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The Impact of Proactive Resilience Strategies on Organizational Performance: Role of Ambidextrous and Dynamic Capabilities of SMEs in Manufacturing Sector

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Abstract: The challenges of the global business environment foster small medium-sized enterprises (SMEs) to continuously improve their performance in the level of vulnerability to possible impacts and interruptions in their operations that may affect their sustainability. Resilience strategies and ambidextrous capabilities have become important determinants of organizational performance, which has developed as an emerging area of interest in supply chain management in recent years. SMEs are one of the major contributing sectors to the Malaysian economy. Therefore, SMEs have been forced to survive in the current market situation to ensure higher economic growth and competitiveness. The resilience strategies and ambidexterity capabilities are important determinants of SMEs' performance. As such, this study aims to examine the relationship between proactive resilience strategies, ambidextrous capabilities, and the performance of SMEs in the manufacturing sector, drawing on the dynamic capabilities perspective. A quantitative research design is adopted, a structured survey questionnaire is used, and data are collected from 351 SMEs in the manufacturing sector. Partial least squares structural equation modeling (PLS-SEM), Smart PLS 3.0 is used to test both direct and mediating results. The findings of this study suggested that proactive resilience strategies may have a significant influence on organizational performance of SMEs. Ambidextrous capabilities also act as a strong mediator between proactive resilience strategies and organizational performance. These findings contribute to the dynamic capabilities literature by highlighting the importance of proactive resilience strategies and ambidextrous capabilities in enhancing the positive impact on organizational performance in SMEs. This study provides a plausible explanation of two important management mechanisms for enhancing organizational performance sustainability. The relationships between proactive resilience strategies, ambidextrous capabilities, and organizational performance are malleable. This study also suggests that fostering formal and informal relationships might hold the key to the sustainable performance of SMEs in the long term. This study's practical contributions are improving the knowledge and performance of supply chain systems for SMEs in the manufacturing sector and enhancing their competitive power in domestic and international markets.

Keywords: supply chain resilience; supply chain ambidexterity; organizational ambidextrous; dynamic capabilities; organizational performance

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1. Introduction

The impact of the COVID-19 pandemic in 2020 has rendered many supply chains fragile and inefficient. This has caused disruptions at numerous nodes and compromised operational continuity, material flow, information flow, and payment flows. Furthermore, natural disasters, human-made disasters, and political and economic upheavals have all disrupted supply networks in recent years, posing ongoing dangers and uncertainties. It is estimated that around 75% of organizations experience some type of supply chain disruption each year [1]. This scenario has induced small medium-sized enterprises (SMEs) to raise alarm. SMEs contribute the global economic growth. The current situation is forcing SMEs to update and renew their knowledge and core competence [2]. They also lack the resources and capabilities, which hinders their performance. Under such circumstances, SMEs must necessarily understand and develop important capabilities that facilitate them to confront the dynamic business environment [3].

Notably, changes in the corporate environment compelled companies to adopt new strategies to stay afloat. Scholars proposed numerous theories to enhance organizations' inability and increase their performance over the last few decades. Adopting new tactics or adapting to a changing environment is critical for every business entity [4]. Resilience is the ability of an organization to rebound from disruption. It entails avoiding observable risks, attaining business objectives in the face of disruptions, and achieving the appropriate performance level once the disruptions have happened [5]. By minimizing instabilities, resilience in the supply chain context aids in rapid adaptation to impulsive events [6]. As a result, understanding and developing supply chain resilience for the future enterprise has become critical.

In addition, organizational ambidexterity can be viewed from a few key theoretical perspectives, such as innovation, organizational learning, and performance improvement in supply chain management (SCM) [7]. Ambidexterity has been defined in the existing literature. For instance, ref. [8] posited that ambidexterity in the context of organizations denotes the ability of an organization to balance the trade-offs between the different operations being performed. Ref. [9] contended that ambidexterity is to balance exploration and exploitation as it enables organizations to persistently seek creativity and adapt to the situations besides carrying their traditional methods.

The ability to participate in exploitation and exploration is regarded as organizational ambidexterity, which enhances the firm's performance [10]. It is regarded as the key factor that fosters an organization's dual orientation of exploration and exploitation to acquire the new resources necessary for survival [11] and investment in resources for exploitation and exploration [12] to drive higher performance. Notably, organizational ambidexterity enables SMEs to explore and exploit opportunities and look into new ways of improving their performance [12]. Recent studies have suggested additional research on the relationship between organizational ambidexterity and performance to ensure that the SMEs' contribution to the global economy [11,13], can be increased. From a theoretical perspective, the dimensions of supply chain ambidexterity remain unexplored, particularly from the dynamic capability viewpoint. Recently, many scholars have paid additional attention to ambidexterity in the context of the organzsation is still a developing paradigm under organizational theory [14]. Therefore, the present study considered organizational ambidexterity as a predictor of SMEs' performance.

The literature mentioned above has highlighted the positive side of organizational ambidexterity. Nevertheless, it poses a significant challenge for organizations to create it [15]. Resilience is one of the critical factors that can result in increased organizational ambidexterity. It enables organizations to focus on the present, plan, and absorb shocks. Nevertheless, limited research addresses resilience outcomes, particularly in developing organizational ambidexterity [16].

Moreover, organizations must become resilient in the uncertain business environment to ensure they can pass through the troubling time. The current dynamic environment demands the supply chain to be adequately resilient to face the growing business challenges

and changes [17]. Accordingly, the presence of a strong supply chain is necessary to confront the ever-dynamic business environment [18]. The topic has also gained much attention from both practitioners and researchers. A growing number of research have explored supply chain resilience from a variety of perspectives. However, because it lacks a developing country perspective, this literature does not give a comprehensive view [19]. Even though developing countries are the ones most affected by supply chain interruptions caused by natural catastrophes or human-made disasters such as wars. Furthermore, meta-analytical data reveal a relative paucity of empirical research in the domain when compared to non-empirical studies [20].

The current dynamic environment demands the supply chain to be adequately resilient to face the growing business challenges and changes [17]. The supply chain is necessary to confront the ever-dynamic business environment [18]. This topic has also gained much attention from both practitioners and researchers. SMEs must become resilient in the uncertain business environment to ensure they can pass through the troubling time.

This paper addresses the literature gap highlighted by [21]. Supply chain resilience and ambidexterity are key dynamic capabilities that can enhance organizational performance [22]. Recently, researchers have performed empirical research to investigate numerous types of organizational ambidexterity and their possible diverse impacts in mediating the association between dynamic capabilities and organizational competitive advantage [21,23,24]. The different types of organizational ambidexterity, for instance, structural or contextual approaches, have been suggested for future studies. Resilience and ambidexterity, which are deemed structural and contextual in nature, can help to enhance organizational performance.

2. Literature Review

2.1. Resilience and Ambidexterity

Resilience and ambidexterity are critical components of the dynamic capacity theory (DCT). The ability of a firm to recover from adverse events and adjust to changes in the environment is referred to as resilience, whereas ambidexterity refers to the ability of a firm to balance exploration and exploitation activities. Several studies have been conducted in recent years to investigate how resilience and ambidexterity capabilities can be developed and leveraged as dynamic capabilities in different contexts.

In the context of the COVID-19 pandemic, ref. [25] investigated the role of resilience as a dynamic capacity. They discovered that resilient firms were better able to adapt to the pandemic's disruptions and keep their performance. As a dynamic capability, the authors identified three important components: absorptive capacity, adaptive capacity, and transformative capacity. Ref. [26] investigated the function of ambidexterity as a dynamic capability in the context of Chinese firm innovation. They discovered that companies that could balance exploration and exploitation activities were more likely to effectively bring new products and services to the market. The authors identified four key skills that firms must develop in order to achieve dynamic ambidexterity: strategic agility, resource reconfiguration, organizational learning, and leadership. Other scholars have investigated the role of resilience and ambidexterity as dynamic capabilities in a variety of contexts, such as sustainability, technology adoption, and supply chain management.

The significance of resilience and ambidexterity as dynamic capabilities for firms seeking to maintain their competitive edge over time. Firms can adjust to changes in the environment, balance exploration, and exploitation activities, and improve their performance by building and leveraging these capabilities. Accordingly, the study is based on the notion that the proactive resilience strategies used by the organization in the form of visibility and predefined decision plan tend to result in ambidextrous capabilities leading towards higher performance. The SMEs' proactive resilience strategies help them exploit and explore the opportunities leading toward higher organizational performance. Dynamic capability theory (DCT) provides a crucial framework for comprehending how businesses, including SMEs, can build upon and utilize capabilities to maintain a competitive edge

over time. DCT has been applied to SMEs to examine how these businesses can adapt to market shifts and enhance their performance.

2.2. Organizational Performance

There are various definitions for organizational performance. For instance, of organizational performance refers to a company's market and financial performance. Previous studies have acknowledged that a firm's performance comprises a series of complex and multi-dimensional constructs and it can be classified in many ways. Such as its can be signified by financial outcomes, sales or market growth, customer satisfaction, or the creation of a foundation upon which future growth may happen. There are four key drivers of performance in an organization in an organization, namely strategy, culture, leadership, and capability. The essence of the strategy involves examining the different types of advantages that a leading company could create and hold over its competitors for some time. Meanwhile, organizational culture is a way to form sustainable competitive advantages and is a cultural phenomenon that is pervasive throughout the organizational lifecycle. Next, leadership is defined as the process of converting organizations from what they presently are to what the leader wants them to be, whereas capability refers to the capacity to carry out a task or activity in a cohesive manner [27]. Financial and non-financial elements are generally employed to justify an organization's performance. Nevertheless, there are other business-related factors or indicators that are much more important in justifying the performance of an organization [28]. Examples of such indicators are innovation capabilities, market share, and other non-financial indicators as well as other factors which can greatly influence organizational performance in supply chain management. There are short-term and long-term goals of SCM in every organization. These objectives can help to increase productivity, enhance market share, and manage or reduce inventory and production lead time. For this research, a few key factors were considered in justifying the effects of SCM in the context of organizational performance, as discussed in the following subsections.

3. Hypothesis Development

3.1. Proactive Resilience Strategies and Organizational Performance

Proactive resilience strategies have been shown to improve organizational performance, especially when faced with unexpected disruptions. Several recent studies have investigated the link between proactive resilience strategies and organizational performance, emphasizing the importance of implementing such strategies to enhance performance.

Ref. [29] investigated the effect of proactive resilience strategies on organizational performance during the COVID-19 pandemic. The study found that organizations that implemented proactive resilience strategies such as redundancy, flexibility, agility, and collaboration were better able to react to the pandemic and maintain their performance. The research also emphasized the significance of continuous improvement in fostering resilience and sustaining performance. Ref. [29] investigated the effect of information sharing on supply chain performance as a proactive resilience strategy. This study discovered that organizations that shared information with their supply chain partners performed better and were better able to handle disruptions. The research also emphasized the significance of developing trust and cooperation with supply chain partners in order to improve information sharing and resilience. Proactive resilience strategies improve organizational success. Ref. [30] found that proactive resilience strategies such as scenario planning and risk management helped organizations handle disruptions and improve financial performance. Organizational performance can be greatly enhanced through the implementation of proactive resilience tactics, which are especially important in the face of unforeseen disruptions. Organizations can strengthen their resilience and sustain their performance by implementing measures such as redundancy, flexibility, agility, collaboration, and information exchange.

For this study, proactive strategies such as visibility and predefined decision plans are considered to examine the relationship. These two strategies are perceived as key

elements of resilience in supply chain management. Ref. [31] classified these two strategies as readiness elements (see Table 1).

Table 1. Visibility (VS) and organizational performance (OP).

Proactive Strategy	**Readiness Elements**	**Sub-Elements**
Proactive strategy	Collaboration	Coordination, cooperation, joint decision-making, knowledge sharing, supplier certification, supplier development
	Human resource Management	Employee training and education, risk-sensitive culture and mindset, cross-functional teams, experienced employees for crisis management
	Inventory management Predefined decision Plans	Use of inventory and safety stocks to buffer disruptions, Contingency plans, communication protocols
	Redundancy	Production slack, transportation capacities, multiple sourcing and production locations
	Visibility	Early warning communication, information sharing, real-time and financial monitoring
Reactive strategy	**Response, recovery and growth elements**	**Sub-elements**
	Agility	Communication, information sharing ($\frac{1}{4}$ visibility), quick supply chain redesign, velocity
	Collaboration	Coordination, cooperation, joint decision-making, knowledge sharing, supplier certification, supplier development
	Flexibility	Backup suppliers, easy supplier switching, distribution channels, flexible production systems, volume flexibility, multi-skilled workforces
	Human resource Management	Employee training and education, risk-sensitive culture and mindset, cross-functional teams, experienced employees for crisis management
	Redundancy	Production slack, transportation capacities, multiple sourcing and supplier locations

Source: Hohenstein et al., 2015 [31].

3.2. Visibility (VS) and Organizational Performance (OP)

Visibility was reviewed in the supply chain context for this study. Visibility in the supply chain allows for better coordination among supply chain stakeholders. This collaboration can lead to better inventory management, on-time delivery, and cost savings [32]. Organizations can use supply chain visibility to spot potential disruptions and risks, allowing them to take proactive steps to mitigate these risks. This has the potential to enhance supply chain resilience and responsiveness [33]. By giving real-time information on product availability, delivery times, and order status, supply chain visibility can help organizations increase customer satisfaction. This can contribute to better customer retention and loyalty performance [34]. By lowering inventory expenses, improving operational efficiency, and reducing supply chain disruptions, supply chain visibility can contribute to better financial

performance. This has the potential to increase profitability and return on investment [35]. Hence, the study proposes that:

H_1. *There is a positive relationship between visibility (VS) and organizational performance (OP).*

3.3. Predefined Decision Plan (PD) and Organizational Performance (OP)

A predefined decision plan is a structured collection of guidelines or procedures that businesses can use to make consistent and efficient choices. Predefined decision plans can assist organizations in improving decision-making quality, decreasing decision-making time, and ensuring that decisions are aligned with organizational objectives and values. The literature has extensively examined the relationship between predefined decision plans and organizational performance. Predefined decision plans can assist organizations in making more efficient decisions by shortening the time needed to evaluate options and make decisions. This can result in increased productivity, profitability, and client satisfaction [36]. By providing a clear record of how decisions were made and who was involved in the decision-making process, predefined decision plans can help organizations increase transparency and accountability. This can help to increase stakeholder confidence and improve overall organizational performance [37]. Predefined decision plans can assist organizations in more effectively managing risks by providing a structured approach to evaluating potential risks and finding suitable mitigation strategies. This can result in better supply chain resilience, operational efficiency, and total organizational performance [38]. Hence, the study proposes that:

H_2. *There is a positive relationship between a Predefined Decision Plan (PD) and Organizational performance (OP).*

3.4. Proactive Resilience Strategies and Ambidexterity Capabilities

Proactive resilience strategies and ambidextrous capabilities are two critical concepts that are becoming increasingly essential in today's volatile and fast-changing business environment. The ability of organizations to balance exploration and exploitation in their innovation activities is referred to as ambidextrous capabilities. Proactive resilience strategies refer to the set of actions that organizations take to foresee and prepare for potential disruptions.

According to [22], the relationship between resilience and ambidexterity can be used to highlight the dichotomy between adaptation, which preserves exploitation (efficiency and persistence), and transformation, which allows exploration (constancy through change). Furthermore, resilience capability is viewed as a dynamic capability that can be utilized to develop processes, increase competencies, assist businesses in dealing with uncertainty and unexpected situations, and lead to ambidexterity [17]. The relationship between resilience and ambidexterity can be established when resilience is perceived as a dynamic capability, while ambidexterity is viewed as an innovative capability. Firms require dynamic capability to achieve long-term ambidexterity [17,39,40].

Recent research has emphasized the significance of proactive resilience strategies and ambidextrous skills for organizational performance. Research conducted by [41] discovered that proactive resilience strategies can improve organizational agility and innovation performance. Ref. [42] discovered that ambidextrous skills can improve organizational performance and competitiveness. Ref. [43] investigated how ambidexterity and proactive resilience tactics affected the innovativeness of businesses. Proactive resilience strategies and ambidexterity skills were found to be highly correlated with a company's ability to innovate and boost performance. Proactive resilience strategies and ambidexterity skills were investigated as potential means of raising an organization's competitiveness [44]. Companies with high amounts of both were found to be more competitive and quicker to recover from disruptions, as discovered. Ref. [45] concluded in their study that proactive resilience strategies were found to help organizations strike a better balance between exploration and exploitation, which is crucial for sustained development and success.

3.5. Visibility (VS) and Exploitation Capability (EI)

Visibility is the capacity to identify and comprehend opportunities and hazards in the external environment, whereas exploitation capability is the capacity to effectively leverage internal resources and capabilities to capitalize on these opportunities. Ref. [46] studied how company innovation performance was affected by factors such as exposure and the capacity to capitalize on discoveries. The authors discovered that innovative and successful businesses were those with high degrees of both visibility and exploitation capability. Ref. [47] investigated the impact of transparency and exploitation capacity. The study found that businesses with high amounts of both were more agile and competitive in the face of market shifts and uncertainty. Refs. [7,48] found that exploitation capability was positively related to organizational agility and performance, suggesting that more visible organizations are better able to spot and capitalize on new market possibilities.

H_3. *There is a positive relationship between visibility (VS) and exploitation capability (EI).*

3.6. Visibility (VS) and Exploration Capability (ER)

Organizations' capacity to see and investigate their external environment for new opportunities is a key part of their dynamic capabilities. Exploration capability refers to the ability to try out new ideas, technologies, and business models, while visibility refers to the ability to recognize and comprehend opportunities and threats in the external world. The power of observation and inquiry in boosting productivity and creativity in organizations. For instance, research by [49] showed that firms' exploration capabilities correlated with their innovation performance, and that increased visibility was associated with the discovery of new business opportunities.

The open innovation in SMEs and the function of visibility and exploration capability are perceived as important. SMEs with higher levels of both visibility and exploration capability were more likely to participate in open innovation activities and expect greater outcomes [50]. According to [51,52], both visibility and exploration capability are favorably related to the adoption of digital technologies in healthcare and sustainable practices in manufacturing, respectively. Innovation and organizational success are strongly influenced by the degree to which information is accessible and can be explored.

H_4. *There is a positive relationship between visibility (VS) and exploration capability (ER).*

3.7. Predefined Decision Plan (PD) and Exploitation Capability (EI)

There are multiple studies that have confirmed a strong correlation between predefined decision plans and exploitation capability. Ref. [53] conducted a study that showed that predefined decision plans influenced the introduction of new goods and services while exploitation capability influenced their commercialization. The capacity to commercialize innovations depends on both a well-defined predefined decision plan and the corresponding exploitation capability. Ref. [54] came to a similar conclusion, finding that start-ups with a well-defined predefined decision plan were more likely to recognize and act upon promising prospects, and that start-ups with a robust exploitation capability were more likely to commercialize their innovations. The authors contend that having a well-defined plan enables businesses to make sound decisions rapidly even in volatile markets, while exploitation capability allows them to make the most of their current assets to provide customers with additional value.

The significance of the relationship between predefined decision plans and exploitation capability has been emphasized by other scholars in a variety of fields and settings as well. For instance, ref. [55] discovered that PDP mediated the link between exploitation capability and innovation performance in SMEs manufacturing firms. Organizations that have a well-defined PDP are better able to spot and pursue potential innovation opportunities, and those with strong exploitation capabilities are better able to commercialize their discoveries.

H_5. *There is a positive relationship between a predefined decision plan (PD) and exploitation capability (EI).*

3.8. Predefined Decision Plan (PD) and Exploration Capability (ER)

There are several studies have investigated the relationship between predefined decision plans and exploration capability and discovered that this is having positive connectivity. [53] concluded in their study that a predefined decision plan positively influenced exploration capability, which helps to positively influence the implementation of new goods and service development. The study also highlighted that there is a clear indication showing that a predefined decision plan enables organizations to identify potential opportunities for innovation, while exploration capability enables them to develop their opportunities effectively. Similarly, ref. [56] concluded in their study that a predefined decision plan affected exploration capability, which in turn influenced new product development performance. There are few other studies that highlight the significant relationship between predefined decision plans and exploration capability in a variety of sectors. Ref. [57] discovered that predefined decision plans positively influenced exploration capability in the context of environmental innovation, which in turn favorably influenced firm performance. The relationship between a predefined decision plan and exploration capability is important for driving innovation and organizational success. Organizations that create a clear predefined decision plan can make choices quickly and effectively in uncertain environments, while organizations that improve exploration capability can find and develop new opportunities for innovation and drive business growth.

H_6. *There is a positive relationship between a predefined decision plan (PD) and exploration capability (ER).*

3.9. Ambidextrous Capabilities and Organizational Performance

Ambidextrous abilities improve an organization's ability to explore new opportunities while also utilizing existing resources, according to extensive research in the literature. Ref. [58] concluded that ambidextrous abilities improve both innovation and financial performance in the Indian manufacturing sector. Similarly, ref. [59] discovered that ambidextrous capabilities were positively related to organizational performance in the context of Australian SMEs. Ambidextrous abilities aid in certain aspects of business success, such as positively influencing financial performance [60].

The ambidextrous abilities have an impact on organization's productivity. Ref. [59] found that being ambidextrous is associated with better business results for Korean service providers. Although ambidexterity and an organization's success have been shown to be positively correlated, the nature of the relationship between the two is complex and context-dependent. The ability to think laterally and creatively is valued in situations where there is a lot of change to navigate. The link between ambidextrous skills and innovation performance is weaker in organizations exposed to a less turbulent environment. This correlation may, however, be conditional on elements such as the degree of environmental uncertainty, the nature of the organization's culture, and the nature of the business sector. More study is required to reveal the underlying causes and conditions of this connection.

3.10. Exploitation Capability (EI) and Organizational Performance (OP)

The ability to exploit opportunities effectively has been shown to improve business outcomes. Specifically, ref. [61] found that exploitation capability positively influenced the financial performance of Greek firms, especially with respect to revenue growth and profitability. The operational performance of Spanish manufacturing firms was positively influenced by exploitation capability, according to research by [62], especially in terms of cost efficiency and delivery performance.

Exploitation capability was found to positively affect new product development performance in high-technology firms [63]. Exploitation capability was found to positively affect innovation performance in Korean firms in a different study [64]. Exploitation capacity and organizational performance appear to be positively correlated, but this finding may be moderated by other variables. One study found that firms with more environmental dynamism had a stronger positive relationship between exploitation capability

and innovation performance. The link between exploitation capability and innovation performance was weaker in companies operating in less dynamic environments. However, the connection may be conditional on elements such as the changeability of the surrounding environment, the culture of the partnering organization, and the nature of the sector. More study is required to reveal the underlying causes and conditions of this connection.

H_7. *There is a positive relationship between exploitation (EI) and organizational performance (OP).*

3.11. Exploration Capability (ER) and Organizational Performance (OP)

An organization's exploration capability exists when it can create novel assets and capacities via experimentation, learning, and innovation. The effect of this skill on organizational effectiveness has been studied, especially as it relates to new product development and long-term expansion. Ref. [65] discovered that Indian companies' sales growth and profitability were positively influenced by their exploration capabilities. There is a positive correlation between exploration capability and some measures of organizational performance. For example, ref. [66] discovered that exploration capability influenced new product development performance in Chinese firms in a positive way. Exploration capability was found to positively impact sustainable performance in SMEs [67]. For instance, a higher level of environmental uncertainty is associated with a stronger positive relationship between exploration capability and sustainable performance. The literature suggests that exploration capability is positively related to organizational performance, especially in the areas of innovation performance, financial performance, and sustainable performance. However, the connection may depend on things such as environmental unpredictability, corporate culture, and the specifics of the industry. The mechanisms and contexts of this connection require additional study.

H_8. *There is a positive relationship between exploration (ER) and organizational performance (OP).*

3.12. Relationship between Visibility (VS), Exploitation Capability (EI) and Organizational Performance (OP)

The relationships between visibility, exploitation, and organizational performance are established in current literature findings. Visibility helps organizations to recognize and understand changes in their environment, while exploitation plays a role as improve the ability of an organization to be effective and efficient in utilizing its existing resources to optimize performance. Ref. [68] found that in a highly dynamic environment, higher visibility and exploitation capabilities were more strongly related to organizational performance. However, in a less dynamic environment, exploration capabilities had a stronger relationship with organizational performance. Ref. [69] concluded that visibility has a direct positive impact on exploitation capability, which in turn leads to improved organizational performance. The study was conducted on Chinese manufacturing firms and found that firms with higher visibility were more likely to possess strong exploitation capabilities, leading to better performance outcomes.

Similarly, ref. [70] examined the relationship between visibility, exploitation capability, and organizational performance in the context of Pakistani firms. The results showed that exploitation capability significantly mediates the relationship between visibility and organizational performance, indicating that visibility can lead to improved performance outcomes through the development of stronger exploitation capabilities. For instance, a study by [71] found that exploitation capability partially mediated the relationship between supply chain visibility and firm performance in the context of Korean manufacturing firms. Similarly, ref. [72] examined the mediating effect of exploitation capability in the relationship between supply chain visibility and firm performance in the context of Chinese manufacturing firms. They found that exploitation capability fully mediated the relationship, indicating that firms with higher exploitation capability were able to better leverage the benefits of supply chain visibility and improve their performance. Ref. [73] investigated the mediating effect of exploitation capability in the relationship between environmental uncertainty and firm performance in the context of Taiwanese manufacturing firms. They

found that exploitation capability partially mediated the relationship, indicating that firms with higher exploitation capability were better able to adapt to environmental uncertainty and improve their performance. In summary, the literature suggests that both exploitation and visibility capabilities are important for organizational performance.

H_9. *Exploitation (EI) positively mediates the relationship between visibility (VS) and organizational performance (OP).*

3.13. Relationship between Visibility (VS), Exploration Capability (ER), and Organizational Performance (OP)

Recent research has suggested that both visibility and exploration capability can positively impact organizational performance, and that the two capabilities may have a complementary relationship. Ref. [74] examined the relationship between visibility, exploration capability, and organizational performance in the context of SMEs in Sweden. The study found that both visibility and exploration capability positively influenced organizational performance, and that exploration capability partially mediated the relationship between visibility and performance. Similarly, a study by [75] investigated the impact of visibility and exploration capability on the performance of Chinese firms. The study found that both capabilities had a positive impact on performance, and that exploration capability partially mediated the relationship between visibility and performance.

Ref. [76] examined the relationship between visibility, exploration capability, and organizational performance in the context of Korean firms. The study found that exploration capability partially mediated the relationship between visibility and organizational performance, indicating that firms with high levels of visibility are more likely to achieve better performance outcomes by having greater exploration capability. Similarly, a study by [77] investigated the impact of visibility and exploration capability on the performance of Chinese firms. The study found that exploration capability fully mediated the relationship between visibility and performance, indicating that exploration capability is an important factor in driving performance outcomes in firms with high levels of visibility.

These findings suggest that exploration capability plays a crucial role in the relationship between visibility and organizational performance. Firms with high levels of visibility need to have the ability to explore new opportunities and adapt to changing environments in order to achieve better performance outcomes. Hence, the study proposes that:

H_{10}. *Exploration (ER) positively mediates the relationship between visibility (VS) and organizational performance (OP).*

3.14. Relationship between Predefined Decision Plan (PD), Exploitation Capability (EI), and Organizational Performance (OP)

The relationship between predefined decision plans (PD), exploitation, and organizational performance has been explored in several studies. PD refers to a set of guidelines, procedures, and decision-making rules that organizations follow to deal with unexpected events and to facilitate decision-making. Exploitation capability involves the ability to improve and optimize existing products, processes, and technologies to gain market share and improve financial performance. Organizational performance, in this context, refers to the achievement of the organization's strategic goals and objectives. Ref. [7] found that PDP positively influences exploitation capability, which in turn enhances organizational performance. Similarly, ref. [78] found that PDP positively affects exploitation capability, which subsequently improves organizational performance in the context of Chinese SMEs.

Ref. [79] examined the mediating effect of exploitation capability on the relationship between strategic decision-making and organizational performance. They found that exploitation capability partially mediates this relationship, suggesting that firms with stronger exploitation capabilities are better able to translate strategic decisions into improved organizational performance. Ref. [80] investigated the relationship between strategic decision-making and firm performance in the context of SMEs. They found that strategic decision-making positively influenced firm performance, and that exploitation

capability played a mediating role in this relationship. Specifically, they found that firms with stronger exploitation capabilities were better able to leverage their strategic decisions to achieve superior performance. Overall, these studies suggest that exploitation capability can play a mediating role in the relationship between predefined decision plans and organizational performance. PDP has a positive impact on exploitation capability and organizational performance, though more research is needed to understand its relationship with exploration capability and organizational performance.

H_{11}. *Exploitation (EI) positively mediates the relationship between a predefined decision plan [PD] and organizational performance (OP).*

3.15. Relationship between Predefined Decision Plan (PD), Exploration Capability (ER), and Organizational Performance (OP)

The relationship between a predefined decision plan, exploration capability, and organizational performance has also been a topic of interest for scholars in the field of strategic management. Ref. [81] investigated the impact of exploration capability and predefined decision plan on the innovation performance of Spanish manufacturing firms. The study found that both exploration capability and predefined decision plan had a positive impact on innovation performance, with exploration capability playing a more significant role. The study suggests that having a predefined decision plan can provide a foundation for exploration activities and lead to better innovation outcomes.

Similarly, a study by [48] examined the impact of exploration capability and predefined decision plans on the performance of Chinese firms. The study found that both exploration capability and predefined decision plans had a positive impact on firm performance, with exploration capability playing a more significant role. The study suggests that having a predefined decision plan can enable firms to more effectively utilize their exploration capability to achieve better performance outcomes.

These findings suggest that having a predefined decision plan can facilitate exploration activities and contribute to better organizational performance. Firms that are able to effectively balance their focus on both exploration capability and predefined decision plans are likely to achieve sustained performance outcomes. However, there is limited research that has specifically examined the relationship between PDP, exploration, and organizational performance. It is suggested that PDP may have a negative effect on exploration capability, as it may limit creativity and innovation by imposing constraints on decision-making. Nonetheless, organizations with a well-designed PDP may have a higher likelihood of successful exploration initiatives, as they have clear guidelines for dealing with unexpected events and managing risks. Hence, the study proposes that:

H_{12}. *Exploration (ER) positively mediates the relationship between a predefined decision plan (PD) and organizational performance (OP).*

3.16. Dynamic Capability Theory (DCT)

The dynamic capability theory (DCT) underpins the present study's framework. Dynamic capabilities denote the frequent use of organizational processes that consume resources, particularly the processes aimed at integrating, reconfiguring, obtaining, and releasing resources to match the changes in the market. Accordingly, the perceptions of the dynamic capabilities include the organizational processes through which an organization leverages the new configurations of its resources, besides matching how the markets expand, emerge, collide, divide and evolve. Notably, the dynamic capabilities developed by an organization comprise a group of activities that explain how they function and operate [82].

The DCT assumes that an organization with greater dynamic capabilities can have more opportunities to outperform compared to those with smaller dynamic capabilities [83]. These capabilities enable an organization to use its resources to drive higher performance [82]. Moreover, researchers have employed the dynamic capability perspective to explain organizational responses to the swiftly changing business environment [84].

Dynamic capability theory (DCT) describes how firms can maintain a competitive advantage over time by consistently adapting to shifting market circumstances. DCT has been used in the manufacturing industry to better understand how businesses can create and use dynamic capabilities to increase performance [85].

There are recent studies emphasized on the DCT in the context of the SMEs in manufacturing sectors. Ref. [86] investigated how SMEs can build adaptable skills to enhance their export performance. They discovered that businesses need to create three essential dynamic capabilities: networking, marketing, and innovation. SMEs can effectively join and compete in export markets by utilizing these capabilities. DCT was applied to SMEs in the food sector in Brazil. The study discovered that businesses must build four vital dynamic capabilities: the capacity for market sensing, the capacity for innovation, the capacity for alliances, and the capacity for learning. These skills can help SMEs become more competitive in the food sector [87]. Several other academics have used DCT to help SMEs in a variety of settings, such as technology adoption, digitalization, and innovation. Ref. [88] investigated how Taiwanese SMEs could develop dynamic capabilities for digital change, whereas [89] investigated how Finnish SMEs could develop dynamic capabilities for innovation.

3.17. Research Framework

This research emphasized the impacts of proactive resilience strategies and ambidextrous capabilities on organizational performance. This research framework can provide valuable insights for researchers and practitioners to develop effective strategies that can enhance organizational performance. Two key proactive resilience strategies such as visibility and predefined decision plan are focused on in this study. Ambidextrous capabilities such as exploitation and exploration were proposed as a mediator to examine their effects on proactive strategies and organizational performance as illustrated in the research framework (see Figure 1).

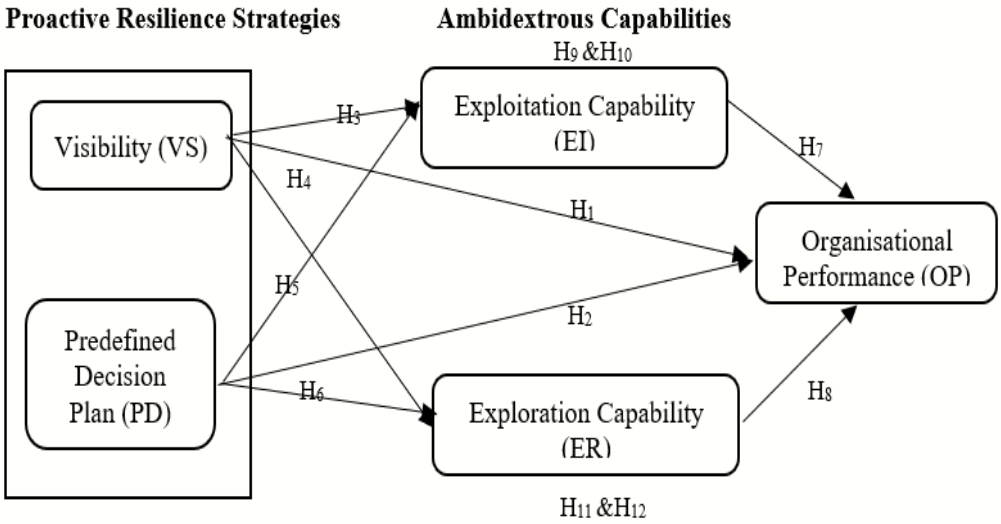

Figure 1. Research framework.

4. Research Methodology

4.1. Questionnaire and Pre-Testing

All the measures in the study were adapted from previous studies as stated in questionnaire in Appendix A. Visibility was measured by adapting eight items [90]. Similarly, the eight items' measures were adapted to measure the predefined decision plan [17]. The organizational performance was measured by adapting fifteen items [91,92]. Additionally, five items for each measure were adapted to assess the exploration and exploitation [17]. The content validity of the scales was established by expert academics and experienced employees. Before starting data collection, a pre-test was conducted with three academi-

cians and two SME managers. These people were expected to possess valuable knowledge due to their working experiences and knowledge of the supply chain processes. As a result, they were able to provide good quality and reliable information. No serious issues were identified concerning the application of the scales in the SME context and there was no adjustment done.

4.2. Sample Design and Data Collection

The population of the study was the managers of SMEs, and the manufacturing industries of SMEs were selected because they share a dominant share in the economy. In total, 358 respondents comprising SME owners and managers were used in this study.

4.3. Data Analysis

Partial least squares-structural equation modelling (PLS-SEM) was used for data analysis. Reliability and validity were measured while performing the data analysis in PLS-SEM before testing the relationship between the variables of the study (see Tables 2–4).

Table 2. Proactive resilience strategies.

Measures	Description
Visibility (VS)	Information exchanged or addressed as the capability to access or share information across the supply chain and apply it in real time
Predefined decision plan (PD)	Having a decision support system along the supply chain pipeline will help the upstream and downstream members to provide relevant information

Source: [17,90].

Table 3. SMEs Performance.

Measures	Description
Organizational performance (OP)	Refining the accountability, competitiveness, and profitability of manufacturing firms via the enhancement of productivity and non-financial factors

Source: [91,92].

Table 4. Ambidextrous capabilities.

Measures	Description
Exploitation (EI)	Organizations can be transformed into exploitative elements and can develop repetitive processes to gain efficiency and effectiveness in operations functions
Exploration (ER)	Explorative capacity in the operational process will help organizations to discover new knowledge and opportunities to gain further economic development and novel technologies

Source: [17].

Common Method Bias

The common method bias may occur when data are collected from a single source. A previous study by [93] discussed the common method variance while using PLS-SEM and recommended using full collinearity. The present study used the variance inflation factors (VIF) engendered by the full collinearity test. Values above 3.3 indicated a common method bias. All the values of VIF were less than 3.3. Therefore, the common method bias was not a problem in the study [94].

4.4. Assessment of the Measurement Model

Before testing the relationship between the variables, confirmatory factor analysis was performed to assess the measurement model. There are three parameters in measurement model assessment. First, the values of the factor loadings should be greater than 0.708 [95]. All of the factor loadings were greater than 0.708. Hence, no item from the questionnaire was deleted. Additionally, average variance extracted (AVE) values should be greater than 0.5. It denotes the extent of variance taken by a construct in relation to variance due to the measurement error [96]. All the values for AVE ranged from 0.619 to 0.666, above the recommended 0.50 value. On the other hand, composite reliability (CR) denotes the correlation of multiple indicators of the same construct that are in agreement [97]. Nevertheless, the CR value ranged from 0.858 to 0.962, which was greater than the recommended value of 0.70 by [95]. Thus, this present research ensured that convergent validity existed. Values of loadings, AVE, and CR are presented in Table 5. The measurement model describes the link between a construct and its manifest variables, whereas the structural model describes the relationships between constructs in the PLS path model in Figure 2.

Table 5. Results of the measurement model.

Variable	Item	Loading	α	CR	AVE
EI	EI01	0.807	0.874	0.909	0.666
	EI02	0.804			
	EI03	0.793			
	EI04	0.862			
	EI05	0.811			
ER	ER01	0.799	0.858	0.898	0.638
	ER02	0.859			
	ER03	0.768			
	ER04	0.775			
	ER05	0.789			
OP	OP01	0.791	0.962	0.966	0.653
	OP02	0.844			
	OP03	0.774			
	OP04	0.767			
	OP05	0.786			
	OP06	0.819			
	OP07	0.788			
	OP08	0.830			
	OP09	0.768			
	OP10	0.862			
	OP11	0.814			
	OP12	0.839			
	OP13	0.853			
	OP14	0.816			
	OP15	0.765			
PD	PD01	0.781	0.905	0.925	0.639
	PD02	0.857			
	PD03	0.805			
	PD04	0.736			
	PD05	0.820			
	PD06	0.781			
	PD07	0.810			

Table 5. *Cont.*

Variable	Item	Loading	α	CR	AVE
VS	VS01	0.745	0.912	0.928	0.619
	VS02	0.759			
	VS03	0.844			
	VS04	0.841			
	VS05	0.832			
	VS06	0.727			
	VS07	0.759			
	VS08	0.779			

Note: Visibility (VS); predefined decision plan (PD); exploitation (EI); exploration (ER); organizational performance (OP).

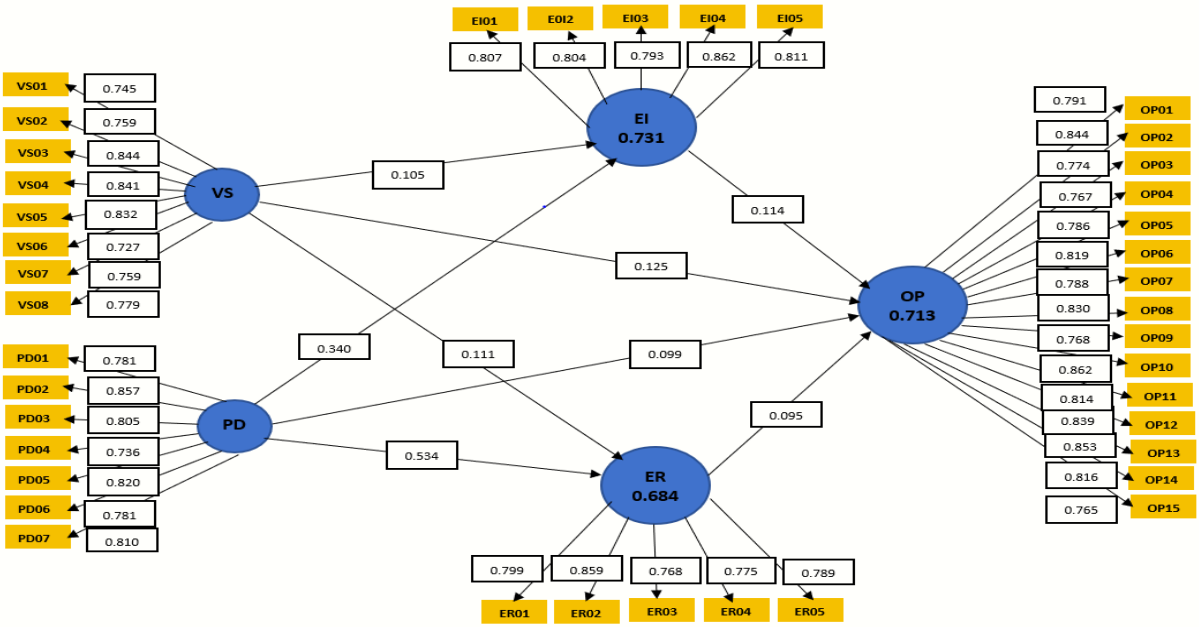

Figure 2. Measurement model.

After confirming the convergent validity, the discriminant validity was also assessed. A recently introduced heterotrait–monotrait (HTMT) ratio was employed to check the discriminant validity of the model. Ref. [98] explained that the HTMT ratio is better than other approaches, such as the Fornell–Larcker criterion [96], because it highlights if there is no discriminant validity between the variables. They proposed two different HTMT threshold cut-off values, namely 0.85 and 0.90, for discriminant validity. This analysis utilized the 0.90 (HTMT) [89] criterion to determine the model's discriminant validity. Table 6 shows the model has discriminant validity because all the HTMT value constructs were below the critical value of 0.90. There were sufficient convergence and disparity in the measuring model.

Table 6. Discriminant validity.

Construct	EI	ER	OP	PD	VS
EI					
ER	0.816				
OP	0.785	0.701			
PD	0.883	0.819	0.760		
VS	0.815	0.749	0.771	0.719	

Note: Visibility (VS); predefined decision plan (PD); exploitation (EI); exploration (ER); organizational performance (OP).

4.5. Assessment of the Structural Model

The structural model was assessed to scrutinize the association between the constructs proposed in the research model after verifying the validity and reliability of the variables. The structural model was evaluated with tolerance and VIF for collinearity assessment [97]. The tolerance level recommended for PLS-SEM predictors is more than 0.2 and lower than 5.0 for VIF. The VIF value is to confirm that no collinearity problem is present in the structural model. If collinearity is found in the structural model, the structures must be merged or removed from the research model. The VIF value and the study tolerance variables are listed in Table 7.

Table 7. Collinearity evaluation of the structural model.

Construct	EI	ER	OP
	VIF	VIF	VIF
PD	2.853	2.853	3.903
VS	3.522	3.522	3.583
EI			4.112
ER			3.504

Note: Visibility (VS); predefined decision plan (PD); exploitation (EI); exploration (ER); organizational performance (OP).

4.6. Path Analysis

The findings reported in Table 8 show the direct relationship between the variables. Visibility (VS) was found to be significantly and positively associated with organizational performance (OP) ($\beta = 0.125$, p-value = 0.018 ($p < 0.05$)), Therefore, H_1 was accepted. Predefined decision plans (PD) had a positive relationship with organizational performance (OP), ($\beta = 0.099$, p-value = 0.049 ($p > 0.05$)); thus, the H_2 was accepted. H_3, visibility (VS]) had a positive relationship with exploitation (EI), ($\beta = 0.105$, p-value = 0.030 ($p > 0.05$)); thus, the hypothesis was accepted. Visibility (VS) had a positive relationship with exploration (ER), ($\beta = 0.111$, p-value = 0.046 ($p > 0.05$)); as such, H_4 was accepted. Predefined decision plans (PD) had a positive relationship with exploitation (EI), ($\beta = 0.340$, p-value = 0.000 ($p > 0.05$)); hence, H_5 was accepted.

Next, H_6 predefined decision plan (PD) had a positive relationship exploration (ER), ($\beta = 0.534$, p-value = 0.000 ($p > 0.05$)); thus, the hypothesis was accepted. The exploitation (EI) was found to have a positive influence on organizational performance (OP), ($\beta = 0.114$, p-value = 0.010 ($p > 0.05$)); thus, H_7 was accepted. Next H_8 proposed that exploration (ER) had a positive relationship with organizational performance (OP), ($\beta = 0.095$, p-value = 0.023 ($p > 0.05$)). All the direct relationships between the variables were statistically supported by the data analysis.

Table 8. Direct hypotheses results (direct relationship).

Hypothesis	Path	Std Beta	Std Error	*t*-Value	*p*-Value	Lower Limit	Upper Limit	Decision
H_1	VS -> OP	0.125	0.060	2.093	0.018	0.030	0.230	Supported
H_2	PD -> OP	0.099	0.060	1.653	0.049	0.020	0.197	Supported
H_3	VS -> EI	0.105	0.056	1.879	0.030	0.023	0.208	Supported
H_4	VS -> ER	0.111	0.066	1.693	0.046	0.001	0.214	Supported
H_5	PD -> EI	0.340	0.059	5.788	0.000	0.240	0.430	Supported
H_6	PD -> ER	0.534	0.053	10.039	0.000	0.453	0.624	Supported
H_7	EI -> OP	0.114	0.050	2.280	0.010	0.026	0.136	Supported
H_8	ER -> OP	0.095	0.048	1.970	0.023	0.032	0.122	Supported

Note: Visibility (VS); Predefined Decision Plan (PD); Exploitation (EI); Exploration (ER); Organizational Performance (OP).

4.7. Specific Indirect Effects

The findings reported in Table 9 shows the indirect relationship between the variables. Exploitation (EI) was found to mediate the relationship between visibility (VS) and organizational performance (OP) positively (β = 0.060, *p*-value = 0.029, ($p < 0.05$)), H_9 the hypothesis accepted. Exploration (ER) also mediate the relationship between visibility (VS) and organizational performance (OP), (β = 0.062, *p*-value = 0.000 ($p < 0.05$)), $H_{10,}$ the hypothesis is accepted.

Table 9. Mediating hypotheses results (indirect relationship).

Hypothesis	Path	Std Beta	Std Error	*t*-Value	*p*-Value	Lower Limit	Upper Limit	Decision
H_9	VS -> EI -> OP	0.060	0.031	1.899	0.029	0.008	0.109	Supported
H_{10}	VS -> ER -> OP	0.062	0.016	3.870	0.000	0.003	0.052	Supported
H_{11}	PD -> EI -> OP	0.193	0.038	5.119	0.000	0.132	0.253	Supported
H_{12}	PD -> ER -> OP	0.106	0.039	2.696	0.004	0.045	0.174	Supported

Note: Visibility (VS); predefined decision plan (PD); exploitation (EI); exploration (ER); organizational performance (OP).

Similarly, exploitation (EI) was found to positively mediate the relationship between predefined decision plan (PD) and organizational performance (OP), (β = 0.193, *p*-value = 0.000, ($p < 0.05$)); thus, H_{11} was accepted. Exploration (ER) also positively mediate the relationship between predefined decision plan (PD) and organizational performance (OP), (β = 0.106, *p*-value = 0.004, ($p < 0.05$)); thus, H_{12} was also accepted.

The route coefficients between the first-order and second-order constructs indicate the loadings/weights of the second-order latent variable; hence, the structural model accommodates higher-order constructs (see Figure 3). Past research has argued that results should be recorded with statistical validity (*p*-value) and analytical relevance [99]. It has been proposed that a change in R^2 should be considered when a model is omitted to calculate the impact (F^2) of an exogenous variable that explains the substantial impact on the endogenous variables [97]. As provided by [100], the generally applied guidelines for effect size are 0.02, 0.15, and 0.35 for small, medium, and large effects, respectively. Nevertheless, scholars have decided that a variable's small effect size does not imply that the variable is not negligible. Researchers such as [101–103] have also agreed that the effect size based on the knowledge and procedure used for the analysis should be cautiously measured instead of being correlated only with the specified standard values. The effect size of all the exogenous study variables is shown in Table 10 in which the findings shows both exploitation and exploration have a small effect on organizational performance. Additionally, predefined decision plans and visibility were also found to have a small effect size on organizational performance. Nevertheless, the effect size of predefined decision plans is greater in exploration as compared to visibility. Moreover, predefined decision plans were found to have a greater effect size on exploitation than visibility.

Table 10. Effect size of the study variables.

Construct	EI	ER	OP
EI			0.003
ER			0.002
PD	0.151	0.317	0.009
VS	0.012	0.011	0.015

Note: Visibility (VS); predefined decision plan (PD); exploitation (EI); exploration (ER); organizational performance (OP).

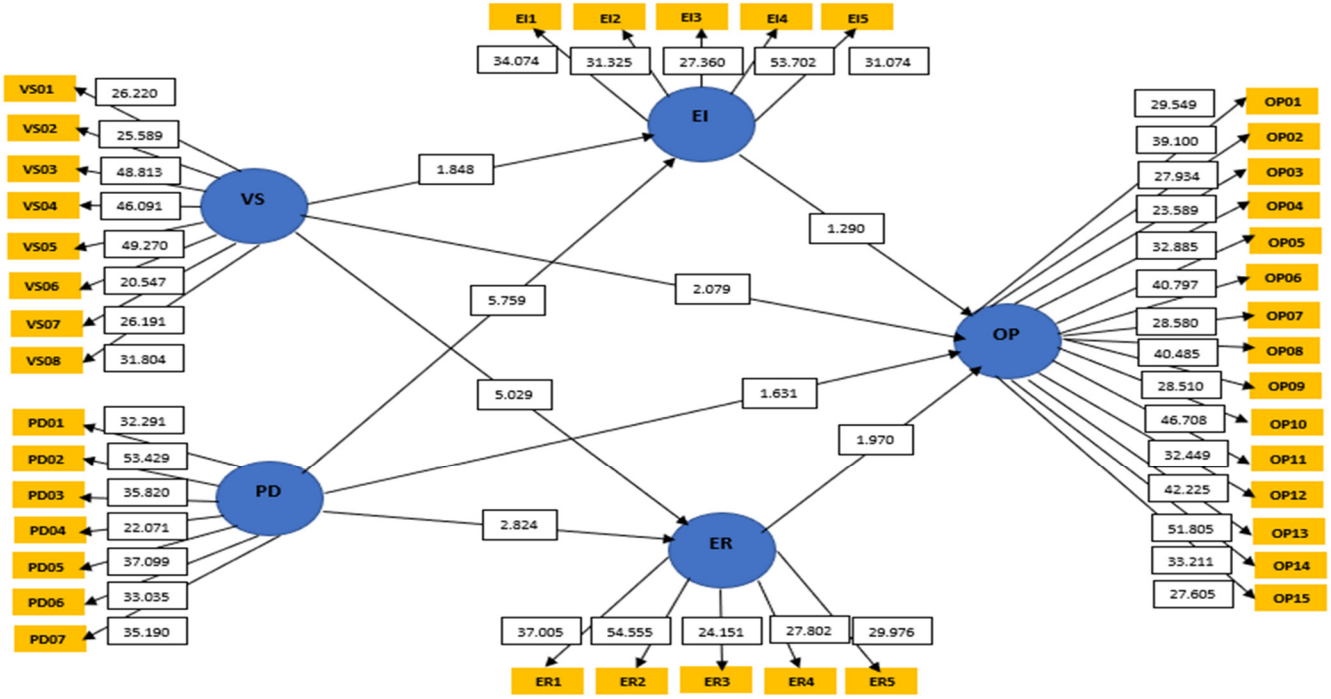

Figure 3. Structural model.

4.8. Predictive Relevance

After the model was assessed with R^2 for predictive accuracy, the Stone–Geisser test was used (Q^2 value) to test the predictive relevance of the model. For exploitation, the $R^2 = 0.731$ ($Q^2 = 0.454$). For exploration, the $R^2 = 0.684$ ($Q^2 = 0.405$) and for organizational performance, the $R^2 = 0.713$ ($Q^2 = 0.325$). Thus, 73.1% of the variance in exploitation, 68.4% of the variance in exploration, and 71.3% of the variance in organizational performance can be explained in the tested model (see Figure 4).

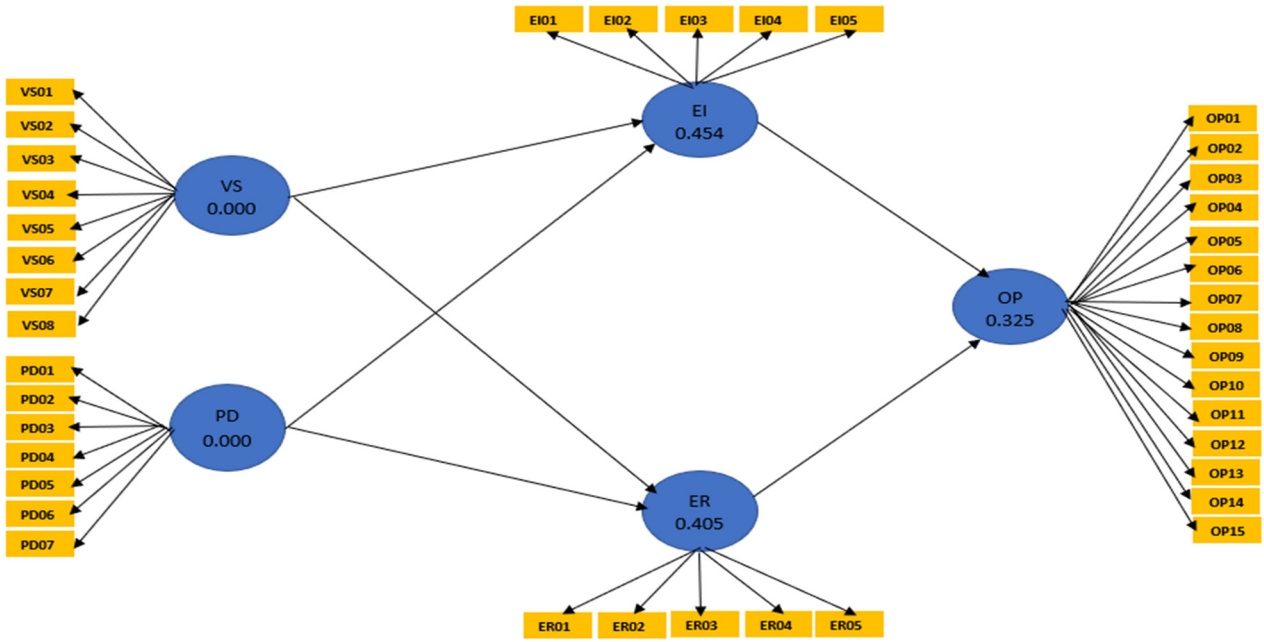

Figure 4. Predictive relevance model.

5. Discussion and Conclusions

The research findings show that all twelve hypotheses were tested and had a positive relationship. The discussion is included as below.

First, this study has examined the relationship between proactive resilience strategies (namely visibility and predefined decision plans) and organizational performance in the SME manufacturing sector. Both hypotheses (H_1 and H_2) were tested, reflecting a positive relationship between proactive resilience strategies and organizational performance. This suggested that SMEs that adopt proactive measures to anticipate and prepare for disruptions are more likely to achieve higher performance levels compared to those that rely solely on reactive strategies [68–70]. By enhancing visibility into the supply chain, production processes, and market demand, SMEs can make more informed decisions, optimize resource allocation, and streamline their operations, leading to improve efficiency. The visibility along the supply chain process allows SMEs to anticipate and identify potential disruptions in advance, while predefined decision plans provide a framework for prompt decision-making and action. This responsiveness enables SMEs to mitigate the impact of disruptions, minimize downtime and maintain business continuity [7]. A similar study conducted in the manufacturing sector explored the relationship between supply chain visibility and organizational performance. The findings indicated that SMEs that implemented visibility-enhancing technologies and practices experienced improved operational efficiency, reduced lead times, and enhanced customer satisfaction, leading to overall better performance. Similarly, another study focused on the role of predefined decision plans in SMEs' response to disruptions. The research findings suggested that SMEs that had predefined decision plans in place, specifying actions and responsibilities during various types of disruptions, were able to respond quickly and effectively. As a result, these SMEs experienced reduced downtime, minimized losses, and improved their overall organizational performance [80]. Proactive resilience strategies such as visibility and predefined decision plans enable SMEs to make better informed and timely decisions. By enhancing visibility into various aspects of the business, including supply chain, market demand, and internal processes, SMEs can gather relevant information and insights. This, in turn, enables more effective decision-making leading to improved organizational performance. The implementation of proactive strategies allows SMEs to optimize their operations, such as visibility along the supply chain and production processes helps identify bottlenecks, inefficiencies, and areas for improvement [48]. The predefined decision plans provide a structured approach to managing disruptions and crises, minimizing downtime, and resource wastage. By enhancing operational efficiency, SMEs can reduce costs, improve productivity, and ultimately enhance their overall performance. Proactive resilience strategies enable SMEs to effectively identify and manage risks [76]. Visibility and predefined decision plans provide guidelines for responding to various scenarios, reducing the impact of disruptions on the organization. By effectively managing risks, SMEs can minimize losses, maintain business continuity and protect their reputation, leading to improved organizational performance. The positive relationship between proactive resilience strategies such as visibility and predefined decision plans and organizational performance in SMEs is rooted in the ability of these strategies to enhance decision-making, operational efficiency, risk management, adaptability, and customer satisfaction. By implementing these strategies effectively, SMEs can gain a competitive edge and achieve better overall performance in the manufacturing sector [75].

Second, the study examined the relationship between proactive resilience strategies (visibility and predefined decision plan) and ambidextrous capabilities such as exploitation and exploration. All four hypotheses (H_3, H_4, H_5, and H_6) showed positive and significant relationship between them. There was a positive relationship between proactive resilience strategies and ambidextrous capability [58–60]. The contextual ambidexterity approach reflected the relationship between visibility and ambidexterity [22]. Ref. [104] stated that this approach promotes that ambidexterity can arise from the unit's features or the organizational context. Risk management culture is shown by the organization's

initiatives in sharing risks and risk data with its supply chain associates. The findings of the study suggested that a positive association between proactive resilience strategies and ambidextrous capabilities of SMEs in the manufacturing sector. The implementation of visibility-enhancing measures and predefined decision plans enables SMEs to effectively manage and respond to disruptions while simultaneously exploring and exploiting new opportunities. This positive association indicates that proactive resilience strategies can facilitate the development of ambidextrous capabilities [54,57]. The proactive resilience strategies can facilitate both exploitation and exploration activities within SMEs [54]. Visibility allows SMEs to identify emerging trends, market opportunities and potential risks, thereby enabling exploratory activities. Predefined decision plans provide a framework for effective decision-making resource allocation and coordination, supporting the exploitative activities required to leverage existing capabilities and assets. The findings indicate that the combination of proactive resilience strategies and ambidextrous capabilities can lead to synergistic effects in SMEs. The integration of visibility and predefined decision plans with ambidextrous capabilities can create a reinforcing cycle, where proactive strategies enhance ambidextrous capabilities, which in turn strengthen the effectiveness of proactive resilience strategies. This synergy enables SMEs to navigate uncertainties, exploit opportunities, and achieve superior organizational performance. A similar kind of study conducted in the technology sector, the study examined relationship between proactive resilience strategies, including visibility enhancing measures, predefined decision plans, and ambidextrous capabilities. The findings indicated that organizations that implemented these strategies were more likely to exhibit ambidextrous behaviours, such as pursing exploratory and exploitative activities simultaneously. This suggests that proactive resilience strategies can enhance the ambidextrous capabilities of firms, allowing them to adapt to market changes while also leveraging existing resources and capabilities [53]. Another similar study done in service industry, the findings show that organizations that embraced proactive resilience strategies were more likely to develop ambidextrous capabilities, enabling them to effectively respond to customer demand, innovate their service offering, and maintain a competitive advantage [57]. This study highlighted the importance of proactive strategies in fostering ambidexterity. The proactive resilience strategies help SMEs optimizes their resources effectively. Visibility-enhancing measures allow SMEs to gather information about market trends, customer preferences and potential disruptions. This information enables them to allocate resources strategically and make informed decisions. Predefined decision plans provide a framework for resource allocation, ensuring that resources are allocated efficiently to both exploratory and exploitative activities. By optimizing their resources, SMEs can enhance their ambidextrous capabilities, effectively balancing innovation, and efficiency [57]. On the other hand, proactive resilience strategies enhance the adaptability and responsiveness of SMEs. Visibility allows SMEs to identify changes in the business environment and anticipate potential disruptions. This early awareness enables them to adjust their strategies, processes, and operations accordingly. Predefined decision plans provide guidelines for responding to different scenarios, enabling quick and effective decision-making. The ability to adapt and respond promptly to changes supports the development of ambidextrous capabilities, allowing SMEs to seize new opportunities while maintaining operational stability. The positive relationship between proactive resilience strategies such as visibility and predefined decision plan and ambidextrous capabilities in SMEs in the manufacturing sector helps to optimize resources, adaptability, risk management, innovation, and organizational learning [56]. These strategies enable SMEs to effectively navigate uncertainties, respond to changes and balance exploitation and exploration activities, by doing so, SMEs can achieve improved performance and gain a competitive advantage in the dynamic manufacturing sector [50].

Third, this study examined the relationship between ambidextrous capabilities and organizational performance. Both hypotheses (H_7 and H_8) showed a positive and significant relationship in between them. The ambidextrous capabilities perceived as a key driver of organizational performance [64,66,67]. The findings highlighted the significant

role of ambidextrous capabilities in enhancing organizational performance. SMEs that effectively balance exploitation (efficiency, optimization) activities are better positioned to adapt to changing environments and achieve superior performance outcomes. Scanning the internal and external environment can enhance the organization's ability to assess strategic decision-making risks to ensure that scanning practices can solve the conflict between exploitation and exploration, leading to performance improvement [105]. Exploitation and exploration can differently affect an organization's performance measures [106,107]. For instance, exploitation emphasizes refinement and execution in the learning processes [108]. Nevertheless, the exploration aspect often focuses on the organization's growth by introducing new products and services and expanding into new markets [109]. Overall, exploitation gears towards total improvement and efficiency in processes, whereas exploration gears towards growth [110]. Some scholars have justified that exploitation and exploration may be able to provide similar outcomes to an organization [111]. Exploitation can work well on short-term benefits and help prevent organizations from reacting to sudden changes in the business environment. On the other hand, exploration can offer uncertainties in the short run and higher benefits in the long run [112]. The exploitation activities focus on improving existing products, processes, and technologies, while exploration activities focus on innovation and the search for new opportunities. Balancing both types of activities is crucial for long-term success. SMEs that emphasize only exploitation may struggle to adapt to changing market conditions, while those that focus solely on exploration may lack stability and fail to fully leverage their existing capabilities [66,67,73]. The ambidextrous SMEs tend to achieve higher performance outcomes compare to those that are not ambidextrous. By engaging in both exploration and exploitation, SMEs can enhance their competitive advantage, improve product innovation, increase market share and achieve higher financial performance. SMEs often face resource constrains such as limited financial resources, expertise, and managerial capabilities. These constraints can pose challenges to the development of ambidextrous capabilities. However, some research suggested that resource-constrained SMEs can still effectively balance exploitation and exploration by leveraging external networks, collaborations, and alliances [73,111,112].

Fourth, this study examined the mediating role of ambidextrous capabilities exploitation and exploration between the relationship of proactive resilience strategies and organizational performance in SMEs context. These four hypotheses were tested, and all hypotheses (H_9, H_{10}, H_{11}, and H_{12}) showed that exploitation capability and exploration capabilities positively mediate the relationship between proactive resilience strategies (such as visibility and predefined decision plan) and organizational performance.

The proposed relationship path analysis, exploitation and exploration were shown to mediate the association between visibility and organizational performance by having a positive and significant relationship. Predefined decision plans can be influenced by ambidexterity under the contextual ambidexterity approach. Scanning the internal and external environment can make the organization's ability to assess strategic decision-making risks better in such a manner that scanning practices can resolve the conflict between exploitation and exploration [105]. Based on the proposed relationship and path analysis, exploitation and exploration were shown to mediate the relationship between predefined decision plans and organizational performance by having a positive and significant relationship.

An organization must have the ability to face and familiarize itself with changes in the business setting. In order to achieve this, researchers have emphasized ambidexterity capabilities [21]. The association between dynamic capabilities and ambidexterity was emphasized by Teece et al. in 1997. Currently, there are several competing stances regarding the association between dynamic capabilities and organizational ambidexterity [21]. Organizational ambidexterity is seen as a form of dynamic capability [39]. Exploitation and exploration are perceived as core components of ambidexterity [113–115]. Most researchers have proposed organizational ambidexterity as a fundamental component of achieving dynamic capability [116]. Dynamic capabilities are reflected well in the key components of ambidexterity, such as in explorative and exploitative activities [117]. The current literature

has highlighted the relationship between organizational ambidexterity and dynamic capabilities, where organizational ambidexterity is proposed as a dynamic capability [83] or base dynamic capability [40,118].

Moreover, various key indicators can measure the association between dynamic capabilities and organizational competitive advantage. For instance, resilience strategies and ambidextrous capabilities are key dynamic capabilities that can enhance organizational performance [7,17,22]. Additionally, [21,119] have performed empirical research to investigate the numerous kinds of organizational ambidexterity and their possibly diverse impacts in mediating the association between dynamic capabilities and organizational competitive advantage. The different types of organizational ambidexterity, for instance, structural or contextual approach, have been suggested for future studies. The SCR and supply chain ambidexterity, which are deemed structural and contextual, can help enhance organizational performance.

Many internal and external environmental aspects influence organizational performance. Organizational structure, management styles, resource management, capability, and financial management form the internal perspective. The external environmental aspects include political, economic, cultural and social, technological, globalization, demographic, competitors, customers, suppliers, and others [120]. The resource-based view [RBV] examines the performance of an organization based on the resources within the organization or its internal capabilities. The resources can be classified through the strength of an organization [121]. Various studies have investigated the effects of supply chain resilience on business entities' operational and financial performances. Outcomes have been unclear between these two capabilities due to different perceptions and actions. The RBV conceptualization refers to tangible and intangible assets within an organization, which can play critical roles in connecting the internal organizational-level resources and emphasizing the accomplishment of competitive advantage.

By aligning with the study's results, ambidexterity can help improve competencies, and organizations can better address environmental uncertainties. Thus, they can accomplish the aim of higher performance. The study's findings suggest ambidexterity as a mediator between proactive resilience and performance. These results establish that SMEs with proactive resilience strategies are more likely to confront the shocks of the dynamic business environment. Such SMEs continue exploring and exploiting the opportunities resulting in their higher performance. Notably, ambidexterity refers to organizational capabilities that can be used in exploiting existing competencies, exploring new opportunities, and sustaining market competitiveness. These results are consistent with the DCT as it considers the resilience strategies as dynamic capabilities developing the ambidextrous capabilities within SMEs, which can potentially influence their desired effect of supply chain instability and improving organizational performance [122]. Consistent with the study's results, ambidextrous businesses can use their existing capabilities to produce incremental innovation while exploring new business prospects to foster radical innovation [123]. In other words, SMEs with proactive resilience strategies can foster the ambidexterity capability to explore and exploit the opportunities leading to higher performance.

This study emphasis on the impact of proactive resilience strategies on organizational performance, focusing on the role of ambidextrous capabilities of SMEs in the manufacturing sector, provides valuable insights into the relationship between these factors. The findings suggest that proactive resilience strategies, such as visibility and predefined decision plans, have a positive impact on organizational performance. This impact is mediated by the presence of ambidextrous capabilities within SMEs in manufacturing sector. The study highlights the importance of balancing exploitation and exploration, adapting to changes and effectively managing risks for SMEs to enhance their performance in the manufacturing sector.

5.1. Theoretical Implications

This study offers several theoretical contributions to extant academic management literature, such as consequences of supply chain resilience and supply chain ambidexterity. This study also added knowledge related proactive resilience strategies and helped to increase the performance of SMEs through the development of dynamic capability. Finally, this study investigated its antecedents and consequences in the SME context.

This study found the consequences of supply chain resilience and supply chain ambidexterity. The negative impact on the supply chain pipeline and supply chain disruption could be alleviated by supply chain resilience and supply chain ambidexterity. Prior research emphasized the influence of ambidexterity on organizational performance, competitive advantage, combinative capability, and product development. From the supply chain's perspective regarding resilience and ambidexterity, the present research has discovered that using and managing available resources and creating novel strategies for supply chain issues and opportunities along the supply chain could have a key role in tackling supply chain disruptions effectively and efficiently. Supply chain resilience and supply chain ambidexterity can positively affect the manufacturing sector SMEs' performance as well as business continuity and growth and support the development of the economy.

This study's findings added to the knowledge regarding proactive resilience strategies (visibility and predefined decision plans) and supply chain ambidexterity (exploitation and exploration) and their relationship with organizational performance in SMEs in the manufacturing sector, whereby no similar studies were conducted. This study is considered novel and thus diversified the direction of SCM literature. Resilience and ambidexterity research in the context of SCM is still in its early stages. Limited studies that could identify and justify the association between supply chain resilience and supply chain ambidexterity and their influence on organizational performance in SMEs are available. This study can be a fundamental contributor to the future growth of similar studies in this field. The findings of this investigation are crucial because, to the best of the researcher's knowledge, no similar findings have been reported. Thus, the findings of this study have added novelty and originality to the literature findings.

Ref. [124] explained, "it is difficult for researchers to fully explain how firms increase their performance", the conceptual model proposed in this research moved beyond the black box of dynamic capabilities in organizations. This present study is one of few studies on SCM, including SEM, approaches to integrate the multifaceted impacts of resource, business processes, and their antecedents into the firm performance model. Therefore, this research quantitatively tested the systematic connections among these variables in contrast to traditional regression analytical methods [125]. Furthermore, the results contributed to the research on SME performance by investigating its antecedents and consequences in the SMEs context, an under-researched area. Research on supply chain resilience in the SMEs generally depends on the theories from Western, European, and American research. In addition to a scarcity of studies detailing the strategic management problems in SMEs, this theoretical drought phenomenon implies that the SCM and business processes are key issues affecting SMEs. Therefore, this study undertaken on a developing nation has provided a global theoretical outlook of SCM and is relevant to scholars in the Southeast Asian region to produce new theoretical insights.

5.2. Managerial Implications

The study offers valuable insights for the managers of SMEs. The study findings may serve as a guideline for SME managers concerning the development of proactive resilience strategies, ambidextrous capabilities, and performance. The study's findings can serve as a guideline for SME managers in the development of ambidextrous capabilities. While SMEs may already focus on exploration and exploitation, but the study highlights that resilience is key to driving performance through dynamic capabilities. Supply chain resilience focuses on balancing managerial capabilities with on the existing core competencies in balancing managerial capabilities with the inherent susceptibilities of the supply chain design and

the business setting it operates. This study identified two proactive resilience strategies, visibility, and predefined decision plans, which managers can actively champion to enhance the ambidextrous capabilities of their SMEs and drive better performance.

The study may guide SMEs to assess the available opportunities and explore new ones to better survive in a dynamic environment. Additionally, SMEs related to the manufacturing industry can seek new opportunities along the supply chain process to swiftly spot and manage problematic situations and sustain their performance by focusing on their existing core competencies. The study may guide SMEs to assess the available opportunities and explore new ones to better survive in a dynamic environment. Additionally, SMEs related to the manufacturing industry can seek new opportunities along the supply chain process to swiftly spot and manage problematic situations and sustain their performance by focusing on their existing core competencies. By concentrating on the exploitation and exploration capabilities, SMEs can emphasize developing stronger competence in the existing supply chain. Additionally, they can also look for new areas in the supply chain. Furthermore, SMEs can use both capabilities to manage and improve resources, specifically humans. The development of the exploration and exploitation among employees at SMEs may result in better outcomes of being proactively resilient.

5.3. Limitations of Study

There were limitations in the availability of information and database materials in the field of SCM and other relevant statistics about SMEs in the manufacturing industry. The SMEs in the manufacturing industry possess different structure, business practices, business culture, managerial system, business scope, and processes compared with other industries. Moreover, the proactive resilience strategies and ambidextrous capabilities remain in their early stages of research in SME related studies. This study's findings are considered unique because of the business structure perspective and characteristics that cannot be generalized to other industries and imitated to other business practices. This study emphasized on proactive resilience strategies, ambidextrous capabilities, and organizational performance, and cannot be generalized to other industries. Moreover, the results obtained from this study do not represent what happens in other SME sectors, for example, service sectors.

This study emphasized the association among proactive resilience strategies, ambidextrous capabilities, and operations management in manufacturing sector SMEs. Only two elements of proactive resilience strategies were scrutinized in this investigation; literature findings revealed 36 elements. Limited studies, including this research, are available about the associations between practice resilience strategies, ambidextrous capabilities, and organizational performance in the context dynamic capability is still in its infancy stage. The total population of SMEs in the manufacturing industry was 16,242 units. This research was unable to meet the total population due to budgetary and time limitations. This study encourages all levels of managers i.e., top level, middle level, and first line to take part in the survey. However, most of the respondents were middle-level and first-line managers. Thus, there was a limitation in the perceptions of top-level managers regarding the importance of proactive resilience strategies and ambidextrous capabilities and their influence toward organizational performance. Additionally, this study did not examine the managers in greater detail by scrutinizing their background or training history. The study treated all the managers as a uniform group. Hence, differences could have arisen based on varying socio-economic and educational backgrounds.

5.4. Future Research Directions

To further advance the understanding of proactive resilience strategies, ambidextrous capabilities, and organizational performance in the manufacuring sector, several future research directions can be explored. Some potential areas of focus include:

First, the different types of organizational ambidexterity, for instance, structural or contextual approaches, have been suggested for future studies. The supply chain resilience

and supply chain ambidexterity are deemed structural and contextual and can help enhance organizational performance. Future research can focus on supply chain resiliencies and supply chain ambidexterity toward SMEs' non-financial and financial performance. These findings can add value and contribute to the current literature and be the starting point of studies related to the supply chain of SMEs in developing countries.

Second, the literature review has revealed 36 factors representing resilience capability in the supply chain context. Moreover, future investigations should focus on the sequential impact of supply chain resiliencies and supply chain ambidexterity as a dynamic capability. Furthermore, the association between supply chain resiliencies and supply chain ambidexterity can be illustrated using time-series data. In the future, a more detailed examination is required to justify the antecedents and consequences of supply chain resiliencies and supply chain ambidexterity toward organizational performance, organizational competitive advantage, and organizational sustainability. The resilience and ambidextrous capabilities can also be proposed as post-pandemic strategies for business continuity.

Third, conducting longitudinal studies to examine the long-term effects of resilience strategies on organizational performance and the dynamic nature of ambidextrous capabilities within SMEs. This would provide insight into the sustainability and long-term benefits of implementing proactive strategies.

Fourth, comparative studies, comparing the impact of proactive resilience strategies on organizational performance across different subsectors within the manufacturing industry or comparing the manufacturing sector with other sectors. This would help identify industry-specific factors that influence the relationship and provide a broader perspective.

Fifth, the data analysis method and robustness tests use alternative variables to test the robustness of the research findings. The additional test using alternative variables to strengthen the robustness of the findings, by conducting research with multiple variables, is crucial to enhance the validity and generalizability of the research findings.

5.5. Conclusions

The contributions of this study lay in increasing our understanding of the role of ambidextrous dynamic capabilities in allowing strategies on organizational performance of a SMEs. Our research focuses on the dynamic capabilities processes involved in the production of BMI, including the progression from a market-driving to a market-driven, and finally to an ambidextrous market-oriented business model. As a result of our actions, we have shown that SMEs can develop and deploy dynamic capabilities that are "fitting" to bring innovations into the design and architecture of their business models. Stressing the relevance of ambidextrous talents in boosting the favorable effect of pro-active resilience methods on manufacturing SME performances, this study rationalizes two crucial managerial techniques for sustaining organizational success.

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Appendix A. Questionnaire

Items Visibility	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Sharing supply chain related issues for better improvement					
Finding major opportunities in our supply chain activities					
Having good observation and judgment ability in our supply chain activities					
Continuously improves our supply chain process					
Having better information sharing for future strategic needs					
Understand customer demand better than competitors do					
Collaborate to monitor supply chain activities					
Kept informed of customer's future demand					
Predefined Decision Plan					
Make timely decisions in supply chain process under any circumstance					
Frequent meetings to discuss the market demand					
Able to quickly reduce manufacturing lead-time to fulfill customer demand					
Able quickly improve supply chain responsiveness towards current market needs					
Able to deal with supply chain conflicts timely and in effective way					
Able to align (or re-distribute) skills to meet the current needs of the whole supply chain					
Able realign (reinvent) supply chain process accordance to market needs					
Able to share supply chain information with our business partners to address problems more effectively					
Exploration					
Constantly leveraging current supply chain technology for better improvement					
Focuses on developing strong competencies in existing supply chain process					
Proactively pursues new supply chain solutions					
Continuously explores new opportunities in supply chain process					
Constantly seeks novel approaches in order to solve supply chain problems					

Items Visibility	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Exploitation					
Able to increase economies of scale in existing markets by focusing on supply chain activities					
Frequently utilizes new opportunities in markets by improving supply chain practices					
Concerned about continuous improvement of supply chain process for better performance					
Continuously monitoring supply chain activities to maintain quality performance					
Continuously communicating with supply chain partners for better performance					
Organizational Performance					
Able to achieve better product quality by improving supply chain processes					
Able achieve better product by focusing on innovative idea in supply chain processes					
Technology enhancement in supply chain practices will eventually lead to higher market share					
constantly lowers product cost by focus on supply chain processes					
Concerned about cost factor in every supply chain process and stages					
Able to respond fast to customer by improving supply chain processes					
Integration between various departments to helps to reduce the departmental barrier					
Close relationship with suppliers will help to improve supply chain activities					
Increasing coordination with customer will help to improve overall performance					
Continues improvement in supply chain practices will lead to increase in sales					
Ability to monitor production and service process to improve quality					
Able to analyze work processes and systems for better customer service					
Concerned about continuous quality improvement in supply chain planning process					
Able to understands customers' needs and response accordingly					
Having capability to incorporate quality factors in product design					

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