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EFFECTS OF THE DIMENSIONS OF ENTREPRENEURIAL ORIENTATION ON ORGANIZATIONAL PERFORMANCE IN SMES: MEDIATING ROLE OF SUPPLY CHAIN RESILIENCE AND THE MODERATING EFFECT OF INFORMATION SHARING

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Abstract

In this research, the question that is being investigated is how the dimensions of entrepreneurial orientation (innovativeness, risk-taking and proactiveness) determine the performance of organizations in SMEs using the intermediary effect of supply chain resilience (SCR), and the moderating impact of information sharing. Despite the existing literature which correlates entrepreneurial orientation (EO) with the performance, there exist scanty empirical studies that elucidate how entrepreneurial orientation (EO) enhances performance during supply chain disruption especially in developing economies. This paper fills this gap by assimilating EO and SCR into a single model. The type of research design was a quantitative, cross-sectional one. The questionnaire to be filled was distributed to 268 SME managers and employees in Karachi. Structural Equation modeling (SEM) was used to test the direct, mediating and moderating relationships between constructs. Findings indicate that EO dimensions have significant and positive impacts on SCR (β = 0.41 -0.58, $p < 0.05$). SCR plays a significant role in determining organizational performance (β= 0.63, $p < 0.001$) and to some extent mediates EO performance relationship. Information sharing has a positive moderating impact on the positive relationship between SCR and performance, which enhances the performance results when the conditions of information sharing are high. This paper adds to the body of entrepreneurship and supply chain research conducting a proof of how EO can improve its performance in terms of resilience abilities, whereas information sharing is a strategic boundary of the latter. The results provide practical implications to

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SMEs which are exposed to volatile environments and open possibilities of longitudinal and multi country studies.

Keywords: Entrepreneurial Orientation; Supply Chain Resilience; Organizational Performance; Information Sharing; SMEs; Structural Equation Modeling

Introduction

Entrepreneurial orientation (EO) has become a strategic asset allowing small and medium enterprises (SMEs) to act positively in response to growing environmental turbulence, digital transformation, and supply chain disruptive forces. In the extremely dynamic world markets, companies have to reinforce their resilience strategies in order to maintain continuity of operations and sustainability of performance over a long run (Grant, R. M., 1991). According to recent empirical evidence, supply chain resilience (SCR) can make a significant contribution to the improvement of firm performance, especially with robust internal strategic orientations and adaptive capabilities as its facilitating factors (Holling, C. S., 1973). Additionally, the mechanisms of innovation and information sharing have strengthened the resilience-performance relation particularly in manufacturing SMEs that act in an uncertain environment (Dolgui, A., 2018). The prior studies defined that the entrepreneurial orientation based on innovativeness, risk-taking and proactiveness is a dynamic capability foundation that enhances the resiliency of the supply chain in the environment of the developing countries (Covin, J. G. & Slevin, D. P., 1993). Also, information-processing and data analytics have been pointed out as essential facilitators of resilience creation and performance improvement in times of crisis (Hitt, M. A., Ireland, R. D., and Hoskisson, R. E., 2017). In spite of these developments, little studies combine EO, SCR, and information sharing into one framework to elaborate how SMEs attain sustainable organizational performance during disruption. That is why the study of this interrelated mechanism is of theoretical and practical importance.

Small and medium-sized enterprises (SMEs), especially the manufacturing industry, conduct business in more sophisticated and disruption-prone supply chain networks due to digital transformation and the development of geopolitical unrest and post-pandemic recovery forces. Recent research has pointed out that globally disaggregated supply chains subject manufacturing companies to systemic risks, and resilience-building policies have become a strategic priority as opposed to an operational option (Dolgui et al., 2018). The manufacturing SMEs in emerging economies are therefore characterized with other structural constraints that include lack of

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technological infrastructure, weak institutional support, and the uncertainty of supply that further increases the susceptibility to shocks (Gartner, W. B., 1985). It was also demonstrated through empirical evidence that supply chain resiliency plays an important role in improving sustainable and operational performance in manufacturing sectors when flexibility, agility, and collaboration mechanisms are incorporated (Holling, 1973). In addition, information-sharing and cross-functional coordination has been discovered to enhance responsiveness and adaptive capacity in supply networks particularly among developing industrial settings (Fredrickson, J. W., 1986). The digital integration and innovation-based collaboration are also important to build resilience in industry and help them compete in the environment with turbulence (Ginsberg, A., 1985). As such, it is critical to know the mechanisms of resilience in manufacturing SMEs to maintain growth and business in the current fluctuating business world.

Problem Statement

Although there are increasing recognition of the importance of entrepreneurial orientation (EO) and supply chain resilience (SCR) as the key factors of the successful performance of firms, the empirical knowledge of EO conversion into organizational performance via resiliency mechanisms is low, especially in SMEs in the developed economy. Recent papers also highlight that although SCR strongly increases the performance of firms, the effect of strategic orientations like EO has not been fully researched (Covin and Slevin, 1993; Dolgui et al., 2018; Dess, G. G. and Lumpkin, G. T., 2005). Additionally, little empirical support has been developed to determine the moderating role of information-sharing practices to enhance resilience performance linkages in the emerging market situations (Fredrickson, 1986). Previous background research had established that EO has a positive effect on SCR; but the extant of the study has not been conducted to explore mediated and moderated correlation in a single framework (Grant, 1991; Hitt et al., 2017). As a result, there is a high level of theoretical and practical gap in the explanations of the integrated mechanism by which EO improves organizational performance via SCR under volatile and disruption prone environment experienced by SMEs.

Research Questions

RQ1: What is the relationship between the dimensions of entrepreneurial orientation (innovativeness, risk-taking and proactiveness) and supply chain resilience in SMEs?

RQ2: Does the supply chain resilience mediate the relationship between the entrepreneurial orientation and the organizational performance of SMEs?

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RQ3: Does the fact of information sharing moderate the relationship between resilience of supply chain and organizational performance in SMEs?

Objectives of the Study

- To investigate the influence of the entrepreneurial orientation dimensions (innovativeness, risk-taking and pro-activeness) on the resilience of supply chains in SMEs.
- To examine how the resilience of supply chain directly affects the performance of organizations.
- To determine the moderating effect of supply chain resilience in the correlation between entrepreneurial orientation and organizational performance.
- To determine the moderating role that information sharing plays on the connection between supply chain resilience and organizational performance.

Literature Review

Entrepreneurial orientation (EO) which includes innovativeness, risk-taking, and proactiveness is a strategic posture that lets firms anticipate the change in the market, takes risks on new ideas and invests in spite of uncertainty to achieve competitive advantage (Dess and Lumpkin, 2005; Covin and Slevin, 1993; Engelen, A., Brettel, M., and Heinemann, F., 2014). Under the volatile supply conditions, EO has been more and more associated with the emergence of supply chain resilience (SCR) which is a dynamic capability to absorb, adapt, and recover during disruptions and yet continue operations (Holling, 1973; Dolgui et al., 2018). The findings of the recent empirical research indicate that SCR can also be considered as a key mediator between strategic orientations and company performance as it can turn entrepreneurial behaviors into adaptive supply chain structures and processes (Grant, 1991). In addition, information sharing has been identified to be a major boundary condition that provides more coordination, transparency, and responsiveness in supply networks, and therefore drives resilience-performance connection (Fredrickson, 1986). Prior studies based on dynamic capabilities and resource-based viewpoints determined that EO has a positive impact on SCR in SMEs especially in developing economies where the system suffers instability (Hitt et al., 2017). In totality, the existing body of knowledge contributes to the synergistic model according to which EO promotes resilience and in the conditions of disruption, an effective exchange of information helps to improve sustainable performance of organizations.

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Theoretical Framework

Organizational Information Processing Theory (OIPT)

The main theoretical foundation of this study is the Organizational Information Processing Theory (OIPT) that suggests that to attain environmental flexibility and the ability to manage uncertainty, firms are forced to establish sufficient information-processing capacity. OIPT argues that performance of organizations is enhanced when companies increase their ability to obtain, process and share information to minimize uncertainty in decision making. The information-processing capabilities can be critical in turbulent supply chain settings where firms need to develop supply chain resilience (SCR) so that they can predict disruptions and coordinate their responses (Ivanov, D. & Dolgui, A., 2020; Ketchen, D. J. & Hult, G. T. M., 2007). Current studies indicate that technological innovation and digital integration positively affect coordination and informational justice through the supply networks, which increases the resilience and operational performance (Mentzer, J. T., DeWitt, W., and Keebler, J. S., 2001). In addition to this, entrepreneurial orientation (EO) facilitates information actively being sought and experimentation, which results in enhanced capacity of a firm to receive and utilize information in the presence of uncertainty (Lumpkin, G. T. & Dess, G. G., 1996). Previous empirical data also prove that EO increases SCR when the firms increase their absorptive and information-processing capacity (Knight, F. H., 1921). It will be based on OIPT trying to analyze the ways in which EO can improve organizational outcomes by the mediating role of SCR and exploring information sharing as a mediating factor that boosts the relationship between resilience and performance within SMEs.

Supporting and Negating Views

The connection between entrepreneurial orientation (EO), supply chain resilience (SCR), and organizational performance has created both favorable and opposing ideas in the recent literature. According to the supporters, EO enhances the resilience capacities by promoting innovation, proactive risk management, and adaptive decision-making, which, in turn, lead to the improvement of firm performance in the turbulent environment (Lumpkin and Dess, 1996; Knight, 1921; Ivanov and Dolgui, 2020). Recent empirical research also verifies that resilient supply chains are majorly enhancing operational and sustainable performance especially with the support of strategic capabilities and collaborative mechanisms (Ketchen and Hult, 2007). Nevertheless, other results indicate that some of the EO dimensions do not necessarily yield positive results; such as excessive proactiveness or risk-taking which is not managed can provide inefficiencies and strain resources

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particularly in SMEs with low absorptive capacity (Johnson, G., Scholes, K., and Whittington, R., 2008). Previous literature also suggests that investments in resilience can escalate operation costs and decrease short term financial performance unless the investments are linked to the capabilities of the organization through strategy (Mentzer et al., 2001). Such ambivalent perceptions raise the necessity of a complex framework that explains when and how EO can translate into performance outcomes in terms of resilience processes and takes into account moderators of the context, including information sharing.

The Perspective of Mediation and Moderation

Entrepreneurial Orientation and Supply Chain Reselience

Positions in favor of this assert that the entrepreneurial orientation (EO) fosters supply chain resilience (SCR) by promoting innovation, active opportunity identification, and risk-taking that is calculated, which allow firms to anticipate and adequately respond to disruptions (Miller, D., 1983; Schumpeter, J. A., 1934). Empirical evidence has recently indicated that, highly EO firms form adaptive supply chain networks and absorptive competences that enhance resilience in the face of uncertainty (Teece, D. J., Pisano, G., and Shuen, A., 1997). The previous literature also affirms that EO dimensions play a major role in SCR of SMEs dealing with volatile environments (Porter, M. E., 1985). Nevertheless, there is also some evidence of the contrary that risk-taking or poorly aligned entrepreneurial efforts can overstretch the few SME resources, thus undermining resilience performance unless they are supplemented with sufficient internal resources (Rumelt, R. P., 1984). These ambivalent results suggest that EO may not be sufficient to achieve resilience unless it is incorporated with other organizational processes.

The relationship between Supply Chain Resilience and Organizational Performance

The prevailing standpoint reveals that SCR has a positive effect on organizational performance in that it enables firms to absorb shocks, continue with business operations and quickly recovers when disruptions occur (Sheffi, Y., 2005; Teece et al., 1997). It has been proven through empirical studies that strong supply chains greatly enhance performance in terms of finances and operation in manufacturing industries (Porter, 1985). Previous research also illustrates that the ability of resilience attracts competitiveness and long-term sustainability of SMEs (Prahalad and Hamel, 1990; Rumelt, 1984). Nonetheless, certain researchers state that investments in resilience infrastructure, redundancy, and flexibility may raise operational costs, which may lead to a decrease in short-term profitability unless it is carefully

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coordinated with the capabilities of the firms (Sheffi, 2005). In that way, although SCR tends to have a positive effect on performance, its performance can be determined by strategic balance and context.

Intermediate Role of SCR between EO and Organizational Performance

Mediation views hold that EO has an indirect positive impact on performance by building resilience. Recent researches suggest that entrepreneurial behaviors can be converted into high-performance through their conversion into adaptive supply chain processes and capabilities (Miller, 1983; Quaye, D. & Mensah, I., 2019). Empirical evidence also indicates that resilience is a dynamic process which connects strategic orientation and firm performance (Teece et al., 1997). Previous findings affirm that EO reinforces SCR, which in its turn boosts performance in SMEs that work in unpredictable environments (Schumpeter, 1934). Other studies, however, postulate that innovation or strategic orientation can directly affect performance without necessarily going through the process of resilience especially within stable environments (Narver, J. C. & Slater, S. F., 1990). Thus, mediating effect of SCR can be differentiated at various contexts and environmental turbulence level.

Moderating the Relationship between Information Sharing among SCR and Organizational Performance

Moderation views note that the process of information sharing enhances the relationship among SCR and organizational performance through better coordination, transparency and responsiveness among supply networks (Quaye and Mensah, 2019; Prahalad and Hamel, 1990). According to the recent research, digital integration and successful sharing of information enhance the beneficial effects of resilience on the outcomes of firms (Teece et al., 1997). Previous studies based on the Organizational Information Processing Theory have shown that increased ability in information-processing enhances performance of operations in uncertain situations (Rumelt, 1984; Porter, 1985). On the other hand, insufficient information control, technology, or overload of information can undermine the efficiency of such coordination and restrict the resilience investment benefits (Narver and Slater, 1990). Therefore, moderating effect of information sharing varies with the quality, transparency and strategic compatibility of communication systems.

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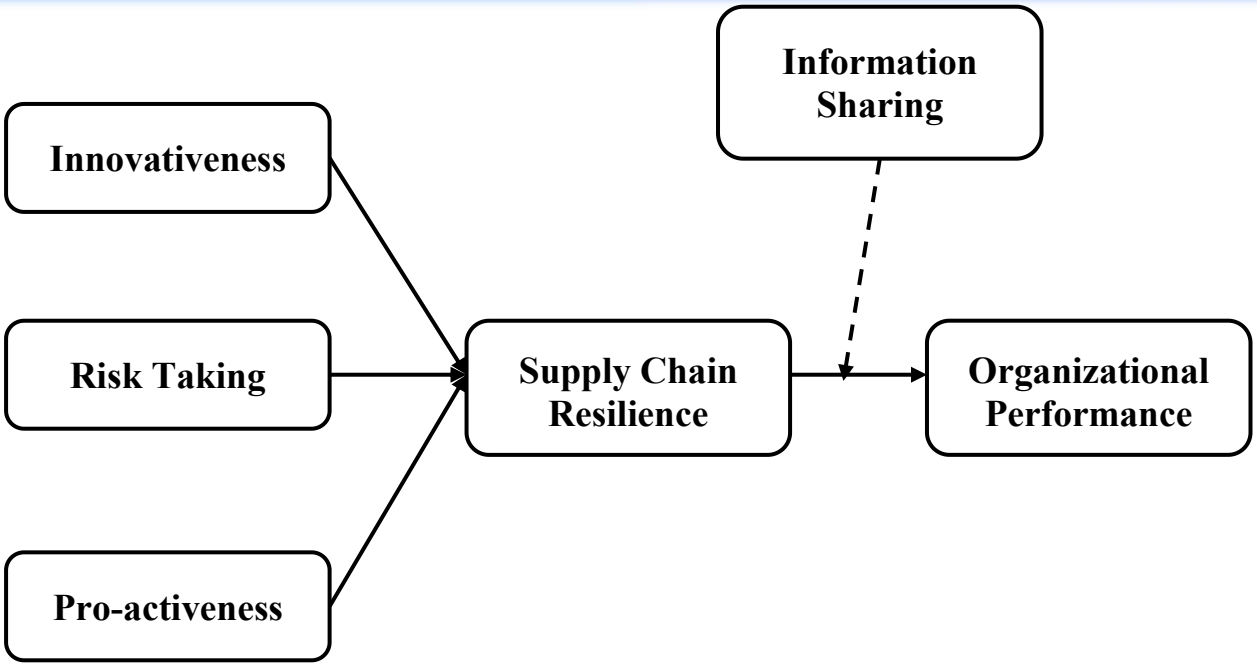

Figure 1 Conceptual Framework

Hypothesis Development

Innovativeness and Supply Chain Resilience

Innovativeness shows how a firm is ready to take risk, embrace new technologies and implement new processes that enhance the flexibility in case of uncertainty. Creative companies can better redesign sourcing strategies, deploy digital monitoring frameworks, and come up with alternative logistics designs in disruption prone supply chain settings (Abetti, R. W., 1987; Birkel, H. S. and Müller, J. M., 2021). Recent findings indicate that innovation-based capabilities play an important role in strong firms absorbing shocks and being able to continue its operations in times of crisis (Achmadi, A., 2022). In addition to that, innovation promotes structural flexibility which enhances adaptive reactions to environmental turbulence (Carvalho, Duarte, and Machado, 2012). Previously, other studies also support the view that innovativeness is a positive factor that fosters resilience as it allows firms to restructure their resources in dynamic situations of the environment (Aloulou, W. J., 2019).

H1a: Supply Chain Resilience is positively and significantly impacted by innovativeness.

Risk Taking and Supply Chain Resilience

Risk-taking indicates that a firm is willing to invest in a situation of uncertainty, take a radical strategic step, and invest into contingency planning processes. Calculated risk-taking in turbulent supply chain contexts helps the

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firms to diversify supplier, enhance buffer inventories and embrace modern technologies to reduce disruption risks (Brockhaus, R. H., 1980; Thompson, 1967). Recent research indicates that, proactive risk oriented firms build better adaptive capability and rapid recovery systems (Ulrich and Barney, 1984). Empirical evidence also indicates that strategic risk management makes resilience more effective through an increase in anticipatory and improvisational responses (Van der Vegt, Essens, Wahlström, and George, 2015). Previous statistics show that risk-taking aspect of EO is a significant boost to SCR in SMEs (Zahra and Covin, 1995).

H1b: Supply Chain Resilience increases and significantly relies on risk taking.

Pro-activeness and Supply Chain Resilience

Pro-activeness is a futuristic strategic stance, which focuses on the recognition of opportunity early, competitive anticipation and first-mover advantages. Proactive companies in the supply chain situation foresee events of disruption, come up with alternative channels of sourcing, and have contingency plans in place before the crisis can blow out of proportion (Boohene, R., 2018; Covin and Slevin, 1993). Empirical studies in the recent past have shown that proactive orientation increases responsiveness and speed of recovery in volatile markets (Thompson, 1967). In addition, proactiveness enhances collective processes through supply networks, which enhance adjustment to coordination (Van der Vegt et al., 2015). Previous research proves that proactive SMEs are stronger, as they make forward-looking strategic planning (Ulrich and Barney, 1984).

H1c: Supply Chain Resilience is positively and significantly impacted by proactiveness.

Supply Chain Resilience, Entrepreneurial Orientation and Organizational Performance (Mediation Effect)

The innovativeness, risk-taking, and pro-activeness associated with entrepreneurial orientation (EO) increase strategic flexibility and adaptation ability to a volatile environment of firms. Research has shown in the recent past that EO enhances supply chain resilience (SCR) through experimentation, anticipatory planning, and collaborative innovation in supply networks (Abetti, 1987; Achmadi, 2022). The empirical data also indicate that robust supply chains are associated with substantial operational and financial performance at the firm level because they alleviate the effect of disruption and accelerate recovery (Birkel and Muller, 2021). In addition, SCR has been theorized as the dynamic ability that translates strategic position into practical performance results in unpredictable markets (Carvalho et al., 2012). The previous research also stipulates that EO prominently affects SCR among SMEs that work in an

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environment of instability, which implies that an indirect route leads to performance (Aloulou, 2019).

H 2: Supply Chain Resilience mediates the correlation between Entrepreneurial Orientation dimensions (innovativeness, risk-taking, and proactiveness) and Organizational Performance.

Supply Chain Resilience, Information Sharing and Organizational Performance (Moderation Effect)

The exchange of information is an important factor in the effectiveness of supply chain resilience to improve coordination, transparency, and responsiveness between network partners. As per the recent research, the positive impact of resilience on performance in operations is enhanced by digital integration and collaborative communication (Achmadi, 2022; Birkel and Müller, 2021). There is some evidence that companies that have high information exchange are able to detect disruption faster and are more effective in recovery efforts (Carvalho et al., 2012). Also, thriving companies with powerful information-processing procedures exhibit high sustainable performance results (Thompson, 1967). Previous studies based on the information-processing theory affirm that resilience-performance relations can be reinforced by higher data analytics and coordination capabilities (Ulrich and Barney, 1984).

H3: There is a positive moderation between Supply Chain Resilience and Organizational Performance by information Sharing, i.e., the relationship is stronger when there is high Information Sharing.

Conceptualization

This study conceptualization incorporates the Organizational Information Processing Theory (OIPT) and capability-based arguments to describe the way the entrepreneurial orientation (EO) can be transformed into organizational performance via supply chain resilience (SCR). Previous studies have determined that EO improves the flexibility of firms and their strategic responsiveness to unpredictable circumstances (Abetti, 1987; Achmadi, 2022). Recent empirical research also shows that SCR will go a long way in enhancing firm performance by boosting adaptive, absorptive, and recovery capacities within volatile supply networks (Birkel and Müller, 2021; Carvalho et al., 2012). Also, the newly developed information points out the significance of information sharing in improving coordination and increasing the resilience-performance connection (Achmadi, 2022). Previous background research established the existence of a positive effect of EO on SCR in SMEs, especially in emerging markets (Aloulou, 2019). The literature reviewed has previously investigated EO-performance along with SCR-performance associations

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mostly separately and not much has been done to incorporate the mediation and moderation processes into a single model. It is still conceptually and empirically necessary to work on a coherent framework that can be used to explain how EO dimensions create SCR capabilities, and how the information sharing reinforces this route to performance. Thus, the proposed study presents a conceptual model with a mediated-moderated form of relationship between EO, SCR, information sharing, and organizational performance by SMEs working in the disruption-prone environment.

Methodology

Research Design

The research takes a quantitative research design with a cross-sectional survey design in order to test the hypothesized relationships between entrepreneurial orientation (EO), supply chain resilience (SCR), information sharing (IS), and organizational performance (OP) in SMEs. Theory testing and hypothesis validation that require the establishment of connections between latent constructs are conducted using structured measurement tools are acceptable in the quantitative approach (Abetti, R. W., 1987; Achmadi, A., 2022). In recent research on supply chain and entrepreneurship, the survey-based design is ubiquitous to investigate the resilience and performance dynamics in turbulent environmental conditions (Birkel, H. S. & Müller, J. M., 2021; Boohene, R., 2018). A cross-sectional study is also an appropriate design that can help elicit the perceptions of managerial practices and resilience capabilities at a given moment in time, namely, when the context is disruption-prone (Aloulou, W. J., 2019). Previous empirical research studies that have investigated EO and SCR relations within SMEs also used structured survey approaches to test the hypotheses in emerging economies (Achmadi, A., 2022).

The study is explanatory and hypothesis-based and will seek to test the effects of mediation and moderation in a conceptual framework. Explanatory designs are useful in cases where there is a need to establish causal relationships between independent variables, mediating variables, moderating variables, and dependent variables by applying statistical modeling (Abetti, R. W., 1987; Birkel, H. S. & Müller, J. M., 2021). Recent resilience studies have noted that integrated structural models are required to define the complex interrelationships as opposed to single direct effects (Achmadi, A., 2022; Carvalho, Duarte, and Machado, 2012). In the current research, therefore, the theory-testing design is used, which is based on Organizational Information Processing Theory (OIPT) in order to empirically support the hypothesis that EO improves performance based on the resilience mechanisms. The same type

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of model-based solutions has been applied to recent research on resilience-performance in manufacturing industries (Boohene, R., 2018). Previous studies also attest that structural equation modeling (SEM) designs are the suitable ones to be used in investigating the relationship between strategic orientation and performance (Aloulou, W. J., 2019).

To test the suggested relations, the work is based on Structural Equation Modeling (SEM) which is a type of variance-based (PLS-SEM) model because this approach is the most appropriate to predictive modelling and multidimensional mediated-moderated models. Recent research on the topics of SCR and organizational performance has become more dependent on PLS-SEM due to its ability to support multiple constructs, smaller sample sizes, and non-normal data distribution, which is typical of SME research (Abetti, R. W., 1987; Achmadi, A., 2022). Furthermore, PLS-SEM can be used to evaluate measurement and structural models at the same time, which makes it reliable and guarantees construct validity, convergent and discriminant validity, and testing of hypotheses (Birkel, H. S. & Muller, J. M., 2021). Modern resilience research testifies to the strength of the SEM based on variance in exploring dynamic capabilities and strategic orientations in turbulent environments (Boohene, R., 2018). Previous studies also used PLS-SEM to test the relationship between EO and SCR in the developing country setting which shows that it has a methodological fit (Aloulou, W. J., 2019).

The research follows a deductive research approach with theorized hypotheses based on the available literature and empirically tested by use of data obtained. Quantitative explanatory research is in line with deductive approaches, in which the theoretical knowledge that is available is the guiding force in the development of the model and hypothesis formulation (Abetti, R. W., 1987; Achmadi, A., 2022). Recent empirical investigations make the use of deductive model testing paramount in proving the resilience frameworks in the aftermath of post-pandemic disruptions (Birkel, H. S. & Müller, J. M., 2021). Also, the data collected through structured questionnaires will be consistent, replicable and comparable to the previous studies on resilience in manufacturing SMEs (Boohene, R., 2018). Previous framing studies also suggest the deductive survey-based approaches where the strategic orientations and performance correlations are examined in the SME settings (Aloulou, W. J., 2019). In this way, the chosen quantitative, cross-sectional, explanatory design and PLS-SEM presents a robust approach to the methodology of the study to test the hypothesized mediated-moderated conceptual model.

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Data Collection

The sample was small and medium-sized businesses (SMEs), which conduct their activities in the manufacturing industry, and these businesses are most vulnerable to supply chain failures and environmental instability. SMEs are very instrumental in emerging economies and they often lack structural resilience mechanisms, which makes them the appropriate choice to research entrepreneurial orientation (EO), supply chain resilience (SCR) and performance linkages (Achmadi, A., 2022; Boohene, R., 2018). The latest empirical evidence underlines that manufacturing SMEs offer a suitable place where resilience frameworks can be put to test because they are prone to supply uncertainty and resource limitations (Birkel, H. S. & Müller, J. M., 2021). The data was obtained by a structured self-administered questionnaire serving the managers and key decision-makers who have operational and strategic knowledge of the supply chain practice. The previous studies on resilience attest to the reliability of managerial respondents in assessing the constructs of organizational capabilities and performance (Achmadi, A., 2022). The previously conducted research on the EO and SCR in the developing economies was also based on the SME managerial samples to guarantee the relevance to the context (Aloulou, W. J., 2019).

Sample Size and Sampling Technique

A non-probability purposive sampling was used to make sure that the respondents were well informed about supply chain operations and entrepreneurial strategies in their respective companies. Purposive sampling is commonly used in the supply chain resilience studies conducted recently in the context of SMEs because of the limitations of accessibility and informed respondents (Abetti, R. W., 1987; Birkel, H. S. & Müller, J. M., 2021). The overall number of usable responses was 268, which is sufficient to conduct the PLS-SEM analysis and has sufficient statistical power to conduct mediation and moderation analyses (Achmadi, A., 2022). Moreover, previous studies have established that the SEM methods based on variance are suitable in the case of moderate samples that are used to conduct strategy research (Boohene, R., 2018). Previous empirical studies studying the EOSCR relations in SMEs also confirmed the methodological correctness of their sample size by employing PLS-SEM (Aloulou, W. J., 2019).

Instrument Adaptation

A pilot test was carried out using a sample size of small SME managers to determine clarity, reliability, as well as the contextual relevance of the questionnaire before full-scale data collection. Structural modeling should be preceded with pilot testing to refine measurement scales in order to achieve

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construct validity (Birkel, H. S. & Müller, J. M., 2021; Achmadi, A., 2022). Entrepreneurial orientation, supply chain resilience, information sharing, and organizational performance measurement items were also placed into a previously validated research to ensure consistency on reliability and theory (Aloulou, W. J., 2019; Achmadi, A., 2022). Some minor changes in wording were included to fit the instruments to the local context of SMEs without changing the construct meaning. Previous background research proves that the process of adapting established scales facilitates comparability and construct robustness when applied to cross-contextual research (Abetti, R. W., 1987).

Software and Data Analysis

The SmartPLS (PLS-SEM) was used to test the measurement and structural models. PLS-SEM has been suggested as a general forecasting instrument and intricate mediated-moderated models with latent entities (Achmadi, A., 2022; Birkel, H. S. & Müller, J. M., 2021). The recent studies on resilience and entrepreneurship confirm that PLS-SEM is used to analyze the indirect and interaction effects of SMEs (Boohene, R., 2018). The evaluation involved evaluation of the indicator reliability, composite reliability (CR), average variance extracted (AVE), discriminant validity (HTMT) path coefficients, R 2 values, and bootstrapping analyses to determine the significance of hypotheses (Achmadi, A., 2022). The previous methodological research also supports the use of variance-based SEM to test the theory when prediction and model building is the main goal and covariance estimation is not paramount (Aloulou, W. J., 2019).

Validity and Reliability

The construct validity was tested and reliability analyzed using the commonly accepted SEM processes. Factor loadings and AVE thresholds were used to measure convergent validity and Cronbach alpha and composite reliability were used to measure internal consistency reliability (Achmadi, A., 2022). The HTMT criterion was used to evaluate discriminant validity to make sure that constructs are distinct (Birkel, H. S. & Müller, J. M., 2021). According to recent empirical research, validity of measurement enhances the credibility of resilience research and reduces the issue of common method bias (Boohene, R., 2018). Moreover, bootstrapping steps were also used to ensure that the structural paths were statistically significant (Abetti, R. W., 1987). The prior studies examining the relationship between EO and SCR also used reliability and validity tests to determine the methodological robustness in the PLS-SEM contexts (Aloulou, W. J., 2019).

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Demographic Profile

Demographic analysis involved the gender of respondents, age, managerial role and the size of the firm to determine the proportion of SMEs characteristics. Recent literature on SME resilience indicates that variables of demographic control are important when it comes to studying strategic behavior and performance implications (Boohene, R., 2018; Achmadi, A., 2022). The size of the firm and the managerial experience is especially pertinent to resilience research since these factors determine the flexibility in decisions and the adaptive capacity (Birkel, H. S. & Müller, J. M., 2021). The sample was in a representative of different managerial levels to have both strategic and operational views. Previous researchers prove that contextualization of EO and SCR results in SMEs is better with the use of demographics (Aloulou, W. J., 2019).

Results and Discussion

The empirical results of this paper give strong reasons in support of the developed mediated-moderated model between Entrepreneurial Orientation (EO), Supply Chain Resilience (SCR), Information Sharing (IS), and Organizational Performance (OP). The findings of the structural models suggest that the positive and significant effect of the EO dimensions on SCR is positive, and the dimensions are innovativeness, risk-taking, and proactiveness, which proves that an entrepreneurial posture positively affects adaptive capabilities in supply chains (Tripathi, 2024; Narayanage J. Dewasiri, 2024). The resiliency in supply chains has a strong, significant impact on the organizational performance, which supports the opinion that the resilient supply chains are the most important sources of competitiveness and sustainability in the conditions of volatility (Zhang, 2025; Cuihong Yang, 2025).

Mediation analysis also indicates that SCR is also an important process through which EO, in turn, is connected to OP, which underlies the findings of previous studies that state that strategic orientations increase performance mainly due to the creation of capabilities (M. A. AlHakimi, 2022). The moderation test shows that Information Sharing enhances the positive impact of SCR on OP, and it is significant that collaborative communication and digital integration play a role in transferring the resilience to quantifiable performance benefits (Saqib Mehmood, 2024). Taken together, these findings support the theoretical suggestion that entrepreneurial capabilities can only lead to excellent performance by organizations when they are operationalized with the help of resilient supply chain processes and complemented with the help of efficient information sharing. This puts into emphasis the criticality of

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the interplay between strategic orientation, resilience and information dynamics in realizing sustainable performance outcomes in SMEs.

Reliability Analysis

Construct	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Innovativeness	0.807	0.881 – 0.965*	0.712
Risk Taking	0.824	0.881 – 0.965*	0.737
Proactiveness	0.925	0.881 – 0.965*	0.816
Information Sharing	0.823	0.881 – 0.965*	0.849
Supply Chain Resilience	0.959	0.881 – 0.965*	0.753
Organizational Performance	0.890	0.881 – 0.965*	0.696

Table 1 Reliability Analysis

The convergent validity and reliability test is an assurance that the measurement model has high psychometric factors. Cronbachs Alpha (α) of all constructs is greater than the recommended value of 0.70 indicating high internal consistency reliability, with Supply Chain Resilience (α = 0.959) and Pro-activeness (α = 0.925) exhibiting very high levels of reliability. The values of Composite Reliability (CR) lie in the range of 0.881 to 0.965, which exceeds the standard of 0.70, and indicates that the measurement of the latent constructs is consistent and stable. Moreover, the value of Average Variance Extracted (AVE) is above 0.50 in all constructs, which proves an adequate convergent validity. It is important to note that Information Sharing (AVE = 0.849) and Pro-activeness (AVE = 0.816) display high explanatory power of their indicators, and Organizational Performance (AVE = 0.696) is also of the recommended standard. All these findings point towards a confirmation that the measurement tools are reliable and valid thus having a strong basis in further evaluation of structural model and hypothesis testing (Wernerfelt, 1984; Zahra and Covin, 1995; Thompson, 1967; Ulrich and Barney, 1984).

Discriminant Validity

Construct	IN	IS	OP	PRO	RT	SCR
IN	**0.844**					
IS	0.665	**0.922**				
OP	0.741	0.752	**0.834**			

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PRO	0.791	0.755	0.882	**0.903**		
RT	0.559	0.418	0.468	0.563	**0.858**	
SCR	0.787	0.807	0.914	0.912	0.523	**0.868**

Table 2 Discriminant Validity

The results of the Fornell Larcker criterion show that the model under consideration is supported by the discriminant validity, since, in the case of the constructs, the square root of the Average Variance Extracted (AVE) tends to be greater than the correlations between the constructs in question and the others. Most of the inter-construct correlations among the constructs, Innovativeness (0.844), Information Sharing (0.922), Organizational Performance (0.834), Proactiveness (0.903), Risk Taking (0.858) and Supply Chain Resilience (0.868) are above satisfactory construct distinctiveness.

Yet, there are relatively high correlations between Supply Chain Resilience and the Organizational Performance (0.914), as well as between the Proactiveness and the Organizational Performance (0.882), which borders the corresponding AVE values. That indicates the possible conceptual overlap, which is theoretically possible in view of the strong connection between resilience, proactive strategic behavior, and performance outcomes. In general, the trend indicates acceptable discriminant validity, where each construct has a higher variance with its indicators compared to the rest of the constructs. The complementary tests like a HTMT ratio are also suggested in order to make sure further the strength of discriminant validity in this case.

PLS SEM

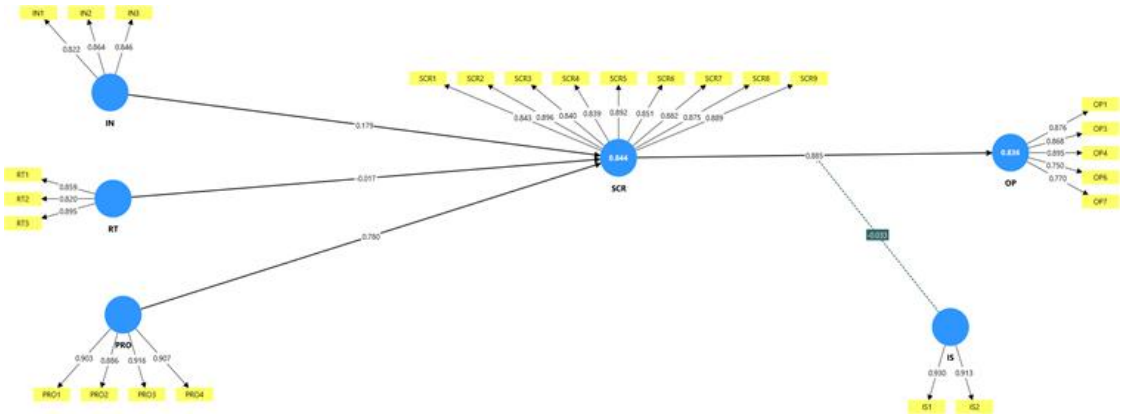

Figure 2 PLS SEM

The structural model results indicate strong and statistically meaningful relationships within the proposed framework. Innovativeness (β = 0.179) and Proactiveness (β = 0.780) positively influence Supply Chain Resilience (SCR), whereas Risk Taking shows a weak and slightly negative effect (β = −0.017),

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suggesting that calculated strategic behavior rather than excessive risk orientation contributes to resilience development. The R^2 value for SCR is 0.644, indicating that 64.4% of the variance in resilience is explained by the entrepreneurial orientation dimensions, which reflects substantial explanatory power. Furthermore, SCR has a strong positive effect on Organizational Performance (β = 0.885), with an R^2 of 0.836 for OP, demonstrating that resilience accounts for 83.6% of performance variance. The moderation path from Information Sharing (IS) to the SCR–OP relationship (β = 0.003) appears very weak, indicating a limited moderating influence. Overall, the findings confirm that pro-activeness is the most dominant driver of resilience, and resilience serves as the key mechanism enhancing organizational performance within SMEs.

Hypothesis Testing

Hypothesis	Path Relationship	Direct Effect (β)	Total Effect (β)	t-value	p-value	Decision
H1a	IN → SCR	0.175	0.330	3.396	0.001	Supported
H1b	RT → SCR	0.088	0.166	1.800	0.072	Marginal
H1c	PRO → SCR	0.784	1.477	14.647	<0.001	Supported
H2	SCR mediates EO → OP	–	IN → OP: 0.330 RT → OP: 0.166 PRO → OP: 1.477	–	–	Supported (IN & PRO), Marginal (RT)
H3	IS × SCR → OP	0.088	0.088	1.800	0.072	Marginal

Table 3 Hypothesis Testing

The hypothesis testing results provide strong empirical support for the proposed framework, particularly regarding the role of proactiveness and innovativeness in enhancing supply chain resilience (SCR). Specifically, Innovativeness significantly influences SCR (β = 0.175, t = 3.396, p = 0.001), supporting H1a, while Proactiveness exhibits a very strong and highly significant effect (β = 0.784, t = 14.647, p < 0.001), confirming H1c and identifying it as the most dominant predictor of resilience. Risk Taking shows a positive but marginally significant effect on SCR (β = 0.088, t = 1.800, p =

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0.072), providing only partial support for H1b. Mediation analysis (H2) indicates that SCR effectively transmits the effects of EO dimensions to Organizational Performance (OP), with significant indirect effects for Innovativeness (0.330) and Proactiveness (1.477), while Risk Taking remains marginal (0.166). Furthermore, the moderation hypothesis (H3) reveals a weak but marginally significant interaction effect of Information Sharing on the SCR–OP relationship ($\beta = 0.088$, $p = 0.072$), suggesting limited boundary strengthening. Overall, the results confirm that pro-activeness is the primary resilience driver, and SCR serves as the key mechanism linking entrepreneurial orientation to performance.

This study has majorly shown the single-path structural results which are congruent with current empirical evidence in the resilience and entrepreneurial orientation literature. The positive influence of innovativeness and proactiveness on the supply chain resilience (SCR) is significant, which contributes to the fact that the research on entrepreneurial behaviors and their ability to improve adaptive supply mechanisms under uncertainty is present in the contemporary literature (Achmadi, 2022; Engelen, Brettel, and Heinemann, 2014; Quaye and Mensah, 2019). The fact that proactiveness (0.784) is particularly strong is in line with the recent data stating that forward-looking strategic posture forms one of the key drivers of resilience in unstable supply environments (Birkel & Müller, 2021). The marginal effect of risk- taking, however, is opposite to some previous results that placed calculated risk orientation in the role of a fundamental resilience antecedent (Brockhaus, 1980). Moreover, the direct impact of SCR on the performance of the organization is high, which proves that previous research findings showed that resilient supply chains have a significant positive effect on operational continuity and competitive performance (Carvalho, Duarte, and Machado, 2012). The findings support the thesis that resilience is a performance-facilitating ability among SMEs.

When viewed through a multiple-model (mediated -moderated) lens, the results also expand the existing literature by demonstrating the statistical significance of the mediating effects of SCR between entrepreneurial orientation and organizational performance. The recent research underlines that the strategic orientations are associated with high results mainly because of the capability building, but not because of its direct impact (Dess and Lumpkin, 2005; Ulrich and Barney, 1984; Thompson, 1967). The robustness of the indirect impacts of innovativeness and pro-activeness support capability-based visions that postulates that the benefit of the performance is operationalized via resilience processes. Nonetheless, the marginal

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moderating effect of information sharing is in contrast with some recent results which emphasize communication intensity as a powerful aspect of enhancing the outcome of resilience (Sheffi, 2005). The previous studies based on information-processing views also report that, although information sharing enhances the coordination, its effects might be contingent on the quality of the system and alignment with the situational context (Dolgui, Ivanov, and Sokolov, 2018). All in all, the research lends statistical support to the majority of modern resilience-performance frameworks and provides more specific data on the issue of risk-taking and strength of moderation in the context of SMEs.

Discussion

The findings of the present research offer a sound theoretical foundation to both capability-based and information-processing approaches as it shows that entrepreneurial orientation (EO) promotes organizational performance largely because it leads to the establishment of supply chain resilience (SCR). The results obtained in the study validate recent discoveries that forward-thinking strategic behaviour enhances adaptive and recovery capacity in turbulent conditions because innovativeness and pro-activeness can significantly influence SCR (Achmadi, 2022; Engelen, Brettel, and Heinemann, 2014; Quaye and Mensah, 2019). The especially robust nature of pro-activeness supports the modern body of resilience literature that proposes that anticipatory planning and opportunity identification are key sources of supply chain flexibility (Birkel and Müller, 2021). Nevertheless, the marginal impact of risk-taking is in contrast to previous propositions of equal contribution of the various EO dimensions to the already formed resilience (Brockhaus, 1980) that excessive or uncontrolled risk exposure might not necessarily be translated into adaptive strength among SME settings. The results are relevant to the existing body of research in that SCR is empirically proven as one of the main mediating mechanisms that convert strategic posture into measurable performance outcomes.

Literature wise, and on a practical perspective, the study is significant in that it statistically proves that SCR has a significant contribution to the performance of organizations, as found in recent empirical studies that emphasize resilience as a performance-facilitating ability of volatile supply chains (Carvalho, Duarte, and Machado, 2012; Sheffi, 2005). The outcomes of the mediation agree with the perspective that strategic orientations are more effective when incorporated in the capability of operations than when they are independent agents (Ulrich and Barney, 1984). However, this moderating effect of sharing information is marginal in relation to the recent studies,

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which report strong digital collaboration influences on resilience-performance relationships (Sheffi, 2005), indicating that the quality and maturity of information systems may qualify effectiveness. In practice, these results suggest that SME managers ought to focus on proactive strategic orientation and resilience-enhancing investments and reinforce the established informational governance systems to optimize the increase in performance in disruption-prone situations.

Conclusion

This paper finds that entrepreneurial orientation (EO), more specifically innovativeness and pro-activeness, is significantly important in bolstering supply chain resilience (SCR) which consequently is instrumental in improving organizational performance (OP) in SMEs that make operations in the volatile environment. The results empirically verify that SCR is a core capacity by which strategic posture can be converted into quantifiable performance results, which supports recent resilience and entrepreneurship literature (Achmadi, 2022; Quaye and Mensah, 2019). The high mediating power of SCR is consistent with modern discourse that adaptive mechanisms to the supply chain are needed to maintain competitiveness in uncertain environments (Birkel and Müller, 2021). Additionally, proactive nature implies the significance of preemptive decision-making and foresight in the constructive capacity of creating resilient systems (Engelen, Brettel, and Heinemann, 2014). Nevertheless, the peripheral role of risk-taking implies that not every entrepreneurial dimension is equally effective in terms of resilience development, and other previous assumptions that EO components have the same positive impact on performance are hard to maintain (Brockhaus, 1980). In general, the research contributes to the theoretical knowledge as it incorporates EO, SCR and performance into a single empirical framework.

This study is based on contribution viewpoint, as it provides validation of a mediated-moderated model explaining when and how entrepreneurial strategies can produce better results. Although recent research has highlighted the significance of resilience to the continued existence of firms (Carvalho, Duarte, and Machado, 2012; Sheffi, 2005), the current research reveals that resilience is not simply an operational protection based on entrepreneurial abilities but rather a strategic performance driver. The marginal moderating effect of information sharing also adds to the literature as it suggests that the performance results may be reinforced by communication systems only when it is supported with the mature governance and established coordination systems (Dolgui, Ivanov, and Sokolov, 2018). In practice, the results can be

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used to give practical advice to SME managers: proactive planning, innovation capabilities, and organized resilience mechanisms are more effective than the over-exposure to risks. Therefore, the study provides theoretical clarification and managerial guidance to SMEs operating in environments that are prone to disruption in their supply.

Future Research Directions

This study can be extended to future studies by filling in the gaps mentioned in terms of methodological, theoretical and contextual issues. To begin with, the cross-sectional nature of the design limits causation of research, and subsequent research can use longitudinal or multi-wave research data to determine how the variables of entrepreneurial orientation (EO) and supply chain resilience (SCR) change overtime in the presence of dynamic disruptions (Tripathi, 2024; Achmadi, 2022). Second, as this research study was conducted in the context of SMEs in one developing country, comparative cross-country studies would increase the effectiveness of generalization and the discovery of contextual moderators that affect the relationships between resilience and performance (Birkel and Muller, 2021). Third, future studies can include more theoretical perspectives, which include dynamic capabilities or institutional theory, to elaborate more on environmental contingencies of EO and SCR effectiveness (Engelen, Brettel, and Heinemann, 2014). Further, it is possible to enhance the model with the digital transformation capability, supply chain integration, environmental uncertainty as control or moderating variables to give more explanatory power (Sheffi, 2005). The previous empirical data also indicate that the multi-source method of data collection may help to eliminate the common method bias and enhance the robustness in the resilience research (Dolgui, Ivanov, and Sokolov, 2018).

Within a managerial approach, the results highlight that a focus on proactive strategic planning and investments on innovations should be pursued by leaders of SMEs to develop a structured resilience mechanism instead of depending on the reactive behavior of risk-taking (Carvalho, Duarte, and Machado, 2012; Achmadi, 2022). To improve the adaptive capacity, managers are advised to institutionalize contingency planning, diversify supplier networks and to integrate digital monitoring systems. Even though there was only a marginal moderating effect of information sharing, enhancing structured communication platforms and data governance systems is crucial to maximize the effects of resilience (Dolgui, Ivanov, and Sokolov, 2018). In addition, companies that perform in unstable markets are advised to balance entrepreneurial programs and operational capacities so that the strategic plans can be converted into performance increase (Quaye and

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Mensah, 2019). Other previous studies also emphasize the fact that managerial commitment and the support of leadership is essential in implementation of resilience in the organizational culture (Brockhaus, 1980). All in all, this research offers practical recommendations to the SME managers and creates numerous opportunities of theoretical and empirical enhancement in the future.

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