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## New forms of partnership: the role of logistics clusters in facilitating horizontal collaboration mechanisms

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### ABSTRACT

Although the benefits of horizontal collaboration have been well documented in the literature, research has yet to offer a detailed understanding of the mechanisms that firms employ to create successful horizontal collaboration. Further, the role of logistics clusters in facilitating horizontal collaboration is crucial but not clear yet. This paper addresses these gaps. In order to address the research objectives, we employ a systematic literature review methodology. As a result of this process, one hundred thirty-three (133) papers published in leading academic journals were systematically analyzed. These studies are reviewed under the theoretical lenses of the transaction cost economics (TCE) and the derived identification of governance mechanisms (i.e. joint value propositions, informal governance, formal governance and information exchange) to achieve successful horizontal collaboration. Further, we provide a detailed description of how logistics clusters can facilitate and promote the development of such mechanisms, illustrated with companies' best practices. As a result, several testable research propositions are put forth.

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Logistics clusters; horizontal collaboration; joint value propositions; governance; information exchange

## Introduction

Companies face continuous pressures to reduce costs and cope with constantly changing customer requirements (Christopher & Holweg, 2011; Pujawan, Arief, Tjahjono, & Kritchanchai, 2015). In response, many have turned to horizontal collaboration as a source of competitive advantage (Soosay & Hyland, 2015). Described as a form of inter-firm relation between companies in the same echelon of supply chains, researchers contend that horizontal collaboration yields a variety of benefits for participant firms. For example, horizontal collaboration can lower cost, improve customer service (Vanovermeire, Sörensen, Breedamb, Vannieuwenhuyseb, & Verstrepen, 2014), spur innovation, reduce environmental impact, and detect potential synergies for the parties involved (Sheffi, 2012). They can 'balance the utilization of production capacity, minimizing unsatisfied demand, minimizing purchasing sales, and distribution costs' (Albino, Carbonara, & Giannoccaro, 2007, p. 265). Horizontal collaboration also allows for the maintenance of business processes (Solesvik & Encheva, 2010), can improve business flexibility, facilitate

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a rapid response to changing environments, and enable adoption of new technology and production techniques (Braguinsky & Rose, 2009). As markets expand, horizontal collaboration can help consolidate product flows and improve adaptation to demand variations through risk pooling that in turn allows firms to increase or maintain their market power (Hingley, Lindgreen, Grant, & Kane, 2011; Mason, Lalwani, & Boughton, 2007; Pomponi, Fratocchi, & Rossi Tafuri, 2015).

Although the benefits of horizontal collaboration have been well documented in the literature, research has yet to offer a good understanding of the mechanisms that firms employ to create successful horizontal collaboration. Brekalo and Albers (2016) systematic literature review explores horizontal logistics alliances and points out the need for additional research in this area. As such, the first research question that we put forth is: What are the mechanisms that firms employ to develop successful horizontal collaboration?

Logistics clusters are defined as geographical agglomerations of firms providing logistics services and firms with logistics-intensive operations for whom logistics represents an important part of their business (Sheffi, 2012). This new form of collaboration (i.e. logistics clusters) has the potential to facilitate and sustain the development of the mechanisms firms employ to develop successful horizontal collaboration. Logistics clusters can foster these mechanisms by providing an environment of physical proximity, pooled resources, shared culture, and related factors (Bolumole, Closs, & Rodammer, 2015; Sheffi, 2012). Horizontal collaboration has been successfully utilized for joint logistics activities, leading to better utilization of distribution and transportation resources (Verdonck, Caris, Ramaekers, & Janssens, 2013).

Industry examples also provide evidence of logistics clusters' potential to facilitate and foster the development of horizontal collaboration. Nestlé, PepsiCo, STEF (a logistics service provider), and TRI-VIZOR (a neutral trustee) engaged in horizontal collaboration resulting in savings of up to 15% in transport costs and an even greater reduction in CO2 emissions for the three firms (Jacobs, Van Lent, Verstrepren, & Bogen, 2014). Another relevant example is the collaborative arrangement between Procter and Gamble and Tupperware that resulted in significantly lower transportation and distribution costs, but after facing several logistics challenges (Muylaert, 2014). The arrangement has increased the utilization of each truck from 50% to 85%, thus improving delivery frequency and service levels. Other examples of successful horizontal collaboration are the collaborative transportation network of Nestlé, Colgate Palmolive, and Mondelez and the joint warehouse collaborative deliveries of Mars, United Biscuits, Saupiguat and Wrigley (Guinouet, Jordans, & Cruijssen, 2012).

Although there is evidence that logistics clusters can spur and sustain the development of horizontal collaboration, research does not offer a clear understanding of the process. As such, our second research question asks: How do logistics clusters facilitate horizontal collaboration?

In order to address these two research gaps we employ a systematic literature review methodology (Saenz & Koufteros, 2015; Tranfield, Denyer, & Smart, 2003) and analyze the results under the theoretical lenses of the transaction cost economics (TCE) (Williamson, 1991), and the derived identification of governance mechanisms (Jones, Hesterly, & Borgatti, 1997). Because of our research, we offer a detailed description of each of the governance mechanisms that firms employ to maximize the potential benefits of horizontal collaboration, i.e. joint value propositions, informal governance, formal governance and

information exchange. Furthermore, we address the second gap by offering a detailed description of how logistics clusters facilitate and foster the mechanisms that firms employ to develop successful horizontal collaboration.

The rest of our paper is organized as follows. First, we introduce the methodology employed to address the research questions. The following section introduces the mechanisms that firms utilize to facilitate horizontal collaboration and describes how logistics clusters enable and foster these mechanisms. Next, we present our conclusions as well as the implications for literature and practice. Finally, we offer noteworthy avenues for future research.

## Methodology

The methodology followed by our research is based on systematic literature review for understanding the role of logistics clusters in facilitating horizontal collaboration. To do so, we integrate the lenses of effective governance mechanisms to better focus on the understanding of how firms achieve successful practices in this domain. For that purpose, we based our analysis of the literature under the theoretical approach developed by Williamson (1991) about the transaction cost economics (TCE).

The systematic literature review methodology facilitates comprehensive search, appraisal, and synthesis of relevant studies on a specific topic (Tranfield et al., 2003). The use of predetermined, explicit criteria facilitates comparability and replicability of the findings. Thus, the methodology provides a multidisciplinary comprehensive coverage of articles and publications on horizontal collaboration and logistics clusters.

The employed method comprises six phases: planning, searching, filtering, screening, extracting, and synthesizing. In the *planning* stage we define the research questions stated in the introduction. Figure 1 depicts a summary of the process.

In the *searching* stage, we looked for relevant literature in the areas of supply chain management, business management, organizational behaviour, and economics. We excluded articles focused on the pharmaceutical, healthcare, computer industries, and

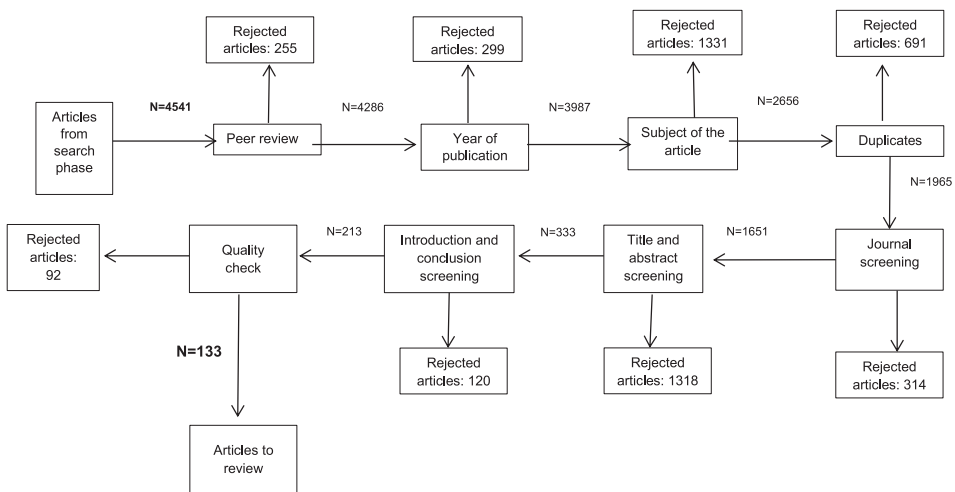


Figure 1. Screening and filtering process.

environment because they focus on singular/one-time event logistics, as opposed to logistics as a continuous process. Five databases were used due to their relevance to this literature: EBSCO, JSTOR, Emerald, Wiley, and Science Direct. We searched each database using a set of words defined by the authors in the articles' title, content, and abstract. These words included: collaboration, cooperation, horizontal collaboration, agglomeration economies, industrial clusters, and logistics clusters. These keywords were also used to create search strings with 'AND' and 'OR' Boolean connectors (see Appendix A, Table A1). The keywords were selected in order to generate a wide list of articles related to the topic of interest. The total number of articles in this stage was 4,541.

The large number of articles raised the need for filters. In the *filtering* stage we used the following criteria for selection: (1) articles published in peer-reviewed journals to better ensure quality (Saenz & Koufteros, 2015); (2) published in the last 20 years, because during this period literature on clusters has flourished; and (3) related to business, management, industries, clusters, districts, inter-firm relationships, industrial concentration and location, logistics, transportation, supply chain, and economic geography. We were left with 2,656 articles.

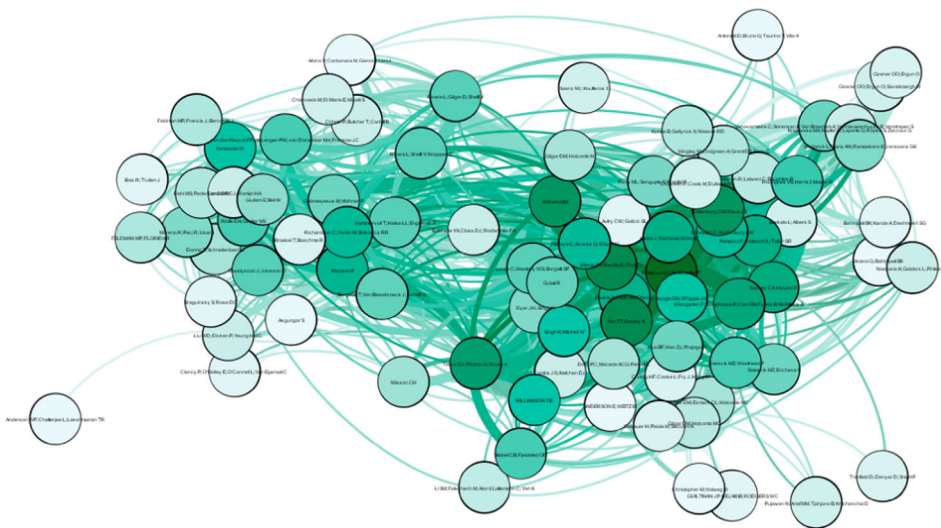
In the *screening* stage, duplicates were eliminated (i.e. articles showing up more than once across the multiple search databases), then the relevance of each article was checked to satisfy three pre-specified conditions: (1) the analysis was at the firm level, (2) referred to horizontal collaboration, and (3) was related to logistics clusters (see Appendix A, Table A2). Therefore, we excluded articles in which the word 'relationship' was misinterpreted or referred to a concept other than firm relationships, as well as articles referring to collaboration between supply chain partners or buyer-supplier relationships since they represent vertical relationships. We also eliminated articles related to humanitarian logistics clusters, health care clusters, and policy analysis as the identified articles didn't provide novel insights into the topic of interest. Additionally, we conducted a *journal screening*. During this process we eliminated articles from journals with very low impact factors (i.e. below 1), except for articles with citations. We retained articles with citations because a journal's impact factor is linked to the aggregate number of citations per article. A total number of 314 articles were eliminated during this stage. The remaining papers were checked for quality, which included alignment between research questions, chosen methods, research execution, and methodological rigour. These quality checks are listed in Figure 1 under the 'Title and abstract screening' and 'Introduction and conclusion screening' steps. Each team member reviewed the articles independently. An article was eliminated if it received more than one elimination vote from the research team. Articles with one exclusion vote were further evaluated by the researchers as a team in order to reach consensus. Ninety-two articles were eliminated during this process leading to a final sample of 133 papers focused on the relation between horizontal collaboration and logistics clusters. See the complete list of journals represented in Appendix A, Table A3, where European Planning Studies has a prominent role.

In the *extracting* phase, the content of each of the 133 papers was analyzed and recorded on a spreadsheet according to methodological and thematic categories. This classification helped identify the mechanisms for successful and sustainable horizontal collaboration practices. The identification of these categories was cross-validated by the authors in an iterative fashion until agreement was reached (Saenz & Koufteros, 2015). Afterwards, in the *synthesizing* phase, we compiled the relevant article findings to help address the research questions.

In this phase we also provide various analyses to understand the structure and characteristics of the literature reviewed. **Figure 2** shows the networks of citations in the field of study. Darker nodes are works that are highly cited in the studied sample of the literature, while brighter are less cited. **Table 1** shows the top 10 most cited works by papers in the field. We can observe that the most influential articles are relatively recent (i.e. 8 out of 10 were published after 2010). This is evidence of an increasing literature discussion on supply chain horizontal collaboration.

The literature was classified into two main categories: research methodology and industry. **Figure 3** shows the classification of the final sample of 133 papers by research methodology into three main categories: Literature review, theoretical and practical. Practical studies account for the majority of the field (55%), while the remaining works are distributed equitably between theoretical (24%) and practical (21%). Practical studies can be qualitative (58%) or quantitative (42%). Most common qualitative and quantitative research methods are case studies (53%) and analytical (43%), respectively on each category. On the other hand, **Figure 4** shows the classification for 119 industry-specific studies. Even though we found studies on a wide industry range (18 industries), the majority of studies are grouped into two categories that account for the 73% of the sample: Logistics (48) and General industry (39).

To address the research questions, based on the theoretical foundations of our research analysis, each member of the research team sought to identify possible horizontal collaboration governance mechanisms within each article reviewed. As a mechanism was identified, every author scrutinized each subsequently reviewed article for the identified mechanism, kept track of the frequency with which the mechanism emerged in the literature, and ranked the mechanisms primarily based on frequency. During this iterative process, the members of the research team met several times (virtual meetings due to geographical distance) to discuss and compare findings. Concomitantly, as collaboration mechanisms emerged from the literature, articles were examined to gain insights on the role of logistics clusters in facilitating horizontal collaboration. These meetings helped

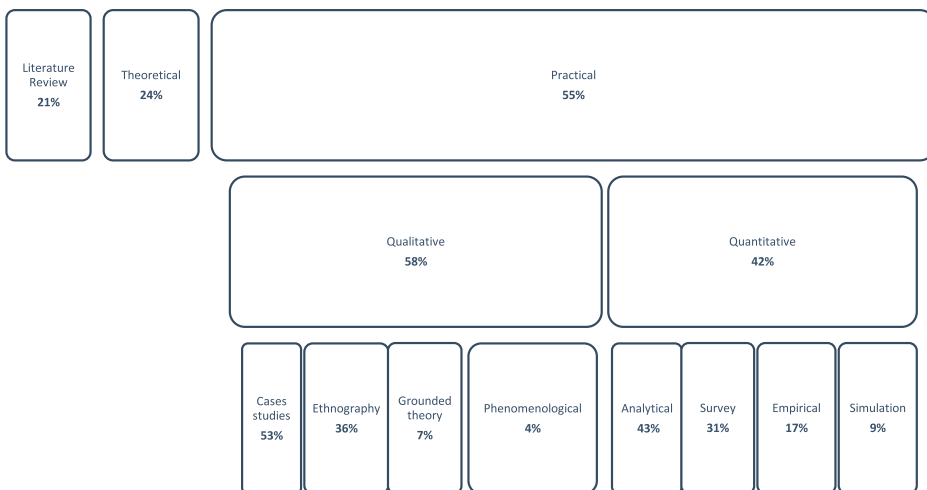


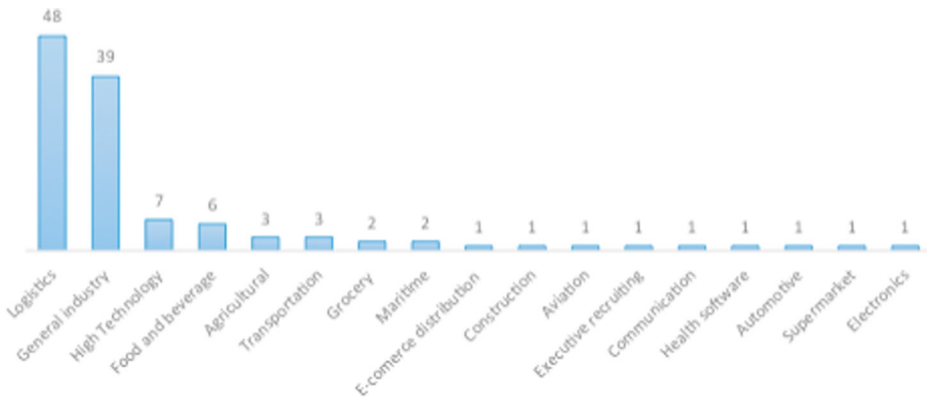
**Figure 2.** Network of citations in the field of study.

**Table 1.** Top 10 most cited works by papers in the field.

Authors	Number of citations by articles in the field	Article title	Journal
Wallenburg & Schaffler (2014)	42	The interplay of relational governance and formal control in horizontal alliances: A social contract perspective	Journal of Supply Chain Management
Villena et al. (2011)	35	The dark side of buyer-supplier relationships: A social capital perspective	Journal of Operations Management
Yan and Dooley (2014)	35	Buyer-supplier collaboration quality in new product development projects	Journal of Supply Chain Management
Wilhelm (2011)	32	Managing coepetition through horizontal supply chain relations: Linking dyadic and network levels of analysis	Journal of Operations Management
Wallenburg and Raue (2011)	32	Conflict and its governance in horizontal cooperations of logistics service providers	International Journal of Physical Distribution and Logistics Management
Teece et al. (1997)	30	Dynamic capabilities and strategic management	Strategic Management Journal
Wiengarten et al. (2010)	28	Collaborative supply chain practices and performance: exploring the key role of information quality	Supply Chain Management: An International Journal
Soosay and Hyland (2015)	27	A decade of supply chain collaboration and directions for future research	Supply Chain Management: An International Journal
Pomponi, Fratocchi, Rossi Tafuri, and Palombo (2015)	26	Horizontal Collaboration In Logistics: A Comprehensive Framework.	Research in Logistics & Production
Vieira, Yoshizaki and Ho (2009)	26	Collaboration intensity in the Brazilian supermarket retail chain	Supply Chain Management: An International Journal

researchers cross-check findings and ensured a common understanding and labeling of the emergent mechanisms across the team members. This process also allowed each reviewer to be sensitive to collaboration mechanisms the rest of the team members identified. The researchers met several times to discuss and compare the findings to reach inter-coder reliability close to 100%.

**Figure 3.** Classification of the literature by research methodology.



**Figure 4.** Classification of the literature by industry type.

### Governance mechanisms for horizontal collaboration in logistics clusters

As part of our research analysis, we apply the lenses of effective governance mechanisms to better describe the practices behind of successful horizontal collaboration in logistics clusters. These lenses are based on the transaction cost economics theory that proposes governance forms as coordinating and control mechanisms (Williamson 1991). More specifically, Jones et al. (1997) integrates transaction cost economics and social network theories, proposing that governance mechanisms in relationships are a response of exchange conditions. In our research we envision that both forms of relationships, horizontal collaboration and logistics clusters, require governance mechanisms that drive firms towards structurally embedding their transactions, as well as use social mechanisms for coordinating their exchanges. In that regards, Jones et al. (1997) integrate social context of firms relationships into the transaction cost economics approach. They pose that exchange conditions require high adaptation and coordination. Within this body of literature, Granovetter (1985) recognizes the embeddedness arguments that propose the consideration of structures of social relationships.

Based on these seminal works, we will lever on the definition of governance forms as ‘mechanisms that enhances coordination and reduce behavioural uncertainty among exchange partners ... , which reduces transaction costs, gaining comparative advantage over markets’ (Jones et al., 1997, p. 913). With these theoretical lenses, we reviewed the papers extracted from the Systematic Literature Review, according to the main research questions posed previously.

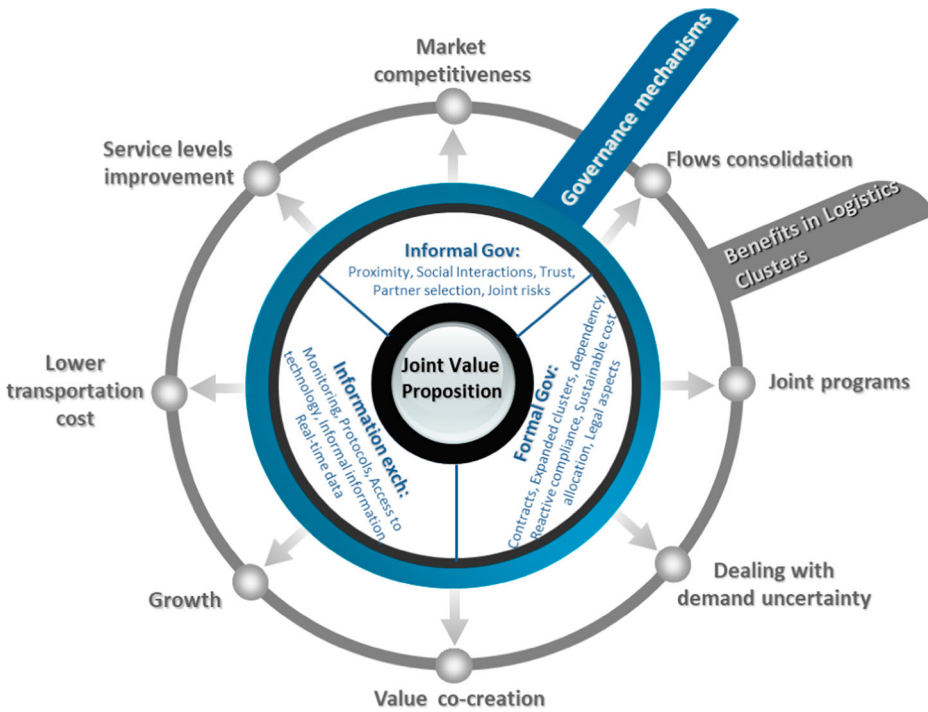
These theoretical lenses helped to identify how to structure the analysis of the papers extracted through the systematic literature review. Consequently we have focused our attention around the main governance mechanisms that firms employ to achieve successful horizontal collaboration: joint value propositions, informal governance, formal governance, and information exchange (Table 2).

In order to complete the research work, we analyzed through the systematic literature review, the consequences of implementing these governance mechanisms in terms of the benefits in logistics clusters. Finally, we integrate the different governance mechanisms, and the benefits in logistics clusters as presented in the visualization of Figure 5.



**Table 2.** Mechanisms for Horizontal Collaboration.

Mechanism	Reference Article
Joint value Propositions	Zeitlin (1992); Nilsson (1997); Malmberg and Maskell (1997); Teece et al. (1997); Fesser (1998); Scott (1998); Clancy, O'Malley, O'Connell, and Van Egeraat (2001); Yamawaki (2002); Finholt (2003); Olson (2003); Caniëls and Romijn (2003); Florax and Plane (2004); Morosini (2004); Pekkarinen (2005); Pekkarinen (2005); Audretsch and Lehmann (2006); Albino et al. (2007); Crijssen et al. (2007); Krajewska et al. (2008); Naesens et al. (2009); Osterwalder and Pigneur (2010); Chiarvesio, Di Maria, and Micelli (2010); Hingley et al. (2011); Van den Heuvel, De Langen, Van Donselaar, and Fransoo (2011). Sheffi (2012); Rai et al. (2012); Verdonck et al. (2013); Yan and Dooley (2014); Saenz et al. (2014); Xu and Carey (2014); Chhetri et al. (2014); Hammervoll et al. (2014)
Informal Governance	Saxenian (1994); Asheim (1996); Malmberg and Maskell (1997); Baptista (1998); Green and McNaughton (2000); Kotzab and Teller (2003); Morosini (2004); Wolfe and Gertler (2003); Dahl and Pedersen (2004); Döring and Schnellenbach (2006); Moodysson and Jonsson (2007); Vieira et al. (2009); Solesvik and Westhead (2010); Li et al. (2010); Wilhem (2011); Schmoltzi and Wallenburg (2011); Wallenburg and Raue (2011); Sheffi (2012); Gebreeyesus and Mohnen (2013); Hammervoll et al. (2014); Chhetri et al. (2014); Wallenburg and Schäffler (2014).
Formal Governance	Lazzarini et al. (2001); Yamawaki (2002); Perry et al. (2004); Ashai et al. (2007); Crijssen et al. (2007); Albino et al. (2007); Özener and Ergun (2008); Schmoltzi and Wallenburg (2011); Özener et al. (2011); Wallenburg and Schäffler (2014)
Information Exchange	Marshall (1920); Asheim (1996); Baptista (1998); Fesser (1998); Yamawaki (2002); Anderson, Chatterjee, and Lakshmanan (2003); Sölvell et al. (2003); Fleischmann et al. (2004); Li et al. (2010); Wolfe and Gertler (2003); Giuliani and Bell (2005); Feldman, Francis, and Bercovitz (2005); Asheim and Gertler (2005); Maskell et al. (2006); Moreno et al. (2006); Döring and Schnellenbach (2006); Akgüngör (2006); Cooke, De Laurentis, Tödting, and Trippel (2007); Morgan (2007); Sturgeon, Van Biesebroeck, and Gereffi (2008); Boix and Trullén (2010); Antonelli, Patrucco, and Quattraro (2011); Molina, Molina, and Garrigós (2011); Rai et al. (2012); Richardson, Yamin, and Sinkovics (2012); Saenz et al. (2014); Chhetri et al. (2014).



**Figure 5.** Framework of governance mechanisms for horizontal collaboration in logistics clusters.

Next, we present these governance mechanisms and describe in each of the following subsections how logistics clusters facilitate each mechanism and, therefore, spur and sustain horizontal collaboration among firms within the cluster. As a consequence of this analysis, several research propositions are posed.

### *Joint value propositions*

The joint value proposition is a statement of purpose that helps firms define how they will collaborate to co-create value (Osterwalder & Pigneur, 2010) and transactional advantages (Granovetter, 1985). The process of definition of joint value proposition that drives the relationship between two firms is an effective mechanism that enhances coordination and reduce behavioural uncertainty along the exchange (Jones et al., 1997).

In order to define an appropriate and sustainable value proposition, each firm's dynamic capabilities (i.e. 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece, Pisano, & Shuen, 1997, p. 516)) should be identified for leveraging the collaboration. Additionally, complementary operational capabilities should be deployed (Gebauer, Paiola, & Saccani, 2013).

### *The role of logistics clusters in facilitating the development of joint value propositions*

Firms within logistics clusters can more easily come together to collaborate and develop joint value propositions. Logistics clusters facilitate the generation of such propositions in several ways. Logistics clusters allow for easier communication between companies located within the same cluster, thus allowing companies to more easily identify opportunities for horizontal collaboration. Research indicates that logistics clusters facilitate rapid decision-making and reduce the degree of uncertainty surrounding outputs (Malmberg & Maskell, 1997). Understanding the source that create uncertainty influence what value proposition could be jointly formulated for the benefit of the collaboration (Jones et al., 1997). Firms within the same logistics cluster can also formulate joint value propositions based on reduced transportation (Morosini, 2004) and transaction costs (Audretsch & Lehmann, 2006; Finholt, 2003; Olson, 2003) resulting from co-location.

Bridgestone and Continental, the tire manufacturers, offer a good example of how logistics clusters facilitate the development of joint value propositions. The two companies realized that sharing a distribution centre would allow them to lower cost, improve service and better compete with Michelin, the market leader. The companies operate a distribution facility that is shaped like an 'H'. Each company is located on a separate side and shipments are handled and combined in the middle. Logistics clustering allowed these two companies to formulate a mutually advantageous value proposition that resulted in cost reductions and more frequent services to dealers for both partners (Sheffi, 2012). Seminal research work from Williamson (1991) and Jones et al. (1997) highlighted that frequent exchange among parties is an important determinant of joint governance from learning by doing and deeper identification of each party's contribution.

Another example of how logistics clusters offer opportunities for the development of joint value propositions comes from three Scandinavian companies in the forest and paper products business. StoraEnso, Norske Skog, and UPM consolidated their inbound flows on a single, dedicated, short sea-lane vessel. The vessel picks up inbound material

in Sweden and Finland for delivery on a biweekly schedule into the Antwerp port and logistics cluster, where the three companies have distribution centres. The horizontal collaboration allowed the companies to reduce their transportation and handling costs, and improve service through more frequent and reliable replenishments of the Antwerp distribution centres (Sheffi, 2012, p. 101).

Research indicates that logistics clusters can facilitate the development of a plethora of other joint value propositions. For example, firms within the cluster can collaborate with other firms located within the same cluster to achieve lower logistics and operational costs of transactions, reduction of CO<sub>2</sub> emissions, improved service levels, better vehicle asset utilization (Crujssens, Cools, & Dullaert, 2007; Naesens, Gelders, & Pintelon, 2009), reduction of lead times through the use of infrastructure (Chhetri, Butcher, & Corbitt, 2014), process standardization, improved management of demand variability, flow consolidations, increased market competitiveness and value added services co-creation (Sheffi, 2012), joint product development (Yan & Dooley, 2014), resource sharing in the form of truckload space sharing, warehouse space sharing, routes sharing (Krajewska, Kopfer, Laporte, Ropke, & Zaccour, 2008), employee sharing, knowledge sharing (Chhetri et al., 2014), and gain new competencies to better anticipate and fulfill consumers' needs (Cante, Calluzzo, Schwartz, & Schwartz, 2004).

In addition, research indicates that exchanges in human assets specificity creates dependency between parties (Jones et al., 1997). Logistics clusters offer value propositions resulting from the availability of a large pool of skilled workers (who would take less time rotating between companies given that they are close to each other), increased specialization due to expanded division of labour among firms, a greater exchange of industry-specific knowledge, and diffusion of innovation (knowledge spillovers) (Akgüngör, 2006; Pekkarinen, 2005), access to specialized services and inputs (Zeitlin, 1992), public policies to promote the cluster's particular industry (Fesser, 1998), consolidation and distribution of the influx of increasing quantities of products into and out of specific regions to and from various global locations (Chhetri et al., 2014), and improved risk management associated with changes in demand and contracting processes (Hammervoll, Halse, & Engelseth, 2014). Thus, we propose that:

RP1a: Logistics clusters facilitate the development of joint value propositions.

### *The role of joint value propositions in horizontal collaboration*

Research indicates that in order to develop successful horizontal collaboration firms need to develop joint value propositions (Crujssens et al., 2007; Gebauer et al., 2013; Mason et al., 2007; Rai, Pavlou, Im, & Du, 2012; Sanchez Rodrigues, Harris, & Mason, 2015; Stabell & Fjedadstad, 1998; Taylor & Jackson, 2000; Yan & Dooley, 2014).

An industry example can help illustrate the important role of joint value propositions. A home appliance manufacturer and a mattress manufacturer located in the same cluster in Spain have similar distribution routes and serve one particular area with low demand rates. In order to achieve horizontal collaboration, the two firms developed the following joint value proposition: 'to achieve easier and quicker response to demand fluctuations ... and increase delivery frequency by filling the trucks together with the collaboration partner'. Both goals represent the value proposition of the collaborative arrangement (Saenz, Ubaghs, & Cuevas, 2014, p. 23). Each firm had its own business model ad hoc,

but once they detected potential opportunities for horizontal collaboration they formulated joint value propositions that drove the collaboration. Thus, we propose that:

RP1b: Joint value propositions facilitate the development of successful horizontal collaboration.

### *Informal governance*

Economic transactions between firms are embedded in structures of ongoing social relations and modern economies must recognize constraints and drivers that this implies (Granovetter, 1985; Jones et al., 1997). Collaboration can be difficult to achieve because individuals and firms are often driven by private gains at the expense of collective benefits (Granovetter, 1985). Conflicts are always possible among horizontally related firms that collaborate in both, core and non-core activities. Seminal work on the topic indicates that collaboration can be facilitated by the dual consideration of governance mechanisms: informal and formal (Granovetter, 1985; Williamson, 1975). First, we discuss the role of informal mechanisms.

#### *The role of logistics clusters in facilitating the development of informal governance*

Proximity facilitates face-to-face interactions that are considered necessary for establishing trustful relations and communicating sensitive information (Jones et al., 1997; Maskell, Bathelt, & Malmberg, 2006; Pilbeam, Alvarez, & Wilson, 2012). Thus, proximity among firms within logistics clusters can enable repeated social interactions over time.

Industry offers several examples of how logistics clusters facilitate the development of informal governance mechanisms, which in turn lead to horizontal collaboration. One case example is the collaboration between SC Johnson and Son Inc., a manufacturer of home cleaning products and Energizer Holdings, Inc., the battery company. Both companies have distribution centres in the Atlanta logistics cluster and they share CVS Caremark Corp. as a customer. Being located in the same logistics cluster, managers from the two firms had the opportunity to interact socially in-person and develop a level of trust that resulted in horizontal collaboration. Seeking to optimize their distribution operations, both companies consolidated their loads and used the same trucking company. They reached an agreement with CVS to receive order delivery on the same day and a single delivery appointment for both companies. Thus, when CVS releases an order to both companies, a truckload carrier picks up the shipment at SC Johnson and then at the Energizer facility to consolidate the loads. The combined cargo is then delivered to the CVS facility in Vero Beach, Florida. The geographical proximity enables Energizer and SC Johnson to observe each other conduct business, interact, and develop a level of trust that allows for a collaborative relationship which resulted in transportation cost reductions and carbon footprint improvements for both shippers. (Sheffi, 2012). Similarly, Zara Inditex (clothing retailer) and Caladero (fresh fish distributor) developed a horizontal collaboration within the Zaragoza logistics cluster. The collaboration allowed the two companies to develop a joint air distribution service (Sheffi, 2012).

Social relations are seen as necessary condition for trustworthy behaviour among firms (Granovetter, 1985). In that regards, previous research indicates that trust is easier to develop in logistics clusters than among dispersed firms. Since geographical proximity

is associated with greater transparency and visibility among rivals (Dahl & Pedersen, 2004; Wilhem, 2011), higher levels of open and fluent communication (Hammervoll et al., 2014; Morosini, 2004), and a higher possibility of monitoring partners (Chhetri et al., 2014), it enhances trust and incentives for firms to commit to long-term horizontal relationships. Whipple, Griffis, and Daugherty (2013) also highlight the importance of trust in collaborative relationships. Gebreyesus and Mohnen (2013) state that clustering fosters social interactions as governance mechanisms. Thus, clustering ‘creates relationships through mutual trust, understanding, and collaboration’ (Chhetri et al., 2014, p. 224). Moreover, constant social interaction between partners contributes to improved communication effectiveness through information sharing (Döring & Schnellenbach, 2006) and technology spillovers (Baptista, 1998), thus enlarging the potential benefits of collaborative relationships.

Finally, the role of logistics clusters in facilitating the development of trust can be illustrated with an example of two competitors engaged in horizontal collaboration. In Singapore, FedEx and UPS share customers who choose between the two companies depending on the services that each offers for a particular period of time (Sheffi, 2012). Although they are competitors, these companies developed a collaborative relationship. For customers, the collaboration smooths the transition when alternating between the two providers. The companies’ common location facilitated the development of the mutual trust needed for horizontal collaboration. Thus, we propose that:

RP2a: Logistics clusters facilitate the development of informal governance.

### *The role of informal governance in horizontal collaboration*

Informal governance mechanisms include social interactions and trust for discouraging opportunistic behaviour among firms (Granovetter, 1985). Social interaction and trust between firms are fundamental in building a rapid response to changing customer demand (Kotzab & Teller, 2003) and demand uncertainty and requires important partner selection criteria (Solesvik & Westhead, 2010).

Social interaction facilitates horizontal collaboration by fostering a mutual understanding of the mission, principles, and values of each of the collaborative partners (Li, Fetscherin, Alon, Lattemann, & Yeh, 2010), as discussed in previous section. Additionally, horizontal collaboration facilitates joint risk taking that can bring synergies and competitive advantage. Proximity facilitates repeated face-to-face interaction, helps establish mutual trust, and promotes reciprocity—all needed elements for stable cooperative relations and collaborative networking (Green & McNaughton, 2000). Relationship quality is thus a key input for horizontal collaboration and a potential source of competitive advantage (Combs & Ketchen, 1999; Nyaga & Whipple, 2011).

Several studies recognize trust as a key element of horizontal collaboration. For example, Hingley et al. (2011) examined the role of trust while exploring horizontal collaboration among grocery retailers. The authors revealed lack of trust as one of the main impediments to communication and collaboration among retailers. Lack of trust was associated with fears that sharing knowledge could result in its exploitation by competitors, thus limiting the possibilities for horizontal collaboration. These findings were later supported by Pomponi, Fratocchi et al. (2015) in their framework exploring trust

development and horizontal collaboration in logistics. These authors also identify trust as a key element for successful horizontal collaboration. Thus, we propose that:

RP2b: Informal governance facilitates the development of successful horizontal collaboration.

### **Formal governance**

Economic transactions between firms require formal governance mechanisms that are performed within the boundaries of hierarchy and market processes (Williamson, 1991). But since these transactions are embedded in structures of social relations, they require the combination with informal governance mechanisms, as presented before (Granovetter, 1985). The recognition of this structural embeddedness allows parties to use implicit and explicit formal mechanisms for customized and complex exchanges among parties under conditions of uncertainty (Jones et al., 1997).

#### ***The role of logistics clusters in facilitating the development of formal governance***

Logistics clusters make it easier to develop formal governance mechanisms, such as contracts, because they facilitate the finding, quantifying, and reinforcing of contract terms (Dolci, Maçada, & Paiva, 2017). Thus, logistics clusters offer better control opportunities and also reduce bargaining and enforcement costs (Lazzarini, Chaddad, & Cook, 2001). Cruijssen et al. (2007) also indicate that logistics clusters can facilitate the establishment of formal contracts among firms located within the cluster. On the other hand, dispersion may lead to a lack of continuity in the implementation of contracts (Wisniewska-Safek, 2010). These formal governance mechanisms in clusters require previously the alignment of goals and shared values that become the anchor points for the content and deployment of the contracts. In that regards, the development and further execution of the customized formal mechanisms create dependency among the firms within the logistics clusters, which help to deal with demand uncertainly (Jones et al., 1997). The logistics cluster in Dubai is an example of how this type of cluster facilitates formal contract development and implementation. Firms inside the cluster that have developed productive capabilities and a wide range of value-added services, obtain government contracts in public tenders more easily than dispersed firms (Ashai, El Dahshan, Kubba, Talati, & Youssefi, 2007). In his comprehensive study of logistics clusters, Sheffi (2012) offers similar evidence for the clusters in Rotterdam, Singapore, Panama, and Singapore. The author notes that these logistics clusters promote the development of internal formal governance mechanisms which facilitate efficient transactions between members of the respective clusters. Such mechanisms promote growth within the logistics clusters by making them more appealing to prospective firms looking for new location alternatives for their logistics operations (Sheffi, 2012), which facilitates cluster expansion. Thus, we propose that:

RP3a: Logistics clusters facilitate the development of formal governance.

#### ***The role of formal governance in horizontal collaboration***

Formal governance models must receive special attention within horizontal collaboration. Most partnerships rely on contracting because it helps set up clear rules that can be

invoked in cases of conflict or division of joint profits. Formal governance models include contracts that emphasize reactive compliance to prescribed behaviours (Li et al., 2010). Contractual agreements generate sustainable cost allocation mechanisms (Özener & Ergun, 2008) and reduce uncertainty over future events, thus constituting an important mechanism of horizontal collaboration.

The legal aspects of horizontal collaborative relationships are particularly important because coordination failure and risks are higher in horizontal alliances than in vertical alliances (Perry, Sengupta, & Krapfel, 2004). Although firms within logistics clusters can experience higher levels of mutual trust, contracts are a desirable tool to help resolve conflicts. More importantly, trust and formal contracts are not mutually exclusive and can be mutually reinforcing.

Research indicates that contracts are an effective means of relationship governance. For example, Schmoltzi and Wallenburg (2011) find that the most common form of partnership among logistics service providers that collaborate horizontally is the joint venture agreement (i.e. written contract). Among joint ventures, agreements with equity involvement are the preferred type of contract for collaboration (Wallenburg & Raue, 2011). Similarly, Özener, Ergun, and Savelsbergh (2011) indicate that contractual obligations or subcontracting prohibitions enable carriers to experience superior levels of service and higher profits. Thus, we propose that:

RP3b: Formal governance facilitates the development of successful horizontal collaboration.

### **Information exchange**

Previous forms of governance mechanisms also require the coordination and safeguard of the exchange conditions among the collaborative firms (Jones et al., 1997). Customization and repetition of information exchange among the collaborative parties, are perceived a relation-specific capital and becomes a particular governance mechanism for coordinating the economic transactions and controlling behavioural uncertainty (Jones et al., 1997; Williamson, 1991).

### **The role of logistics clusters in facilitating information exchange**

Empirical evidence shows that logistics clusters provide infrastructure for the development of IT (Sheffi, 2012). For example, the Tanjong Pagar Container Terminal facilitates information exchange for firms located in the Logistics Park of Singapore by fostering the use of new IT to automate operations within the cluster. IT functions such as tracking, tracing, and EDI are vital for handling the risk of demand fluctuations and creating a more stable environment for logistics processes such as product recovery (Fleischmann, Gnutzmann, & Sandvoß, 2004). These functions also help monitor the execution of collaborative activities (Hammervoll et al., 2014). Well-developed IT structures in logistics clusters attract more companies to the cluster and thus bring additional opportunities for collaboration to firms operating within the cluster.

Firms within logistics clusters have also been shown to capitalize on the collaborative opportunities presented by the opportunity to communicate face-to-face with partners. For example, Rivera, Gligor, and Sheffi (2016, p. 253) indicate that ‘in Memphis, a large logistics company facilitates and sets up forums for its partners and customers in the

health care industry to talk about logistics issues ... these forums represent a safe environment where we can talk even with competitors’.

Companies located in logistics clusters benefit from the development of common norms of behaviour (Jones et al., 1997) and the implementation of protocols for data accessibility and data sharing that enhance information transfer (Anderson et al., 2003; Chhetri et al., 2014; Hammervoll et al., 2014; Sölvell, Lindqvist, Ketels, & Porter, 2003). Geographical proximity allows actors with similar specific competences to interact frequently, sharing information and performing a more refined interpretation of data due to common access to technology that in turn favours the diffusion of knowledge (Moreno, Paci, & Usai, 2006). Thus, firms within logistics clusters have the potential to better use gathered information.

Logistics clusters also facilitate the exchange of informal information. Managers of firms located within logistics clusters can more easily interact with each other because of close geographic proximity. Research shows that repeated interaction can significantly enhance the exchange of information. For example, Rivera et al. (2016, p. 253) indicate that logistics clusters can provide a platform for firm managers across various logistics companies to ‘talk about general or specific topics together and have open discussions about it [communications forum] or how it could be improved’. Their findings are consistent with literature indicating that closer physical proximity of companies leads to faster and more efficient processes of absorption and diffusion of information (Akgüngör, 2006; Boix & Trullén, 2012). Thus, we propose that:

RP4a: Logistics clusters facilitate the development of information exchange.

### *The role of information exchange in horizontal collaboration*

The role of information exchange in facilitating collaboration has been long recognized by scholars. Before supply chain management emerged as a distinct field, Forrester’s (1958) marketing treatise put forth a theory of distribution management that emphasized the key role of information exchange in overall channel performance. Information exchanged has been considered the ‘glue’ that enables collaboration and facilitates the management of relationships. Information exchange fosters participative collaborative decision-making (Anderson & Weitz, 1992), the coordination of joint programmes (Guiltinan, Rejab, & Rodgers, 1980), and is a key relational competency that can generate sustainable strategic advantage for the parties involved (Paulraj, Lado, & Chen, 2008).

Information exchange within logistics clusters can take place both, informally or formally (Rivera et al., 2016). Informal communication exchanges can help relationship participants improve the nature of the communication process by enhancing trust and creating a more open communication platform (Huo, Han, & Prajogo, 2016; Pomponi, Fratocchi, & Rossi Tafuri, 2015; Rivera et al., 2016; Wiengarten, Humphreys, Cao, Fynes, & McKittrick, 2010). Formal information exchange can take place via established information technology (IT) systems. Rai et al. (2012) indicate that IT promotes collaboration by providing a foundation for the co-creation of value (Williamson, 1991) between interconnected companies as they ‘help manage the flows of physical goods, information, and finances in interfirm logistics processes’ (Rai et al., 2012, p. 2).

Whipple, Frankel, and Daugherty (2002) state that information exchange through IT promotes collaboration and helps establish closer cooperative linkages leading to alliance



satisfaction. Further, IT plays an important role in enabling horizontal collaboration by facilitating real-time data access regarding products, services, money, and information flows through the supply chain. This promotes the quantification and execution of gain sharing (Saenz et al., 2014). Mason et al. (2007) also report that developments in IT present renewed opportunities for sharing information. Similarly, Naesens et al. (2009) recognize in their strategic framework the key role of information exchange in facilitating horizontal collaboration. Thus, we propose that:

RP4b: Information exchange facilitates the development of successful horizontal collaboration.

## Implications for literature and practice

Horizontal collaboration has been considered a source of competitive advantage in an increasingly complex and dynamic global business environment (Gligor, Esmark, & Holcomb, 2015; Saenz et al., 2014). Despite the benefits associated with this type of collaboration (e.g. Braguinsky & Rose, 2009; Cruijssen et al., 2007; Vanovermeire et al., 2014), extant literature offers little guidance on the governance mechanisms that firms employ to achieve successful horizontal collaboration and reap associated benefits. Thus, Brekalo and Albers (2016) specifically call out for additional research on the mechanisms that facilitate collaboration between logistics firms. In addition, little is known about the role of logistics clusters in facilitating horizontal collaboration. We employed a systematic literature review to address these limitations and create additional theory in the areas of horizontal collaboration and logistics clusters. Specifically, we developed eight testable research propositions bridging the literature on horizontal collaboration with the literature on logistics clusters.

Our research study makes several noteworthy contributions to literature and practice. We expand horizontal collaboration theory by building on extant studies such as the Saenz et al. (2014) research on the enabling role of continuous relational learning in horizontal collaboration. We contribute to this body of literature by identifying key governance mechanisms that firms employ within horizontal collaboration. Our systematic literature review revealed that firms employ four distinct mechanisms to achieve successful horizontal collaboration.

Figure 5 visualizes the proposed framework that integrates the main elements of this research, according to the analysis previously conducted. The inner black circle (Joint Value Proposition) represents the main purpose of the collaboration and should be defined collectively as the key governance mechanism. The other three governance mechanisms (Informal, Formal and Information exchange) should be deployed through the implementation of a set of drivers that enhance horizontal collaboration in logistics clusters (represented in the interior of the blue circle). Each of these mechanisms is described in previous sections of the paper. The implementation of these governance mechanisms (grey arrows) takes along some benefits in logistics clusters.

First, our findings indicate that, in order to maximize the potential benefits of horizontal collaboration, firms develop joint value propositions, as governance mechanism that improves coordination. As such, we make a noteworthy contribution to literature by illustrating how firms with potentially distinct goals and business models can establish

mutually beneficial horizontal collaboration. For managers, the findings indicate that firms should be screening the environment for potential partners within the same echelon of supply chains and even consider establishing horizontal collaboration with firms that have seemingly different business models. Also, logistics clusters can serve as an environment that facilitates the adequate conditions and procedures (i.e. informal governance, formal governance and information sharing) that ultimately will result in firms' collaborative joint value propositions. Our review suggests that, if such firms can develop joint value propositions they can still develop successful horizontal collaboration.

Second, the results of our literature review indicated that successful horizontal collaboration is achieved through the use of informal governance mechanisms, such as social interactions and trust. We expand the literature in this area (e.g. Green & McNaughton, 2000; Nyaga & Whipple, 2011) by providing additional evidence that social interaction is more than a simple social lubricant needed for the completion of business. Social interactions were found to be a mechanism that firms employ to better collaborate. In addition, we further expand extant theory (e.g. Hingley et al., 2011; Pomponi, Fratocchi et al., 2015) by highlighting the role of trust in horizontal collaboration. For managers, our article emphasizes the importance of the 'soft' aspects of relationships. Perhaps some firms have diligently tried to develop collaborative relationships with other firms and have been unsuccessful because they ignored the soft aspects of relationships. We urge those firms to reevaluate those relationships and ensure informal governance mechanisms are in place. The literature reviewed suggests that the geographical closeness of the firms within logistics clusters can facilitate their social interaction, communication and trust development; these are essential aspects of an effective horizontal collaboration. Of course, this does not guarantee that the collaborative relationship will be mended. However, lack of social interaction and trust could have been one of the factors undermining the success of the relationship.

Third, our literature review showed that successful horizontal collaboration relies on formal governance mechanisms, such as contracts. This further reinforces the need for using contracts to ensure all parties benefit from the relationship. In this vein, to develop contracts among firm within logistics clusters offer benefits such as better control opportunities and the reduction of opportunistic behaviour, bargaining and enforcement costs. For managers, our review signals the importance of employing both, formal and informal mechanisms to develop mutually beneficial collaboration.

Fourth, our results highlight the important role of both, informal and formal mechanisms for information exchange. We extend the work of Pomponi, Fratocchi et al. (2015) by indicating to managers that both modes of information exchange are important for successful horizontal collaboration. We also remark that logistics clusters facilitate informal and formal information sharing. On the one hand, informal information exchange is reinforced by frequent interaction of the firm's members. And, on the other hand, formal information exchange is evident through common IT infrastructure within the cluster and the implementation of protocols for data sharing and accessibility.

Fifth, Ghaderi, Darestani, Leman, and Ismail (2012) showed that horizontal collaboration in logistics activities can help firms lower outbound logistics cost by 10% to 30%. Although cost savings is a desirable outcome for firms, the authors do not provide information on how firms can develop successful horizontal collaboration. Thus, we make another contribution to literature by expanding on the work of Ghaderi et al. (2012)

and illustrating the mechanisms firms employ to achieve successful horizontal collaboration and, consequently experience such significant cost reduction. For managers, our study indicates that locating within a logistics cluster can facilitate the development of horizontal collaboration and further help reduce outbound logistics cost.

Sixth, we expand on the research of Anand and Bahinipati (2012) and Bahinipati, Kanda, and Deshmukh (2009). These authors explored the role of horizontal collaboration intensity within a supply chain setting, but did not reveal how firms collaborate. If managers wish to increase the level of horizontal collaboration intensity with a specific partner, our literature review indicates to them four mechanisms that they can focus on in order to achieve their goal.

Seventh, Hingley et al. (2011) identified some benefits of horizontal collaboration between supply chain members but pointed out the need for additional work to clearly identify the elements of such relationships. We respond to this call by identifying the four mechanisms that firms employ to develop horizontal collaboration. As mentioned before, these mechanisms can be reinforced in a logistics clusters setting.

Eight, our research further helps theory development by complementing the work of Pomponi, Fratocchi et al. (2015). These authors explored the black box of unsuccessful horizontal collaboration. Pomponi, Fratocchi et al. (2015) highlighted the need for future research to offer additional insights into how firms can address unsuccessful horizontal collaboration. Our findings provide four mechanisms that managers can evaluate for improvement if their horizontal collaborative relationship with a specific firm is not satisfactory.

Ninth, our most important contributions come from integrating the literature on horizontal collaboration (e.g. Cruijssen et al., 2007; Verdonck et al., 2013) with the literature on logistics clusters (e.g. Bolumole et al., 2015; Sheffi, 2012). Our research highlights the role of logistics clusters in enabling and fostering the various governance mechanisms firms rely on for successful horizontal collaboration. Specifically, we detail how logistics clusters help firms establish joint value propositions, employ informal and formal governance, and exchange information. Managers of firms already located in a logistics cluster can use the findings for each mechanism to better understand how to develop more effective horizontal collaboration with firms in the cluster. On the other hand, for managers of firms not currently in a logistics cluster, our review helps highlight how locating to such a cluster could help their firms develop better horizontal collaboration. For example, it could be the case that a company has identified a potential firm to collaborate with, or even tried to collaborate with, but the efforts were unsuccessful. Our findings indicate that, if consistent with the firm's overall strategy, locating within such a cluster could enhance the chances of a successful horizontal collaboration. Based on Sheffi (2012) and other literature, our article offers practical examples of firms who have successfully employed this approach.

## Limitations and future research

We employed a systematic literature review to achieve our research objectives. Limitations associated with this method can be addressed through future research. First, we developed several research propositions that should be tested. This would help provide empirical evidence for the positive role of logistics clusters in facilitating horizontal collaboration.

Similarly, future empirical research could examine the endogeneity of the research propositions put forth in this study.

Second, future research should investigate additional mechanisms, not only governance, that firms employ to develop successful horizontal collaboration and reap potential benefits associated with these relationships. Our choice of method constrained the number of mechanisms we were able to identify. Thus, future research should employ qualitative, discovery-oriented methods to find additional mechanisms.

Third, our study offers a detailed description of the role of logistics clusters in enabling and fostering the various governance mechanisms firms rely on for successful horizontal collaboration. Qualitative studies could help provide additional insights into these phenomena and lead to a better understanding of how logistics clusters enable horizontal collaboration. Our study provides a building block in this process, but more empirical research is needed.

Fourth, our study focuses on the positive role of logistics clusters. Future research could examine the challenges that firms within logistics clusters may encounter when attempting to develop horizontal collaboration. For example, companies like FedEx and UPS might compete for the same customers. Thus, horizontal collaboration between the two firms could lead to one of the firms gaining customers at the expense of the other.

Fifth, future research can help investigate additional benefits associated with horizontal collaboration within logistics clusters. For example, it would be interesting to explore the link to financial performance. Several financial metrics could be of particular interest to supply chain managers such as, return on assets, inventory turnover, and net profit margin. This type of research could help further promote the development of logistics clusters, primarily in the policy-making arena.

Sixth, vertical collaboration presents certain challenges to participant parties (Villena, Revilla, & Choi, 2011). Thus, relevant research questions emerge: are these challenges also present in the context of implementing horizontal collaboration practices? and, How complex (and beneficial) would it be to combine horizontal and vertical collaboration? The last question is especially relevant given that resource and demand complementarities can be greater when collaboration occurs between firms in the same echelon of supply chains.

Seventh, we identified four governance mechanisms that firms employ to develop horizontal collaboration. Researchers have explored these mechanisms primarily within the context of vertical relationships. For example, the concept of trust, which is part of informal governance mechanisms, has been studied primarily within buyer-supplier relationships. However, there is no evidence that the development of trust in horizontal relationships follows a similar pattern with the development of trust in vertical relationships. The distinct dynamics of horizontal and vertical relationships (Mason et al., 2007) suggest that the development of trust might also follow a distinct pattern in the two types of relationships. This provides a very fruitful area for future research. Further studies can investigate whether the extant theory on concepts such as trust and information exchange can help explain phenomena within horizontal collaboration. To illustrate, it is plausible that information exchange occurs differently between FedEx and its customers on one hand, and FedEx and UPS on the other.

Eighth, firms within the same logistics cluster could compete for the same resources within a region, such as human resources. Thus, it would be beneficial for future research

to investigate how firms within logistics clusters manage a collaborative relationship with a firm while directly competing for resources with the same firm. It would be interesting to better understand how firms mitigate the possible tension that might occur and the various strategies that firms employ to balance the collaborative side of the relationship with the competitive one. Future case studies could offer a rich description of these strategies.

Ninth, our study focuses exclusively on the role of logistics clusters. Future research could also investigate how other types of clusters (e.g. manufacturing, technology) impact horizontal collaborative relationships. Such studies could also compare the effects of different types of clusters and help determine which types of clusters are more conducive to the development of horizontal collaboration. Similarly, future research should examine potential differences in facilitating horizontal collaboration between logistics clusters and other types of clusters. Finally, we explored what makes horizontal collaborations successful. Future research could investigate situations where horizontal collaborations ended in failure. This could help further advance theory development in this area by highlighting what practices firms should avoid when attempting to develop successful horizontal collaborations.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix A

**Table A1.** Keywords used in the systematic literature review.

Keyword
Horizontal collaboration
Agglomeration economies
Industrial clusters
Logistics clusters
Collaboration AND agglomeration economies
Collaboration AND industrial clusters*
Collaboration AND logistics clusters
Cooperation AND agglomeration economies
Cooperation AND industrial clusters
Cooperation AND logistics clusters
Horizontal collaboration AND agglomeration economies
Horizontal collaboration AND industrial clusters
Horizontal collaboration AND logistics clusters
Collaborat* OR Cooperat* OR Alliance* OR Relation* AND Logistic* OR Transport* OR Distribut* OR Suppl* OR SC OR SCM and Horizontal Or Inter-fir

Note: \* Industrial clusters were included in the search to facilitate the identification of horizontal collaboration mechanisms.

**Table A2.** Criteria for inclusion and exclusion of Papers during the title and abstract screening.

Criteria	Rationale
<b>Inclusion</b>	
Scholarly (peer-reviewed) journals and periodicals	Inclusion of high-quality research
Publication has existed since 1995	The topic of horizontal collaboration in logistics clusters is a recent topic.
Firm-level studies	To avoid studies at an individual or group level.
Journals published in English	To guarantee further validation and dissemination of results
<b>Exclusion</b>	
Relationships between concepts	To avoid the misinterpretation of the word 'relationship.'
Collaboration between supply chain partners or buyer-supplier relationships.	The focus of the study is horizontal collaboration, which implies collaboration between partners in different supply chains.

**Table A3.** Complete list of journals cited in the review.

<i>Academy of Management Review</i>	1
<i>Annals of the Association of American Geographers</i>	1
<i>British Journal Of Management</i>	1
<i>Business Networks: Prospects for Regional Development</i>	1
<i>California Management Review</i>	1
<i>Chemical Engineering Transactions</i>	1
<i>Competitiveness Review</i>	1
<i>Computers &amp; Operations Research</i>	1
<i>Economic Development Quarterly</i>	1
<i>Economic Geography</i>	6
<i>Economics of Innovation and New Technology</i>	2
<i>European Journal of Operational Research</i>	3
<i>European Planning Studies</i>	12
<i>European Urban And Regional Studies</i>	1
<i>Harvard Business Review</i>	3
<i>IDS Bulletin</i>	1
<i>Industrial And Corporate Change</i>	1
<i>Industrial Management and Data Systems</i>	2
<i>Industrial Marketing Management</i>	2
<i>International Journal of Economic Development.</i>	1
<i>International Journal of Forecasting</i>	1
<i>International Journal of Operations and Production Management</i>	1

<i>International Journal of Physical Distribution and Logistics Management</i>	11
<i>International Journal of Production Economics</i>	5
<i>International Journal of Technology Management</i>	1
<i>Journal of Business Logistics</i>	3
<i>Journal of Business Research</i>	3
<i>Journal of Development Studies</i>	1
<i>Journal of Economic Behavior &amp; Organization</i>	1
<i>Journal of Management Studies</i>	1
<i>Journal of Marketing Research</i>	1
<i>Journal of Operations Management</i>	3
<i>Journal of Supply Chain Management</i>	2
<i>Journal of the Operational Research Society</i>	1
<i>Journal on Chain and Network Science</i>	1
<i>Knowledge Management: Critical Perspectives On Business and Management</i>	1
<i>Management International Review</i>	1
<i>Maritime Economics and Logistics</i>	1
<i>MIS Quarterly</i>	1
<i>Oxford University Press</i>	2
<i>Papers in Regional Science</i>	1
<i>Proceedings of the National Academy of Sciences of the United States of America</i>	1
<i>Progress In Human Geography</i>	1
<i>R&amp;D Management</i>	1
<i>Regional Studies</i>	2
<i>Research Policy</i>	4
<i>Research School for Operations, Management and Logistics</i>	1
<i>Small Business Economics</i>	1
<i>Strategic Management Journal</i>	3
<i>Supply Chain Management: An International Journal</i>	15
<i>Technovation</i>	2
<i>The Academy Of Management Annals</i>	1
<i>The Oxford Handbook Of Innovation</i>	1
<i>Transport Review</i>	1
<i>Transportation Journal</i>	1
<i>Transportation Research Part A: Policy and Practice</i>	1
<i>Transportation Research Part E: Logistics and Transportation Review</i>	2
<i>Transportation Science</i>	2
<i>Urban Geography</i>	2
<i>Urban Studies</i>	3
<i>World Development</i>	2

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