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Cogent Business & Management >

Volume 7, 2020 - Issue 1

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The impact of entrepreneurial orientation on the supply chain resilience

Mohammed A. Al-Hakimi   & Deleep B. Borade | Len Tiu Wright (Reviewing editor)

Article: 1847990 | Received 02 Sep 2020, Accepted 05 Nov 2020, Published online: 18 Nov 2020

 Cite this article

 <https://doi.org/10.1080/23311975.2020.1847990>



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Abstract

Despite the great interest that the concept of Supply Chain Resilience (SCR) has received over the past few years, empirical research examining its antecedents still limited, especially, in the context of small and medium enterprises (SMEs) in developing countries, like Yemen. Based on the resource-based view (RBV) and dynamic capabilities theory (DCT), this paper examines the impact of entrepreneurial orientation (EO) on SCR. Based on a research framework, a self-administered questionnaire was used to collect data from a sample consisted of 217 SMEs owners/or managers. A structural equation model was used to test the relationships in the proposed model. The results obtained appear that EO has a positive and significant effect on SCR of SMEs through its dimensions represented by:

In this article

demonstrated a negative impact on SCR, while the effect of competitive aggressiveness was insignificant. These findings provide advantageous insights for SMEs, especially in the Yemeni manufacturing sector, which pursuing to be resilient towards any disturbance that may lead to disruption in their supply chains by adopting EO.

Q Keywords: supply chain resilience entrepreneurial orientation resource based view
dynamic capabilities theory SMEs

PUBLIC INTEREST STATEMENT

Nowadays, the pursuit to adopt supply chain resilience for SMEs is a fateful issue and firms are making an effort to attain this goal. Hence, entrepreneurial orientation (EO) can be the best approach lead to improve supply chain resilience. EO not only mitigates environmental disruption and uncertainty but also enables the firms' to adapt to them. EO typically includes the decision-making status at the firm level, strategy-formulation process, and allocates resources to find out, invest new opportunities in order to grow. This study provided evidence showing that EO has a positive and significant impact on the supply chain resilience for SMEs. and also supported the argument that entrepreneurial activities play a critical role in the turbulent business environment in terms of anticipation, preparation, adapt to those disturbances, especially in light of the opportunities that constantly emerging in the market side by side with the uncertainty conditions, which may motivate SMEs to adopt EO.

1. Introduction

Recently, with the increasing disturbance of the business environment and the uncertainty surrounding it, firms have become more vulnerable to supply chain disruptions (Gligor et al., [2019](#); Soni et al., [2014](#)). In line with that, firms have sought to

(Fiksel, [2015](#); Jüttner & Maklan, [2011](#); Ponomarov & Holcomb, [2009](#)), and at the same time make them more resilient against supply chain disruption (Blackhurst et al., [2011](#); Polyviou et al., [2019](#)). As a result, an interest in the concept of SCR has increased, and the understanding and knowledge of how firms manage disturbances and disruptions in the supply chain have become a concerned focus for academics and practitioners in this field (Parast & Shekarian, [2019](#)). This was confirmed by a study of the World Economic Forum and Accenture (World Economic Forum, [2013](#)) that revealed the importance of resilience in the supply chain disruption as a top priority for 80% of the firms studied. On the other hand, although the dynamic environment changes have led firms to compete through their supply chains rather than competing as independent entities (Soliman, [2017](#)), supply chains are more vulnerable to disturbances and risks compared to individual companies, which is reflected on the individual firms' resilience within the chain (Gölgeci & Ponomarov, [2014](#)).

Prior research has emphasized that EO has an essential role in how firms are enabled to respond and adapt to changes and disruptions, uncertainty in the business environment through creates opportunities and allocates resources to invest them in order to survive and grow (Hisrich et al., [2016](#); Hitt et al., [2001](#); Sathe, [2003](#); Wiklund & Shepherd, [2003](#)). In this sense, the turbulence of the business environment may represent one of the primary motives of entrepreneurial activities in various countries in the world (Al-Maqtari et al., [2020](#)). For example, a study by Chang et al. ([2007](#)) revealed that there is a significant relationship between EO and manufacturing flexibility. As well, Li et al. ([2008](#)) reported that EO enhances the strategic flexibility of firms. Besides, Eshegheri and Korgba ([2017](#)) concluded in their study that EO significantly associates with organizational resilience.

SMEs play a strategic role in accomplishing the economic development of developing countries, including Yemen, through raising the level of national income, creating employment, and contributing to innovation diffusion (Alhakimi & Mahmoud, [2020](#); OECD, [2017](#)). Nevertheless, SMEs suffer from a lack of resources (Freel, [2000](#)), that compel them to adopt innovation as a means of competing with large firms through their behavioral advantages than resources (Saleem & Hussain, [2004](#)). Based on PDV

EO can be viewed as a critical path for leading firms to achieve superior performance through innovation, since the predominant entrepreneurial philosophy motivates firms to continuously generate new ideas and develop innovations that boost performance (Thoumrungrroje & Racela, [2013](#)). In this sense, innovation as a dynamic capability is linked with entrepreneurial behaviors. Furthermore, empirical research on SMEs is still limited compared to large enterprises (Brem et al., [2017](#); Didonet & Diaz-Villavicencio, [2020](#); Maldonado-Guzmán et al., [2018](#)), especially in developing countries (Gölgeci & Ponomarov, [2013](#); Scholten & Schilder, [2015](#)), although firms in developing countries represent an integral part of global supply chains and have also suffered the negative influences of supply chain disruptions (Tukamuhabwa et al., [2017](#)).

Previous studies carried out on SCR did not take EO as an antecedent, except the study of (Mandal & Saravanan, [2019](#)) that addressed EO within the strategic orientation as a one-dimensional construct. While that EO may better be viewed as a multidimensional construct (Naldi et al., [2007](#)), where the impact of dimensions may differ across different organizational contexts. Nevertheless, Mandal and Saravanan ([2019](#)) concluded that the relationship between EO and SCR is non-significant, despite the arguments presented by Chang et al. ([2007](#)), Li et al. ([2008](#)), and Eshegheri and Korgba ([2017](#)), which emphasized the importance of the EO of firms in alleviating environmental disturbances via enhancing capability resilience of firms, in particular under the rapidly changing business environment. Additionally, the most important empirical studies addressed partially the relationship between the EO dimensions and SCR or organizational resilience, such as a study of Gölgeci and Ponomarov ([2013](#)) which revealed that innovativeness significantly is associated with supply chain resilience. As well as a recent study conducted by Coleman and Adim ([2019](#)), which reported there is a significant relationship between proactiveness and organizational resilience. Another study was carried out by (Tamunosiki-Amadi et al., [2019](#)) also showed that competitive aggressiveness affects organizational resilience. These indecisive results related to this relationship call for more studies to be carried out in different circumstances. Therefore, this study seeks to bridge this gap through a more detailed study of the relationship between EO that was expressed in five dimensions

competitive aggressiveness) and SCR, which has not been addressed in previous studies, especially in the context of SMEs in developing countries.

This paper is structured as follows. First, we display the theoretical background. Next, we develop the hypotheses and proposed model, and this is followed by a description of the methodology. Then, an analysis of the data. After that, discussion of the results and their implications. The paper concludes with the conclusions, limitations, and paths for further investigation.

2. Theoretical background

2.1. Supply chain resilience

SCR is key to the success of firms and supply chains (Liu et al., [2017](#); Pereira et al., [2014](#)). However, resilience is related to the ability to respond to disturbances and interruptions and return to the previous original state (Mallak, [1998](#)). As nearly all supply chains may face unforeseen disruptions from varying types, SCR defined as *"the adaptive capability of the supply chain to prepare for unexpected events, responds to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function"* (Ponomarov & Holcomb, [2009](#), p. 131). While Christopher and Peck ([2004](#)), denoted that SCR reflects the ability of the supply chain to deal with the results of unavoidable risks and disruptions in order to return to its original situation or move to a better state. In line with this, the adaptive capability of the supply chain has been built based on three phases, namely "readiness", "responsiveness" and "recovery" (Sheffi & Rice, [2005](#)), which are included in almost all definitions. In addition, Briano et al. ([2009](#)) believe that resilience involves "regeneration", based on the view that resilience not only includes recovery and return to a previous state but may also be to a better state.

According to the previous literature, it can be seen the firm's SCR as a crucial dynamic capability releasing from the characteristics of firms' supply chains and affects their performance (Gölgeci & Ponomarov, [2013](#); Khan et al., [2012](#)). Even though investment

disturbance and increases its resilience to handle any disruption in the future, it has its costs that represent an additional challenge for supply chain managers (Chang & Lin, [2019](#); Nooraie & Parast, [2016](#)).

2.2. Entrepreneurial orientation

Miller ([1983](#), p. 771), one of the first researchers who focused on studying and analyzing the concept of EO, views *"an entrepreneurial' firm is one that engages in product market innovation, undertakes somewhat risky ventures and is first to come up with 'proactive' innovations, beating competitors to the punch"*. According to many studies on the strategic management literature, EO conceptualizes as a strategic orientation based on a set of practices, processes, and decision-making activities that make the firm more resilient to environmental changes and disturbances through exploring new opportunities, delivery of innovative products or services, that distinguish a firm from its competitors in the market (Covin & Slevin, [1989](#); Jeong et al., [2019](#); Kropp et al., [2006](#); Lumpkin & Dess, [1996](#); Wales et al., [2011](#)).

Entrepreneurial behaviors are distinguished by tending to innovate, identifying potential opportunities in the marketplace, and taking risks in the face of challenges (Adomako et al., [2016](#)), which contribute to attaining growth and value creation and thus differentiation over competitors (Habib et al., [2020](#)).

Many researchers and practitioners agree that EO is "a compound or mix of innovativeness, risk-taking, and proactiveness" (Covin & Slevin, [1989](#); Kreiser & Davis, [2010](#); Miller, [1983](#); Okangi, [2019](#); Syrja et al., [2019](#); Tang et al., [2009](#)). In addition to the above three dimensions, Lumpkin and Dess ([1996](#)) added another two dimensions, namely (Autonomy and competitive aggressiveness), to provide a more detailed description of EO scope. Notably, there is no general agreement in the EO literature as to how to treat the EO construct. On one hand, Covin and Slevin ([1989](#)) contend that the EO concept is presented as a one-dimensional concept more efficiently, while on the other hand, researchers such as Lumpkin and Dess ([2001](#)), Kreiser and Davis ([2010](#)) have suggested that it is important to address EO as a multidimensional structure, allowing consideration of synergistic relations between EO dimensions with

other variables. Therefore, our study here has included the five dimensions in examining the effect of EO construct on SCR, as below.

3. Hypotheses development

According to RBV, firms own integrated set of various resources and capabilities (Barney & Clark, [2007](#)), and the firm has a competitive advantage if it is able to take advantage of its distinct resources and capabilities in adapting to changes in the business environment (Feng et al., [2017](#); Tho, [2019](#)). Grant ([1991](#)) made a distinction between firm resources and capabilities: resources are the basis for developing a firm's capabilities, whereas capabilities represent the key sources of competitive advantage, and reflect the firm's competence to deploy resources in ways that correspond to the turbulent market environment (Barreto, [2010](#); Teece et al., [1997](#)). EO is viewed as a valuable strategic resource in terms it reflects the degree to which a firm can engage in risky ventures through proactiveness practices and the tendency to innovate (Covin & Slevin, [1989](#)). Based on this perspective, such risk-taking behavior helps to develop the strategies of risk mitigation, which in turn provides a rapid response to disruptions (Mandal & Saravanan, [2019](#)). Despite the uncertainty state that may arise as a result of the disturbances under market dynamics, which may hinder the transportation of materials required to deliver products effectively (Tangvitoontham & Sattayanuwat, [2017](#)), appropriate incentive and plan for risk initiatives may enable firms in supply chains to take advantage of the uncertainty in their favor (Mandal et al., [2016](#); Roy et al., [2016](#); Zhang et al., [2009](#)).

From another perspective, and while RBV lacks appropriate identification of capabilities when dynamic changes happen in uncertain environments, DCT has emerged which is an extension of the RBV to address the shortcomings of RBV through the planning of appropriate resources and capabilities in order to respond to each case's changes (Chowdhury & Quaddus, [2017](#)). In this context, a firm's ability to merge, build, and redistribute resources using its activities in order to respond to environmental changes and to design effective value-creating strategies is the premise of the DCT (Teece et al., [1997](#)). In this regard, many of the literature of

environments because they enable the firm to deal with the turbulence and uncertainty conditions in those environments by redeploying its existing resources to adapt to new situations (Buccieri et al., [2020](#); Eisenhardt & Martin, [2000](#); Engelen et al., [2014](#); Ponomarov, [2012](#); Roy et al., [2016](#); Sabahi & Parast, [2019](#); Teece, [2007](#); Teece et al., [1997](#)). Moreover, Wu ([2010](#)) argued that dynamic capabilities constitute an integrative approach to exploring new sources of competitive advantage, irrespective of the level of environmental fluctuations. In this sense, environmental fluctuations do not change the relationship between dynamic capabilities and competitive advantage. As such, the need for resilience capability under environmental disruptions can be justified through the lens of the DCT (Chowdhury & Quaddus, [2017](#)). Accordingly, we believe that in an environment characterized by uncertainty, supply chains of firms necessitate building dynamic capabilities to mitigate disruptions, which involve developing the capabilities of resilience to succeed in the long term.

Additionally, and based on the DCT, firms must be proactive in predicting environmental changes and have the needed resilience and adaptability to recover competencies during turbulent times (Chowdhury & Quaddus, [2017](#)). In other words, the DCT focuses on the firm's ability to explore and invest opportunities, and thus the dynamic capabilities of the firm reflect the EO of management (Adam et al., [2017](#)). In this context, Rhee et al. ([2010](#)) indicated that EO represented a behavior towards seeking opportunities. EO with its dimensions represented by the tendency to innovate, risk-taking, and be proactiveness, has a significant impact on developing dynamic capabilities (Lin et al., [2008](#); Merlo & Auh, [2009](#)).

In line with this, Li et al. ([2008](#)) concluded that EO could lead firms to enhance their capability resilience, in particular under the rapidly changing business environment. Later, a study by Eshegheri and Korgba ([2017](#)) on 125 medium businesses, revealed that EO significantly associates with organizational resilience. Before that, Chang et al. ([2007](#)) conducted a study on 115 manufacturers in Taiwan to investigate the effect of EO on manufacturing flexibility, the results have shown that EO enhances the flexibility of manufacturing for the firms, which is considered one of the capabilities that improves firms' resilience to the environmental disruptions (Christopher & Baskerville, 2009).

[2004](#)), by developing new products, providing a wide variety of products, and production as needed. Moreover, despite the argument that SMEs lack flexibility in the face of external environmental disturbances because they have fewer resources for planning, response, and recovery (Ingirige et al., [2008](#)). Baker and Nelson ([2005](#)) have argued that entrepreneurial-oriented SMEs are unrestricted by resources to the level the resource-oriented school assumes, and they affirmed that entrepreneurs can be vigilant toward resources on the same level that they view opportunities. In the same vein, Branicki et al. ([2018](#)) affirmed that entrepreneurial behaviors offer a basis that enables SMEs to be resilient and able to respond to changing environments.

Despite the above, a recent study about the impact of strategic orientation on SCR by (Mandal & Saravanan, [2019](#)) showed that there is no significant relationship between EO and SCR. However, relying on RBV and DCT that have argued about EO's role in relieving environmental disturbances by enhancing capability resilience of firms, it can be assumed that EO leads to improve SCR of firms through its dimensions represented by innovativeness, risk-taking, proactiveness, Autonomy, and competitive aggressiveness.

3.1. Innovativeness

Innovativeness is defined as the tendency to creativity and experimentation by engaging in new ideas and creative processes that result in introducing new products or processes or improving existing products and processes (Boso et al., [2012](#); Hult et al., [2004](#); Presutti & Odorici, [2019](#); Lumpkin & Dess, [1996](#)). Kreiser ([2011](#)) views that innovativeness reflects the firm's commitment to introducing new or improved products to the market. According to RBV, a firm that possesses valuable resources and scarce capabilities can achieve better competitive advantages compared to other firms in the market (Hsu & Ziedonis, [2013](#)). The expansion of the RBV has led to the concept of "dynamic capabilities", which reflects a firm's ability to develop and invest resources and competencies in order to adapt to changing and disruptive business environments (Eisenhardt & Martin, [2000](#); Lopez, [2005](#)). In other words, it is how the firm can channel its resources into capabilities to introduce innovative products,

[2004](#)). In this context, Akman and Yilmaz ([2008](#)), and Guan et al. ([2006](#)) noted that the innovative capability of the firm is associated with its internal processes and its ability to respond suitably to environmental changes. Where firms should adopt and/or create innovations along the time to adjust to environmental changes (Hult et al., [2004](#)). In the same direction, Eshegheri and Korgba ([2017](#)) stressed the fact that propensity of innovativeness is significantly associated with firm' resilience. Where turbulent markets periodically require firms to present innovative offerings in order to respond and adapt to changes in customer demands (Jaworski & Kohli, [1993](#)). That is mean propensity to innovate enhances the firm's resilience in adapting to the disturbances of the market environment. Additionally, Tahmasebifard et al. ([2017](#)) concluded in their study that a firm's innovativeness is enhancing the responsiveness and flexibility capabilities by using new technologies, methods, and processes. Before that, Gölgeci and Ponomarov ([2013](#)) emphasized that inclination the firm towards innovativeness makes it more resilient to respond and adapt to disorders in its supply chain. Accordingly, innovativeness can improve a firm's ability to managing the business environment and creating innovative solutions for responding and adapting with disruptions in its supply chain. Based on the previous arguments, we propose the following hypothesis:

H1. Innovativeness has a positive impact on SCR.

3.2. Risk-taking

Risk-taking is one of the main features of entrepreneurship (Hornsby et al., [2002](#)), which reflects the firm's inclination and willingness to devote significant resources in order to engage in adventurous projects, whose results are difficult to predict (Baker & Sinkula, [2009](#); Frank et al., [2010](#); Lumpkin & Dess, [1996](#)). In this regard, although the risk-taking may lead to unknown results of failure or success, it may represent an opportunity to leap success (Al-Dhaafri & Al-Swidi, [2016](#)). However, the firm's entrepreneurial-oriented does not necessitate making impulsive decisions, but a reasonable awareness of the risks with the ability to manage these risks (Naldi et al., [2007](#)). The literature indicates that engaging in risky ventures can enhance the firm's resilience to environmental disturbances. For example. Chang et al. ([2007](#)) reported

respond and adapt to the market changes by introducing new products fast as well as adjusting the levels of production. Giunipero et al. (2005) also confirmed that managers who behave more entrepreneurially in managing risk possess skills that make them resilient. In contrast, Tahmasebifard et al. (2017) found in their study that there is no association between risk-taking and the firm's flexibility. Generally, we propose the following hypothesis:

H2. Risk taking has a positive impact on SCR.

3.3. Proactiveness

Proactiveness represents a strategic perspective that reflects the ability to anticipate and willing for new developments in the business environment (Frank et al., 2010, p. 180), rather than interact with them after arising. In other words, proactiveness refers to a firm's ability to expect emerging opportunities in the market and seize them before competitors (Lumpkin & Dess, 1996). Depend on DCT. Proactiveness is one of the dynamic capabilities that enables the firm to rebuild its internal and external competencies to deal with changing environments fast (Teece et al., 1997), i.e., proactiveness enables the firm to anticipate any changes in the business environment, discover more opportunities and how to seize them through its existing resources, which could enhance the capability resilience of the firms in facing environment disruptions.

In this regard, Empirical studies offer much evidence that proactiveness can make a firm more ready for fluctuations in the business environment. For example, Chang et al. (2007) postulate that new product and volume resilience will be reinforced if the firm is proactive-orientated. A study by Coleman and Adim (2019) also revealed that proactiveness significantly affects organizational resilience. In this context, it is worth noting the proactive aspect of the concept of resilience, where remedial actions are taken for any potential disruptions before they occur (Gligor et al., 2019). Before that, Eshegheri and Korgba (2017) also confirmed that proactiveness is significantly associated with firm' resilience. On the contrary, the study results of Tahmasebifard et al. (2017) revealed that proactiveness does not effect on firm's flexibility. Based on the

H3. Proactiveness has a positive impact on SCR.

3.4. Autonomy

Like all enterprises, SMEs suffer from disruptions in supply chains, which negatively affect their performance (Tukamuhabwa et al., [2017](#)), autonomous orientation helps to handle frequent changes in the market environment. Where Lumpkin and Dess ([1996](#), p. 140) describe Autonomy as *"the ability and will to be self-directed in the pursuit of opportunities"*. While Muthusamy et al. ([2005](#)) also illustrated that a high level of Autonomy generated by self-managed work teams stimulates the exchange of information freely and encourages the learning of new ways of handling problems related to the firm's products, which increases the firm's flexibility towards changes in market demands. Additionally, Pedersen and Kofod-Jensen ([2017](#)) indicated that in order for the firm to respond to challenges and opportunities within the business environment, it must have a certain level of Autonomy in making its decisions and carrying out its activities. It should be noted here that Autonomy may not represent a problem for SMEs, which are often independently managed by their owners, where Autonomy offers for them with the freedom needed to perform various activities (Lumpkin et al., [2009](#)). At the same time, the results of a study (Tahmasebifard et al., [2017](#)) affirmed the impact of Autonomy on flexibility. Accordingly, we suggest that:

H4. Autonomy has a positive impact on SCR.

3.5. Competitive aggressiveness

Competitive aggressiveness is defined as a firm's propensity to exceed its market competitors through the rapid entry to the new market or improve competitive posture by accelerating the product development cycle and rely on modern ways of competing in order to achieve the competitive advantage (Lumpkin & Dess, [1996](#)). In this regard, small businesses are considered more vulnerable to competition, so, they have to be more aggressive towards the competitors in the market in order to survive and adapt to changes (Rahman et al., [2016](#)). Many studies in the strategic management domain showed that firms that inclined to aggressiveness, compared to competitors, are more resilient towards unforeseen changes in their environment.

resilience of a firm' product mix, which enhances its position in the market. In addition, the results of a study by Tamunosiki-Amadi et al. (2019) revealed that competitive aggressiveness significantly affects organizational resilience in Nigerian mobile telecommunications firms. Furthermore, Covin and Covin (1990) also argued that successful firms often tend to aggressive competitive orientation to mitigate disturbances and facing environmental hostility, where the competitive aggressiveness enhances the firm's resilience to adapt to uncertainty circumstances and environmental disruptions. Accordingly, competitive aggressiveness can make the firm more resilient in dealing with its supply chain disruptions. Therefore, we assume that:

H5. Competitive aggressiveness has a positive impact on SCR.

Depend on the literature review and the study hypotheses that were formulated in the Second Section, the conceptual framework of this study is displayed as in Figure 1.

Figure 1. Conceptual

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4. Methodology and results

4.1. Research population and sample

The population of the study consisted of Yemeni small and medium-sized enterprises (SMEs) operating in the city of Sana'a, which numbered (1058) enterprises in the field of manufacturing according to (YMIT, [2014](#)). However, since the size of the study population is unknown recently, and it has not been disclosed by any official agency, this study relied on the (YMIT) report mentioned above. It also took consideration into Roscoe's ([1975](#)) suggestion that any sample size between 30 and 500 is considered appropriate for most research studies. Where the sample size was calculated by using a table of (Krejcie and Morgan, [1970](#)), which is equal to approximately 285 randomly selected enterprises. A self-administered questionnaire was used to collect the required data from these enterprises' managers as the sampling unit of this study, due to their knowledge of the various activities of the enterprise. Out of 285 questionnaires, the received and analyzable responses were 217 questionnaires with a response rate of 76% of the total sample size.

4.2. Measures

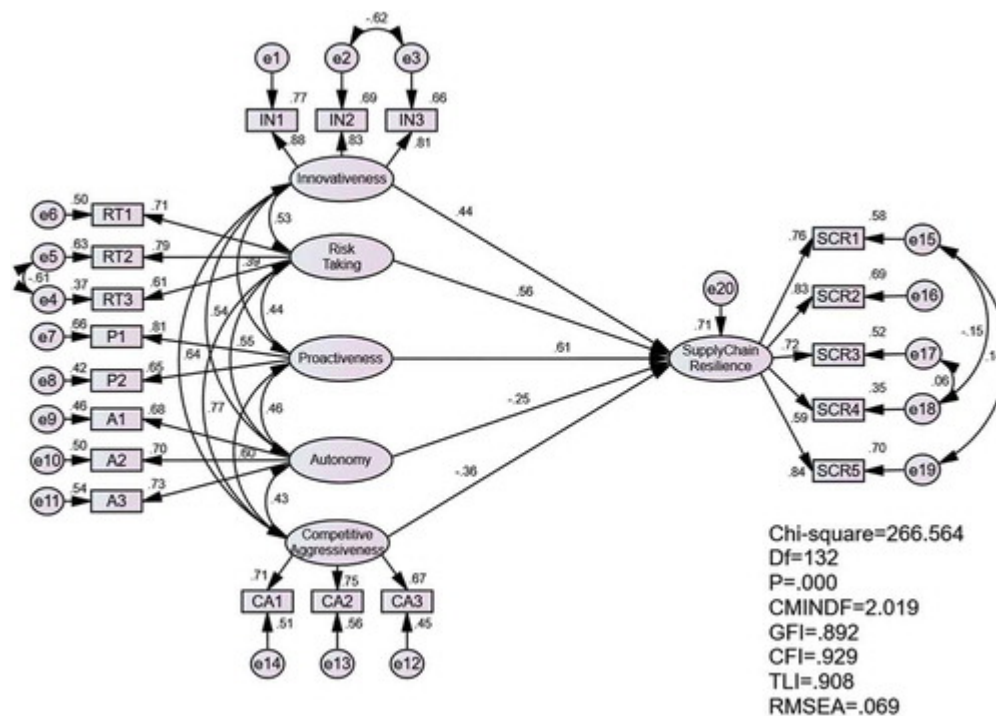
To obtain the necessary data to measure the relationships between the different constructs of this study, the questionnaire was adopted as a basic research tool, and a Five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was applied to measure the responses. However, EO (the independent variable) with its five dimensions represented by innovativeness, risk-taking, proactiveness, Autonomy, and competitive aggressiveness was measured through fourteen items adapted from Hughes and Morgan ([2007](#)), Chang et al. ([2007](#)), and Saha et al. ([2017](#)). And regarding SCR variable (dependent), it was measured through five items adapted from Ponomarov ([2012](#)), Gölgeci and Ponomarov ([2014](#)), and Roy et al. ([2016](#)), Mandal ([2017a](#), [2017b](#)), Dubey et al. ([2019](#)), and Gölgeci and Kuivalainen ([2020](#)) as shown in Appendix I.

4.3. Construct validity and reliability

Evaluating research instruments is an important step in testing the proposed model. In this paper, the quantitative analysis was conducted using SPSS v25. Therefore, reliability analysis was conducted to measure the internal consistency among items

used to measure the convergent ratio of variance. Convergent validity is achieved when loadings of items are significant, as the minimum value of factor loadings is 0.5 (Hair et al., 2010). Furthermore, the structural equation model was applied to test the hypothesized model by examining the relations between constructs and scale items. To measure the fitness of the hypothesized model with data, some indexes were also used such as Chi-square/df < 5 (Tabachnick & Fidell, 2012), the Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) above 0.9, and the Root Mean Square Error Approximation (RMSEA) below 0.08 (Hair et al., 2010), as in Figure 2.

Figure 2. Structural equation model



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The findings in Table 1 indicate that all of the Cronbach's alpha values are greater than 0.60, denoting the apparent consistency among items for all constructs (Sekaran & Bougie, 2016), except for a construct of the proactiveness for which its Cronbach's alpha values was (0.56), which is unacceptable in the context of this study. Therefore, by looking at Cronbach's alpha values if items deleted, to see whether it is possible to delete some items that if deleted, Cronbach's alpha values will rise for this construct, where the item P3 was removed to become the Cronbach's alpha values (0.68).

Table 1. Reliability and validity of scale



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Additionally, the associations of all items with their factors (loading) were higher than 0.5; Which indicates the good consistency between those items and their overall factors. The Average Variance Extracted (AVE) for all the constructs was found above 0.5; hence, it displays sufficient convergent validity (Hair et al., [2010](#)). Overall, all constructs are having acceptable convergent validity and reliability, as illustrated in Table 1.

Moreover, The model seems to fit the data reasonably well, according to the following results: GFI = 0.89, CFI = 0.93, TLI = 0.91, CMIN/df = 2.019, and RMSEA = 0.069, all denoted an acceptable fit.

Discriminant validity was applied to measure the extent to which the latent factors were distinguished. However, a high correlation between two latent factors indicates that this latent factor is interpreted better through another factor, that is, from a different factor than its observed factors. As per Fornell and Larcker ([1981](#)), discriminant validity is achieved if the square root of AVE of all latent factors is greater than the correlation between latent factors. The results in Table 2 showed that the measurement model displays high discriminant validity; because the values of the square root of AVE for all constructs are larger than the corresponding squared inter-construct correlation values. In the sense that indicators are more related to their factors than associated with other factors.

Table 2. Discriminant Analysis



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Moreover, the results of the descriptive analysis indicate that the mean values of all constructs are high, ranging between (4.2811) and (4.6959), and this is confirmed by the values of the standard deviation that reflect a higher degree of consistency between the data.

4.4. Hypotheses testing

As shown in Table 3, the results of hypotheses test display that there is a positive and significant effect of EO (for three dimensions only, namely, innovativeness, risk-taking, and proactiveness) on SCR. However, increasing one-unit in innovativeness, risk-taking, and proactiveness will lead to 0.436, 0.557 and 0.608 unit increase in SCR, at the significance level <0.05 ($P = .000$, $.003$, and $.000$) respectively; therefore hypotheses H1, H2, and H3 are supported. In this sense, the firm with the tendency for innovation, proactive, and risk-oriented is more resilient in the context of its supply chain. In addition, the results also show there is a negative and significant effect of Autonomy on SCR, with a statistical significance level <0.05 ($P = 0.037$); so hypothesis H4 is supported. In contrast, there is no significant effect of competitive aggressiveness on SCR; thus, hypothesis H5 is rejected.

Table 3. Standardized regression weights



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5. Discussion

Depend on the RBV and DCT, we sought to examine the impact of EO on SCR. According to which the findings of this study emphasize the important role of EO in improving SCR, in particular for SMEs. Even though the study of (Mandal & Saravanan, 2019) illustrated that the relationship between EO and SCR is non-significant, this study disclosed the opposite. Where the findings showed that EO has a significant

by (Li et al., [2008](#)), which showed that firms under the uncertain business environment could improve their strategic resilience (resource and capability) through EO. In this sense, EO can drive firms to promote their SCR.

The evidence presented herein confirmed that a significant and positive effect exists for three dimensions of EO namely (innovativeness, risk-taking, and proactiveness) on the SCR of SMEs in Yemen. This result points out that when managers of SMEs tend to innovation, engage in risky ventures, and are more proactive in finding out and seize the market opportunities, and wish their firms to become leaders in the industry, they can improve the resilience of their firms, thus the resilience of their supply chains. This result is in line with the results of the study of (Gölgeci & Ponomarov, [2013](#)) that disclosed the impact of innovativeness on SCR. And also, the study by (Eshegheri & Korgba, [2017](#)), who found the fact that propensity of innovativeness and proactiveness is significantly associated with a firm's resilience. Although innovativeness in the prevailing traditional literature has been considered the product of a proactive activity to improve the level of performance (Damanpour, [1991](#)), this study revealed that innovativeness may arise through negative incidents in an environment characterized by turbulence and ambiguity. Hence, firms can leverage innovativeness as a strategy to adapt to disruptions in the business environment, which can disrupt their supply chains. Additionally, the results related to investigating the relationship between EO dimensions and SCR are considered a precious addition to the literature addressing EO and SCR. Where the findings of this study have supported the results put forward by (Coleman & Adim, [2019](#)), in terms of that proactiveness affects significantly the measures of organizational resilience, which also were similar to the findings of (Chang et al., [2007](#)), regarding the effect of proactiveness and risk-taking on new product development flexibility. While the results of this study partially differed from the results of the study by (Tahmasebifard et al., [2017](#)), which showed that risk-taking and proactiveness do not improve the firm's flexibility.

Contrary to expected, the results showed that autonomy has a significantly negative impact on SCR of SMEs in spite of the existence of theoretical basis through the literature that addressed this issue, which concluded its results contrary to the results

of the current study such as (Chang et al., [2007](#); Tahmasebifard et al., [2017](#)). Where SMEs are characterized by the ease of management that gives them the character of independence in terms of that the owner of the enterprise is often the manager, which speeds up decision-making processes (Lumpkin et al., [2009](#)). That is why small and medium enterprises are more flexible and able to adapt to changing business conditions, and any disruptions in supply chains. As such, Yemeni SME managers should adopt autonomous orientation, which allows dealing flexibly with changes in the business environment, and collaboration with the other partners in the supply chain in order to face disturbances.

Finally, the results of the analysis show that competitive aggressiveness has no significant effect on SCR for SMEs. The rationale for investigating this relationship was to find out whether SMEs with a competitive aggressive tendency to achieve entry or improve the competitive position in the marketplace can be more resilient within their supply chains towards environmental disruptions. For Yemeni SMEs, this result reveals the fact of the intense competition that SMEs face in the Yemeni market by large firms that seek to enhance their resilience through their competitive aggressiveness as a means of repositioning in a more aggressively and strategically manner. Moreover, the incidence of new entrants who may be viewed as competitors participating in the market is much higher when the limits and standards for penetration are lowest, as well as when there are many firms who intend or wish to compete or be engaged in the market, and where current market players have little control or actually do not want to oppose their entry into the marketplace (Tamunosiki-Amadi et al., [2019](#)). This result partially supports the study by (Tahmasebifard et al., [2017](#)), which revealed that there is no impact of competitive aggressiveness on a firm's flexibility. While contrasted with the results of the study of (Tamunosiki-Amadi et al., [2019](#)), which showed that competitive aggressiveness significantly affects organizational resilience, as well recommended by the need to adopt aggressive competitive systems and flexible organizational structures help to the application of the most innovative strategies and proactive to adapt to changes and achieve competitive advantage.

The findings concluded from this study are decisively applicable only within the context of SMEs Yemeni. Some literature undertaken earlier, however, indicated that perhaps the findings obtained are applicable to similar environments as well. Nevertheless, this study assumes that further research and analysis will be required for such generalizability.

6. The research implications

6.1. Theoretical implications

Our research contributes to the literature in two fields. First, drawing on RBV and DCT, we examined the effect of EO on SCR, which represents one of the contributions that has not received sufficient scientific attention. Second, we examine this relationship in the context of SMEs of developing countries since much of the literature has studied the issue of SCR in the context of large firms from developed countries (Pettit et al., [2013](#); Wieland & Wallenburg, [2013](#)).

6.2. Practical implications

In addition to the theoretical implications, there are many practical implications. Where the results of this study can help decision-makers and managers of SMEs to improve the SCR of their firms in face uncertainty and environment disruptions by enhancing innovative capabilities resulting from adopting the EO philosophy. EO is one of the important pillars of dynamic capabilities, that are usually built through appropriate deployment for the resources and capabilities firm-specific. Because SCR is a dynamic capability, thus, this study affirmed the above assumption and presented to SMEs managers evidence that shows the impact of EO in make SMEs more resilient towards supply chain disruptions in the context of developing countries. Specifically, our results highlight the importance of adopting EO in terms of innovativeness, risk-taking, proactiveness, autonomy, and competitive aggressiveness in SMEs towards any disturbances that may occur in their supply chains in terms of anticipation, preparation, adapt to and recover from those disturbances. Where our results

environments and that a mix of permanently appearing new opportunities in the marketplace together with uncertainty about the future, may motivate SMEs to engage in entrepreneurial activities (Nabi et al., [2011](#)).

The results of this study have managerial implications for decision-makers. These implications help improve SCR of Yemeni SMEs according to the factors examined. Regarding this, the Yemeni SMEs managers should adopt EO in terms of: autonomy in different decisions-making, spreading the innovation culture within the firm, looking at risks as an opportunity that can be taken advantage of it, and adopting the proactive approach for anticipation and response. All of these factors are keys to improving resilience in the context of SMEs to any disruptions that may be produced by the business environment in general and their supply chains in specific.

7. Conclusions

The purpose of this research is to examine the impact of EO on SCR. Previous studies seldom considered the impact of EO on SCR in the context of SMEs in developing countries. In this research, we have paid greater attention to the organizational context for the different dimensions of EO and their impact on the SCR of SMEs. The findings showed that EO is a critical strategic orientation and that it positively effects on SCR of SMEs through its dimensions represented by innovativeness, risk-taking, and proactiveness. This is a contribution to the literature on EO and SCR since it shows that a strategic focus on adopting strong EO would be valuable in improving the SCR of SMEs to manage risks of their supply chains and adapt to disruptions resulting from them where EO enhancing dynamic capabilities of the firm, which makes it more resilient in responding and adapting to changes and disruptions in the business environment. In addition, we found that autonomous orientation in Yemeni SMEs is negatively related to SCR, this indicates that the high level of autonomy that SMEs have in making decisions may not always lead to a faster response to any disruptions in the supply chains of those firms. For example, a high level of autonomy may cause hasty decisions, to launch innovations that may fail to adapt to environmental disruptions. or to allocate a large amount of resources to invest an

negatively affect their response to any potential disruptions that may occur. Further, the results illustrated that the effect of competitive aggressiveness on SCR is non-significant.

8. Limitations and future research

Similar to a lot of empirical research, this study has some limitations. First, the scope of the sample was limited to SMEs located in one area. Thus, further empirical evidence that explores the relationship between EO and SCR in the context of SMEs in similar environments would help to generalize the results. Second, the sample is confined to the manufacturing sector, without the distinction among the various types of those firms, even though SMEs represent a heterogeneous group. Thus, future research should consider the relationships between EO and SCR of SMEs beyond the manufacturing sector with the distinction among those firms. Third, only one respondent was represented in each enterprise. Fourth, the study measured SCR overall, while it may be important to study the different dimensions of it. Fifth, because the EO did not interpret all the variance in SCR, there are other foreteller variables of SCR. These foretellers could include intellectual capital and product development strategies. Therefore, future researches may focus on investigating the influence of intellectual capital or product development strategies on SCR. Additionally, it could be useful to examine the moderators and mediators' variables in the relationship between EO and SCR, notably, relating to the impact of autonomy and competitive aggressive on SCR. Furthermore, our model, which is proposed in the context of emerging markets from developing countries, can be tested in developed countries, taking into account the application on micro, small and medium enterprises (MSMEs).

Additional information

Funding

The authors received no direct funding for this research.

Notes on contributors



Mohammed A. Al-Hakimi

Mohammed A. Al-Hakimi is currently a PhD. scholar at the department of management, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, India. He is working as a senior lecturer in the department of Marketing & Production of Tamar University, Yemen. His research interests are supply chain management, production & operations management, innovation, and strategic management.

Deleep B. Borade

Dileep B. Borade is currently an assistant professor at the Department of Commerce, Dr. Babasaheb Ambedkar Marathwada University. His research interests are financial management, corporate accounting, entrepreneurship and innovation. He has published several papers. He has participated in several international and national conferences.

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