Firm disruption orientation and supply chain resilience:

understanding mechanisms to mitigate disruption impact.

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Abstract

Purpose – This study aims to investigate the interplay between a proactive attitude towards disruptions – supply chain disruption orientation – and supply chain resilience, increasing our understanding of their influence on reducing the impact of supply chain disruptions within the B2B context.

Design/methodology/approach – As unexpected disruptions are closely related to a dynamic and changing perception of the environment, this research is framed under the Dynamic Capabilities lens, consistent with existing resilience literature. We used partial least squares-path modeling (PLS-PM) to empirically test the proposed research model using survey data from 216 firms.

Findings – Results show that a proactive approach to disruptions alone is insufficient in mitigating their negative impact. Instead, a firm's disruption orientation plays a crucial role in boosting its resilience, which acts as a mediator, reducing the impact of disruptions.

Originality/value – This paper sheds light on the mechanisms by which firms can mitigate the impact of supply chain disruptions and offers insights into how certain capabilities are needed so that firms' attitudes can effectively impact firm performance. This research thus suggests that dynamic capabilities, traditionally perceived as being enabled by other elements, act themselves as enablers. Consequently, they have the potential to translate strategic orientation or attitudes into tangible effects on performance, enriching our understanding of how firms combine their internal attitudes and capabilities to achieve sustained competitive advantage.

Keywords

Disruption orientation, supply chain resilience, disruption impact, risk management, attitude.

1. Introduction

Supply chain (SC) management is crucial for creating business value in the current highly competitive market. Adequate management of the supply chain in the B2B context can be a source of generation of valuable capabilities, derived from the interaction and interdependence relationships (Dominidiato et al., 2023). It is even more important now because SCs have become more complex due to several factors such as the globalization of production systems, technological advancements, increased demand for customization, and immediacy or intense competition (Chhetri *et al.*, 2022). Such an increase in complexity can lead to greater uncertainty and make the firm's SC more vulnerable to disruptions (Brandon-Jones *et al.*, 2014). These unexpected events alter the normal flow of products and services and can cause short and long-term damage to sales, reputation, shareholder value, and general firm performance (Azadegan *et al.*, 2020; Bode and Wagner, 2015). Not only do businesses suffer the consequences of disruptions, but so does society. For example, the recent geopolitical conflict in Ukraine has led to limited access to basic products such as fertilizers or wheat in developing nations, putting low-income populations at risk (Caprile, 2022).

Managers in B2B interfaces are conscious of these potential risks, and their approach to them affects business performance. Recent literature has studied how a proactive approach against disruptions (being aware, concerned, conscious, and recognising new opportunities derived from them), also known as SC disruption orientation (Bode *et al.*, 2011), can positively impact a firm's economic and operational performance (Laguir *et al.*, 2022; Stekelorum *et al.*, 2022). Adopting a disruption-oriented approach is thus considered an attitude that reflects the motivation to react following a disruptive event (Bode *et al.*, 2011). Indeed, a well-defined strategic orientation guides firms in navigating market challenges, enabling them to create specific capabilities or business practices to improve their competitive advantage (Gatignon and Xuereb, 1997; Hong et al., 2023; Zhou and Li, 2010).

In the context of disruptions, these specific capabilities have been studied to better understand how a firm can overcome unexpected situations. For example, SC agility to adapt or respond to potential and actual disruptions (Braunscheidel and Suresh, 2009) or external knowledge use (Ambulkar *et al.*, 2022). However, especially after the pandemic, researchers' and practitioners' interest has focused on the concept of SC resilience. Resilience is defined as a firm's ability to respond and recover from disruptions, thereby reducing its impact (Ponomarov and Holcomb, 2009). Recent literature has stressed the importance of studying the characteristics of resilient SCs, the mechanisms through which they reduce the impact of

disruptions or the specific external conditions in which the positive effect increases (Gu *et al.*, 2021; Han *et al.*, 2020; Wong *et al.*, 2020).

However, the interplay between two critical elements in the context of SC management—disruption orientation as a strategic orientation and resilience as capability—remains unclear. Existing research has treated them as distinct variables with separate influences on strategies or performance metrics within the SC domain (Bode *et al.*, 2011; Laguir *et al.*, 2022). On the contrary, other scholars argue that SC resilience acts as an antecedent of SC disruption orientation, as they consider the latter a learning capability partially built by resilience (Hussain *et al.*, 2022). Conversely, a different research stream points to strategic orientation as an antecedent and generator of capabilities. In fact, existing research suggests that SC disruption orientation is a prerequisite of SC resilience (Ambulkar *et al.*, 2015), focusing on the capabilities and activities that enable that influence (Liu and Wei, 2022).

This divergence in perspectives underscores a significant research gap in our understanding of the relationship between disruption orientation and resilience within SC management. Clarifying the nature of their connection in the context of real disruptions, using an empirical approach, is essential for advancing theoretical frameworks and informing practical strategies for SC risk management. By exploring the nuanced dynamics between the firm's strategic orientation (disruption orientation) and capabilities (resilience) under a disruptive context, we aim to contribute to the evolving body of knowledge in SC management, shedding light on effective approaches for reducing the negative impact of unexpected disruptions. This investigation is thus guided by the following central question:

RQ: How does the interplay between supply chain disruption orientation and resilience influence the reduction of disruption impacts?

This is important because the reduction of impact is indeed a mechanism through which the firm can partially explain the improvement of overall performance, despite suffering from a disruption. A better understanding of these mechanisms advances current knowledge in SC risk management and guides practitioners on effective attitudes towards unexpected events.

To shed light on this phenomenon, we frame the study in the Dynamic Capabilities theory, which describes the firm's ability to integrate, build, and reconfigure internal and external resources and competences, enabling the firm to address and shape rapidly changing business environments (Teece *et al.*, 1997) and, ultimately, respond better to disruptions. This theoretical lens can be considered appropriate because disruptions are dynamic and unexpected events that challenge a firm's ability to respond effectively. This study thus aims to highlight

the relevance of SC disruption orientation in building resilience. And also, to empirically study and understand the role of this attitude in the effective reduction of SC disruption impact, providing a framework of how disruption orientation and resilience are combined to mitigate the impact of unexpected events in SCs.

Through an examination of 216 survey responses from managers, the proposed relationships are empirically tested using structural equation modeling. We expect to clarify the existing dynamics between the variables under study and how their combination can reduce the impact of disruptions in the SC. In this way, we can contribute to the debate in the existing literature and define how certain business practises minimise the negative effects of unexpected events.

The article is structured as follows. We first review the existing literature to develop the hypotheses, leading to a theoretical framework. Then, the methodology and data analytics processes are explained, followed by a discussion of the results and the contribution of the findings.

2. Literature review and hypothesis development

In the face of a globalized and uncertain environment, the growing complexity of the supply chain (SC) is one of the greatest challenges in business management (Chand *et al.*, 2022). The main factors that contribute to this increased complexity of SCs are the growing uncertainty of the environment, the high speed of technological developments, the growing global geopolitical risk, and the growing demand from consumers for greater product customization (Chhetri *et al.,* 2022; Wiengarten *et al.*, 2017), resulting in a decline in SC performance (Heim *et al.,* 2014) and therefore business results (Akın Ateş *et al.*, 2022). Consequently, reducing complexity has become an essential factor for business survival and the sustainability of competitive advantage (Chand *et al.*, 2022).

Bode and Wagner (2015) determined that a high level of complexity in the SC is associated not only with lower SC performance, but also as a significant factor leading to SC disruptions. In this sense, the recent literature has highlighted that given the increase in SC complexity, avoiding and mitigating the effects of SC disruptions is crucial for companies. In fact, companies are not aware of the degree of vulnerability of their SCs until a disruption occurs (Bier *et al.*, 2019).

One of the most cited definitions of SC disruption in the literature is provided by Craighead *et al.* (2007), referring to any event or occurrence that, not being foreseen, interrupts the usual flow of goods and materials within an SC. Therefore, it usually comes from an event whose

probability of occurrence is low (Dolgui *et al.*, 2019), but if it occurs, it represents a serious threat to the normal development of a company's operations (Bode *et al.*, 2011). The origin of a disruption can be diverse and come from the demand side, suppliers, regulations or norms, infrastructure, the occurrence of a catastrophe, or even a cyber-attack (Ambulkar *et al.*, 2015; Bode and Macdonald, 2017; Wagner and Bode, 2008). The instability caused by an SC disruption has direct consequences for the focal company, even in the long term, related to customer dissatisfaction, damage to reputation, and a negative impact on performance parameters and stock value (Bode and Wagner, 2015; Filbeck and Zhao, 2020). Baghersad and Zobel (2021) empirically analyse the impact of SC disruptions and their direct relationship with a decrease in operating income, return on sales, return on assets, sales, and a negative performance in total assets.

Bode *et al.* (2011, p. 836) defined the impact of disruption as "a critical piece of information that a firm interprets to construct its beliefs about the stability of the affected exchange". Therefore, the high uncertainty associated with SC disruptions questions the usefulness and real value of existing resources in the firm to develop the necessary capabilities to initiate and develop a recovery process after the disruption. In complex environments, the development and implementation of capabilities are fundamental to ensuring survival (Golgeci and Ponomarov, 2013). Thus, companies have sought ways to reduce the impact of SC disruptions through the development of resilient capabilities (Ambulkar *et al.*, 2015; Azadegan *et al.*, 2020). In the literature, there are multiple definitions of SC resilience. Table I summarizes some of the main ones.

Table I Definitions of SC resilience in literature

Authors	**Definition**
Rice and Caniato (2003)	The capacity to respond to a disturbance and restore normal operations.
Sheffi and Rice (2005)	The capacity to contain disturbances and manage recovery.
Ponomarov and Holcomb (2009)	The adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function.
Pettit et al. (2013)	The ability to anticipate and overcome disturbances in the supply chain.
Ambulkar et al. (2015)	The ability of the firm to cope with changes due to a supply chain disruption, the ability to adapt to a supply chain disruption and provide a quick response, and the ability to maintain high situational awareness.

Yao and Fabbe-Costes (2018)	The adaptive and collective capacity of supply network companies to maintain a dynamic balance, react to disruption and recover, and leverage generated knowledge.
Tukamuhabwa et al. (2017)	The ability of a supply chain to prepare and react to disruptions to get original performance with control and connectedness over functions better than competitors.
Ivanov et al. (2018)	The ability to maintain the supply chain by relying on adaptive systems as conditions vary over time.
Blackhurst et al. (2011); Poberschnigg et al. (2020)	A capability of the supply chain to quickly return to the normal state of operation after being disrupted.

Source: Authors' own work

In recent years, scientific literature has shown a great deal of interest in the role of resilience in SCs in the face of disruptions. For example, specific mechanisms for improving SC resilience (Scholten *et al.*, 2019) and their impact on SC performance (Chowdhury *et al.*, 2019) have been analysed. Its antecedents have also been studied (El Baz and Ruel, 2021; Nikookar and Yanadori, 2022), as well as its relationship with the implementation of industry 4.0 processes and its role in developing new capabilities (Ivanov *et al.*, 2018; Ralston and Blackhurst, 2020). There are also studies that highlight the role of SC resilience in sustaining dynamic capabilities, given the changing and uncertain nature of SC operations (Ponomarov and Holcomb, 2009; Tukamuhabwa *et al.*, 2017). Tukamuhabwa *et al.* (2015) found in their literature review on SC resilience that only a limited number of empirical studies have been conducted, and few articles use theoretical frameworks to improve the understanding of SC resilience.

In recent years, several studies have analysed from different theoretical perspectives how to deal with the increasing SC complexity as well as the role of SC resilience in mitigating the SC risk associated with these high levels of uncertainty. For instance, Mishra et al. (2016) used Strategic Choice theory to build a theoretical model that explores how firms operating in different business environments respond to buyer-supplier risk by adopting appropriate mitigation strategies. Strategic Choice theory determines that, through the analysis of inter-organisational relationships, companies make strategic decisions for risk mitigation, considering the important dimensions of the organizational environment (Miles and Snow, 2007). Other studies focus on the systemic nature of SC strategies, especially in industries where SC exhibits unique characteristics, employing the Complex Adaptive System theory as the theoretical framework (Choi et al., 2001; Yaroson et al., 2021; Zhao et al., 2019). These studies do not conceptualise SC resilience as a resource or capability, but rather as a set of

strategies resulting from behaviours and interactions among various agents and their environment. In this way, coordination strategies are deployed to foster a collective, adaptable, flexible, and coherent behaviour in SCs (Surana et al., 2005).

Other articles do not focus on the systemic nature of SC resilience but rather examine resources and capabilities associated with value creation and/or the competitive advantage. According to the contingent Resource-Based View (RBV), value creation depends on certain conditions of the organizational context and the environment that affect the effectiveness of different resources or capabilities in enhancing a firm's competitive advantage (Aragón-Correa and Sharma, 2003; Grötsch et al., 2013). Brandon-Jones et al. (2014) identified several contingencies related to SC complexity that impact the relationship between SC visibility capability and SC resilience: geographic dispersion, scale complexity, differentiation, and delivery complexity.

Finally, one of the most prevailing perspectives is the theory of Dynamic Capabilities (Teece et al., 1997), which underpins the present study. This extension of the resource-based view (RBV) (Barney, 1991) takes a dynamic and changing perception of the environment, suggesting the need to develop or reconfigure capabilities and resources to achieve sustained competitive advantage over time (Eisenhardt and Martin, 2000). As a dynamic capability, SC resilience enables firms to absorb the negative effects from a range of different risk sources (Yu et al., 2019). According to Golgeci and Ponomarov (2013), SC resilience emerges as a dynamic capability that enables firms to better manage disruptions and therefore maintain higher performance through continuance of product and service deliveries to customers. Chowdhury and Quaddus (2017) argue that SC management is a significant strategic organisational process for which resilience (or the lack thereof) must be appraised following a structured path, and thereafter, corrective actions can be taken by identifying and integrating appropriate resources. They propose that the components of their SC resilience scale (proactive, reactive and design elements) are essentially dynamic in nature. This dynamic perspective was maintained when developing measures for SC resilience. Researchers have used in survey items terminology such as 'changes', 'adapt', 'quick response' or 'maintaining awareness' (Ambulkar et al., 2015), responding to the need to address the turbulence of the environment. Finally, the Dynamic Capabilities lens has also been used to explore the antecedents of resilience in SC operations (Brusset and Teller, 2017) or the mediating role of SC resilience in justifying sustainable SC performance (Gani et al., 2022).

Within this framework, disruptions to the SC threaten the stability of the environment and increase its complexity and dynamism (Bode *et al.*, 2011). Therefore, SC resilience is

conceptualized as a dynamic capability of the company (Yu *et al.*, 2019) that allows it to adapt, change, and reorganize dynamically while facing disruptions (Walker, 2020).

Because disruptions to the SC generate great uncertainty and require managing large amounts of information, the handling of that information is fundamental and critical to mitigate risk in the SC (Duhadway *et al.*, 2019; Wu *et al.*, 2013). Thus, information processing capabilities improve a company's ability to manage its SC (El Baz and Ruel, 2021). Adequate information processing would allow the firm to learn from past unforeseen events, which is crucial for taking a proactive approach to identify and mitigate potential disruptions. Therefore, we consider SC disruption orientation as a capacity that rests on a deep recognition and awareness by the company of possible disruptions (Bode *et al.*, 2011).

Although recent research efforts have made significant progress in determining the organisational capabilities necessary to develop SC resilience, there is still an important research gap in the literature on SC resilience (Nikookar and Yanadori, 2022). In this sense, some authors have determined that companies can improve their disruption management by developing a strong SC disruption orientation capacity (Bode *et al.*, 2011).

Despite the growing interest in these elements, the relationship between SC disruption orientation and resilience is not consistent in the recent literature. Hussain *et al.* (2022) determined that SC resilience should be an antecedent to SC disruption orientation. Others argue that such orientation is a necessary prerequisite (Ambulkar *et al.*, 2015), whose relationship is mediated by the development of SC risk management practices (Liu and Wei, 2022).

The impact of disruption orientation on SC resilience and financial performance in dynamic environments has been previously studied through resilience (Yu *et al.*, 2019). However, no studies have examined how this orientation can reduce the impact of disruptions themselves. Therefore, this study aims to investigate the relationship between SC disruption orientation and the development of SC resilience in analysing the impact of disruption.

As SC disruption orientation indicates the company's proactive preparedness to disruptions, we argue that a firm with a strong disruption orientation is more likely to learn from past disruptions and make necessary improvements to become more resilient, in line with existing research (Ambulkar *et al.*, 2015). This aligns with existing research on how a firm's culture and orientation can contribute to a more resilient SC (Mandal, 2017). Furthermore, having a disruption orientation can also facilitate a culture of continuous improvement and learning within the organisation. Firms can use their experiences with past disruptions to refine their strategies and improve their response capabilities, thus increasing the effectiveness of their

overall resilience. Therefore, we pose that:

H1: *The adoption of a Supply Chain Disruption Orientation has a positive effect on Supply Chain Resilience*.

At the same time, existing research has shown that SC resilience has a positive effect on financial and non-financial performance (Wong *et al.*, 2020). However, it is important to narrow down the focus to understand the specific mechanisms or capabilities through which firms achieve performance improvement. Bode and Macdonald (2017), for example, found that information processing is a capability that could reduce disruption impact, ultimately leading to better general performance. Similarly, we argue that firms with a higher SC resilience can more quickly and effectively implement contingency plans to minimise the impact of disruption in terms of, for example, sales, quality, or costs. We thus argue that:

H2: *Supply Chain Resilience is associated with a reduction in disruption impact*.

Although the effect of SC disruption orientation has been tested on firms' economic performance (Yu *et al.*, 2019), it is not clear whether this managerial approach can reduce the disruption impact alone. A simply proactive attitude based on learning from past disruptions, anticipating and preparing for future challenges, may drive the firm's motivation to respond to challenges associated with disruptions (Bode *et al.*, 2011) and reduce the impact. However, it might not be sufficient, as existing research has argued that instrumental mechanisms, such as resilience, are needed to fully understand the effect on financial outcomes (Yu *et al.*, 2019). As we aim to understand how this relationship behaves in the context of its effects on disruption impact, we posit that:

H3: *The adoption of a Supply Chain Disruption Orientation is associated with a reduction in disruption impact.*

3. Methodology

3.1 Research instrument

For this study, direct information from firm managers was considered essential. Secondary data were inaccessible due to difficulties in proxying the variables under study. Primary data collected by other researchers were not available either. Therefore, a self-administered web-based survey was designed to collect the information required to test our hypotheses. This

method allows us to gather information from a larger group of managers, ensuring a high degree of consistency and providing more anonymity, reducing social desirability bias and increasing response rates (Straits and Singleton, 2018).

The survey's initial draft was first distributed to three academics with relevant experience in SC management and B2B research. We have incorporated the feedback from these experts to improve the initial survey version and address potential structural issues in the measures. In addition, a pretest was conducted before administering the survey. All items included the response options "I don't want to answer" and "I don't exactly understand the question". Respondents were also invited to provide feedback. These responses were not included in the final sample.

3.2 Sampling and data collection

As managers and executives are a key source of firm-level information in similar studies (Gayed and Ebrashi, 2023), the relevance of addressing the survey to adequate respondents is acknowledged. Therefore, a convenience sampling strategy was developed (Bajpai, 2018), which was restricted to one country only (Spain) to avoid heterogeneity due to cultural differences and legal frameworks. To reach potential respondents, we used LinkedIn as a channel for identifying suitable participants. This approach has been used in similar studies and has been shown to be both valid and effective in facilitating responses in the B2B context, especially during the COVID-19 pandemic (Hoai and Nguyen, 2022).

Aligned with our research focus on B2B interfaces with suppliers, we targeted individuals in roles pertinent to our study, such as SC managers or purchasing managers. This ensures a respondent pool with direct insights into the specific variables of interest. These efforts to find the right respondent aligned with the recommendations for an adequate single-respondent survey design (Montabon *et al.*, 2018). The sampling frame was thus composed of Spanish firms with specific positions relevant to the procurement of supplies. Within that frame, respondents were randomly contacted.

First, they would receive a short message on LinkedIn, advising them about the survey and giving them a chance to participate. Then, once each respondent's firm was identified, a nominative email was sent to the company. To improve response rates, the emails were personalised by addressing the recipient by name (Dillman *et al.*, 2014). In addition, the importance of their participation was explicitly communicated, accompanied by messages ensuring anonymity and confidentiality, as recommended to increase the likelihood of response (Straits and Singleton, 2018). Data collection began in September 2020, and responses were

gathered over a three-month period. According to an F-test, a minimum sample size of 191 subjects was recommended to attain a statistical power of 95% (Faul et al., 2009). 216 valid responses were collected, yielding a response rate of 19,3%. Respondents were thus prone to collaborate in a higher proportion than in general massive email-sending strategies, maintaining the quality of the responses, in line with existing research findings (Sauermann and Roach, 2013).

3.3 Non-response bias

While LinkedIn serves as a useful tool to identify adequate respondents, we acknowledge the potential for response bias due to platform usage. However, we consider this a minor concern given its broad accessibility. In addition, we included 'years of experience' question to ensure that senior professionals were also represented in the sample. The average was 13.5 years, suggesting that more experienced SC or purchasing managers were not excluded from the sampling frame. To address non-response bias, we compared the characteristics of respondents with those of non-respondents (Wagner and Kemmerling, 2010), applying a T-Test analysis using IBM SPSS software. We collected additional information from a randomly selected subsample of firms that did not respond, such as their age. We then compared whether there were significant differences between the sample included in the study and the rest of the sampling frame analysed. No significant differences were found, suggesting that non-response bias was not a critical concern in this study.

3.4 Measures

We used established constructs and their measurement scales to create a questionnaire. These constructs were then translated into Spanish and back-translated to ensure consistency. All items in the questionnaire were measured using a seven-point Likert scale to capture variability in the responses. The constructs of SC disruption orientation were adopted from Bode *et al.* (2011), and they have been successfully employed in subsequent work related to resilience and SC risk management (e.g., Ambulkar *et al.*, 2015; Yang *et al.*, 2021). Respondents were asked to express their inclination towards staying vigilant, identifying areas for improvement, acknowledging the ongoing risk of disruptions, or their engagement in thorough post-incident analysis, capturing the firm's proactiveness against disruptions. The measurement of the SC disruption impact was also adopted from Bode *et al.* (2011). The scale for measuring the impact of SC disruption ranges from 1 (very negative) to 7 (not negative at all), with a high score indicating a positive outcome. It is crucial to accurately interpret the

results of the analysis. To avoid confusion among respondents, the titles of the variables were not revealed (e.g., 'SC disruption impact'). The anchors for the remaining variables were rated on a scale of 1 (Completely disagree) to 7 (Completely agree).The items to measure SC resilience were taken from Golgeci and Ponomarov (2013). This measure continues to be widely employed in the current literature (e.g., Laguir *et al.*, 2022; Yu *et al.*, 2019) and aims to capture whether the firm's SC can return quickly to its original state or maintain control during unexpected events. All key constructs in the model are specified as emergent variables or composite constructs. An emergent variable is a composite of variables whose correlations with other variables in a model are proportional to one another (Benitez *et al.*, 2020; Dijkstra, 2017).

As resilience and disruption orientation are capabilities highly related to the experience and size of the firm, both firm age and size (number of employees) have been used as control variables to test their influence on the impact caused by disruptions.

4. Analysis and results

The proposed research model was empirically tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. PLS-SEM is a variance-based SEM technique that creates proxies as linear combinations of observed variables, and then estimates the model parameters using these proxies (Henseler, 2021). We opted for PLS-SEM for three main reasons. First, PLS can test for exact overall model fit, being a full-fledged variance-based SEM estimator (Henseler *et al.*, 2016). Second, PLS-SEM can support composite models (as the proposed research model) (Benitez *et al.*, 2020). Third, it has been used in similar empirical research regarding SC (López-Morales *et al.*, 2022). We used the statistical software Advanced Analysis for Composites (ADANCO) 2.2. to test both the measurement and structural models. Our analytical strategy consists of the following steps. As a first step, a CCA was performed to test the adequacy of the measurement structure. PLS provides bootstrap-based tests of exact model fit (Dijkstra and Henseler, 2015), by which a confirmatory composite analysis (CCA) can be conducted (Henseler *et al.*, 2014). A CCA can detect several forms of model misspecifications, such as incorrect assignment of indicators to constructs or incorrect number of constructs (Henseler *et al.*, 2014). Once we find support for the measurement structure, composite constructs are assessed in terms of validity by performing an analysis of multicollinearity, weights, and loading for our constructs (Cenfetelli and Bassellier, 2009). Next, the structural model is evaluated. In this case, the goodness-of-fit of the structural model

and the structural model estimation are assessed. A bootstrapping algorithm with 5000 subsamples was used to obtain the level of significance of weights, loadings, and path coefficients. Overall, we found similar empirical studies focusing on resilience and disruptions that used survey data and structural equation modeling to derive conclusions (Yu *et al.*, 2019).

4.1 Confirmatory composite analysis

Given that we are proposing a composite model, we performed a confirmatory composite analysis (CCA) to check the adequacy of the measurement model by comparing the empirical correlation matrix and the model-implied correlation matrix (Benitez *et al.*, 2020). We used the weighting schemes of correlation weights (mode A) to estimate the three constructs of the model because this mode generates better estimations when there is a strong correlation between indicators (Braojos *et al.*, 2020; Rigdon, 2016). The results of the CCA are presented in Table II. Three well-accepted measures of the discrepancy are considered for evaluation. The standardized root mean squared residual (SRMR), which is a proxy for the discrepancy between the empirical and model-implied correlation matrix, should be below 0.800, while the unweighted least squares discrepancy (d_{ULS}) and geodesic discrepancy (d_G) values should be below the 99%-quantile of the bootstrap discrepancy. We found that no matter which discrepancy between the empirical and model-implied covariance we examine, the discrepancies are so small that it is not unlikely that they originate from sampling variation. Table II shows that an acceptable fit exists between the model and the data exists, supporting the structure of our measures (Henseler, 2017).

Table II: Results of the confirmatory composite analysis

Discrepancy	**Overall saturated model fit evaluation**		
	Value	**HI_{99}**	**Conclusion**
SRMR	0.051	0.056	Supported
d_{ULS}	0.316	0.377	Supported
d_G	0.108	0.122	Supported

Source: Authors' own work

4.2 Prevention and testing of common method variance (CMV)

Composite measures are unlikely to suffer from CMV because they are assumed to be error-free (Rönkkö and Ylitalo, 2011). However, we made every possible effort to prevent and test for CMV. CMV reflects the shared variance among variables due to the use of the same measurement method (Podsakoff *et al.*, 2003). First, we prevented CMV in the research design

by assuring confidentiality and anonymity in the survey administration, which encourages more honest and accurate responses. In addition, following Podsakoff *et al.* (2003) guidelines, we randomized the order of variables in the survey to minimise the impact or response order effects on the data, and questions were not tagged as they are in the current research. Because PLS-SEM is composite-based structural equation modeling, previous studies have stated that traditional techniques such as Harman's single factor method are not appropriate for the detection of CMV (Sabol *et al.*, 2023). In line with this issue, we tested for potential CMV in two ways. First, we examined the correlation matrix to ensure that there were no high correlations ($r > 0.90$) (Bagozzi *et al.*, 1991).

The highest correlation among the key variables is 0.533 (please, see Table III for a reference). Second, we applied a full collinearity assessment approach to check for potential CMV (Kock, 2017; Sabol *et al.*, 2023). A full collinearity test allows for the identification of collinearity among all variables in the model regardless of where they are located in the model (Kock and Lynn, 2012). In this test, we estimated the VIF values at the construct level, where values equal to or greater than 3.3 may alert about potential CMV in the context of variance-based SEM (Kock and Lynn, 2012). VIF values at the construct level range from 1.341 to 1.663, suggesting that it is unlikely that the research model suffers from CMV.

Table III: Correlation matrix

Construct	Disruption orientation	Supply chain resilience	Disruption Impact	Firm size	Firm age
Disruption orientation	1.000				
Supply chain resilience	0.533	1.000			
Disruption impact	0.324	0.495	1.000		
Firm size	0.012	-0.103	0.028	1.000	
Firm age	0.031	0.135	0.225	-0.393	1.000

Source: Authors' own work

4.3 Measurement model evaluation

We validated the composite constructs by assessing the content validity, multicollinearity, and significance of weights and loadings (Cenfetelli and Bassellier, 2009). First, content validity was ensured using previously validated scales. Multicollinearity was assessed by evaluating the variance inflation factor (VIF). Traditionally, VIF values above 5 are signals of problematic collinearity (Hair *et al.*, 2011). However, weights estimated using mode A, as in our case, ignore multicollinearity because this model equals scaled covariances, and an assessment of

multicollinearity would not be necessary (Rigdon, 2012). Finally, we checked the level of significance of the indicators' weights and loadings. Composite weights refer to the relative contribution of an indicator to its construct, and composite loadings refer to the absolute contribution, that is, the correlation between the indicator and the construct (Cenfetelli and Bassellier, 2009). All indicators' weights and loadings are significant at 0.001 level, as shown in Table IV.

Table IV: Measurement model evaluation

Construct/indicator Except where otherwise indicated below, the possible range for measures was from 1 to 7 (1: Strongly disagree, 7: Strongly agree)	**Mean**	**S.D.**	**VIF**	**Weight**	**Loading**
Disruption orientation: Regarding the potential disruptions within the supply chain (such as the COVID-19) *(Composite, Mode A)*					
We feel the need to be alert at all times.	5,94	1,18	2.001	0.303***	0.802***
Show us where we can improve.	5,73	1,24	2.165	0.339***	0.840***
Are always looming.	4,58	1,55	1.141	0.220***	0.531***
After it has occurred, it is analyzed thoroughly.	4,94	1,43	1.445	0.436***	0.813***
Supply chain resilience: Against disruptions (such as the COVID-19), our supply chain is able to *(Composite, Mode A)*					
Adequately respond to unexpected disruptions by quickly restoring its product flow.	4,99	1,45	2.090	0.263***	0.824***
Quickly return to its original state after being disrupted.	4,85	1,47	1.986	0.224***	0.797***
Deal with financial outcomes of supply chain disruptions.	4,49	1,47	2.280	0.245***	0.835***
Maintain a desired level of control over connectiveness at the time of disruption.	4,82	1,39	2.200	0.238***	0.823***
Extract meaning and useful knowledge from disruptions and unexpected events.	5,38	1,38	1.777	0.259***	0.791***
Disruption impact: In the short run how did the disruption produced by the COVID-19 negatively affect (directly or indirectly) your business unit on the following dimensions? (1: Not negative at all, 7: Very negative) *(Composite, Mode A)*					
Procurement costs/Prices for the purchased item.	3,68	1,72	1.515	0.131***	0.592***
Overall efficiency of our operations.	4,02	1,61	1.813	0.209***	0.746***
Product quality of our final product(s).	5,53	1,46	1.461	0.257***	0.704***
Responsiveness to customer demands.	4,85	1,70	2.253	0.317***	0.844***
Delivery reliability (on-time delivery, order accuracy).	4,49	1,71	2.203	0.286***	0.826***
Sales	3,88	2,02	1.223	0.168***	0.487***

Source: Authors' own work

4.4 Structural model evaluation and results

To assess the structural model, we check the overall fit of the estimated model, the path coefficient estimates, their significance, effect sizes (f^2), and the coefficient of determination (R^2) (Benitez *et al.*, 2020).

As in the CCA for the measurement model, we assess the model fit of the structural model by considering the same three well-accepted measures. Evaluation of the overall fit of the estimated model is necessary to confirm or disconfirm a researcher's theory. Table V shows that the SRMR value is below the threshold of 0.800 and that d_{ULS} and d_G discrepancy values are below the 99%-quantile of the bootstrap discrepancies. This suggests that our model should not be rejected.

Then, we proceed with the evaluation of the structural model. We estimated two models. First, a baseline model that only includes the hypothesized relationships, and second, a mediation model that includes a direct effect from SC disruption orientation to disruption impact. In the baseline model, we found support for H1 and H2, indicating that SC disruption orientation is positively related to SC resilience (0.533, $p_{value}<0.001$), and that SC resilience is positively related to disruption impact (0.482, $p_{value}<0.001$). As we did not find support for the direct effect of the mediation model, we performed a mediation analysis following the guidelines of Zhao *et al.* (2010). We aimed to analyse the effect between SC disruption orientation and disruption impact (H3). To do this, we checked the significance of the direct, indirect, and total effects of this relationship. While the direct effect is found to be non-significant, the indirect effect does (0.232, p_{value} <0.001). This means that the relationship between SC disruption orientation and disruption impact is not direct but rather mediated through SC resilience.

The R^2 values of the model range from 0.284 to 0.294 in the baseline model, which suggests a good explanatory power of the endogenous variables (Benitez *et al.*, 2020). As for the effect sizes, which indicate the relative size of including each additional relationship to the model (Benitez *et al.*, 2020), values range from 0.397 to 0.033, indicating weak-medium to large effect sizes in the model. Tables V and VI present the results of the test of hypotheses and mediation analysis.

Table V: Test of hypothesis

Beta coefficient	Baseline model		Mediation model	
Disruption orientation --> Supply chain resilience (H1)	0.533*** (9.174) [0.425, 0.651]		0.530*** (9.058) [0.420, 0.648]	
Supply chain resilience --> Disruption impact (H2)	0.482*** (8.327) [0.370, 0.599]		0.438*** (5.481) [0.279, 0.592]	
Disruption orientation --> Disruption impact (H3)			0.085 (1.029) [-0.069, 0.256]	
Firm age --> Disruption impact (CV)	0.226** (3.670) [0.099, 0.341]		0.226** (3.705) [0.100, 0.338]	
Firm size --> Disruption impact (CV)	0.166** (2.568) [0.037, 0.292]		0.162** (2.515) [0.033, 0.288]	
R^2	**R^2**	**Adj. R^2**	**R^2**	**Adj. R^2**
Supply chain resilience	0.284	0.281	0.281	0.277
Disruption impact	0.294	0.284	0.301	0.288
Overall fit of the estimated model	**Value**	**HI_{99}**	**Value**	**HI_{99}**
SRMR	0.056	0.061	0.055	0.056
d_{ULS}	0.476	0.569	0.457	0.488
d_G	0.130	0.157	0.128	0.155
Effect size (f^2)	**f^2**			
Disruption orientation --> Supply chain resilience (H1)	0.397		0.390	
Supply chain resilience --> Disruption impact (H2)	0.322		0.193	
Disruption orientation --> Disruption impact			0.007	
Firm age --> Disruption impact (CV)	0.060		0.061	
Firm size --> Disruption impact (CV)	0.033		0.032	

Note: t-values in parentheses. Bootstrapping 95% confidence interval bias-corrected in square bracket (based on n = 4999 subsamples). $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Source: Authors' own work

Table VI: Mediation analysis

Relationship	Direct effect	Indirect effect	Total effect
Disruption orientation --> Disruption impact	0.085 (1.029) [-0.069, 0.256]	0.232*** (4.747) [0.146, 0.338]	0.317*** (4.544) [0.187, 0.458]

Source: Authors' own work

5. Discussion

Using the Dynamic Capabilities lens, this study theorizes and empirically tests the interplay between capabilities and strategic orientation in the context of SC disruptions, which are external drivers of SC risk management (Shrivastava, 2023). This is particularly relevant in the B2B context, as these disruptions are primarily experienced within B2B interactions. Effective management of such disruptions is increasingly critical for firms as they refine their supply strategies. In particular, by examining the relationship between SC resilience and disruption orientation, our study provides insights into mitigating the adverse impact of disruptions within the SC.

The results suggest that firms with a strong disruption orientation improve their SC resilience, which is consistent with existing research (Ambulkar *et al.*, 2015; Yu *et al.*, 2019). Firms that are alert and proactively learning from past experiences are therefore more likely to restore their activity after such an event occurs. Simultaneously, SC resilience was found to minimise the impact of disruptions, as expected according to similar studies (Castillo, 2022).

However, we did not observe a direct effect between SC disruption orientation and disruption impact. This suggests that while this specific attitude has positive effects, enhancing resilience, it does not necessarily alleviate the negative impact of disruptions. Yet, the results show a significant indirect effect. That is, SC resilience functions as an instrumental variable that operationalizes the positive impact of strategic orientation on the reduction of disruption impact. This finding highlights that disruption orientation is not only important for general financial or operational performance, as shown in previous studies (Laguir *et al.*, 2022; Stekelorum *et al.*, 2022), but also plays a critical role in minimising disruption impact.

Our findings also challenge the rationale of studies such as Hussain *et al.* (2022). They considered SC disruption orientation as a behaviour fostered by resilience because it provides novel learning to improve the response to future disruptions. We argue that unique learning experiences, which eventually shape SC disruption orientation, can arise from past disruptions regardless of the degree of resilience. Furthermore, these experiences and responding behaviours increase the degree of resilience, thereby mitigating the impact of future disruptions, as shown in our analysis. Therefore, SC disruption orientation requires instruments to effectively reduce the impact of disruptions. Ultimately, this means that a capability partially based on the characteristics of your external B2B partners (e.g., SC resilience) can be the mechanism needed to transform an internal proactive attitude into an effective mitigating strategy.

5.1 Theoretical contribution

Existing research has previously highlighted the need to further explore not only capabilities as potential mitigators of disruption impact (e.g., information processing) but also decision-makers' attitudes (Bode and Macdonald, 2017). While the existing literature has explored the correlation between a specific managerial approach, such as disruption orientation, and overall performance (Stekelorum *et al.*, 2022), we seek a more detailed understanding. Instead of examining performance in a broad sense, our focus is on understanding the specific influence of this orientation on the impact of disruptions within a turbulent and disruptive context. As these previous models explore broader connections, the underlying mechanisms of these relationships have not been clearly examined. Consequently, the capacity of SC disruption orientation to directly alleviate disruption impact remains unclear. This study provides an empirical answer and finds that firm capabilities must be considered for a comprehensive understanding of the effect of disruption orientation on performance, through the reduction of disruption impact.

Therefore, the theoretical contribution in the field of B2B SC management is threefold. First, the study complements the attitude-as-enabler approach, which argues that a certain capability needs a certain managerial approach, attitude, or culture to exploit its potential benefits (Fosso Wamba *et al.*, 2020). There are cases in which a managerial attitude contributes to a higher impact on performance. For example, organisational culture increases the effect of data analytics capability on firm performance (Upadhyay and Kumar, 2020). In this line, we contributed by showing that in the context of SC disruptions, a particular attitude can yield positive effects on a firm's performance, but certain capabilities are likely to be needed to act as enablers themselves. In this specific case, a certain degree of SC resilience is necessary to fully leverage the advantages of a SC disruption-oriented approach.

Second, it extends knowledge about the proactive role of dynamic capabilities, which are capable of making the firm's orientation or attitude tangible in terms of performance. Despite the growing interest in this interplay, past research has mainly focused on how internal attitudes fostered the development of dynamic capabilities (Fainshmidt and Frazier, 2017) or on how supply chain related dynamic capabilities exert themselves a positive effect on the firm (Lee, 2023). Our results suggest that the value of dynamic capabilities linked to the B2B context (such as SC resilience) can also lie in their capability to make the firm's internal orientation or attitudes tangible in terms of performance.

Third, it contributes to understanding the role of SC resilience beyond its direct effect on

performance. The study of resilience has gained attention from scholars in B2B and supply chain research in recent years. Recent research on trends in SC management of B2B firms found SC risk and resilience as one of the key themes, highlighting the importance of studying internal drivers such as organisational culture and external drivers such as disruptions (Shrivastava, 2023). In this line, other scholars have tested how resilience can also act as a mediator of certain capabilities that impact firm performance, such as data analytics capability or entrepreneurial leadership (Bahrami *et al.*, 2022; ul Haq and Aslam, 2023). We contributed by showing that, in the B2B context, SC resilience not only has a direct effect but also enables certain managerial attitudes to impact firm performance.

5.2 Managerial implications

This article also proposes managerial considerations for executives facing SC disruptions. Managers should take a proactive role in improving the firm's disruption orientation. Although disruption orientation itself may not reduce the impact of disruptions, it can result in a more resilient SC, which ultimately minimises the negative consequences of these unexpected events.

Firm managers, particularly those with presence in B2B interfaces (e.g., SC or purchasing managers), would benefit from incorporating disruption orientation into the firm strategy. This would help to anticipate and prepare potential disruptions, thereby reducing their impact and potentially gaining competitive advantage over similar competitors. For this purpose, companies can implement different strategies, such as developing a risk management plan after disruptions to identify areas for improvement and protocols of action, which could be updated and incorporated with new experiences as they occur. For example, in the B2B context, the implementation of a performance measurement system to assess a firm's SC risk has a positive impact on decision-making to tackle SC potential threats (Guillot et al., 2023). These protocols can lead to formal contingency plans that could be created by focusing on the areas that have suffered the most in previous unexpected situations.

Furthermore, the results show that actions reflecting a firm's disruption orientation need resilience to effectively influence performance. Managers are thus encouraged to foster a resilient SC culture. In line with this purpose, particular actions have been proposed in the literature. For example, improving the firm's processes to establish contacts with new suppliers since redundant sourcing is effective as a complement to existing suppliers for responding to disruptions (Kamalahmadi et al., 2022). This approach, involving redundant suppliers, can help restore product flow in case the disruption affects specific suppliers, regions, or materials.

Resilience can also be promoted by investing in technological advancements that enhance the quality of information acquisition, facilitate more informed decision-making, and improve relationships (Lin et al., 2022). Specific examples include real-time monitoring of sourcing, integration of stock systems with suppliers, and professionalization of data analysis processes. Finally, recent research has highlighted the benefits of actively developing relational norms, trust, and commitment with B2B partners to improve the ability to respond to changes and enhance performance (Li et al., 2023). In this context, personal relationships with suppliers can also increase the commitment of business partners and improve the quality of information flow, enabling better decisions to enhance resilience (Hu, 2022).

5.3 Limitations and future research

As in other studies, the present work has natural limitations that can be overcome by future research; therefore, the results need to be interpreted with caution. Methodologically, the use of cross-sectional data in this investigation restricts the ability to predict outcomes over time and theoretically establish causal relationships.

In addition, the collection method and survey instrument have intrinsic limitations, such as potential respondent biases. It is important to acknowledge a limitation concerning the generalization of results, as the study sample was not chosen entirely at random. Many efforts have been made to find suitable respondents, as this is crucial in single-informant surveys (Krause *et al.*, 2018). This has been achieved by using LinkedIn although at the expense of assuming that membership in that social network is not completely random. These biases were addressed in the survey design to minimize their impact, such as conveying the anonymity of respondents, the confidentiality of responses, or the randomized contacting process in LinkedIn. Despite these limitations, the validity and contribution of using work-oriented social networks in obtaining valuable information have been shown. Therefore, it is recommended that researchers consider LinkedIn as a valid source of information because it allows them to focus on specific job-related information within a company, compare across sectors or countries, etc.

The findings from this study can serve as a guide for future exploration. Subsequent research may integrate the disruption orientation perspective with other potential antecedents of SC resilience and study their interactions to better understand and control the causal relationships. Additionally, researchers are encouraged to collect longitudinal data and combine different sources of information (e.g., primary and secondary data) to obtain a more accurate interpretation of the processes under study. It is also a new avenue for exploration to investigate

under which circumstances SC resilience can increase its positive effect against disruptions thanks to a certain attitude, further extending our contribution to the understanding of resilience.

Finally, although this empirical research clarifies the relationship between disruption orientation and resilience, more research is needed to better understand how that relationship may fluctuate depending on specific environmental factors, such as dynamism or complexity.

6. Conclusion

Recent studies have shown that having a SC disruption orientation is crucial for dealing with unexpected events in the SC. However, previous research is not clear on how this orientation and SC resilience are linked or how it contributes to minimising the impact of disruptions. To address this gap, we conducted empirical tests and found that a SC disruption orientation does indeed reduce the impact of disruptions, albeit indirectly. This is because the adoption of a disruption orientation leads to greater SC resilience, which in turn minimizes the impact of disruptions.

These findings contribute to an understanding of how firms can effectively mitigate the effects of SC disruptions. They highlight the necessity for specific capabilities to complement a firm's attitudes or orientation to significantly influence business performance. Therefore, this research suggest that it is important not only to explore the factors that drive dynamic capabilities but also to analyse the cases in which those capabilities are needed for translating managerial attitudes into tangible improvements in performance.

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