





# “Meta-analysis of organizational and supply chain dynamic capabilities: A theoretical-conceptual relationship”

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# META-ANALYSIS OF ORGANIZATIONAL AND SUPPLY CHAIN DYNAMIC CAPABILITIES: A THEORETICAL- CONCEPTUAL RELATIONSHIP

## Abstract

Creating resilient supply chains and more agile and competitive organizations are challenges that companies face today in a highly competitive and changing environment. Therefore, organizations must understand the importance of developing and strengthening their dynamic capabilities (DC) and supply chain dynamic capabilities (SCDC) in order to improve their market performance, participation, and sustainability. This study performs a meta-analysis of the literature related to organizational and supply chain dynamic capabilities, which together constitute an ecosystem of capabilities that every organization should develop to improve performance. After an exhaustive review of 1203 articles aligned with the base theoretical construct of dynamic capabilities, the information was decanted from strict filters. This allowed to evidence the contribution of this construct in literature aligned with organizational performance, as well as to identify the contribution that can be made by other constructs aligned with the dynamic capabilities' ecosystem. The findings show a theoretical relationship between both constructs, presenting how the supply chain dynamic capabilities constitute a specialization and differentiation of organizational dynamic capabilities. In addition, the study highlights their major contribution to developing competitive advantages and improving organizational performance.

## Keywords

supply chain, dynamic capabilities, supply chain  
dynamic capabilities, dynamic capabilities ecosystem,  
organizational performance

## JEL Classification

L21, L25, M10, M19

## INTRODUCTION

A supply chain (SC) is a network of firms interacting in backward and forward relationships while performing varying processes to offer products and services to consumers (Stadler et al., 2015). Proper coordination and communication in an SC network require a set of organizational resources and capabilities associated with the organizations that are part of this SC.

Globalization and market integration require that SC respond nimbly and appropriately to the demands of its customers. Along with these challenges, local and international competition in unstable and susceptible markets exposes SCs to more significant risks, and their vulnerability to unexpected events has increased. To respond to these challenges, SCs must develop strong integration and coordination links between their constituent organizations. Moreover, these organizations must identify and strengthen the resources and capabilities that enable them to compete and be sustainable over time.

Different studies have identified the organizational resources and capabilities that generate competitive advantage and sustainability for organizations. Among these studies, those associated with identifying and reviewing organizational dynamic capabilities DC stand out.

## 1. LITERATURE REVIEW

Nowadays, two specific research questions have arisen. The first one is: How organizational and supply chain dynamic capabilities can affect and improve organizational performance? Furthermore, the second one is: Is there a research gap in the contribution that CD and SCDC can make to organizational performance?

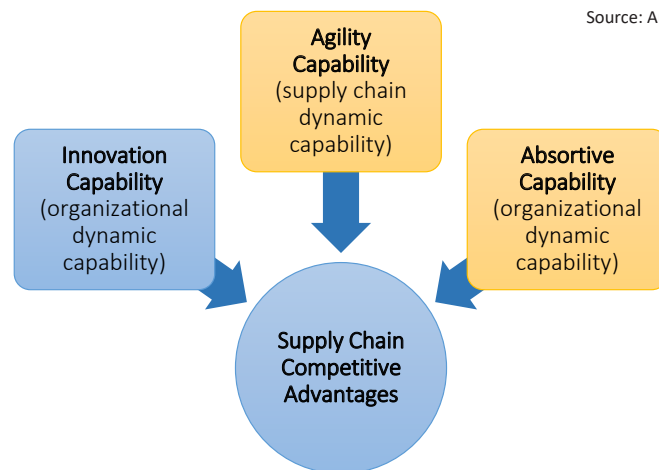
The meta-analysis was conducted to answer the questions using the Resource-Based View (RBV) theory. This theory explains how to obtain competitive advantages (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991; Peteraf, 1993; Wernerfelt, 1984). For this, a company must know itself, deepening the understanding of available resources to create a strategy that allows it to exploit and develop the resources it needs for the future. In addition, the analysis focuses on organizational performance that can be affected by a dynamic capabilities ecosystem.

Considering the world of resources and capabilities, some encompassed resources as capabilities (Barney, 1991; Dierickx & Cool, 1989; Hall, 1992); defining resources as the means to achieve a predefined objective (Camisón et al., 2014). On the other hand, some studies distinguished differential characteristics between resources and capabilities (Amit & Schoemaker, 1993; Grant, 1991; Teece

et al., 1997). However, based on these approaches, this paper will use the conception of the interrelationship between resources and capabilities as determinants of competitive advantage (Acosta Prado et al., 2013). In addition, the study visualizes it as a conjunction of resources and skills to achieve high performance of a routine or complex of interacting routines (Grant, 1991).

In line with Rivera and Figueroa (2017), the study of DC has been positioning itself in strategic management and sustainable competitive advantages. In this sense, companies have developed changing skills due to the changing events of the ecosystem and the need for flexibility to promote innovation. Both DC and SCDC allow the ongoing elaboration of skills following the fluctuating environment and harmonizing knowledge with complex environments. Moreover, they create new characteristics for development and future growth, seeing these as a DC ecosystem that allows companies to develop and improve performance (Hong et al., 2018; Ju et al., 2016; Sunder & Ganesh, 2021; Teece, 2007, 2014; Tripathi & Joshi, 2019).

According to Acosta Prado et al. (2013) and Maynez-Guaderrama et al. (2018), DC results from the dynamic interaction of multiple sources of knowledge. As a result, these become developers of sustainable competitive advantage for both SC and the organization (Figure 1).



Source: Authors' elaboration based on Maynez-Guaderrama et al. (2018).

Figure 1. Organizational DC model

**Table 1.** Conceptual framework DC and SCDC

Source: Authors' elaboration.

Conceptual approach	Conceptual discussion	References
Dynamic capabilities (DC)	<ol style="list-style-type: none"> <li>1. Specific organizational skills and knowledge given through the use, combination, and development of resources for the achievement of its objectives.</li> <li>2. Complex interaction between resources and capabilities that seeks to measure the efficiency of their use.</li> <li>3. Ability to achieve new ways to compete and innovate, generating competitive advantages, providing sustainability and permanence in the market.</li> <li>4. Combination of organizational resources that cannot be easily imitated. It requires coordination of inter-organizational relationships, which supports the development of organizational competitive advantage.</li> </ol>	Amit and Schoemaker (1993), Barney (1986, 1991), Collins (1994), Eisenhardt and Martin (2000), Garzón (2015), Grant (1996), Griffith and Harvey (2001), Henderson and Cockburn (1994), Hong et al. (2018), Lessard et al. (2016), Teece (2007, 2014), Teece and Pisano (1994), Teece et al. (1997)
Supply chain dynamic capabilities (SCDC)	<ol style="list-style-type: none"> <li>1. They are daily activities and resources updated to intentionally face the ever-changing external business environment and show high organizational effectiveness to meet the needs of SC actors and customers.</li> <li>2. The capacity of this crucial component to determine and integrate internal and external resources into the organization in a dynamic environment ensuring sustainability and organizational flexibility.</li> <li>3. The capacity to modify the SC following the changing environment, which involves a complex and close relationship between the internal and external aspects of the organization. SCDC makes organizations more flexible, resilient, and easily adaptable to change. This concept is comprehensively composed of different sub-capabilities: <ul style="list-style-type: none"> <li>• Coordination;</li> <li>• Adaptability;</li> <li>• Agility;</li> <li>• Competitive Priorities;</li> <li>• Reconfiguration;</li> <li>• Collaboration;</li> <li>• Integration; and</li> <li>• Flexibility.</li> </ul> </li> </ol>	Aslam et al. (2020), Blome et al. (2013), Colicchia and Strozzi (2012), Hong et al. (2018), Jiang and Li (2011), Ju et al. (2016), Kareem and Kummitha (2020), Li et al. (2006), Olavarrieta and Ellinger (1997), Rajaguru and Matanda (2019), Storer and Hyland (2011), Tripathi and Joshi (2019), Isnaini et al. (2020)

According to the meta-analysis conducted, Table 1 depicts a conceptual framework that combines the main concepts or definitions of DC from an organizational approach, followed by the meanings given by several authors about SCDC without detaching itself from its conceptual roots in DCV.

Faced with dynamic and turbulent environments, companies must develop capabilities that allow them to maintain agility and flexibility. Moreover, they should simultaneously synchronize technologies, incorporate products, and develop and enhance best practices in SCs. This, as a consequence, improves organizational performance (Aslam et al., 2020; Baker, 2008; Castillo et al., 2016; Kareem & Kummitha, 2020; Ketchen & Hult, 2007; Mangla & Kumar, 2014; Swafford et al., 2008).

According to Monge and Guaderrama (2015), a key aspect of the competitive market environment in the 21st century is the internalization of organizations to enhance their presence in the market not as individual entities but as members of global SCs. This leads them to develop their DC to enhance their competitive advantages. For Castillo et al. (2016), an SC must have the ability to have agility, added to learning how to meet new conditions in the environment. Thus, companies achieve a vision to create a source of knowledge, coordination, and collaboration between companies in the supply processes, and generate various aspects of improvement, management, and SC performance (Lane et al., 2006; Zahra & Gerge, 2002).

For Lee (2004), in order for an organization to develop competitive advantages and be recognized in its sector, its SCs must be developed based on

three specific DC, which he calls the Triple A (Adaptation, Agility, and Alignment). They are added to adequate infrastructure, investments, networking, and an organizational culture oriented toward fulfilling objectives supported by its leaders. This allows achieving organizational performance, sustainability, and competitive advantages.

According to the multiple and most relevant definitions of organizational DC and SCDC, it should be recognized that the latter concept arises to enable specialization and differentiation of DC. It is aimed at strengthening the sustainability and

contribution of the SC to the development of competitive advantages of the organization (Cheng et al., 2014; Hong et al., 2018; Mentzer et al., 2001; Um et al., 2017).

In addition, a summary of the main definitions of the main sub-skills found in the literature is given in Table 2, focusing on SCDC.

Table 2 shows how different authors, from their positions and analyses, value each SCDC according to its perceived impact on the SC and, likewise, the importance of its development and strengthening, which enhances SC performance and sustainability.

**Table 2.** Definition of main SCDCs

Source: Authors' elaboration.

Sub-capacity (SCDC)	Definitions	References
Coordination	Capability that seeks to effectively coordinate tasks, resources, and objectives between cooperating enterprises (along or across the chain).	Jiang and Li (2011), Li et al. (2006), Mentzer et al. (2001), Storer and Hyland (2011), Tripathi and Joshi (2019)
	Ability to support and manage changes in the environment through effective communication.	
Adaptability	A form of flexibility that an SC possesses, allowing it to meet various environmental changes.	Aslam et al. (2020), H. Chan and F. Chan (2010), Hülsmann et al. (2008), Ketchen and Hult (2007), Lee (2004), Stefanelli et al. (2016), Tuominen et al. (2004), Whitten et al. (2012), Xia et al. (2008)
	A mechanism to cope with uncertainties and new demands.	
Agility	Capacity to respond to unexpected market changes, supply and demand.	Aslam et al. (2020), Baker (2008), Blome et al. (2013), Christopher et al. (2004), Bergvall-Forsberg and Towers (2007), Jiang and Li (2011), Kareem and Kummitha (2020), Lee (2004), Li et al. (2006), Polater (2021), Swafford et al. (2008), Van Hoek (2006), Whitten et al. (2012)
	Ability to face events among its members, cope quickly with changes in demand, and handle possible disruptions and interference from outside the chain.	
Competitive Priorities	A value given through four fundamental aspects: speed, quality, cost, and flexibility.	Boyer and Lewis (2002), Ketchen and Hult (2007), Lee (2004), Storer and Hyland (2011), Ward et al. (1998), Whitten et al. (2012)
	Competitive priorities are crucial in organizational operations and competitive advantages, for which a quality management system is of utmost importance.	
Reconfiguration	Ability that enables organizations to transform their structure and resources into competences. It enables the development and generation of new competences by recombining existing knowledge.	Blome et al. (2013), Cao and Jiang (2020), De Moura and Saroli (2020), Hülsmann et al. (2008), Masteika and Čepinskis (2015), Polater (2021), Storer and Hyland (2011), Teece et al. (1997)
	Capability interdependent with flexibility.	
	Reconfiguration is closely related to the organization's alternatives in its actions and has to do with endogenous issues.	
Collaboration	Ability to create competitive advantage through the strategic use of its resources focused on new market opportunities.	Allred et al. (2011), Balcik et al. (2019), Barratt (2004), Colicchia and Strozzi (2012), Dani (2011), Hallikas (2003), Kareem and Kummitha (2020), Klassen and Vachon (2003), León-Bravo et al. (2017), Polater (2021), Ramanathan et al. (2014), Shin et al. (2019), Tieman (2017), Vilko (2012)
	Means and capacity to reduce cross-functional and inter-organizational conflicts and develop distinctive relational advantage.	
	Ability to combine and configure resources outside the boundaries of their own organization.	
	Value creation processes are becoming increasingly complex, suggesting the integration of resources along the SC as a strategic factor in decision-making to mitigate organizational conflicts.	

**Table 2 (cont.).** Definition of main SCDCs

Sub-capacity (SCDC)	Definitions	References
Integration	Ability to combine resources, information, knowledge, and activities effectively with suppliers, distributors, customers, and competitors to improve performance and competitiveness.	Chang et al. (2008), Chaudhuri et al. (2020), Kareem and Kummitha (2020), Mentzer et al. (2001), Polater (2021), Rajaguru and Matanda (2019), Swafford et al. (2008), Wu and Ragatz (2010)
	Ability to partner and relate internally and externally, horizontally and vertically with other actors in the SC.	
	Integration allows the management of an organization to focus on the Core Business and delegate the management of other supporting processes to achieve the benefits of cost savings of scale.	
Flexibility	An instrument that enables organizations to manage complex and dynamic scenarios related to their strategic planning and process construction. It is closely linked to efficiency.	Baker (2008), Boyer and Lewis (2002), H. Chan and F. Chan (2010), Cheng et al. (2014), Choi et al. (2001), Christopher et al. (2004), Grant (1996), Hülsmann et al. (2008), Jiang and Li (2011), Ketchen and Hult (2007), Mangla and Kumar (2014), Swafford et al. (2008), Ward et al. (1998)
	Skills that enable the development and generation of competitive advantages, which in turn increase the reconfiguration and replication capabilities in complex logistical structures.	
	Ability to adapt and respond to different changes is also seen as an ability to innovate, integrate with others, or network to manage its processes, and as a strategy for risk management.	

Therefore, this study aims to determine research gaps in the literature and the contribution that can be made by the SCDC construct thanks to other research constructs.

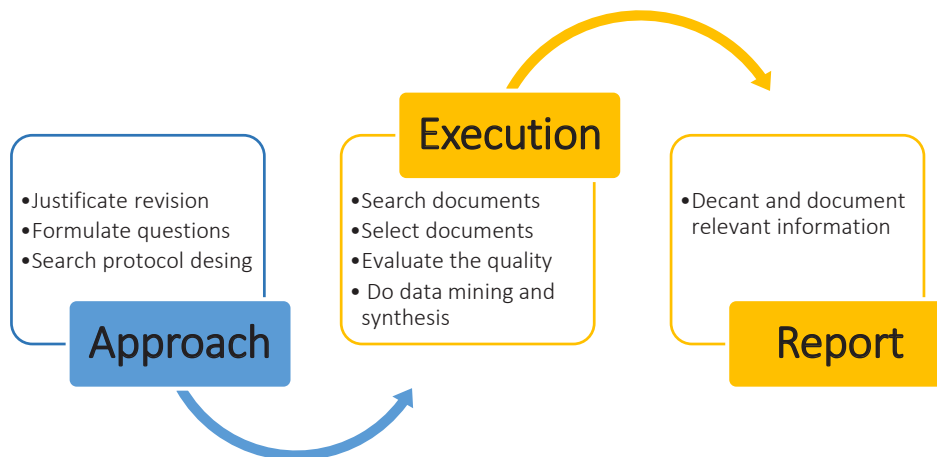
## 2. METHODOLOGY

The study adopted literature analysis methods to analyze diverse thoughts on this topic. The aim was to synthesize clearly and concisely the existing evidence of that specific knowledge, stimulate the creation of new knowledge, and generate conclusions thanks to the review’s findings. Rigorous development of a meta-analysis facilitates trans-

parent means to explore and compose in-depth the relevant literature concepts in a way that allows the reproduction of material and overcomes the limitations given by the generalization of concepts associated with multiple individual studies (Bartunek & Rynes, 2010; Bhamra et al., 2011; Friday et al., 2018; Liberati et al., 2009).

The meta-analysis is supported by the PRISMA statement, which is a tool that seeks to perform a rigorous analysis of the literature where a clearly formulated research question is found. For this, explicit methods are used to determine, choose, and assess the study object (Liberati et al., 2009; Moher et al., 2010). Similarly, this methodol-

Source: Authors’ elaboration based on Velásquez (2014).



**Figure 2.** Methodological process

**Table 3.** Elements included in the meta-analysis

Source: Authors' elaboration based on Moher et al. (2010).

No.	Criteria	Information provided
1	Title	Identifies the document analyzed.
2	Abstract	Provides a summary of what is analyzed in the selected study (objectives, methodology, study synthesis, conclusions, and general limitations).
3	Keywords	Identifies the most relevant topics of the study.
4	Objectives	Provides an explicit statement of the research question addressed.
5	Methodology	Allows identifying the research construction protocol, as well as the use of analysis tools.
6	Results	Shows the findings of the study.
7	Limitations	Allows showing the limitations of the study and whether there is room for information bias.
8	Conclusions	Details the general interpretations of the study and suggests future research.

ogy is a tool to help improve clarity and transparency in the publication of systematic reviews (Pérez, 2012, p. 2). Figure 2 depicts the methodological process followed in carrying out the meta-analysis.

In order to document the search and review of relevant documents for the meta-analysis, the study used a verification table where the information downloaded from the databases analyzed is deposited (Scopus and Web of Science (WoS)). Table 3 shows the analysis criteria selected to decant the information collected.

### 3. RESULTS

In order to refine the literature collected, the criteria were defined as:

- 1) Inclusion criteria: Articles that within their titles, abstracts, and keywords relate the words “dynamic capabilities,” “supply chain dynamic capabilities,” “organizational performance,” “business performance,” and “supply chain.”
- 2) Exclusion criteria: Articles from research areas different than “business and management,” “engineering,” and “social science” are excluded.

In the same way, the following search equations were conducted to refine the information after the first search in the selected databases, and these results were obtained:

- Equation 1: “dynamic capabilities” AND “supply chain” – SCOPUS 440 – WoS 763 documents;

- Equation 2: “dynamic capabilities” AND “enterprise performance” – SCOPUS 17 – WoS 33 documents;
- Equation 3: “supply chain dynamic capabilities” – SCOPUS 21 – WoS 5 documents;
- Equation 4: “dynamic capabilities” AND “supply chain” AND “enterprise performance” – SCOPUS 3 – WoS 3 documents.

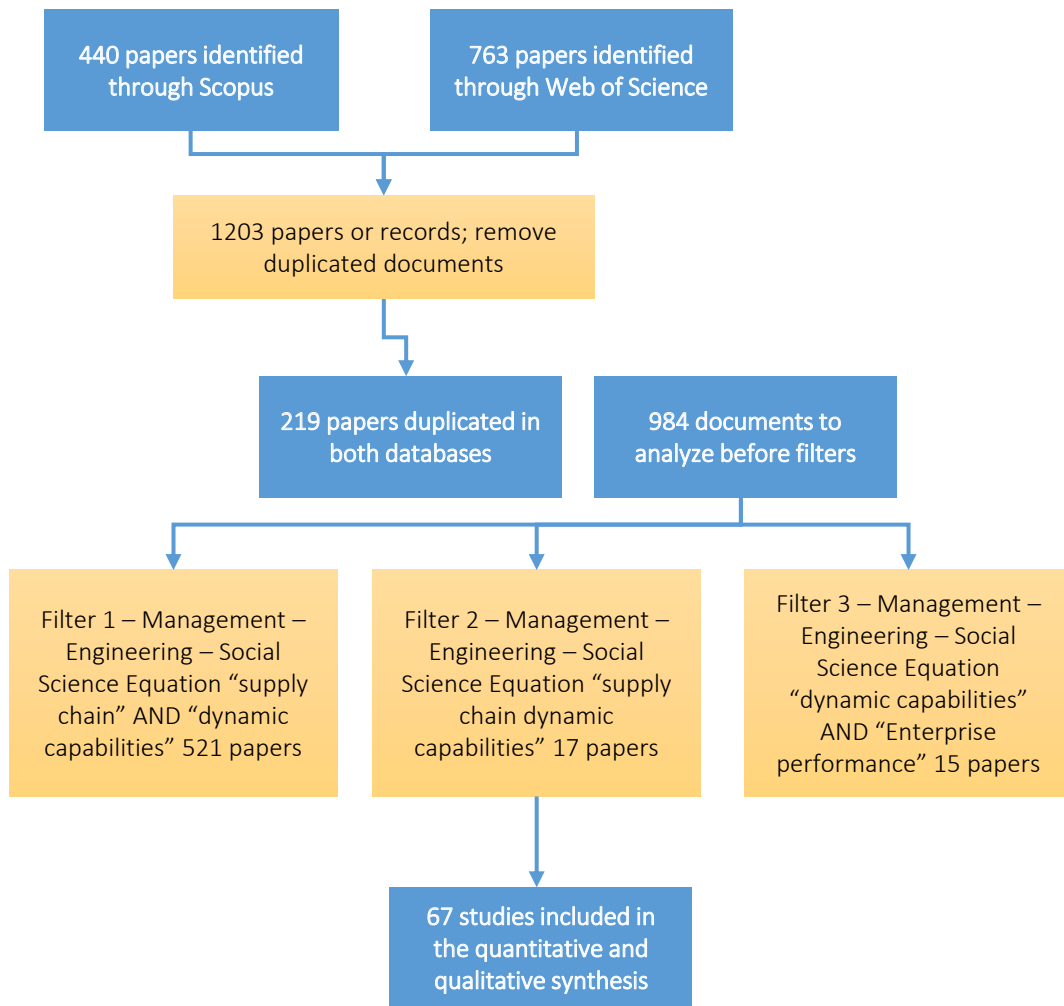
It is important to highlight that the meta-analysis did not limit or perform a date filter since it contemplated the analysis of the seminal literature from the construct of the DC view and SCDC. Figure 3 shows the flow of information through the phases carried out for the literature analysis.

As Figure 3 shows, there is a research gap from supply chain dynamic capabilities construct to organization or enterprise performance. However, it can show the relevance of research aligned with SCDC and its contribution to other constructs.

Based on the VosViewer bibliometric tool and the previous data presented in accordance with the search equations, an exercise to identify representative authors on the conceptual category in question is carried out (Figures 4 and 5). Authors with the most significant contribution to this review are shown (Aslam et al., 2020; Blome et al., 2013; Hallikas, 2003; Han et al., 2020; Kähkönen et al., 2018; Li et al., 2006; Sharma et al., 2020; Xu et al., 2019).

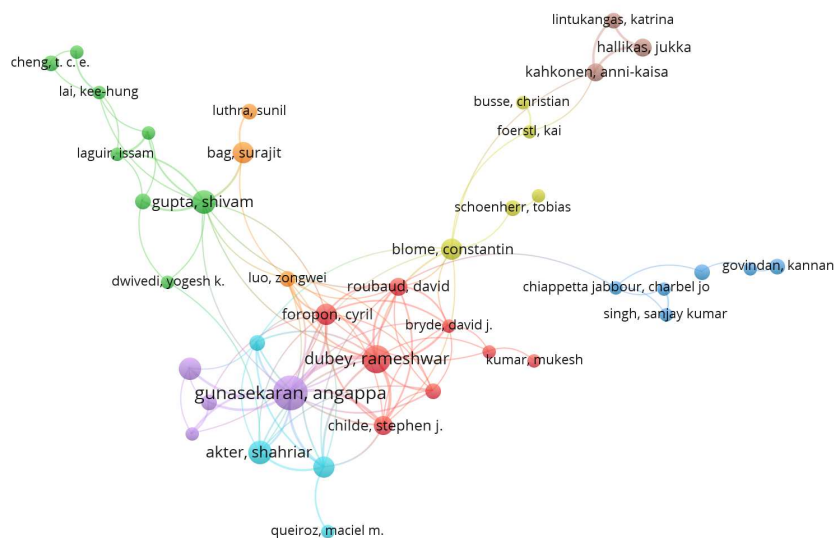
Likewise, Figures 6 and 7 show the conceptual relationships. For example, the Scopus database has 440 records and offers 1,100 terms, from which it was possible to extract the concepts that had at

Source: Authors' elaboration based on Moher et al. (2010).



**Figure 3.** Information flow during the phases of meta-analysis

Source: Authors' elaboration in VosViewer.



**Figure 4.** Cluster of authors in Web of Science



Source: Authors' elaboration in VosViewer.

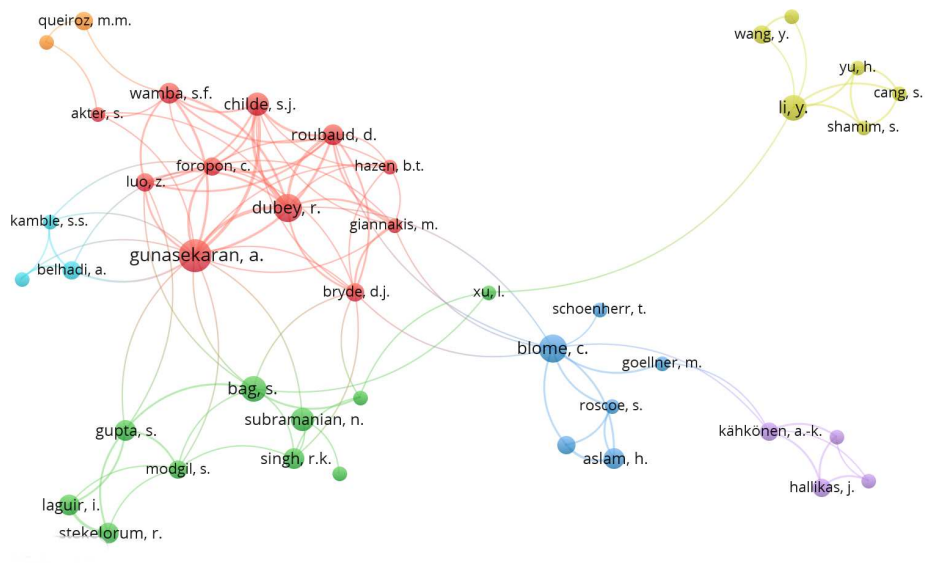


Figure 5. Cluster of authors in Scopus

Source: Authors' elaboration in VosViewer.

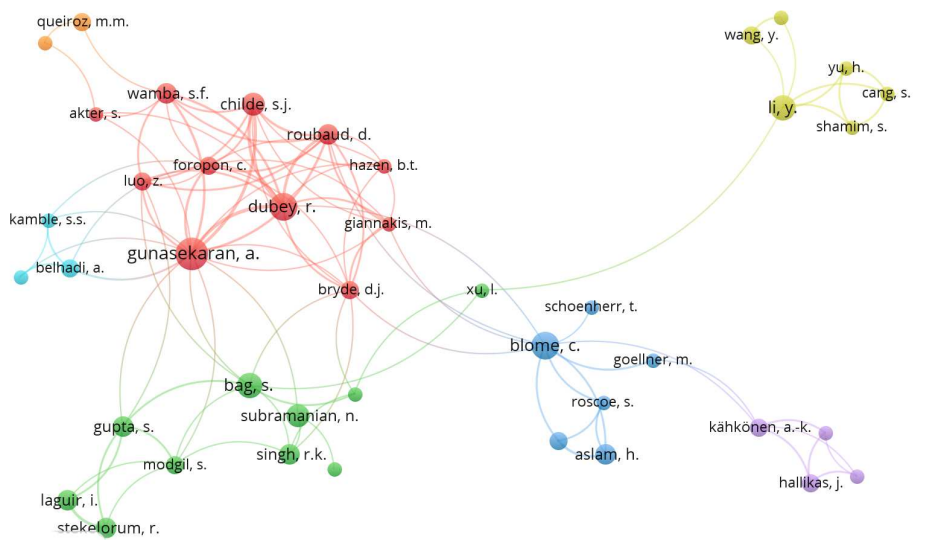
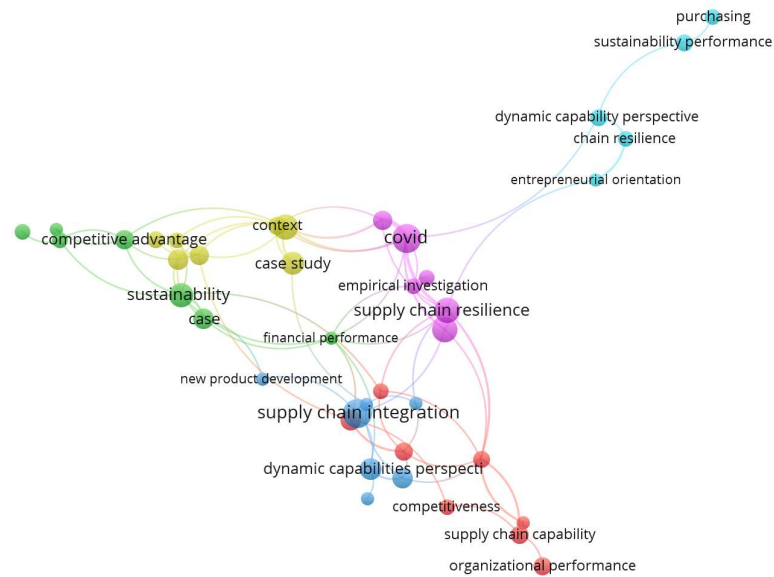


Figure 6. Concepts related to supply chain and DC in Web of Science

least 4 occurrences for title. This allowed identifying 43 terms that reach a visibility threshold, in which 5 groups are shown, each represented by a different color. In the same way, for the Web of Science database, there are 762 records, 1,826

terms are offered, 127 that reach a visibility threshold, and eight possible thematic groups are identified: sustainability, sustainable competitive advantage, business performance, SC performance, supply, DC perspective, and SC capabilities.

Source: Authors' elaboration in VosViewer.



**Figure 7.** Concepts related to SCDC in Web of Science

## 4. DISCUSSION

In a highly changing and competitive environment, companies strive to develop competitive advantages and high organizational performance (Beske, 2012; Rajaguru & Matanda, 2019). As a result, several authors have investigated the effect and critical role of supply chain management and its dynamic capabilities to enhance organizational performance and how the supply chain integration and supply chain capabilities can improve organizational performance (Allred et al., 2011; Kareem & Kummitha, 2020; Tashfeen, 2018; Um et al., 2017).

The globalization of markets has demanded regional and continental collaboration and has increased the international exchange of production. This way, relationships develop between sectors and regions, and industrial production and strategic decisions become global. In highly competitive contexts, the intense international search for new resources requires organizations to establish relationships with new markets and manage their SCs and strategic relationships with external markets (Rajaguru & Matanda, 2019; Shan et al., 2020; Vanpoucke et al., 2014).

For supply chains to satisfy their customers' needs, companies involved in their processes must act in a coordinated and collaborative manner rather

er than in an isolated and disconnected way. Therefore, the level of integration of the supply chain is a determining factor in its ability to meet its objectives and purposes (Bititci et al., 2004; Friday et al., 2018). In addition, this type of collaborative strategy also promotes and strengthens SCDC, which can support and contribute to improving organizational performance (Isnaini et al., 2020; Mekhum, 2019).

However, SCDC necessarily refers to developing and promoting DC into the organization and its supply chain and stimulating integration and collaboration between supply chain stakeholders. Therefore, the combination and interaction between resources and capabilities of SC can encourage and enhance organizational performance (Garcia-Torres et al., 2019; Jin et al., 2019; Sandberg et al., 2019).

The literature analysis highlights that innovation, absorption, flexibility, and agility are the most relevant organizational DC. The interaction between resources and capabilities is complex, and their measurement is based on the efficiency of their use. Thus, they can create and reconfigure operational competencies and develop and adapt the use of its resources. Moreover, they can face new demands and changing conditions and thus respond to changes as they arise. They enable them

to innovate and generate processes that generate organizational competitiveness and sustainability (Singh, 2005; Teece et al., 1997). On the other hand, the DC associated with the SC corresponds to the capabilities that are obtained from the collaboration and integration of resources and capabilities of the organizations that act in the SC network (Isnaini et al., 2020; Mekhum, 2019; Sandberg et al., 2019; Tripathi & Joshi, 2019).

In order to develop a sustainable competitive advantage and organizational performance, organizations must build and strengthen a dynamic capabilities ecosystem for continuous improvement. SCDC is a sophisticated and specialized set of DC that enables the supply chain to support the organization in improving its performance (Colicchia & Strozzi, 2012; Isnaini et al., 2020; Ju et al., 2016; Mekhum, 2019).

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## CONCLUSION

This paper showed a clear position on how organizations and their SCs are involved in highly changing environments. Development and strengthening of organizational and supply chain dynamic capabilities play a leading role, facilitating the construction of a sustainable competitive advantage at the level of strategic direction and constant evolution of internal conditions in the face of changing environments.

Beyond the search for utopically stable environments, it is argued that companies must confront and embrace dynamic, changing, risky and fluctuating contexts. These environments will undoubtedly affect their stability and durability in post-pandemic scenarios. However, by developing a solid dynamic capabilities ecosystem and building more agile and flexible organizations, SCs that can simultaneously synchronize with new technologies and develop best practices to enhance their competitive advantages are encouraged.

SCDCs are complex to identify, measure, and understand since they are sophisticated combinations of organizational DC and skills developed by the supply chain. Therefore, their identification and definition require a detailed and profound analysis of the interactions and collaborations. Equally, their documentation and definition is vital; thanks to the analysis of the different information collected from different authors, the following terms are recognized as the most important ones: coordination, adaptability, agility, competitive priorities, reconfiguration, collaboration, integration, and flexibility.

The literature analysis allowed identification of the existing gap aligned with DC ecosystems, SCDC, and their contribution to organizational performance and other constructs. Therefore, it is recommended for future research contributions from different perspectives that also show how this affects organizational performance and sustainability, thus allowing strategic positioning that generates sustainable competitive advantages over time.

## AUTHOR CONTRIBUTIONS

Conceptualization: Isabel Alzate, Eva Manotas, Antonio Boada, Camilo Burbano.

Data curation: Antonio Boada.

Formal analysis: Isabel Alzate, Eva Manotas, Camilo Burbano.

Investigation: Isabel Alzate, Eva Manotas, Antonio Boada.

Methodology: Isabel Alzate, Eva Manotas, Camilo Burbano.

Project administration: Isabel Alzate, Antonio Boada.

Resources: Isabel Alzate, Eva Manotas, Antonio Boada.

Software: Camilo Burbano.

Supervision: Eva Manotas, Antonio Boada.

Validation: Isabel Alzate, Camilo Burbano.

Writing – original draft: Isabel Alzate, Eva Manotas, Antonio Boada, Camilo Burbano.

Writing – review & editing: Isabel Alzate.

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