply chain management is constructed on a theoretical basis which includes inventory, procurement, and logistics theories. Inventory theory refers to reducing costs and ensuring maximum supply based on raw materials, products in process, finished products, repair products and other forms of stock. Procurement theory refers to the cooperation and exchange of raw materials and semi-finished production as a bridge to intersect production and demand of goods. This perspective has the objective of achieving the right quantity, right time, right place, right price, and appropriate resources. Also, logistics theory refers to the division of work that encompasses logistics outsourcing, like provision of own storage facilities, transport facilities and advanced information management capabilities. Supply chain management theory refers to the benefits of using 3PLs providers, which are focusing on core business, reducing the employment of capital, tackling seasonal fluctuations, improving flexibility and other complementary benefits (Xiao, 2014).

The second logistics outsourcing approach is the resource-based theory, propounded in 1984 by Wernerfelt, who explores the usefulness of analyzing firms from the resource side rather than from the product side, suggesting the concepts of resource position barriers and growth-share matrices (Wernerfelt, 1984). The mentioned author understood resources as anything which could be thought of as a strength or weakness of a given firm. A firm's resources at a given time could be defined as tangible or intangible assets, tied semi permanently to the firm (Caves, 1980). This theory was further developed to study a firm's internal strengths and weaknesses by examining the link between firm resources and sustained competitive advantage, resulting in four empirical indicators, which are value, rareness, imitability, and substitutability (Barney, 1991). Most recently the interest has been focused on understanding the empirical implications of the theory and more specifically on how the resources and capabilities of a firm can affect its performance (Godfrey & Hill, 1995). As the resource-based view of the firm developed, researchers started to discuss on boundary choices, in-house or outsourcing, and competitive advantage; indicating that core activities will not be outsourced because this allows firms to leverage their unique competences (Insigna & Werle, 2000; Lieblein & Miller, 2003).

The third approach to understand logistics outsourcing decisions is the transaction cost theory (Williamson, 1979). Transaction cost analysis combines economic and management theory in order to select the best type of relationship a firm should develop in the marketplace, setting the foundations of purchase discipline, which employs analysis of the factors that determine the internal and external boundaries of the firm (McIvor, 2000). The theory was presented in 1975 by Williamson, and its core focuses on the costs of completing a transaction by one institutional mode rather than another (Williamson, 1975). Transaction cost describes the efficient boundaries that can be derived by aligning different transactions with governance structures of the firm or market in a discriminating way (Williamson, 1998). This theory in logistics management suggests that when aiming to conduct a transaction in a cost-efficient manner, managers always analyze the characteristics of the transaction and then, they determine the most economical governance structure, which is outsourcing or maintaining in-house operations (Williamson, 1981).

This theory is based on two assumptions, which are bounded rationality and opportunism on human agents. Bounded rationality refers to the limitation of decision-makers when searching and processing information; this contemplates the rationality of human behavior as a limited ability of an actor to process information (McIvor, 2000; Williamson, 1981). On the other hand, opportunism of human agents refers to the existing self-interest between the parties, where one or both are willing to benefit from using false information or keep it with the objective of limiting the availability of information from the other party. This asymmetry of information derives in benefits from the transaction to one party at the expense of the other. This factor produces transactional difficulties because it assumes that people are prone to behave opportunistically seeking self-interest with guilt (McIvor, 2000; Wan et al., 2019). When talking about factors that generate transactional difficulties it is also possible to mention two additional elements, which are small number bargaining and information impactedness. Small numbers bargaining embodies an oligopoly in terms of the limited availability of bargaining situations, therefore resulting in a prohibitive cost of obtaining full information. Information impactedness, on the other hand, refers to the uneven distribution of information among the exchanging parties, resulting in a situation where one party has more knowledge than the other (McIvor, 2000).

All these elements represent together the transaction difficulties within the resource-based view theory. They are also associated with an increase in costs when transactions are characterized by (a) asset specificity, which are transactions that require high investments specifically needed on a particular exchange relationship; (b) Uncertainty, which refers to transactions where ambiguity predominates on the definition and performance; and (c) Infrequency; which refers to transactions which are seldom undertaken (Williamson, 1985).

2.4 Supply chain disruptions

In today's turbulent and uncertain environment, every firm in a supply chain is susceptible to disruption events (Knemeyer et al., 2008), that implies different degrees of operational risks to which a company is exposed to (Stauffer, 2003). Supply chain disruptions are unplanned and unanticipated events that interrupt the normal flow of goods and materials within the supply chain (Svensson, 2000). The competitive business environment that involves outsourcing and a high degree of globalization, have created longer and more

complex supply chains, which are more vulnerable to business disruptions in the present context of global instability (Rossi et al., 2005). Understanding how firms manage supply chain disruptions has become an important topic for both academics and practitioners (Craighead et al., 2007). A disruption in any point of the supply chain can have the potential to cause an entire supply to fail because of a variety of problems such as long lead-times, stock-outs, inability to meet customer demands and the increase of costs (Shao, 2013). Due to resulting costs associated with supply chain disruptions, organizations have turned their attention to better understanding and managing supply chain risks (Chopra & Sodhi, 2014), with the aim of enhancing product safety and security, as well as financial health (Blackhurst et al., 2005).

Literature on the subject has classified the source of supply chain disruptions, identifying a variety of cases, such as accidents or natural disasters (Kleindorfer et al., 2003), and intentional or unintentional disruptions (Speier et al., 2011). We can find theft, contamination, sabotage, and even terrorists attacks as intentional supply chain disruptions; and other unintentional supply chain disruptions such as hurricanes, tornados, and floods that occur naturally and may disrupt a supply chain's transportation infrastructure, supply routes and manufacturing facilities. Unintentional disruptions can also be man-made, an example of this can be an accident that causes transportation delays or production stoppage, that also negatively affects the quality of the products in transit (Speier et al., 2011). Taking into consideration the food industry as an example, contamination is a common unintentional supply chain disruption causing illnesses, hospitalizations and even death (Mead et al., 1999).

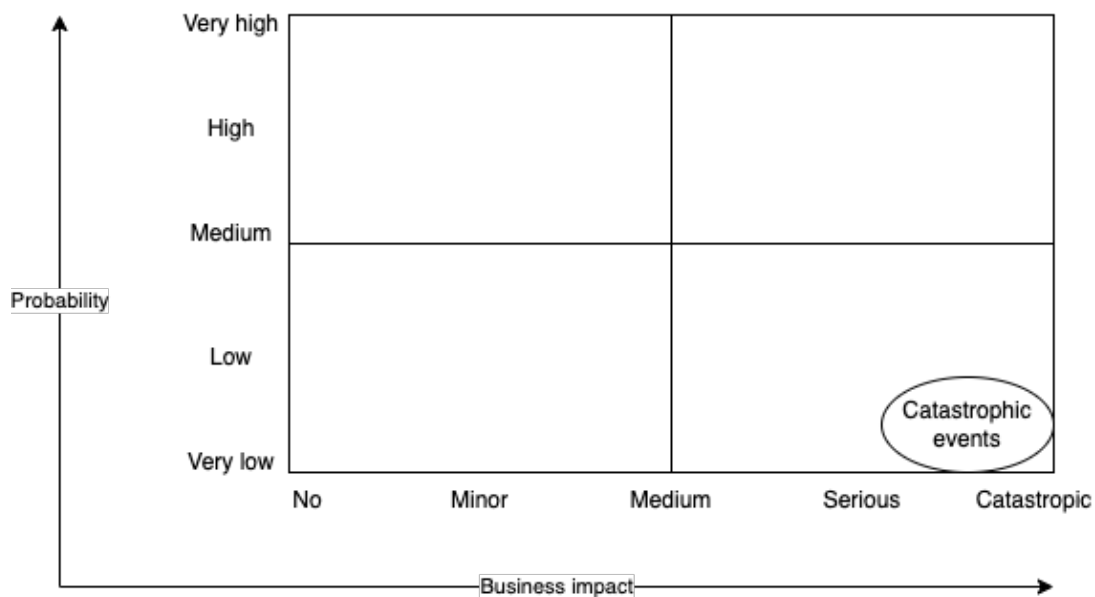
As a result of intentional acts, supply chain disruptions can range in the degree of severity. As an example, theft can significantly increase the costs of a firm, but also can shut down a source of supply as has occurred before with the increase of piracy incidents in open seas, where entire routes are now unavailable for commercial trade (Speier et al., 2011). Deliberate contamination of products is also an issue to take into consideration, as well as business entities that are attractive for international sabotage. Even terrorist attacks are a source of risk of intentional supply chain disruptions, an example of this is the fact that

about 80% of terrorist attacks against the U.S. interests over the last thirty years targeted businesses (Dobie et al., 2000).

The operational risks involved in the occurrence of a supply chain disruption that have the potential of affecting a firm's supply chain can be categorized in a scheme of business impact and probability of a disruption. Here we can find regularly occurring events with a very high probability of occurrence and minor business impact, such as variability in demand or the chance of damaged products during transportation. As well as catastrophic events with a very high business impact and very low probability of occurrence. As an example, catastrophic events is located in the bottom right corner of Fig. 2.

Figure 2

Risk categorization scheme



Source: Adapted from Brindley (2004)

In the business environment, after the September 11th terrorist attack on New York city, managers became increasingly aware of potential damage that can be caused by catastrophic events, both intentional and unintentional. Besides terrorist attacks, catastrophic events also include earthquakes and floods that can potentially interrupt the flow of supply chains at any given time (Kleindorfer et al., 2003). Highly efficient supply chains typically do not have excess assets and staff to cope with the aftermath of a

catastrophic event, additionally, due to globalization of markets and supply chain operations, local catastrophic events increasingly have indirect global repercussions (Wagner & Bode, 2006). In the current landscape of supply chain management, companies need to examine the concept of resilience in supply chain design. Resiliency refers to a firm's capacity to survive, adapt, and grow in the face of change and uncertainty (Fiksel, 2006). Despite the need to build resilience in supply chain design facing catastrophic events, there is currently only limited literature on the evaluation and risk of catastrophic events. In fact, most firms develop plans to protect against low-impact and recurrent risks in their supply chains, ignoring low-probability high-impact risks (Chopra & Sodhi, 2014).

3. PROPOSITION DEVELOPMENT

3.1 Proposition 1

Once the main factors of logistics outsourcing in literature are considered, it is inferable that a supply chain disruption may be a factor that companies contemplate when deciding to outsource logistics. Previous evidence shows that the most important selection criterion for 3PLs providers is that their core competencies are able to address the lack of assets of the firm outsourcing (Cheong, 2004). Besides human and physical assets (Zailani et al., 2015), control and physical aspects (Gattorna et al., 1991), and basic and advanced logistics (Andersson & Norman, 2002), all as logistics outsourcing factors of importance, we can understand supply chain disruptions as a transversal concept of complication on those classifications, thus being non-exclusive to any single one of them. Considering that supply chain risk management is nowadays more important than ever with the damage done by COVID-19 to supply chains, and the evidence of thousands of manufacturing companies suffering severe supply disruptions; it is important for researchers to study the determining factors considered in supply chain risk management (Yang et al., 2020). Under current circumstances of an increase of intentional and unintentional supply chain disruptions (Speier et al., 2011), and following the reasoning presented before, proposition one is presented:

Proposition 1: *A supply chain disruption is a factor of importance for the company when deciding to outsource logistics.*

3.2 Proposition 2

The resource-based theory indicates that a firm can achieve competitive advantage only when resources are rare, valuable, inimitable, and non-substitutable (Barney, 1991). In this context, logistics outsourcing can be understood as a means to obtain valuable resources from an external provider to obtain competitive advantage in a given market (Bolumole et al., 2007), therefore, following that reasoning, it is possible to understand that a 3PLs provider can offer valuable resources to a company in a supply chain disruption scenario due to the expertise of the logistics provider. Thus, proposition 2 is presented:

Proposition 2: *In a context of supply chain disruptions, a third-party logistics provider is capable of offering valuable resources to the company due to specialization, therefore affecting positively on the mutual relationship.*

3.3 Proposition 3

The classification of human and physical assets discussed before is relevant within the transaction cost theory. Specifically in logistics outsourcing, determined assets including equipment, facilities, and hardware; and human assets, including substantial specific knowledge and specific training of employees are clear examples (Wan et al., 2019). In this context, if a party walks away from a contract in an opportunistic manner, the party that has invested highly specific assets in a given transaction will bear high losses (Williamson, 1991), therefore, potentially affecting the relationship between a company and its 3PLs provider if acting in such opportunistic way. Previous literature based on empirical studies suggests that there is a negative relationship between asset specificity and outsourcing decisions (Geykens et al., 2006; Leiblein & Miller, 2003), but also inconclusive results as well (Aubert et al., 2004; Liu & Wang, 2009; de Vita et al., 2010). Another major precedent is that without uncertainty, asset specificity might be a minor constraint, because problems derived from it can be mitigated through long-term contracts (Williamson, 1985). Based on transaction cost theory, specifically on the basic assumptions of bounded rationality and opportunism (Williamson, 1981), and following the reasoning of previous evidence, proposition 3 is presented:

Proposition 3: *Supply chain disruptions as a factor of transaction uncertainty, negatively affects the relationship of a company and its third-party logistics provider in absence of a long-term contract.*

3.4 Proposition 4

In a context of increasing supply chain disruptions, 3PLs providers become important to supply chains for their capacity to adapt using their scale. Companies on their own can hardly create resilience capacities; on the other hand, 3PLs providers have access to carriers, real estate and networks that are not accessible to individual firms. A clear and recent example of this is the impact on the supply chain of the COVID-19, where 48% of logistics providers reported a net negative impact on operations and volume capacity (Langley, 2022). It is critical for logistics providers to offer a planning system for their clients to enable them to respond effectively to catastrophic events (Narasimhan & Talluri, 2009). An important reference taken into consideration, and directly related to supply chain design is Kleindorfer's framework for risk analysis (Cohen & Kunreuther, 2009), where the author proposed a proactive process involving four stages, which are identification of key supply chain locations and threats, estimation of probabilities and loss for each location, evaluation of alternative countermeasures for each location, and selection of countermeasures for each location (Narasimhan & Talluri, 2009). This risk assessment can be potentially provided by a specialized 3PLs provider, offering to the company a service that could develop into a competitive advantage. In this manner, a 3PLs provider is integrated in a business value chain to give rise a cooperation agreement with a supplier that helps the organization to adapt more efficiently and effectively to the changing environment, thus becoming a strategic partner (Núñez-Carballosa & Guitart-Tarrés, 2011). Following that reasoning, proposition 4 is presented:

Proposition 4: *In a context of supply chain disruptions, a third—party logistics provider can offer a planning system of risk management on the supply chain design to the company and develop a strategic outsourcing partnership.*

3.5 Proposition 5

In a logistics outsourcing scenario, the relationship between a company and its 3PLs provider is initially driven basically by cost considerations, but once outsourcing moves from there to a tactical level, the relationship usually grows deeper with the aim to pursue mutual benefits that can be generated from working together. It is becoming more usual for companies to develop these close relationships, because 3PLs providers are taking increasingly strategic overview of logistics and no longer only basic logistics services (Núñez-Carballosa & Guitart-Tarrés, 2011). An important strategic overview is the degree of awareness and consciousness on supply chain disruptions (Bode et al., 2011), besides also the preventive measure to obtain updated information regarding potential disruptions (Pettit et al., 2010). When companies start to develop a relationship of mutual benefit and the 3PLs provider starts to perform strategic tasks, two of the factors considered when defining the extent of usage of logistics providers is the geographical coverage provided by third party firms (Bhatnagar et al., 1999), and the number of logistics functions. Recently, logistics providers have expanded the range of services offered, engaging in more complex activities, and serving a bigger client portfolio (Núñez-Carballosa & Guitart-Tarrés, 2011). 3PLs providers not only provide traditional services as warehousing and transport, but also have integrated functions alongside the supply chain, undertaking strategic outsourcing of integral functions with the aim of achieving effectiveness rather than outsourcing separate functions (Boyson et al., 1999; Bolumole, 2001). Following this reasoning, proposition 5 is presented:

Proposition 5: *By managing a larger portion of the supply chain of a company, third party logistics providers can overcome supply chain disruptions due to expertise and capabilities, and therefore develop a strategic outsourcing relationship with the company.*

4. METHODOLOGY

The methodology of this study follows a qualitative approach. This approach is adopted due to the characteristics of the object of study, since this methodology is indicated because the research questions need to be investigated in its natural context, interpreting phenomena directly from the people involved (Denzin & Lincoln, 1995). With the objective set, the data required to be collected will present the characteristics of being highly related to the social

world and involves concepts and behaviors of people, therefore its interpretation would not be easily reduced to numbers, therefore the qualitative approach is selected (Anderson, 2010).

An exploratory case study was employed to ascertain if supply chain disruptions challenges are a factor considered by companies when deciding to outsource logistics, to establish if supply chain disruptions have a positive or negative effect on the relationship of a company and its 3PLs provider, and to determine how does the relationship between a company and its 3PLs provider develops into a relationship of strategic outsourcing under the context of supply chain disruptions. This methodology is especially appropriate for analyzing the links that may exist between complex phenomena and their context when the research question conveys an implicit *how* and *why* (Yin, 1994). When in-depth, descriptive questions are needed, as it is in this study, where an in-depth understanding about different cases will bring light into the issue, the case study is the one recommended on research methodology (Creswell et al., 2007). The methodology and approach selected for this study was also used in previous literature of similar characteristics on operations management, as seen in (Etokudoh et al., 2017; Hertz & Alfredsson, 2003; Núñez-Carballosa & Guitart-Tarrés, 2011; Sohail et al., 2004; Wilding & Juriado, 2004), just to name a few in a broad landscape of logistics outsourcing scientific research, proving that exploratory case study is a preferred option and an excellent tool for logistics research (Ellram, 1996; Zacharia et al., 2011).

The target population considered were companies that operate in the agricultural industry in Peru that maintain large operations management, involving logistics across the country and have export operations to international markets. For this, the unit of analysis will be agricultural companies that export the product of fresh grapes operating in the coastal region of the country, and have an important share of total exports to the selected country of Canada. The reasons for choosing these firms as sample are that first, the country of Peru is a main actor in the supply chain logistics and participates in several stages on the market of fresh grapes in the world (Fernandez-Stark et al., 2016). Second, the country is a developing economy geographically located in a region that suffers several weather disasters; the most notorious one being El Niño-Southern Oscillation, which affects mostly equatorial and sub-equatorial regions (Ubilava, 2011). Hence, Peru is a scenario where

supply chain disruptions take place and have the potential to harm and disrupt the flow of goods and exports (Ambulkar et al., 2014). Furthermore, the selection of the product of fresh grapes is based on how representative is this product for the country, being a main facilitator of the rapid entry into the international market and value chain, an enabler of a following successful pattern of non-traditional agricultural exports that served the objective of diversifying the sector export's basket, as well as a representative of a product developed strictly to fulfill exports demands and parallelly developing and modernizing farming techniques (Fernandez-Stark et al., 2016). Thus, the reasons exposed link together weather and economic variables (Abril-Salcedo et al., 2020), resulting in an optimal country, industry, and product selection for the purpose of this study.

By performing a search with the code of the product fresh grapes from The Harmonized Commodity Description and Coding System of the World Customs Organization (WCO), which is 0806100000, the Peruvian *Sistema Integrado de Información de Comercio Exterior* (SIICEX) presents the most representative exporters and importers from the world, as well as the most important companies that export fresh grapes from Peru. The following companies presented in Tab. 1 conform the sampling setting of possible cases for the study.

Table 1

Main Peruvian firms that export fresh grapes

Firms	Total market share of fresh grapes exports to the Canadian market
Sociedad Agrícola Rapel S.A.C.	10%
El Pedregal S.A.	9%
Ecosac Agrícola S.A.C.	6%
Complejo Agroindustrial Beta S.A.	5%
Sociedad Agrícola Saturno S.A.	5%
Camposol S.A.	4%
Agrícola Andrea	4%
Agrícola Don Ricardo	3%
Others	54%

Source: (*Sistema Integrado de información de Comercio Exterior* (SIICEX), 2022)

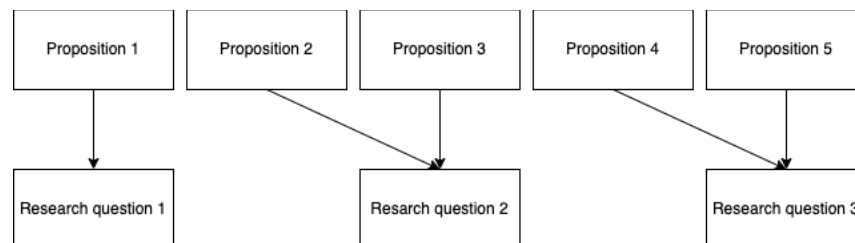
Regarding the subject selection, operations managers of the companies specified in Tab. 1 were interviewed. They were needed to adjust to the following criteria: (a) Have at least 7 years of experience, this amount of time is set due to the last occurrence of a major supply chain disruption in the country, El Niño-Southern Oscillation in 2016 (Abril-Salcedo et al., 2020), so that the managers would have first-hand experience in the management of operations in this context. (b) Have a degree of involvement in the exports operations of the company. The number of interviewees was not limited, although the participation of at least one manager or director was necessary to include the company into the sample. This selection of cases followed the aim to ensure construct validity by including multiple sources of knowledge in the data collection phase (Yin, 1990).

Regarding the sampling procedure, the non-probabilistic technique of convenience sampling was employed due to the reduced availability of resources, considering time as the predominant factor of limitation. Three interviews to managers that accomplished the criteria were successfully completed, each one in two or more sessions carried out by phone calls, given the geographic distance between the researcher and the selected informants.

When using a case study methodology, one of the main criticisms is that it fails to sufficiently develop an operational set of measures, and that “subjective” judgements are used to collect the data, therefore, establishing correct operational measures for the concepts being studied is imperative to ensure construct validity (Yin, 1990). To do that, this study addressed the objectives set with the aid of five propositions based on a detailed literature review. Fig. 3 illustrates how each proposition supports the set of research questions proposed, to later reach the objectives of the study

Figure 3

Scheme of propositions



Source: own elaboration

The data collection process was carried out with the aid of the instrument of interviews, specifically in-depth semi-structured interviews to the operations managers. The method followed was to obtain informant consent from the participants, guarantee anonymity and with the support of an audio recorder device, record the interview to be later transcribed to a word processing software, as suggested by (Anderson, 2010). Regarding construct validity, a commonly used strategy of having the draft case study report reviewed by key informants was adopted with the aim of obtaining approval and additional useful comments (Yin, 1994). To ensure reliability of the method, the instrument was pre-tested on individuals that have related expertise on the subject. Pre-testing the instrument guarantees the validity and consistency of the instrument before it is applied to the target sample (Moss et al., 2004).

To proceed with the data analysis section, the data gathered was analyzed with the use of the software of qualitative analysis ATLAS.ti 9. This software allows us to create relationships among the variables and identify patterns. For case study data analysis, one of the most desirable strategies is to use pattern-matching logic (Yin, 1994), where the objective is to describe patterns with as much accuracy as possible to ensure internal validity. The responses of each manager were subject to this analysis and the data collected was used to create patterns and highlight citations with the aim to respond to the research questions proposed. The coding strategy followed an accounting-scheme approach, which combines a previously created list of codes extracted from the literature review section and research questions, whilst also generating new categories and labels during the transcription of interviews process (Miles et al., 2019). Therefore, the first stage of the data analysis consisted in creating an initial code list framework on the basis of the theoretical framework and research questions of the study. This initial list covered concepts of logistics outsourcing, factors that influence logistics outsourcing, logistics outsourcing theoretical approaches and the categories and types of supply chain disruptions. Then *open coding* of transcripts occurred based on the responses obtained from the managers in the interviews. Based on the open coding phase, the initial coding framework was revised and consolidated into a final list of codes.

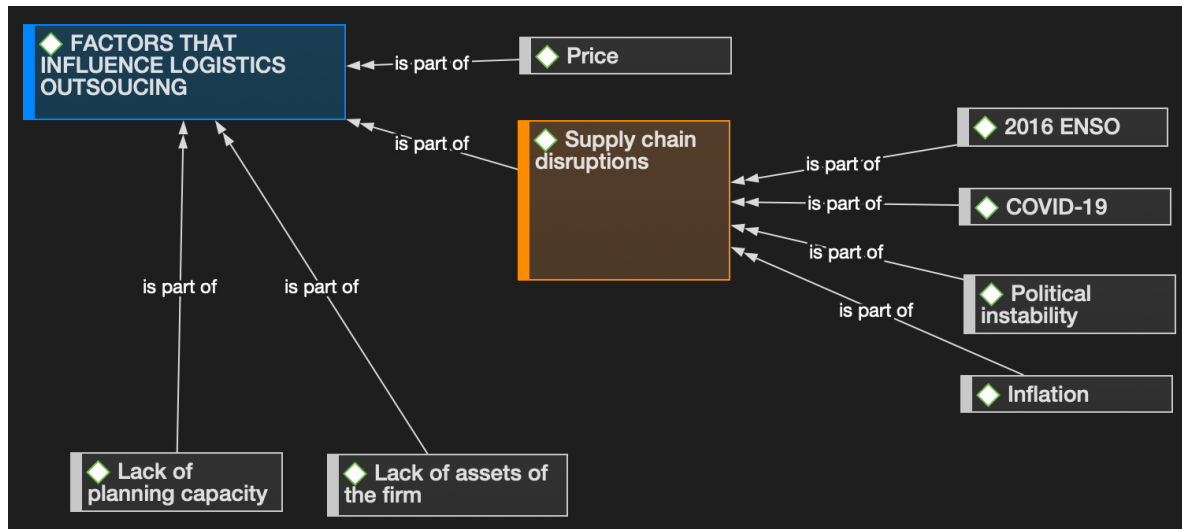
5. RESULTS

5.1 Research question 1

With the aim of obtaining an answer to research question 1, which is: *Are supply chain disruptions a factor considered by companies when deciding to outsource logistics?* Proposition 1, which is: *A supply chain disruption is a factor of importance for the company when deciding to outsource logistics*, was presented based on the literature review of logistics outsourcing and factors that influence logistics outsourcing. With the aid of a network, this question is addressed and the results are illustrated in Fig. 4.

Figure 4

Network 1: Factors that influence logistics outsourcing



Source: own elaboration

Fig. 4 indicates that supply chain disruptions are a factor that influence logistics outsourcing among other factors such as lack of planning capacity from the company, lack of assets of the firm and price considerations. When talking about lack of planning capacity and lack of assets of the firm, we are essentially referring to the focus on core operations of the firm. This result goes in line with the study of Sink et al. (1996), where it was found that the most important criterion for the selection of 3PLs providers was the focus of core competences of the firm.

The consideration of price is relevant because it is considered as an important factor that determines logistics outsourcing decisions. Price is the first factor considered when outsourcing logistics, once the company starts to get a better knowledge of the market, additional factors affect the decision. This result supports previous studies, where the most commonly cited factors affecting the final decision of logistics outsourcing include the price offered by the 3PLs companies; among quality of the service provided, reputation of the company, the range of services offered, and previous experience (Bhatnagar et al., 1993).

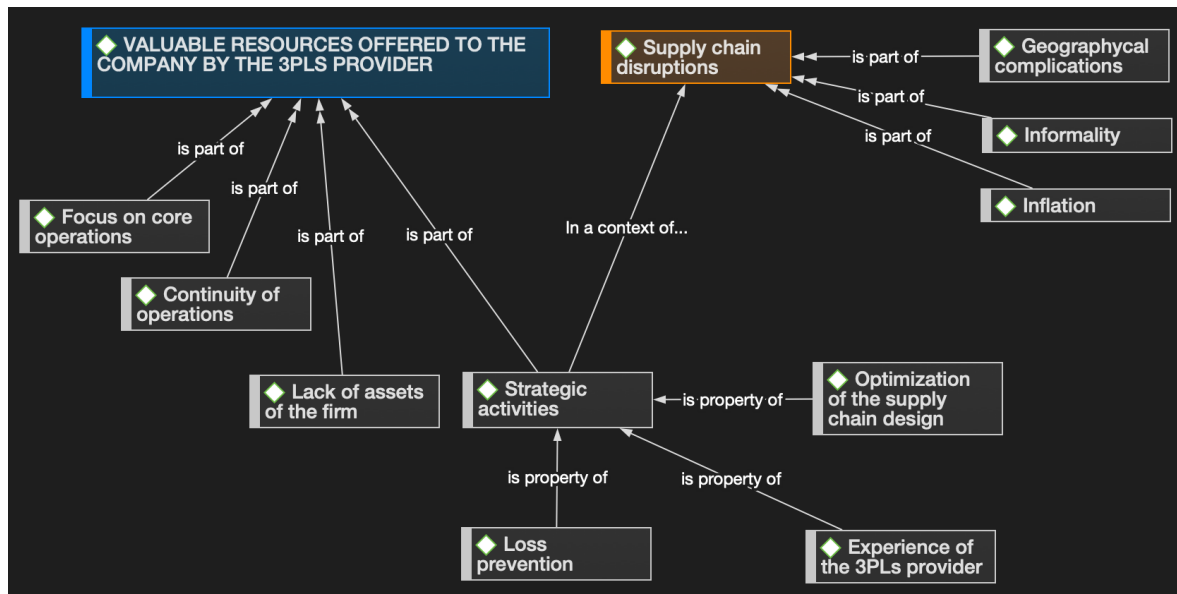
Managers indicate that supply chain disruptions are a considerable factor, especially in the industry selected, where companies regularly are affected due to the costly nature of supply chain disruptions as identified in previous literature (Craighead et al., 2007). Risks potentially affecting a firm's supply chain can come in a variety of forms, some supply chain disruptions were identified, considering COVID-19 as the most harmful to the industry due to the impact in almost all parts of the logistics chain, as initially stated by Yang et al. (2020). Following with El Niño-Southern Oscillation as a catastrophic event of climate variation leading to economic disasters as indicated before by Baawain et al., (2005), that affected mostly production in the northern and southern regions, where fresh grapes are produced. And also, a quite recent series of supply chain disruption identified that occurred just a few weeks ago due to economic and political issues taking place in the country in regions where the product of fresh grapes is produced including cities in the south and north of the country.

5.2 Research question 2

With the aim of obtaining an answer to research question 2, which is: *Supply chain disruptions have a positive or negative effect on the relationship of a company and its Third-party logistics provider?* Proposition 2, which is: *In a context of supply chain disruptions, a third-party logistics provider is capable to offer valuable resources to the company due to specialization, therefore affecting positively on the mutual relationship*, and proposition 3, which is: *Supply chain disruptions as a factor of transaction uncertainty, negatively affects the relationship of a company and its third-party logistics provider in absence of a long-term contract*, were presented based on the literature review of logistics outsourcing, resource-based theory, and transaction cost theory. With the aid of two networks, these questions are addressed, and the results are illustrated in Fig. 5 and Fig. 6.

Figure 5

Network 2: Valuable resources provided by a 3PLs provider in a context of supply chain disruptions



Source: own elaboration

Fig. 5 indicates that logistics providers offer valuable resources, including strategic activities that later will represent a competitive advantage for the company they partner up with. This is consistent with the asset-based logistics outsourcing view, where imitating the frequent or successful practices is a common practice interpreted as an external-pressure driven decision of outsourcing logistics (Haunschil & Miner, 1997). Companies recognize that they are not capable of performing the logistics operations by themselves and therefore they opt to outsource logistics with the primary objectives of focusing on their core operations and have regular logistics providers that perform the logistics tasks. Companies acknowledge that they have limited assets and capacities, therefore they don't find it beneficial to carry the logistics operations on their own and prefer to concentrate on their core business, going in line with previous literature of driving factors of logistics outsourcing (Wan et al., 2019).

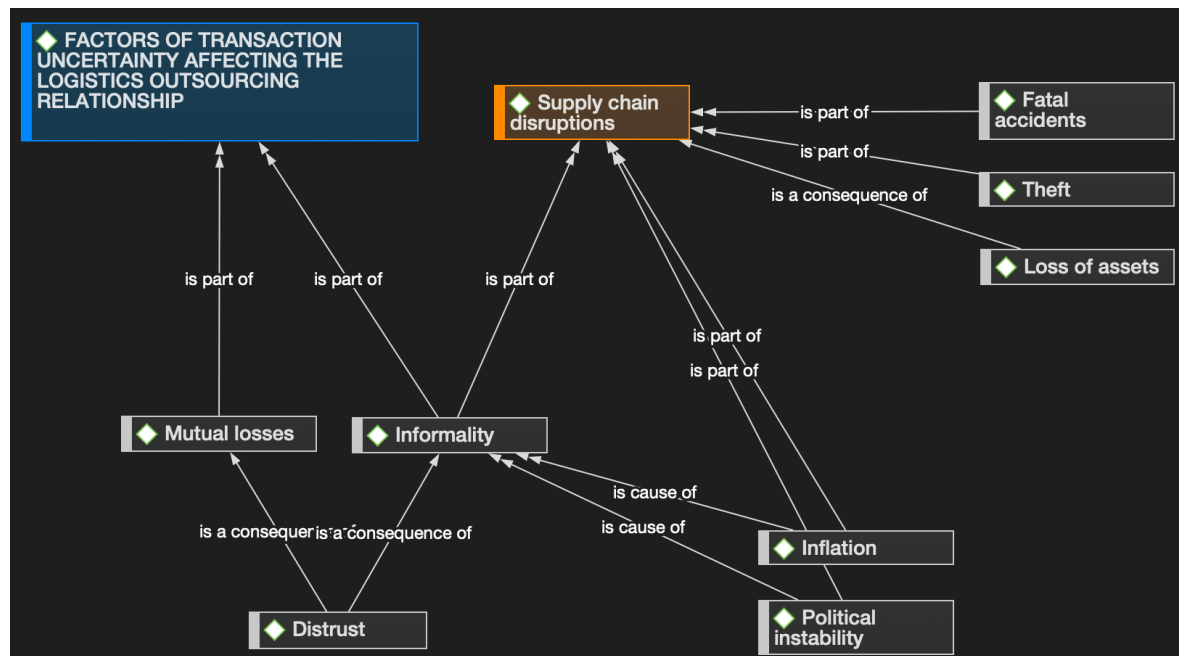
Regarding strategic activities offered by logistics providers, we can find that loss prevention, optimization of the supply chain design and experience of the 3PLs provider are activities that companies find valuable and affect positively on the mutual relationship. This goes in

line with extensive studies that have investigated logistics outsourcing decisions (Aktas & Ulengin, 2005; Grewal et al., 2008; Hsiao et al., 2010).

It is important to indicate that the supply chain disruptions recognized in this network are geographical complications of the country, which can be explained with the logistics specialization required in each region, demanding different capacities from the logistics providers to perform the task efficiently. The informality that predominates in the country and the current situation of inflation reflected on fuel prices represent supply chain disruptions that affect the logistics operations of the companies in the industry and demand strategic capacities from the logistics providers to overcome these circumstantial difficulties. These sources of supply chain disruptions fall under a previous classification presented by Kleindorfer & Saad (2009), where political instability is listed as a disruption risk source.

Figure 6

Network 3: Factors of transaction uncertainty affecting the logistics outsourcing relationship



Source: own elaboration

Fig. 6 illustrates the factors of transaction uncertainty that affect the logistics outsourcing relationship in absence of a long-term contract. Companies manifest that long-term contracts are not usual for logistics outsourcing services in the research setting studied. This

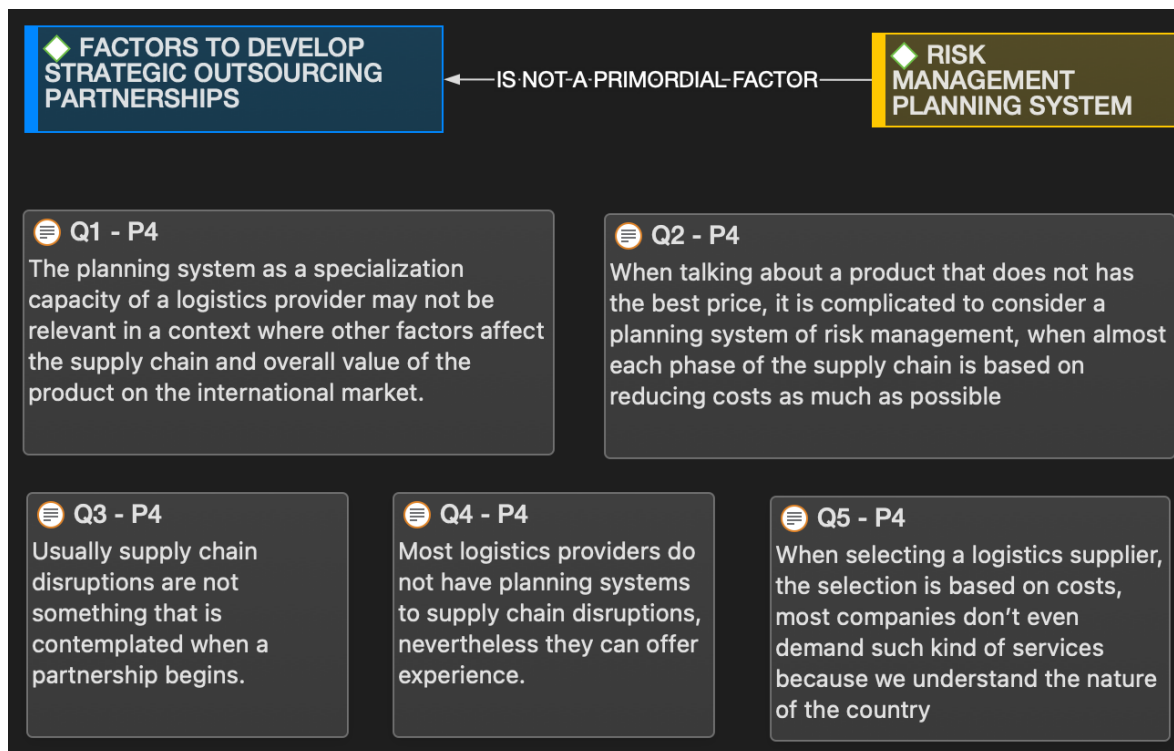
develops into a situation of mutual losses of assets when a logistics disruption occurs in a market characterized by informality. In this situation of mutual losses, both parties understand that the responsibility is shared and generally each party bears the loss of the assets involved in the operation without the mediation of a contract. This result aligns with previously identified sources of supply network instability, finding risksharing among others as factors of transaction uncertainty in logistics management (Zheng et al., 2001). Informality on the other hand refers to the general context of the country, where factors such as inflation and political instability are currently generating considerable disruptions on the logistics chains. This maintains relationships with previous dimensions of logistics factors that influence outsourcing, finding economic volatility as a factor of transaction uncertainty (Rahman, 2011). All those elements mentioned cause distrust in the relationship of the company and the 3PLs provider, therefore negatively affecting the partnership.

5.3 Research question 3

With the aim of obtaining an answer to research question 3, which is: *How does the relationship of a company and its third-party logistics provider develop into a relationship of strategic outsourcing under the context of supply chain disruptions?* Proposition 4, which is: *In a context of supply chain disruptions, a third—party logistics provider can offer a planning system of risk management on the supply chain design to the company and develop a strategic outsourcing partnership.*, and proposition 5, which is: *By managing a larger portion of the supply chain of a company, third party logistics providers can overcome supply chain disruptions due to expertise and capabilities, and therefore develop a strategic outsourcing relationship with the company*, were presented based on the literature review of logistics outsourcing, supply chain design and supply chain disruptions. With the aid of two networks, these questions are addressed, and the results are illustrated in Fig. 7 and Fig. 8.

Figure 7

Network 4: Planning system of risk management as an element to develop strategic outsourcing



Source: own elaboration

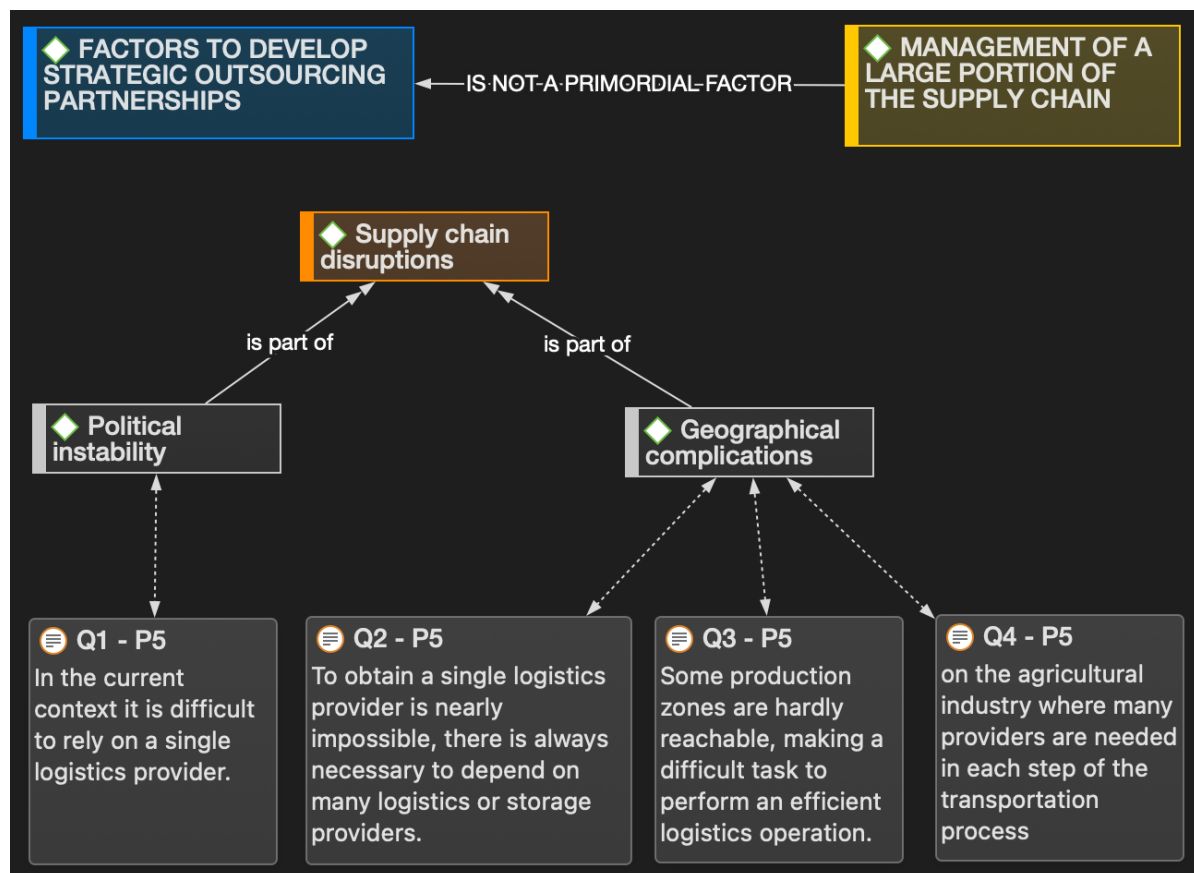
Due to the non-hierarchical nature of answers of this proposition, network 4 is presented with the aid of quotations to support the results. A risk management planning system is not considered as a factor to develop a strategic outsourcing partnership, mostly because of contextual limitations. This contradicts previous findings where the topic of risk management is determinant for researchers and practitioners of supply chain management (Narasimhan & Talluri, 2009). Literature on the subject, contrarily to the results obtained, indicate that supply chain risk management provides a strong contribution to overall firm performance, but also cultural differences are contemplated on this relationship of a company with a 3PLs provider (Manhart et al., 2020). Results also contrast with current trends towards strategic outsourcing by firms and increased reliance on the risk management capacity of 3PLs providers to obtain competitive advantage (Narasimhan & Talluri, 2009).

When deciding to outsource logistics, a risk management planning system is not demanded by the company to the 3PLs provider. The most important factor for this is that when a partnership begins, the most influential factor is the price of the service, where the lowest price in the market is the option to be first considered. another element is that logistics

providers don't even offer a risk management planning system to their clients, this because of how the market behaves, identifying a supply chain disruption as an irregular and low likely to happen event. This contradicts the reasoning of proactive planning, where supply chain managers should prioritize prevention in case of occurrence of a catastrophic event, which has a low probability of occurrence but significant consequences if it ends up happening (Knemeyer et al., 2008). Nevertheless, companies identify factors that are valuable in case of a logistics disruption, which are knowledge and experience of the 3PLs provider. Both of those elements are considered as factors that can help in the planning process of the identification of potentially dangerous locations where disruptions can have a negative effect. This goes in line with a previously presented systematic approach of occurrence probability and financial impact of catastrophic events (Knemeyer et al., 2008).

Figure 8

Network 5: Management of a larger portion of the supply chain as an element to develop strategic outsourcing



Source: own elaboration

Due to the non-hierarchical nature of answers of this proposition, network 5 is presented with the aid of quotations to support the results. The management of a large portion of the supply chain logistics of a company is not a primordial factor to develop a strategic outsourcing partnership, mostly because of contextual limitations. These results contradict previous literature on logistics management, where empirical research indicates that the longer the relationship between a company and its logistics provider, the more extensive would be the use of third-party logistics services, as well as the higher would be the level of commitment to the relationship from either side (Lieb et al., 1993). Nevertheless, literature indicates some degree of variation when comparing different geographical regions. An example is that it was found that geographical coverage provided by 3PLs providers is a factor in defining the extent of usage, recognizing European firms significantly more committed to allocate a larger share of logistics to a 3PLs provider in comparison to firms in the United States (Bhatnagar et al., 1993). Also, Dapiran et al., (1996) found that Australian firms present a similar behavior of the ones from the United States regarding the commitment to 3PLs providers. These differences presented by regions may explain the contradictory results found in this study, where some factors may influence differently depending on geographical location.

In a supply chain disruptions scenario, companies indicate that political instability and geographical complications of the country make it difficult for 3PLs providers to manage larger portions of the supply chain logistics of a company. Also, they understand those elements as unavoidable and consider risk as a constant variable under daily operations. This aligns with previous literature on supply chains, indicating that supply chain disruptions are not preventable, and all supply chains are risky by nature (Craighead et al., 2007).

Regarding political instability, it is described that the current situation in the country has affected a series of businesses, and companies in the sector resulted troubled to some degree, limiting their capacity, and sometimes even making some logistics providers temporarily or permanently close operations. On the other hand, geographic complications refer to characteristics of the industry and the product, where it is nearly impossible to rely on a single logistics provider due to the node complexity of the supply chain design, where

many actors need to be involved on the logistics processes, each one specialized on a specific task as warehousing, consolidation of shipments, transportation, gathering in production zones, sanitary inspection among others.

5.4 Summary of results

A summary of the results is presented in Tab. 2, alongside a response to the research questions of the study.

Tab. 2

Summary of results

Propositions	Results	Answer to research questions
Proposition 1	Supported	RQ1: Supply chain disruptions are a factor considered by companies when deciding to outsource logistics
Proposition 2	Supported	RQ2: Supply chain disruptions have a positive and negative effect on the relationship of a company and its 3PLs provider
Proposition 3	Supported	
Proposition 4	Not supported	RQ3: Supply chain disruptions don't enhance the relationship of a company with its 3PLs provider by developing strategic outsourcing due to contextual factors
Proposition 5	Not supported	

Source: own elaboration

6. CONCLUSIONS

In the past years, a fairly new research area has emerged in supply chain management literature and has gained considerable attention from academics and practitioners, which is supply chain risk management. This concept gains relevance in a relatively unstable world and increasingly sensitive supply chains. This study focuses its attention on supply chain disruptions that are becoming more frequent and represent a serious threat to companies. The main objective of this research was to get a better understanding on the landscape of the relationship between a company and its 3PLs provider, and how this relationship develops in a situation of supply chain disruptions, focusing on how supply chain disruptions influence the relationship of a company and its 3PLs provider in becoming a strategic

outsourcing partner. To accomplish this objective, five propositions were presented based on an extensive literature review, obtaining qualitative data from interviews to managers that accomplished a set of criteria.

Despite the relevant literature base, this study provided additional value to this research area stating the relevance and importance of supply chain disruptions to enhance managerial decision making. Proposition 1 served to ascertain that supply chain disruptions are a factor considered by companies when deciding to outsource logistics. Propositions 2 and 3, based on the resource-based theory and the transaction cost theory, served to confirm that supply chain disruptions affect positively and negatively on the relationship of a company and its 3 PLs provider. Finally, propositions 4 and 5, by not being supported, indicate that supply chain disruptions don't enhance the relationship of a company with its 3PLs provider by developing strategic outsourcing practices due to contextual factors. The contextual factors influencing the responses, may fall under geographical differences already found in literature and are proven to be significant in supply chain design.

Several managerial implications can be deduced from this study. First, one contribution of this study is that companies outsource logistics in a tactical way, under the main consideration of price of the service as predominant factor, thus its relationship with the 3PLs provider is not based on collaborative links, hampering the desired goal of moving into a relationship of strategic logistics outsourcing. Second, supply chain disruptions are a factor considered when deciding to outsource logistics, recognizing that 3PLs providers offer valuable resources to companies, but at the same time, logistics disruptions have the potential to represent a transaction uncertainty; thus, managers should consider how to manage risks, as well as the relationship with its 3PLs providers in order to obtain the final goal of conforming a strategic outsourcing relationship that leads to a competitive advantage. And third, understand that contextual factors have an important influence on the effect of supply chain disruptions on the relationship of companies and its 3PLs provider. Therefore, managers could emphasize on the understanding of the context and main influential factors in that situation, and evaluate how those specific factors will influence on the relationship with a 3PLs supplier when intending to develop a strategic outsourcing relationship.

Moving forward, three potential research opportunities are noteworthy. First, develop this study from the point of view of the logistics provider. This observation is common in recent literature where there is a lack of articles that analyze supply chain risk management from the standpoint of the logistics provider rather than the company that outsources its logistics. The aim of such research would be useful as a research gap already identified in literature that could give interesting results regarding how logistics providers manage supply chain risks and how they use its capacity and expertise to deal with supply chain disruptions as a competitive advantage in the market. Second, replicating the study in a different setting would be a consequential next step. The results obtained in this study hold true for settings and firms with a similar political, economic, and geographic setting. Therefore, the objective of replicating this study in other settings may support the results obtained, or otherwise understand how supply chain disruptions affect the relationship between a company and its logistics provider in other settings with presumably different risk profiles. Third, an empirical study that analyzes supply chain disruptions in a setting where logistics providers are able to undertake the logistics of the complete supply chain of a company. Results of such research would bring light on how logistics providers manage logistics disruptions holistically in the presence of contracts where they assume responsibility of the goods transported, therefore considering the factor of supply chain risk management as a more predominant factor of competitive advantage.

Regarding the limitations of the study, the first and most important was the use of non-probability convenience sampling, which may hamper generalizability as well as present the threat of sampling bias. The reason for using this technique was the limitation of resources, among them considering time as the most important. Convenience sampling was employed due to the urgency of collecting data in a limited period of time, when a probability criterion sampling would have been impossible to perform. The second limitation was presented in the data analysis phase, where the use of intercoding is necessary to ensure reliability of data analysis. The reason for not using an intercoding strategy was the limitation of human resources. This strategy demands at least two researchers that would work together to consolidate a final set of codes before the elaboration of the networks, both with expertise on the study, as well as on the use of a qualitative analysis software. Finally, the limited

access to data represented a difficulty while analyzing the results. The sampling setting identified eight companies, but only three were ultimately reachable and considered for this research. It would have been optimal to include more units of analysis and perform more interviews to managers with the aim of getting more data in quality and quantity.

REFERENCES

- Aktas, E., & Ulengin, F. (2005). Outsourcing logistics activities in Turkey. *Journal of Enterprise Information Management*, 18(3), 316–329.
<https://doi.org/10.1108/17410390510591996>
- Ambulkar, S., Blackhurst, J., & Grawe, S. (2014). Firm's resilience to supply chain disruptions: Scale development and empirical examination. *Journal of Operations Management*, 33–34(1), 111–122. <https://doi.org/10.1016/j.jom.2014.11.002>
- Anderson, C. (2010). Presenting and Evaluating Qualitative Research. *American Journal of Pharmaceutical Education*, 74(8), 141. <https://doi.org/10.5688/aj7408141>
- Andersson, D., & Norrman, A. (2002). Procurement of logistics services—a minutes work or a multi-year project? *European Journal of Purchasing & Supply Management*, 8(1), 3–14. [https://doi.org/10.1016/s0969-7012\(01\)00018-1](https://doi.org/10.1016/s0969-7012(01)00018-1)
- Aubert, B. A., Rivard, S., & Patry, M. (2004). A transaction cost model of IT outsourcing. *Information & Management*, 41(7), 921–932.
<https://doi.org/10.1016/j.im.2003.09.001>
- Baawain, M. S., Nour, M. H., El-Din, A. G., & El-Din, M. G. (2005). El Niño southern-oscillation prediction using southern oscillation index and Niño3 as onset indicators: Application of artificial neural networks. *Journal of Environmental Engineering and Science*, 4(2), 113–121. <https://doi.org/10.1139/s04-047>
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Bhatnagar, R., Sohal, A. S., & Millen, R. (1999). Third party logistics services: a Singapore perspective. *International Journal of Physical Distribution & Logistics Management*, 29(9), 569–587. <https://doi.org/10.1108/09600039910287529>
- Blackhurst, J., Craighead, C. W., Elkins, D., & Handfield, R. B. (2005). An empirically derived agenda of critical research issues for managing supply-chain disruptions. *International Journal of Production Research*, 43(19), 4067–4081.
<https://doi.org/10.1080/00207540500151549>
- Blackhurst, J., Dunn, K. S., & Craighead, C. W. (2011). An Empirically Derived Framework of Global Supply Resiliency. *Journal of Business Logistics*, 32(4), 374–391.
<https://doi.org/10.1111/j.0000-0000.2011.01032.x>

- Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding Responses to Supply Chain Disruptions: Insights from Information Processing and Resource Dependence Perspectives. *Academy of Management Journal*, 54(4), 833–856. <https://doi.org/10.5465/amj.2011.64870145>
- Bolumole, Y. A. (2001). The Supply Chain Role of Third-Party Logistics Providers. *The International Journal of Logistics Management*, 12(2), 87–102. <https://doi.org/10.1108/09574090110806316>
- Bolumole, Y. A., Frankel, R., & Naslund, D. (2007). Developing a theoretical framework for logistics outsourcing. *Transportation Journal*, 46(2), 35–54.
- Boyson, S., Corsi, T., & Rabinovich, E. (1999). Managing effective third party logistics relationships: what does it take? *Journal of Business Logistics*, 20(1), 73–100.
- Caves, R. E. (1980). Industrial organization, corporate strategy and structure. *Readings in Accounting for Management Control*, 335–370. https://doi.org/10.1007/978-1-4899-7138-8_16
- Cheong, M. L. F. (2004). Logistics outsourcing and 3PL challenges. *Challenges*, (November), 1, 1–8.
- Chopra, S., & Sodhi, M. (2014). Reducing the risk of supply chain disruptions. *MIT Sloan Management Review*, 55, 72–80.
- Christopher, M. (1993). Logistics and competitive strategy. *European Management Journal*, 11(2), 258–261. [https://doi.org/10.1016/0263-2373\(93\)90049-n](https://doi.org/10.1016/0263-2373(93)90049-n)
- Christopher, M., Mena, C., Khan, O., & Yurt, O. (2011). Approaches to managing global sourcing risk. *Supply Chain Management: An International Journal*, 16(2), 67–81. <https://doi.org/10.1108/13598541111115338>
- Cohen, M. A., & Kunreuther, H. (2009). Operations Risk Management: Overview of Paul Kleindorfer's Contributions. *Production and Operations Management*, 16(5), 525–541. <https://doi.org/10.1111/j.1937-5956.2007.tb00278.x>
- Craighead, C. W., Blackhurst, J., Rungtusanatham, M. J., & Handfield, R. B. (2007). The Severity of Supply Chain Disruptions: Design Characteristics and Mitigation Capabilities. *Decision Sciences*, 38(1), 131–156. <https://doi.org/10.1111/j.1540-5915.2007.00151.x>

- Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative Research Designs. *The Counseling Psychologist*, 35(2), 236–264.
<https://doi.org/10.1177/0011000006287390>
- Dapiran, P., Lieb, R., Millen, R., & Sohal, A. (1996). Third party logistics services usage by large Australian firms. *International Journal of Physical Distribution & Logistics Management*, 26(10), 36–45. <https://doi.org/10.1108/09600039610150442>
- de Vita, G., Tekaya, A., & Wang, C. L. (2010). Asset specificity's impact on outsourcing relationship performance: A disaggregated analysis by buyer–supplier asset specificity dimensions. *Journal of Business Research*, 63(7), 657–666.
<https://doi.org/10.1016/j.jbusres.2009.04.019>
- Denzin, N. K., & Lincoln, Y. S. (1995). Editors' Introduction. *Qualitative Inquiry*, 1(1), 3–6.
<https://doi.org/10.1177/107780049500100101>
- Dobie, K., Glisson, L. M., & Grant, J. (2000). Terrorism and the global supply chain: where are your weak links? *Journal of Transportation Management*, 12(1), 57–66.
<https://doi.org/10.22237/jotm/954547560>
- Ellram, L. M. (1996). The use of the case study method in logistics research. *Journal of Business Logistics*, 93–138.
- Etokudoh, E. P., Boolaky, M., & Gungaphul, M. (2017). Third Party Logistics Outsourcing: An Exploratory Study of the Oil and Gas Industry in Nigeria. *SAGE Open*, 7(4), 215824401773556. <https://doi.org/10.1177/2158244017735566>
- Fawcett, S. E., Birou, L., & Taylor, B. C. (1993). Supporting global operations through logistics and purchasing. *International Journal of Physical Distribution & Logistics Management*, 23(4), 3–11.
- Fiksel, J. (2006). Sustainability and resilience: toward a systems approach. *Sustainability: Science, Practice and Policy*, 2(2), 14–21.
<https://doi.org/10.1080/15487733.2006.11907980>
- Gargasas, A., & Mūgienė, I. (2018). Creation and evaluation of logistic services value. *Management Theory and Studies for Rural Business and Infrastructure Development*, 40(2), 187–197. <https://doi.org/10.15544/mts.2018.18>
- Gattorna, J., Day, A., & Hargreaves, J. (1991). Effective Logistics Management. *Logistics Information Management*, 4(2), 2–86.
<https://doi.org/10.1108/09576059110143603>

- Geyskens, I., Steenkamp, J. B. E. M., & Kumar, N. (2006). Make, Buy, or Ally: A Transaction Cost Theory Meta-Analysis. *Academy of Management Journal*, 49(3), 519–543. <https://doi.org/10.5465/amj.2006.21794670>
- Godfrey, P. C., & Hill, C. W. L. (1995). The problem of unobservables in strategic management research. *Strategic Management Journal*, 16(7), 519–533. <https://doi.org/10.1002/smj.4250160703>
- Grewal, C. S., Sareen, K. K., & Gill, S. (2008). A multicriteria logistics-outsourcing decision making using the analytic hierarchy process. *International Journal of Services Technology and Management*, 9(1), 1. <https://doi.org/10.1504/ijstm.2008.016808>
- Halldórsson, R., & Skjøtt-Larsen, T. (2004). Developing logistics competencies through third party logistics relationships. *International Journal of Operations & Production Management*, 24(2), 192–206. <https://doi.org/10.1108/01443570410514885>
- Harland, C., Brenchley, R., & Walker, H. (2003). Risk in supply networks. *Journal of Purchasing and Supply Management*, 9(2), 51–62. [https://doi.org/10.1016/s1478-4092\(03\)00004-9](https://doi.org/10.1016/s1478-4092(03)00004-9)
- Haunschild, P. R., & Miner, A. S. (1997). Modes of Interorganizational Imitation: The Effects of Outcome Salience and Uncertainty. *Administrative Science Quarterly*, 42(3), 472. <https://doi.org/10.2307/2393735>
- Hendricks, K. B., & Singhal, V. R. (2003). The effect of supply chain glitches on shareholder wealth. *Journal of Operations Management*, 21(5), 501–522. <https://doi.org/10.1016/j.jom.2003.02.003>
- Hertz, S., & Alfredsson, M. (2003). Strategic development of third party logistics providers. *Industrial Marketing Management*, 32(2), 139–149. [https://doi.org/10.1016/s0019-8501\(02\)00228-6](https://doi.org/10.1016/s0019-8501(02)00228-6)
- Hoon Hum, S. (2000). A Hayes-Wheelwright framework approach for strategic management of third party logistics services. *Integrated Manufacturing Systems*, 11(2), 132–137. <https://doi.org/10.1108/09576060010314125>
- Hsiao, H., Kemp, R. G., van der Vorst, J. G., & Omta, S. O. (2011). Logistics outsourcing by Taiwanese and Dutch food processing industries. *British Food Journal*, 113(4), 550–576. <https://doi.org/10.1108/00070701111124014>
- Hsiao, H., van der Vorst, J., Kemp, R., & Omta, S. O. (2010). Developing a decision-making framework for levels of logistics outsourcing in food supply chain networks.

- International Journal of Physical Distribution & Logistics Management*, 40(5), 395–414. <https://doi.org/10.1108/09600031011052840>
- Insinga, R. C., & Werle, M. J. (2000). Linking outsourcing to business strategy. *Academy of Management Perspectives*, 14(4), 58–70. <https://doi.org/10.5465/ame.2000.3979816>
- Jiang, H., & Zhao, S. L. (2010). Assessment on Logistics Outsourcing Risk Based on Rough Set Theory and Unascertained Measure Model. *Key Engineering Materials*, 439–440, 51–58. <https://doi.org/10.4028/www.scientific.net/kem.439-440.51>
- Kleindorfer, P. R., Belke, J. C., Elliott, M. R., Lee, K., Lowe, R. A., & Feldman, H. I. (2003). Accident Epidemiology and the U.S. Chemical Industry: Accident History and Worst-Case Data from RMP*Info. *Risk Analysis*, 23(5), 865–881. <https://doi.org/10.1111/1539-6924.00365>
- Kleindorfer, P. R., & Saad, G. H. (2009). Managing Disruption Risks in Supply Chains. *Production and Operations Management*, 14(1), 53–68. <https://doi.org/10.1111/j.1937-5956.2005.tb00009.x>
- Knemeyer, A. M., Zinn, W., & Eroglu, C. (2008). Proactive planning for catastrophic events in supply chains. *Journal of Operations Management*, 27(2), 141–153. <https://doi.org/10.1016/j.jom.2008.06.002>
- König, A., & Spinler, S. (2016). The effect of logistics outsourcing on the supply chain vulnerability of shippers. *The International Journal of Logistics Management*, 27(1), 122–141. <https://doi.org/10.1108/ijlm-03-2014-0043>
- La Londe, B. J., & Cooper, M. C. (1988). *Partnerships in providing customer service: a third party perspective*. Council of Logistics Management. Oak Brook.
- Lai, F., Chu, Z., Wang, Q., & Fan, C. (2013). Managing dependence in logistics outsourcing relationships: evidence from China. *International Journal of Production Research*, 51(10), 3037–3054. <https://doi.org/10.1080/00207543.2012.752591>
- Lambert, D. M., Emmelhainz, M. A., Gardner, E., & Gardner, J. T. (1999). Building successful logistics partnerships. *Journal of Business Logistics*, 20(1), 165–181.
- Langley, C. J. (2020). *2020 Third-party logistics study. The state of logistics outsourcing*. <https://www.infosysbpm.com/portland/resources/documents/third-party-logistics-study.pdf>

- Langley, C. J. (2022). *26th Annual Third-Party Logistics Study: The State of Logistics Outsourcing*. NTT DATA.
- Langley, C. J., & Caphemini. (2009). *The state of logistics outsourcing. 2009 Third party logistics. Results and findings of the 14th annual study*.
http://1i4rh11vccjs3zhs5v8cwkn2.wpengine.netdna-cdn.com/wp-content/uploads/2016/05/State-of-Logistics-Outsourcing_2009-study.pdf
- Large, R. O., Kramer, N., & Hartmann, R. K. (2011). Customer-specific adaptation by providers and their perception of 3PL-relationship success. *International Journal of Physical Distribution & Logistics Management*, 41(9), 822–838.
<https://doi.org/10.1108/09600031111175807>
- Leiblein, M. J., & Miller, D. J. (2003). An empirical examination of transaction- and firm-level influences on the vertical boundaries of the firm. *Strategic Management Journal*, 24(9), 839–859. <https://doi.org/10.1002/smj.340>
- Lieb, R. C., Millen, R. A., & van Wassenhove, L. N. (1993). Third Party Logistics Services: A Comparison of Experienced American and European Manufacturers. *International Journal of Physical Distribution & Logistics Management*, 23(6), 35–44.
<https://doi.org/10.1108/09600039310044894>
- Liu, H. T., & Wang, W. K. (2009). An integrated fuzzy approach for provider evaluation and selection in third-party logistics. *Expert Systems with Applications*, 36(3), 4387–4398. <https://doi.org/10.1016/j.eswa.2008.05.030>
- Manhart, P., Summers, J. K., & Blackhurst, J. (2020). A Meta-Analytic Review of Supply Chain Risk Management: Assessing Buffering and Bridging Strategies and Firm Performance. *Journal of Supply Chain Management*, 56(3), 66–87.
<https://doi.org/10.1111/jscm.12219>
- Martínez, R., Zambrano, E., Nieto López, J. J., Hernández, J., & Costa, F. (2017). Evolución, vulnerabilidad e impactos económicos y sociales de El Niño 2015–2016 en América Latina. *Investigaciones Geográficas*, 68, 65.
<https://doi.org/10.14198/ingeo2017.68.04>
- McIvor, R. (2000). A practical framework for understanding the outsourcing process. *Supply Chain Management: An International Journal*, 5(1), 22–36.
<https://doi.org/10.1108/13598540010312945>

- Mead, P. S., Slutsker, L., Dietz, V., McCaig, L. F., Bresee, J. S., Shapiro, C., Griffin, P. M., & Tauxe, R. V. (1999). Food-Related Illness and Death in the United States. *Emerging Infectious Diseases*, 5(5), 607–625.
<https://doi.org/10.3201/eid0505.990502>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2019). *Qualitative data analysis: A methods sourcebook* (4th ed.). SAGE.
- Moss, P. A., Sutherland, L. M., Haniford, L., Miller, R., Johnson, D., Geist, P. K., Koziol, S. M., Star, J. R., & Pecheone, R. L. (2004). Interrogating the generalizability of portfolio assessments of beginning teachers: A qualitative study,. *Education Policy Analysis Archives*, 12(32), 1–70.
- Narasimhan, R., & Talluri, S. (2009). Perspectives on risk management in supply chains. *Journal of Operations Management*, 27(2), 114–118.
<https://doi.org/10.1016/j.jom.2009.02.001>
- Noble, P. J. (2022, May 12). *The Ukraine-Russia War's Impact On The Supply Chain: Why MRO Optimization Is A Top Priority*. Forbes.
<https://www.forbes.com/sites/paulnoble/2022/05/12/the-ukraine-russia-wars-impact-on-the-supply-chain-why-mro-optimization-is-a-top-priority/>
- Núñez-Carballosa, A., & Guitart-Tarrés, L. (2011). Third-party logistics providers in Spain. *Industrial Management & Data Systems*, 111(8), 1156–1172.
<https://doi.org/10.1108/02635571111170749>
- Peck, H. (2006). Reconciling supply chain vulnerability, risk and supply chain management. *International Journal of Logistics Research and Applications*, 9(2), 127–142. <https://doi.org/10.1080/13675560600673578>
- Pettit, T. J., Fiksel, J., & Croxton, K. L. (2010). Ensuring supply chain resilience: development of a conceptual framework. *Journal of Business Logistics*, 31(1), 1–21. <https://doi.org/10.1002/j.2158-1592.2010.tb00125.x>
- Qureshi, M., Kumar, D., & Kumar, P. (2007). Modeling the logistics outsourcing relationship variables to enhance shippers' productivity and competitiveness in logistical supply chain. *International Journal of Productivity and Performance Management*, 56(8), 689–714. <https://doi.org/10.1108/17410400710833001>

- Rahman, S. (2011). An exploratory study of outsourcing 3PL services: an Australian perspective. *Benchmarking: An International Journal*, 18(3), 342–358.
<https://doi.org/10.1108/14635771111153527>
- Razzaque, M. A., & Sheng, C. (1998). Outsourcing of logistics functions: a literature survey. *International Journal of Physical Distribution & Logistics Management*, 28(2), 89–107. <https://doi.org/10.1108/09600039810221667>
- Robertson, T. S., & Gatignon, H. (1998). Technology development mode: a transaction cost conceptualization. *Strategic Management Journal*, 19, 515–531.
- Rossi, T., Noe, C., & Dallari, F. (2005). A Formal Method for Analyzing and Assessing Operational Risk in Supply Chains. *23rd International Conference of the System Dynamics Society*.
- Shao, X. F. (2013). Supply chain characteristics and disruption mitigation capability: an empirical investigation in China. *International Journal of Logistics Research and Applications*, 16(4), 277–295. <https://doi.org/10.1080/13675567.2013.815695>
- Sink, H. L., Langley, C. J., & Gibson, B. J. (1996). Buyer observations of the US third-party logistics market. *International Journal of Physical Distribution & Logistics Management*, 26(3), 38–46. <https://doi.org/10.1108/09600039610115009>
- Sohail, M. S., Austin, N. K., & Rushdi, M. (2004). The use of third-party logistics services: Evidence from a sub-Saharan African nation. *International Journal of Logistics Research and Applications*, 7(1), 45–57.
<https://doi.org/10.1080/13675560310001619268>
- Speier, C., Whipple, J. M., Closs, D. J., & Voss, M. D. (2011). Global supply chain design considerations: Mitigating product safety and security risks. *Journal of Operations Management*, 29(7–8), 721–736. <https://doi.org/10.1016/j.jom.2011.06.003>
- Stauffer, D. (2003). The weak link in your supply chain. *Harvard Management Update*, 8(3), 3–5.
- Stock, G. N., Greis, N. P., & Kasarda, J. D. (2000). Enterprise logistics and supply chain structure: the role of fit. *Journal of Operations Management*, 18(5), 531–547.
[https://doi.org/10.1016/s0272-6963\(00\)00035-8](https://doi.org/10.1016/s0272-6963(00)00035-8)
- Svensson, G. (2000). A conceptual framework for the analysis of vulnerability in supply chains. *International Journal of Physical Distribution & Logistics Management*, 30(9), 731–750. <https://doi.org/10.1108/09600030010351444>

- Ubilava, D. (2011). El Niño, La Niña, and world coffee price dynamics. *Agricultural Economics*, 43(1), 17–26. <https://doi.org/10.1111/j.1574-0862.2011.00562.x>
- van Laarhoven, P., Berglund, M., & Peters, M. (2000). Third-party logistics in Europe – five years later. *International Journal of Physical Distribution & Logistics Management*, 30(5), 425–442. <https://doi.org/10.1108/09600030010336216>
- Wagner, S. M., & Bode, C. (2006). An empirical investigation into supply chain vulnerability. *Journal of Purchasing and Supply Management*, 12(6), 301–312. <https://doi.org/10.1016/j.pursup.2007.01.004>
- Wagner, S. M., & Bode, C. (2008). An Empirical Examination of Supply Chain Performance along several dimensions of risk. *Journal of Business Logistics*, 29(1), 307–325. <https://doi.org/10.1002/j.2158-1592.2008.tb00081.x>
- Wan, Q., Yuan, Y., & Lai, F. (2019). Disentangling the driving factors of logistics outsourcing: a configurational perspective. *Journal of Enterprise Information Management*, 32(6), 964–992. <https://doi.org/10.1108/jeim-10-2018-0236>
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180. <https://doi.org/10.1002/smj.4250050207>
- Wilding, R., & Juriado, R. (2004). Customer perceptions on logistics outsourcing in the European consumer goods industry. *International Journal of Physical Distribution & Logistics Management*, 34(8), 628–644. <https://doi.org/10.1108/09600030410557767>
- Williamson, O. E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. Free Press, New York, NY.
- Williamson, O. E. (1979). Transaction-cost economics: the governance of contractual relations. *Journal of Law and Economics*, 22(2), 233–261.
- Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3), 548–577. <https://doi.org/10.1086/227496>
- Williamson, O. E. (1985). *The Economic Institutions of Capitalism: Firms, Markets and Relational Contracting*. Free Press, New York.
- Williamson, O. E. (1991). Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36(2), 269. <https://doi.org/10.2307/2393356>

- Williamson, O. E. (1998). Transaction Cost Economics: How It Works; Where It is Headed. *De Economist*, 146(1), 23–58. <https://doi.org/10.1023/a:1003263908567>
- Xiao, S. F. (2014). Study of Supply Chain Management Theory in Manufacturing Innovation. *Applied Mechanics and Materials*, 484–485, 448–452. <https://doi.org/10.4028/www.scientific.net/amm.484-485.448>
- Xiao, X. S. (2012). Business Logistics Outsourcing Risk and Management. *Advanced Materials Research*, 479–481, 1718–1721. <https://doi.org/10.4028/www.scientific.net/amr.479-481.1718>
- Yang, J., Xie, H., Yu, G., & Liu, M. (2020). Antecedents and consequences of supply chain risk management capabilities: an investigation in the post-coronavirus crisis. *International Journal of Production Research*, 59(5), 1573–1585. <https://doi.org/10.1080/00207543.2020.1856958>
- Yeung, K., Zhou, H., Yeung, A. C., & Cheng, T. (2012). The impact of third-party logistics providers' capabilities on exporters' performance. *International Journal of Production Economics*, 135(2), 741–753. <https://doi.org/10.1016/j.ijpe.2011.10.007>
- Yin, R. K. (1990). *Case study research: Design and methods* (2nd ed.). Newbury Park Calif.: Sage.
- Yin, R. K. (1994). Case Study Research. Design and Methods. *Thousand Oaks*, Sage.
- Zacharia, Z. G., Sanders, N. R., & Nix, N. W. (2011). The Emerging Role of the Third-Party Logistics Provider (3PL) as an Orchestrator. *Journal of Business Logistics*, 32(1), 40–54. <https://doi.org/10.1111/j.2158-1592.2011.01004.x>
- Zailani, S., Shaharudin, M. R., Razmi, K., & Iranmanesh, M. (2015). Influential factors and performance of logistics outsourcing practices: an evidence of malaysian companies. *Review of Managerial Science*, 11(1), 53–93. <https://doi.org/10.1007/s11846-015-0180-x>
- Zheng, J., Johnsen, T., Harland, C. M., & Lamming, R. C. (2001). Taxonomy of supply networks. *Proceedings of the 10th International IPSERA Conference*.
- Zhu, W., Ng, S. C., Wang, Z., & Zhao, X. (2017). The role of outsourcing management process in improving the effectiveness of logistics outsourcing. *International Journal of Production Economics*, 188, 29–40. <https://doi.org/10.1016/j.ijpe.2017.03.004>