KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

SCHOOL OF BUSINESS

WHEN MORE IS BETTER (OR WORSE): SUPPLY CHAIN RESILIENCE, ENVIRONMENTAL MUNIFICENCE AND FINANCIAL PERFORMANCE.

By:

OKAI ALBERT ATSU

(BSc. Logistics and Supply Chain Management)

A THESIS SUBMITTED TO THE DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS, SCHOOL OF BUSINESS, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHILOSOPHY IN (LOGISTICS AND SUPPLY CHAIN MANAGEMENT)

NOVEMBER, 2023

DECLARATION

I declare that this thesis is the result of my original work towards the MPhil in Logistics and Supply Chain Management and that to the best of my knowledge, it neither contains material published by another person nor materials which have been accepted for the award of any other degree of the University, except where due acknowledgments have been made in the text.

Albert Atsu Okai	……..…….....	…….
(PG5639220**)**	Signature	Date

Certified by:

Prof. Nathaniel Boso	…….....	……..
(Supervisor)	Signature	Date

Certified by:

Prof. David Asamoah	…….....	……..
(HOD, SCIS DEPT)	Signature	Date

DEDICATION

This thesis is dedicated to the Glory of God through whose unmerited favour I have been able to complete this work.

I also dedicate it to my lovely beautiful **late** wife; Judith Bedzrah Okai and my lovely mother; Mary Aku Ahiamata Okai for their enormous support throughout my entire education.

ACKNOWLEDGEMENT

My deepest appreciation goes to God Almighty for His Mercies and Grace during the period of the study. I am most grateful to my supervisor, Professor Nathaniel Boso, for allowing me to do this research and assisting me to finish on time. I appreciate his timely feedback and patience which was very influential in the successful completion of this work. I also greatly appreciate the guidance and support of Dr. Dominic Essuman. His valuable input inspired this research.

Again, I am grateful to Professor Kwame Owusu Kwateng (Senior lecturer at the SCIS department) for his words of encouragement and the mental support offered me during the whole process of this research.

Many thanks to my lovely mother, sister, and late wife; Mrs. Mary Aku Okai Ahiamata, Mad. Josephine Atsufui Okai and Mrs. Judith Bedzrah Okai, and other siblings. I'm very much grateful for your prayers and all the other sacrifices you make for me.

Thanks to my coursemates and the entire staff of CARISCA KNUST for their contribution in one way or another.

Finally, I appreciate the management and staff of the various manufacturing firms who willingly responded to the questionnaire.

ABSTRACT

The role of environmental munificence is to provide external resources to firms, serving as a supplement to the firm's internal resources, which in turn serve as buffers and slack resources the firms utilize in times of disruptions and unforeseen events. Within the midst of these resources, supply chain in many industries, particularly in the manufacturing sector, is currently facing several environmental issues on a global scale, including natural disasters, technological turbulence, and changing consumer preferences. It is within this stream that this study examines the role of environmental munificence on the relationship between supply chain resilience and financial performance. To achieve this objective, the study adopted the quantitative research approach to empirically analyze the relationship between the study variables. Data was collected from senior managers and executives (i.e., one per firm) from manufacturing firms in Ghana that operate in diverse contexts: food and beverages, chemicals, industrial machinery, plastic and rubber, paper and packaging, textile and clothing. Hierarchical regression using SPSS was employed to examine the relationship between the variables. The results were further confirmed using Mplus (version 7.4). The results revealed that supply chain resilience positively and significantly enhances financial performance. Further, environmental munificence does not significantly moderate the relationship between supply chain resilience and financial performance. The study recommended that operations and supply chain managers should invest reasonable resources in building and maintaining resilience within and around their supply chain. In addition, operations and supply chain managers should be trained on issues of resilience building, the various forms of resilience and how to build internal capability in the form of slack resources and buffers as a form of resilience to mitigate most supply chain disruptions and greatly limit the impact of those that occur.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

SCR **Supply Chain Resilience**

FP	**Financial Performance**
EM	**Environmental Munificence**
EM*SCR	**Interaction term for Environmental Munificence and Supply Chain Resilience**
SC	**Supply Chain**
SCs	**Supply Chains**
RM	**Risk Management**
SCRMC	**Supply Chain Risk Management Culture**
SCDO	**Supply Chain Disruption Orientation**
RMP	**Risk Management Performance**
MP	**Market Performance**
SSD	**Supply Side Disruption**
ROA	**Return on Assets**
ROE	**Return on Equity**

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Manufacturing organizations are becoming increasingly conscious of their operational and financial sensitivity to threats and pressures from their external environment due to the increasing complexity of managing supply chains (SC) and satisfying rising consumer needs. Every manufacturing company's commercial activity conveys an inherent risk of unanticipated disruptions that might result in losses of revenue and, in some circumstances, the liquidation of the company (Skipper and Hanna, 2009). As a matter of fact, the SC in many industries, particularly in the manufacturing sector, is currently facing several environmental issues on a global scale, including natural disasters, technological turbulence, and changing consumer preferences (Mathivathanan et al., 2018). As a result, some firms, namely; Coca-Cola, Proctor and Gamble, Boeing, and Cisco (www.scrlc.com), always work with firms across their SCs to create resilience.

Resilience ability may help businesses (such as manufacturing businesses) reduce the effects of disruptions to their internal and external SC and return to their pre-disrupted condition. Consequently, SC resilience (SCR) is seen as a dynamic capability that enables the SC to successfully adapt, respond, and recover from disturbances and, as a result, boosts enterprises' competitive advantage (Yu et al., 2019; Golgeci and Ponomarov, 2013; Chowdhury and Quaddus, 2017). For instance, when a fire outbreak at their chip provider put Philips, Nokia, and Ericsson in the same predicament with chips, Nokia worked closely with Philips to quickly regulate manufacturing plans and win market share, whereas Ericsson stopped its mobile phone production

business the next year due to the absence of such resilience (Lee, 2004). Again, Toyota was able to restore manufacturing at 29 factories within 3 to 4 days after the 1995 Kobe earthquake due to the same resilience (Fujimoto, 2011). SCR - defined as the capacity of firms to bounce back to normalcy after disruption (Brandon-Jones et al., 2014), permits the seamless stream of goods and information to be rapidly restored in the SC after being disrupted (Ortas et al., 2014; Kolinski et al., 2020; Karimi and Walter, 2015; Min et al., 2019). This aids flexibility, collaboration, visibility, and responsiveness within the operational activities of firms during times of uncertainty.

Promoting financial performance (FP) may be a key factor in a company's decision to deploy SCR (Yang and Hsu, 2018). Existing research shows that resilient businesses have ways to cope with disruptions, which allows them to achieve better performance results (Wong et al., 2019; Essuman et al., 2020; Yu et al., 2019; Edwards, 2020), namely its FP (Hendricks et al., 2009; Yang and Hsu, 2018; Lee and Rha, 2016). No matter how expensive it may be to implement resilience in the SC (World Economic Forum, 2013), its impact on FP must always be taken into account (Jüttner and Maklan, 2011) so as to identify the conditions under which such financial investment in resilience should be made, to reap a desirable performance outcome. For instance, Li et al. (2017) discovered that SCR (i.e., alertness, preparedness, and agility) has a positive influence on a business' FP. Yu et al. (2019) studied the effect of such dynamism on resilience, disruption orientations and FP and revealed that FP has a positive influence on SC disruption orientation via SCR. In a similar vein, Wong et al. (2020) observed the moderating role of several SC disruptions on performance outcomes and found that SCR is positively linked to FP. On the contrary, Liu et al. (2018) examine the model that defines the relationship between SCR and FP via the theoretical constructs of SCR dimensions such as risk management culture, agility, SC re-engineering and integration. Findings

identified no direct relationship between SCR (integration, agility and SC re-engineering) and FP. Consistent with Liu et al. (2018), Abeysekara et al. (2019) contend that risk management culture and re-engineering as dimensions of SCR show no positive link with FP. Therefore, the need to put the business environment into consideration when examining the effect of resilience on performance outcomes.

The presence of munificence around an organization's environment determines the degree of external resources, the concentration of competition, and eventually, the extent to which opportunities exist for firms to grow and make profits (Verbeke and Yuan, 2013), increasing the FP of the firm. Besides, EM improves the worth of the organisational resources that promote low cost of operation (Terjesenet al., 2011) resulting in good financial savings for a firm. On the contrary, Thanos et al. (2017) outlined that a low munificence (hostile) environment is dangerous and threatening as well, with inadequate opportunities for business growth as well as posing many threats to firms (Goll and Rasheed, 2005). Therefore, organisations operating in such hostile environments must commit more resources and time to plan, so as to develop a thorough comprehension of threats and opportunities (Elbanna and Fadol, 2016). From a different viewpoint, Xie et al. (2015), discovered that EM has a positive impact on FP, indicating that FP is better when there is more space for industrial development. In view of this backdrop, the current study seeks to examine the form of relationship existing between SCR and FP as well as the moderating role of EM in the relationship using data from manufacturing firms in Ghana.

1.2 Problem Statement

Bhatia et al. (2013) stated in a report presented for a world economic forum that disruptions were inevitable and that the affected firms might see a loss of up to 7% in their share price. Therefore,

SCR is crucial for mitigating the vulnerabilities brought on by various disruptions and threats, according to earlier studies (Craighead et al., 2007; Chowdhury and Quaddus, 2017). Otherwise, those disruptions may hugely and negatively affect FP (Yu et al., 2019). However, the findings on the relationship between SCR and FP have been inconclusive – there are disagreements as to if SCR improves FP. While, some studies find a positive relationship between SCR and FP (Li *et al.*, 2017; Wong *et al.*, 2020; Yu., *et al.*, 2019), Others find no statistically significant relationship (Liu *et al.*, 2018; Abeysekara *et al.,* 2019). This inconsistency creates notable limitations in earlier studies that prompt urgent inquiries concerning whether and how SCR contributes to the FP of manufacturing firms from a universal standpoint.

From extant research, it has been empirically proven that the external business setting has an influence on the responsiveness and effectiveness of SCR to yield a desirable performance outcome in firms (Essuman et al., 2020; Yu et al., 2019). Mandal (2017) and Laguir et al. (2022) studied the link between SCR and operational performance within the dynamic contexts of environmental uncertainty using manufacturing companies in the Sub-Indian continent and revealed that environmental uncertainty significantly moderates the effects of SCR on operational performance and the link between Analytics Capability of firms and SCR was positively supported and this in the long run improved operational performance. Likewise, Wong et al. (2020) in their work revealed that SCR built within the external environment of supply-side disruptions and infrastructure disruptions has a positive association with FP. However, the external environment in which SCR is likely to improve the performance outcome (i.e., FP) of firms remained relatively under-studied. And that the inconsistencies found in this previous research may be attributed to other potential factors within the external environment, such as munificence (Kownatzki et al.,

2013). Overall, there has been an absence of clear and systematic treatment of environmental variables: With the sense of concentrating on some environmental variables (i.e., dynamic contexts) and refusing to consider the impact of others (i.e., environmental contingencies). Considering the strategic position of SCR and FP, it is of the greatest importance to comprehend the exact external environment in which the relationship between SCR and FP is exceedingly effective. In this study, the researcher studied and examined this research question intensively. This paper examines whether the external environment (i.e., environmental contingency) of EM is the key concept maximizing the relationship between SCR and FP.

It can also be observed empirically from extant research (Mandal, 2017; Laguir et al., 2022; Wong et al., 2020; and Essuman et al., 2020) that, almost all dynamic contexts (environmental uncertainty, operational disruption, supply side disruptions, catastrophic disruptions and infrastructure disruption) used to moderate SCR and their respective performance outcomes are variables which do not support the building of resilience, its sustainability and firm growth. In other words, such external environment dimensions are the main situations and reasons why firms build resilience (eg. Darvishmotevali et al., 2020) around their SCs due to their dynamic disruptive nature. Moreover, in this study, the use of EM – the lack or abundance of essential resources required by businesses operating within an environment (Tang, 2008) will act as a support (more munificence environment) or hostility (less munificence environment) to resilience building, its sustainability and firm's existence. In other words, this study is of the view that EM is acting as an environmental contingency (for example, a supportive mechanism) for building resilience (highly munificence environment) or a threat (hostile or less munificence environment) to resilience building and sustainability. Relatedly, there is a scarce discussion on how different levels of EM

impact differently on FP. Thus, the impact of EM on the relationship between SCR and FP is lacking in the literature.

1.2.1 Contextual Analysis of SCR and FP

Within the stream of latent research, the relationship between SCR and FP is generally limited. More so, the analysis of the literature reveals that knowledge of external parameters (i.e., external environment) and performance outcomes of resilience among firms in developing economies, particularly in Africa, is very under-researched (see Table 2.1). The bulk of the emerging studies on these variables depend on data from China, France, and USA. Besides, firms in Africa are more sensitive to disruption impacts as the continent generally lacks the requisite economic, risk management, and SC infrastructure (FM Global Index Report, 2019). The majority of company managers in Ghana (i.e., those in manufacturing firms) faced strategic difficulties due to the country's unstable economy (Business Continuity Institute 2018:20) and a lack of understanding on how to manage SC disruptions (FM Global Resilience Index Report, 2019; Sodhi et al., 2012).

Given this contextual knowledge gap, the current study draws on data from manufacturing firms in Ghana (https://www.ghanayello.com), an important economic context within the West African region (World Bank, 2017) to test its proposed research model. It is possible for manufacturing firms operating within any given socio-economic context to record different SCR, and accordingly FP, due to differences in the level of resources available within the external environment for the firm to use. In that regard, a high level of external environmental resources can provide support for building SCR. Also, it is possible that the external environment surrounding SCR and FP is dependent upon relevant contingent resource variables (e.g., EM) impacting the resilient capability

to disruptions. Therefore, generating context-specific insight into resilience is theoretically and practically imperative.

1.3 Research Objectives

The general objective of this study is to examine the degree to which EM conditions the relationship between SCR and FP. Specifically, the study seeks to examine:

1) The relationship between supply chain resilience and financial performance; and.
2) How environmental munificence moderates the relationship between supply chain resilience and financial performance.

1.4 Research Questions

The following questions are outlined to achieve the overall objective of this study:

1) What form of relationship exists between supply chain resilience and financial performance? 2) How does environmental munificence moderate the relationship between supply chain resilience and financial performance?

1.5 Significance of the Study

This study argues that while the firm's FP is dependent on SCR, it may require EM to support and sustain SCR. Data is acquired from manufacturing firms in Ghana to test the relationship between SCR and FP. The study makes three broad contributions to knowledge, practice, and academia. First, this work contributes to literature investigating the relationship between SCR and FP in many ways. A plethora of research has revealed that, within the SC domain, SCR has a superior impact on firm performance (e.g., Li et al., 2017; Yu et al., 2019; Wong et al., 2020).

Though, these studies assist to highlight the positive facets of SCR, they do ignore and therefore do not consider that an increase in SCR for focal firms usually involves additional investments and higher operating overhead (World Economic Forum., 2013; Jüttner and Maklan, 2011). Therefore, the need to build resilience in a high munificence environment to promote business sustainability and growth. To my knowledge, this is the first study to address the influence of SCR on FP from the viewpoint of EM.

Secondly, this study offers a cohesive conceptual model which puts managers in a better position to comprehend the link among SCR, EM and FP. Companies should learn from their external environmental circumstances e.g. EM, in order to survive and prosper. Since, EM enables firms to achieve superior FP by making resources and opportunities available to them via their external environment (eg., Dess and Beard, 1984; Tang, 2008). An example of such opportunities is market potential existence within the external environment (Dess and Beard, 1984; Elbanna and Child, 2007; Petrou et al., 2020). This compels firms to allocate appropriate resources to various SC initiatives e.g., SCR. Therefore, SC managers, consultants and decision makers within manufacturing firms will benefit from the results of this study for working and enhancing FP during uncertain times by way of fostering SCR capability under different levels of EM.

Thirdly, the study would be useful to students as well as other professional groups in higher education institutions. Students would specifically acquire information for research purposes by being exposed to the financial advantages of building SCR in a high or low munificence setting.

Moreover, this study will add up to the existing body of knowledge on SCR, EM, and FP. Therefore, it would be considerably simpler for academics to reference the study in their future studies.

1.6 Overview of Methodology

Consistent with previous studies (Chowdhury and Quaddus, 2017; Kwak et al., 2018), the study objectives are examined using cross-sectional survey data. Data was obtained from manufacturing firms located and operating in diverse contexts: food and beverages, chemicals, industrial machinery, plastic and rubber, paper and packaging, textile and clothing within the major Sub-Saharan African economy, precisely Ghana.

A total of 302 firms were identified in the search and this formed the target population. Using a face-to-face approach, senior managers and executives of firms (i.e., one per firm) were approached to respond to the study's questionnaire. 224 valid responses were obtained after several calls. A sample frame was generated from the Ghana business directory: https://www.ghanayello.com. Those operating in major cities were considered for logistical reasons. Information about these manufacturing companies was extracted from Ghana Yellow online directory.

The research specifically employed the use of pre-defined closed-ended questions that had been used by previous researchers in related studies. The completed questionnaires were edited, coded and inputted into Statistical Packages for Social Science (SPSS), version 25. Baseline data analysis which involves cleaning and eliminating unengaged responses was done using SPSS.

Again, a descriptive technique was used to analyse the demographic responses of the data. Further, in establishing the link between the dependent variable (FP) and independent variables (SCR and EM), regression analysis is performed.

1.7 Scope of the Study

The conceptual scope of the study covers the link between SCR and FP, and the moderation role of EM in manufacturing firms in Ghana. The study takes into consideration manufacturing firms in Ghana that operate in diverse contexts: food & beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. Those operating in major cities were considered for logistical reasons.

Regarding the organizational context, the study is limited to manufacturing firms in Ghana that operate in diverse contexts: food & beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. Those operating in major cities were considered for logistical reasons.

1.8 Limitation of the Study

This current study is limited to examining the relationship between SCR and FP under moderating variable of EM in the manufacturing industry and one country - Ghana. So, researchers should be cautious when interpreting the results within the jurisdiction of other industries. Meanwhile, future studies could take a broad view of this research model and results to other firms, industries and countries.

Secondly, this current research used the cross- sectional design, and a longitudinal research design would strengthen any findings with regard to the causal relationship between SCR and FP as well as the moderating role of EM in such a relationship.

1.9 Organization of the Study

The research is organised into five major chapters. The study focuses on the background, the problem to be researched, the objectives, the research questions, the significance, the limitations, and the way the study is organized in chapter one, which is the introduction. Chapter two explores the concepts used in this study, which includes a review of related literature. Additionally, it examines the theories underpinning the link between these factors and empirical studies within the field of research. Chapter three contains the methodology. It draws on the research design and strategies adopted in carrying out the research. It goes on to describe how data is collected while ensuring its validity and reliability and how this data will be analysed. The researcher's data are presented in Chapter four, depicting results and discussions, which also compares the study's findings to those of other similar studies. Chapter five deals with the summary, conclusions, and recommendations. The study is concluded by summarizing, drawing conclusions, and presenting recommendations in view of the results obtained.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This part of the study focuses on a review of relevant literature. This chapter evaluates the literature on the concepts of SCR, EM and FP in accordance with the study's objectives. Also, the chapter discusses theories underpinning the study. The study is grounded in two major theories namely Dynamic Capability View (DCV) and Contingent Resource Based View (CRBV). The empirical review which focuses on previous studies on the relationship among the study variables is also presented. The chapter concludes by discussing the research model in addition to the development of hypotheses.

2.2 Conceptual review

In this section of the study, key concepts are defined along with an overview and discussion of such concepts as a whole. Pertinent among the concepts are; SCR, FP and EM.

2.2.1 Supply chain resilience (SCR)

A resilient SC promotes competitive advantages through the absorption of unanticipated disruptions and reinstating the SC to a robust form of operation (Pettit et al., 2013; Hohenstein et al., 2015; Ali et al., 2017; Kamalahmadi and Parast, 2016; Pereira et al., 2014). Following the work of Yu et al. (2019), the current study defines SCR as a "proactive and reactive mechanism that uses external resources to generate a buffer within the SC as a support for internal resources and helps SCs build their capacity to deal with unforeseen events". The increased disruptions within the SC of businesses have ultimately made resilience enormously important in the SC field of studies (Pondeville et al., 2013). As a result, SCR remains an adaptive capability of the SC by means of preparing for unanticipated events, responding to disruptions, and recovering

from them by keeping continuousness of operations at the required degree of connectedness and control over functions and structures (Yu et al., 2019).

According to Mensah and Merkuryev (2012), a SC is a sequential web of business partners engaged in the production processes which convert raw materials into finished products or services so as to satisfy customers' demands. Upstream firms, the focal firm, and downstream firms make up this network. Prior scholars guided by this idea (i.e., the scope of SC network) classify SCR into internal (focal firm), supplier (upstream), and customer (downstream) resilience (Gu and Huo, 2017; Pettit et al., 2019; Sawik, 2013; Voss et al., 2009; Pournader et al., 2016). Further, these three components of resilience allow the SC the capacity to respond to disruptions and recover by continuing production. More so, the customer and supplier resilience formed the external resilience capability of the focal firm, which equally supports the SC members to sustain the upstream supply of material and downstream delivery of products after disruptions (Gu et al., 2021). As a result, the level of resilience created around the SC network connecting suppliers' and consumers' supply networks determine the survival and advancement of organisations' performance. This is because these two SC members (i.e., customers and suppliers) are impacted by the disruptive behaviour of the external environment. However, the focal firm's capacity to absorb and recover from interruptions reduces cascading impacts that raise the resilience levels of external SC participants. (Ivanov, 2018; Ivanov and Dolgui, 2019). To ensure the integrity of cooperative processes and structures, the focal firm should be able to cooperate with its customers and suppliers (Brandon-Jones et al., 2014; Ponomarov and Holcomb, 2009; Jüttner and Maklan, 2011). This is a useful approach for firms to speedily

evaluate the effects of risks on the SC and the potential degree of recovery during disturbances, which enhances the association among SC members (Soni et al., 2014).

More so, every activity a SC participant engages in carries an integral risk of unanticipated disruptions somewhere else in the SC that may result in financial losses and, in some instances, the failure of the firm (Skipper and Hanna, 2009; Yu et al., 2019; Scholten et al., 2014) since the individual firms within the SC and their corresponding environments are in an interdependent relationship (Teece, 2007). As a result, to enhance the business's capacity to contain disruptions and swiftly return to a steady state (Blackhurst et al., 2011; Hohenstein et al., 2015; Pettit et al., 2013; Sheffi and Rice, 2005), Sodhi et al. (2012) and Revilla and Saenz (2017) encouraged SC partners (i.e., managers) to implement various mitigation strategies. For example, SCR should be strengthened to increase the company's capacity to absorb disruptions and quickly return to a stable state of operation (Blackhurst et al., 2011; Sheffi and Rice, 2005; Pettit et al., 2013; Hohenstein et al., 2015) so as to maintain high SC performance.

2.2.2. Environmental munificence

Rosenbusch et al. (2013) and Stoel and Muhanna (2009) explain munificence as the extent to which opportunities exist and the degree to which an environment makes available resources to enhance and sustain the growth of firms. Previous studies identify the abundance of resources and their pool in the environment as EM (Castrogiovanni, 1991; Dess and Beard, 1984). Following the work of Jambulingam (2005), this study defined EM as the supportive resource within the external environment of the focal firm. This firm's external environment affects how businesses grow over the long term (Li et al., 2019) and munificence (as opposed to hostility)

within the external environment determines the level of resources, the strength of competition, and eventually, the degree to which there exist opportunities for firms to grow and make profits (Verbeke and Yuan, 2013).

A high munificence environment has the ability to make available enough financial and other resources external to firms (De Clercq et al. 2013) as well as offer a supply of resources; a significant factor for the survival and growth of firms (Li et al., 2010). This has been supported by prior literature that resource and institutional benefits make it easier for businesses to take advantage of current possibilities while EM is high (Walter and Block, 2016). As a result, firms will consequently observe a greater likelihood of business success (Barbosa et al., 2019). Literature has emphasized that in addition to high munificence environment offering abundant resources and opportunities for growth (Barbero et al., 2017), empirical data demonstrates that businesses operating in high munificence environments are able to take corrective action to reverse a strategic decision if its implementation has confirmed to be unsuccessful (Elbanna, 2012).

On the contrary, an environment lacking in munificence is threatening and dangerous (Thanos et al., 2017) and offers limited growth opportunities (Wiersema and Bantel, 1993). Such environments limit resources, increase business challenges, and decrease profitability (Chassé and Courrent, 2018). As a result, directing several threats to businesses (Goll and Rasheed, 2005) since opportunities to correct unsuccessful choices are infrequent (Shepherd et al., 2021). Thus, companies will perceive a larger risk of entrepreneurial failure when the capacity of firms to exploit possibilities is constrained by resources (hostile environment) (Zhao et al., 2020).

Management literature categorises EM into three different facets: growth and/or decline, opportunity and/or threat, and environmental capacity (Goll and Rasheed, 2004; Castrogiovanni, 1991). Environmental growth and/or decline discusses the comparative change in capacity (e.g., Koberg, 1987), environmental opportunity and/or threat is the degree to which capacity is idle (e.g., Astley, 1985), Environmental capacity denotes the availability of resources in a business environmental setting (e.g., Aldrich, 1979). For example, organisations with high munificence environment place less limitations on organizations than environments with limited resources (Tushman and Anderson, 1986). Randolph and Dess (1984) also point out that the scarcity (threat) or munificence of an environment influences the capability of new businesses to go in a particular business setting.

2.2.3. Financial performance (FP)

The FP of a firm denotes how well a business accomplishes its financial obligations compared with the company's prime competitors (Cao and Zhang, 2010). Thus, a comparison of the degree of a firm's FP compared to the industry average. Following the work of Schilke (2014), the current study defined FP as the monetary benefit derived from the operations of the business. This can be measured using the degree of an overall return on investment (ROI), return on equity (ROE), profitability, return on assets (ROA), net profit margin and overall FP of the firm compared to the industry average. Return on investment (ROI) directly measure the amount of return on a particular investment, compared to the investment's cost (Fernando, 2022). Return on equity (ROE) is measured as the return on net assets and is regarded a measure of how effectively management can use a firm's resources to create profits (Garcia and Orsato, 2020). Also, return on assets (ROA) is considered by using income before extraordinary items divided

by total assets, representing firms' earnings controlled by total assets. Therefore, a higher ROA denotes better FP and is comparable across firms of differing operational sizes (Kimmel et al., 2013).

2.3. Theoretical Review

Particularly in communication research, theories are essential tools because they provide a study with a comprehensive sense of wholeness when combined with reviewed literature and study results. Researcher participation in global discussions and significant contributions to initiatives to address issues with globally standardized techniques are made possible by the understanding and use of theories (Olorunnisola, 2007).

Mayer and Sparrowe (2013) observe and conclude that "several research questions cannot be adequately investigated by drawing only on a single theory". With Mayer and Sparrowe (2013), theory integration can offer a more comprehensive account of a particular occurrence than a single theory can on its own. For instance, this research uses the dynamic capability theory and the contingent resource-based view to explain the link between SCR and FP as well as the moderating role of EM in such a relationship following an extensive review of the literature.

2.3.1 Dynamic Capability View (DCV)

Teece et al. (1997) developed the DCV as an extension of the Resource Based View (RBV) (Wernerfelt, 1984; Barney, 1991). The RBV stresses that companies need to create capabilities to overcome challenges in order to gain a competitive advantage. However, the RBV lacks the appropriate delimitation of capabilities when dynamic changes occur in uncertain environmental

settings. This gives rise to the development of the DCV to address this gap which considers refreshing the present stock of resources (Eisenhardt and Martin, 2000; Teece, 2007). As well, advocated that businesses should focus on effectively integrating their assets to adapt to changing environments. As a result, it has been proposed that organizations should create, integrate, and reorganize their firm-specific reserves and capabilities to sustain optimal performance in dynamic environments (Mandal, 2017).

Though some researchers have criticized DCV (Priem and Butler 2001a, 2001b), the concept was formulated (Ambrosini and Bowman, 2009; Schilke, 2014) to represent the dynamic challenges firms face (Winter 2003; Teece 2012) and how improved efficiency is generated using a resource-based rent (Schilke, 2014; Teece, 2014). Additionally, DCV is defined by Lee and Rha (2016) as an organization's adaptability and resilience to change in turbulent and uncertain environments. Thus, the capacity to build, combine, and reconfigure internal and external skills in response to a speedily changing environment is provided by dynamic capabilities, thereby, providing SC companies a competitive advantage (Teece et al., 1997; Wilden et al., 2013).

This study conceptualizes and applies DCV to define the nature of the relationship that exists between SCR and FP as SCR satiates these two attributes: (i) SCR helps businesses to absorb the adverse impacts from a variety of risk sources (Teece, 2007); (ii) It is a higher-level capability that is growing across the SC as a result of the effective culmination of each firm's capabilities and resources (Winter, 2003). Regarding SC disruption and uncertainty, dynamic capabilities (DCs) are forms of capabilities that allow firms to react to turbulent environments (i.e., disruption and uncertainty) (Teece et al., 1997). Therefore, DCV is an important theoretical

framework to investigate how firms (i.e., manufacturing firms) might coordinate their capabilities to ensure SCR, therefore realizing a desirable FP (Ponomarov and Holcomb, 2009; Blome, 2013; Brusset and Teller, 2017; Yu et al., 2019). Further, according to the study model shown in Figure 1, SCR was predicted to have positive FP implications for businesses.

2.3.2 Contingent Resource-Based View (CRBV)

According to Resource Based-View (RBV) theory (Barney, 2001; Wernerfelt, 1984), synergizing capabilities and resources is how a company may get a competitive advantage. These capabilities and resources operate in a specific environment and are impacted by a number of contingent factors (Jeble et al., 2017). Additionally, the contingency theory proposes that factors which are difficult to predict are both internal and external to businesses which further influence the final possible output (for example, performance outcomes) of these capabilities (Grötsch et al., 2013). But, advocates of the RBV have lately called for the addition of the contingency perspective in valuations of the competitive value of company's capabilities and resources (Priem and Butler, 2001a,b; Barney, 2001). This is due to the RBV suffering from context insensitivity (Ling-yee, 2007). In general, CRBV aids to comprehend contextual implications on capabilities and resources that ultimately influence the performance of businesses (BrandonJones et al., 2014).

The CRBV supports the assertion that an organisation's present resources (Park, Chen, and Gallagher, 2002) and the environmental circumstances within which the organisation finds itself (Aragon-Correa & Sharma, 2003; Miller, 1995) are all significant factors in determining the effect of the firm's attained resources on performance. For example, in the model of the dynamics of strategic alignment, Zajac et al. (2000) demonstrated that changes in strategy in the U.S. savings and loans industry could be foreseen on the basis of differences in exact organisational

resources and forces in the bigger business environment. They further disclosed that strategic implementation of the organisation's resources within the overall business environment produced greater competitive benefits. This clearly explains the positive condition effect of resources within the environment (EM) as a contingent on firms' high-performance outcomes. Moreover, the impact of SCR on FP in different environmental contexts is not well defined and researched theoretically or empirically. Despite the theoretical insights offered by earlier research, dynamic contexts, such as environmental uncertainty and disruptions, have received the majority of attention (Treffers et al., 2020) and important environmental factors (i.e., contingency factor) like munificence (for instance, EM) have been overlooked (Treffers et al., 2020). This is challenging since munificence (as opposed to hostility) dictate the amount of resources available, the strength of competition, and eventually the likelihood that businesses will grow and make profit (Verbeke and Yuan, 2013). It is within this stream of CRBV that, this current study tries to find the conditional effect of EM on the link between SCR and FP.

2.4. Empirical Review

This section reviews empirical studies that focused on key themes of resilience at the SC level. This section focuses on discussing prior empirical understandings on the outcomes of firm/SCR and previous key findings on SCR relationships. Further, the section highlights variables analysed as moderators in the models of the outcomes of SCR and the context in which data for such prior research were collected.

2.4.1 Outcome

Table 2.1 shows how different resilience elements have been linked to SCR performance outcomes. A detailed review of the previous literature revealed that firms build resilience for performance outcomes from different levels using different resilience dimensions and, in the process, achieve different results. At the SC level, prior research has examined several outcomes of SCR which have been operationalised with different labels used in describing them. For instance, indicators used in Essuman et al. (2020) to capture "operational efficiency" is close in line with those used in Laguir et al. (2022) and Mandal (2017) to capture "operational performance" and firm performance (Lee and Rha, 2016; Liu et al. 2018; Abeysekara, et al. 2019).

Other researchers used performance outcomes such as risk management performance (Liu et al. 2018; Wong et al. 2020) and SC disruptions of negative magnitude (Lee and Rha, 2016) so as to measure the performance of resilience in their respective studies. The synthesis of the performance results of firm/SCR is rather challenging due to all these issues. As a result, the findings are discussed below using a case-by-case methodology. In Table 2.1, the studies' results are summarised.

In the study of firms in the Taiwanese liner shipping industry, Liu et al. (2018) find that the effectiveness of risk management (RM) is crucial for the three forms of SCR (agility, integration, and SC (re-)engineering) to have a positive impact on firm performance. Also, findings from

Abeysekara et al's (2019) study of a manufacturing sector within the apparel industry sector in Sri Lanka revealed that SC risk management culture (SCRMC) positively influence SCR capabilities, namely collaboration, agility and re-engineering. Further, agility demonstrates the

greatest influence on competitive advantage and firm performance. More so, the study conducted by Mandal (2017) at the sub-Indian continent revealed that SCR (recover, adapt, taking advantage of disruptions, minimise losses) positively affects both operational performance and relational performance.

Table 2.1: Different Resilience Elements with their respective Performance Outcomes

Author(s)	*Context/Methodology*	*Labelling of resilience*	*Resilience Dimensions*	*Moderators*	*Outcome*	*Theory*	*Key findings / Moderation result*
Gu et al. (2021)	• **Context** 206 manufacturers in China • **Methodology** Survey (Questionnaire data)	• Suppler resilience • Customer resilience	• Supplier IT use for exploitation • Supplier IT use for exploration • Customer IT use for exploitation • Customer IT use for exploration • Ambidextrous customer IT use • Ambidextrous supplier IT use		Supply chain performance	Information processing theory	Supplier and customer resilience positively affects supply chain performance.

Laguir et al. (2022)	• **Context** 405 manufacturing companies in France • **Methodology** Survey (Questionnaire data)	Supply chain resilience	• Respond to unexpected disruptions by quickly restoring its product flow • Return to its original state after being disrupted, • Move to a new, more desirable state after being disrupted • Prepared to deal with the financial outcomes of supply chain disruptions. • Ability to maintain a desired level of control over structure and function at the time of disruption. • Ability to extract meaning and useful knowledge from disruptions and unexpected events.	Environmental uncertainty	Operational performance (OP)	Dynamic capability theory	Analytics Capability of an Organization (ACO) positively affects Chain Disruption Orientation (SCDO), SCR and Operational Performance (OP). **Moderation result** Environmental uncertainty positively affects operational performance by strengthening the influence of ACO on SC resilience

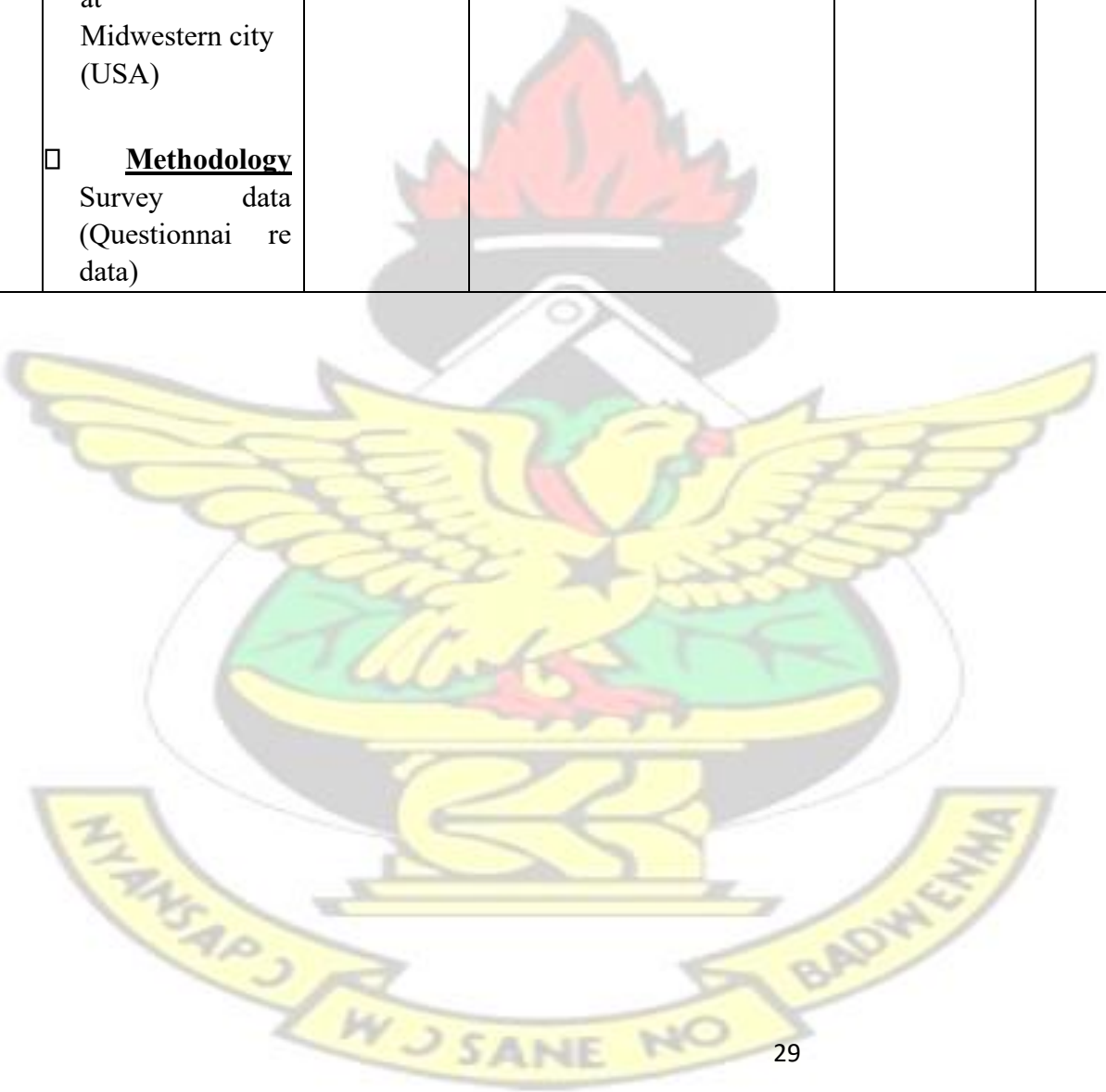
Essuman et al. (2020)	• **Context** 259 firms in a sub-Saharan African economy • **Methodology** Survey (Questionnaire data)	Operational resilience	• Disruption absorption • Recoverability	Operational disruption	Operational efficiency	• Resourcebased view • Contingency theory	Disruption absorption and recoverability positively effects operational efficiency. **Moderation result** Operational disruption positively moderates; • the link between disruption absorption and operational efficiency under high operational disruption condition. • the link between recoverability and operational efficiency under low operational disruption condition.
Wong et al. (2020)	**Context** Manufacturing industry of Taiwan	Supply chain resilience	• Ability to return to its original state after being disrupted • Ability to maintain a desired level of connectedness among its	Supply side disruptions	Risk management performance	Organizational information	supply chain resilience positively affects risk management performance, market

	Methodology Primary and secondary data sources		members at the time of disruption. • Ability to maintain a desired level of control over structure and function at the time of disruption. • Knowledge to recover from disruptions and unexpected events.	(SDD) • Infrastructure disruptions (ID) • Catas trophi c disru ptions (CD)	•Market performance (MP) •Financial performance (FP); (ROA, ROE, Profit)	process theory	performance and financial performance. **Moderation result** •SSD moderates the link between SCR and RMP, SCR and MP. But does not moderate the link between SCR and FP. •ID do not moderate the link between SCR and RMP, SCR and MP, and SCR and FP. •CD moderates the link between SCR and RMP, SCR and MP. But do not moderate the link between SCR and FP.

Liu et al. (2018)	• **Context** Taiwanese liner shipping industry • **Methodology** Survey (Questionnaire data)	Supply chain resilience (Agility, integration, and Supply chain (re)engineering			• Risk management performance (RMP) • Firm Performance (FP)	Resourcebased view	• RMC positively affects Agility, integration and Supply chain (re-)engineering individually. • Agility, integration and Supply chain (re-)engineering positively affects RMP. • RMP positively affects FP.
							Agility, integration and Supply chain (re)engineering do not affects FP.

Abeysekara et al. (2019)	• **Context** 89 Apparel manufacturers in Sri Lanka • **Methodology** Survey (Questionnaire data)	Supply chain resilience capabilities (SCRes)	• Agility • Collaboration • Re-engineering (Re-en)		• Firm performance (PF) • Competitive advantage (CA)	Dynamic capability theory	• Supply-chain riskmanagement culture positively affects SCRes (re-engineering, agility and Collaboration). • Competitive advantage positively affects firm performance. • SCRes (Agililty) positively affects firm performance and competitive advantage. • SCRes (re-engineering and collaboration) positively affects competitive advantage. • SCRes (re-engineering and collaboration) do not affect firm performance .
Li et al. (2017)	**Context** 77 firms of the local chapter of the association	Supply chain resilience	• Preparedness • Alertness • Agility		Firm financial performanc e (Average ROI,	Dynamic capability theory	Supply chain resilience (i.e., preparedness, alertness and agility) positively affects

	for Operations Management at Midwestern city (USA) ▯ **Methodology** Survey data (Questionnai re data)				average profit, Profit Growth)		firm's financial performance



Mandal (2017)	• **Context** Sub-Indian continent • **Methodology** OnlineQuestionnaire-based Survey	Supply chain resilience	• Recoverability • Adaptability • Taking advantage of disruptions, Minimise losses	• Process compliance • Environment uncertainty	• Operational performance (delivery performance • Relational performance	• Resourcebased view • Dynamic capabilities theory	Supply chain resilience positively affects both operational performance and relational performance. **Moderation result** Environment uncertainty positively moderates; •the link between supply chain resilience and operational performance. •the link between supply chain resilience and relational performance.

Yu et al. (2019)	• **Context** cross section of 241 Chinese companies • **Methodology** Survey (Questionnaire data)	Supply chain resilience	• Ability to adequately respond to unexpected disruptions by quickly restoring its product flow. • Quickly return to its original state after being disrupted. • Ability to move to a new, more desirable state after being disrupted. • Well prepared to deal with financial outcomes of supply chain disruptions. • Ability to maintain a desired level of control over structure and function at the time of disruption.		Financial performance (Return on sales (ROS), Profit, Market share, ROI, ROA)	Dynamic capabilities view (DCV)	Supply chain resilience positively affects financial performance.

Ruel and El Baz (2021)	• **Context** 398 French firms. • **Methodology** Survey (Questionnaire data)	Supply chain resilience	•Ability of the SC to cope with changes due to an SC disruption. •Ability to adapt to an SC disruption. •Ability to provide a quick response. •Ability to maintain high situational awareness.		Financial Performance (Profit margin, return on sales (ROS), Return on total assets and sales over assets)	•Dynamic capabilities view •Organisational readiness for change theory	Supply chain resilience positively affects financial performance.
Chowdhury and Quaddus (2017)	• **Context** Apparel industry in Bangladesh • **Methodology** Crosssectional survey Questionnaire	Supply chain resilience (SCRE)	•**Proactive capability**: disaster readiness, flexibility, redundancy/reserve capacity, integration, efficiency, market strength, financial strength •**Reactive capability**: response, recovery •**Supply chain design quality**: density, complexity, criticality		• Operational vulnerability • Supply chain performance (Sales, cost, profit, customer satisfaction, on time delivery and Quality	Dynamic capabilities theory	•SCRE positively affects supply chain performance. •SCRE negatively affects operational vulnerability. •Operational vulnerability negatively affects supply chain performance.

Lee and Rha (2016)	• **Context** 316 Korean Firms • **Methodology** Survey (questionnaire data)	Supply chain (SC) ambidexterity	• Simultaneous exploitation • Exploration of competences • Opportunities		• SC disruptions' negative magnitudes. • Firm performance	Dynamic capabilitie s theory	Supply chain ambidexterity positively affects firm performance. SC disruption's negative impact positively affects firm performance.

In addition, findings from Wong et al.'s (2020) study of the Manufacturing industry in Taiwan indicate that SCR (infrastructure disruptions, supply side disruptions and catastrophic disruptions) is positively associated with market performance, risk management and FP. Further, indication from a cross-section of 241 Chinese companies revealed that SCR is influenced by SC disruption orientation (SCDO). However, the FP influence of SCDO is strictly via SCR (Yu et al., 2019). In addition, it has been revealed by Li et al. (2018) that SCR (alertness, preparedness and agility) impact FP positively. As well, findings from Liu et al.'s (2018) study of the Taiwanese liner shipping companies show that integration, SC re-engineering and agility (as elements of SCR) has a positive relationship with risk management performance (RMP), but a negative impact on FP. Nevertheless, RMP has shown a positive impact on FP. Ruel and El Baz

(2021), realised a positive influence of SCR on FP in their studies on 398 French firms. Lastly, Chowdhury and Quaddus (2017) indicate that SCR positively and negatively affects SC performance and operational vulnerability respectively in their study on the apparel industry in Bangladesh.

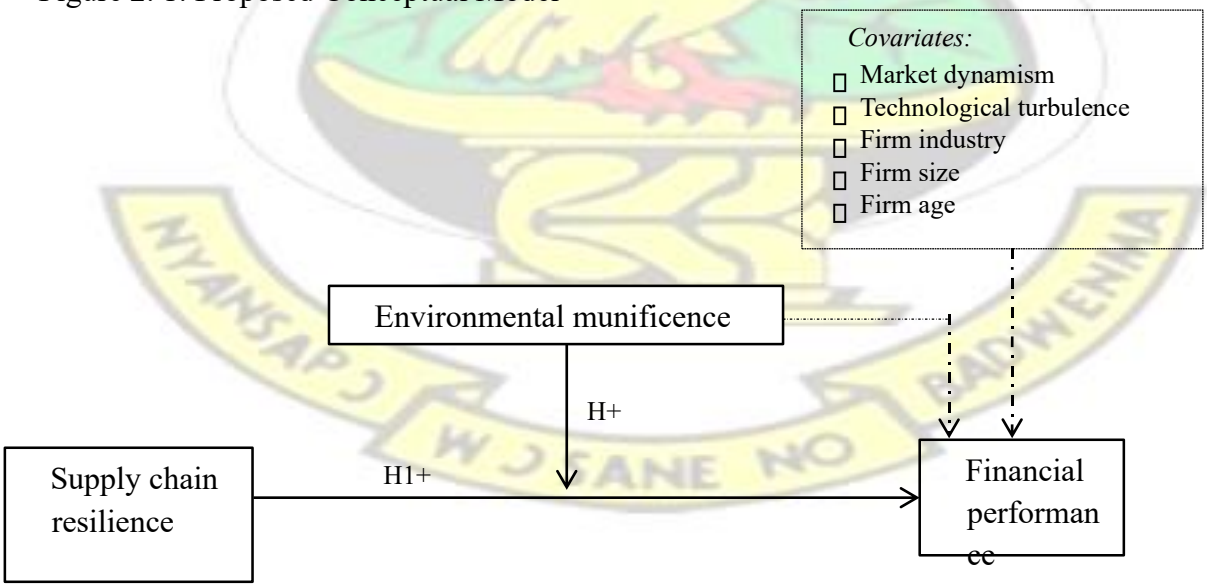
2.4.2 Moderators

Prior studies also found that the relationship between SCR and its performance outcomes may be moderated by contextual factors. For example, Wong et al. (2020) study of the relationship between SCR and market performance, RMP and FP revealed that SCR has a positive relationship with market performance (MP) and risk management under a high level of supplyside disruption (SSD). Also, SSD do not show any moderating role in the link between SCR and

FP in terms of net profit, ROA and ROE, indicating that the relationship is not significant. In other words, regardless of the degree of supply-side disruption, SCR contributes to FP. Again, when there is high level of infrastructure disruption, SCR is very crucial. However, the association between SCR and FP in terms of ROA, ROE, and net profit was not shown to be moderated by infrastructure disruption, suggesting that SCR influence the FP positively. Laguir et al. (2022) discover that while the relationship between an organization's analytics capabilities and its SCDO was not supported under the moderation level of environmental uncertainty, the relationship between analytics capability of firms and SCR was supported and this further improved operational performance. Further, Essuman et al. (2020) found that when there is a significant level of operational disruption, the impact of disruption absorption on operational efficiency is higher. Also, under situations of minimal operational disturbance, the effect of recoverability on operational efficiency is stronger. Mandal (2017) also discover that SCR (in terms of adaptability, recovery, taking advantage of disruptions, and minimising losses) has a significant moderating effect on operational and relational performance.

2.5 Research Model and Hypotheses Development

Figure 2. 1: Proposed Conceptual Model



Source: Researcher's Own Construct (2022)

As captured above, the conceptual framework presents the pictorial view of the entire research. Drawing inferences from the objectives of the study, the researcher crafts two hypotheses to help address the research problem or topic. Hypotheses H1 suggests that SCR has a positive relationship with FP whiles hypothesis H2 sees a moderating role of EM in the relationship between SCR and FP such that SCR has a stronger positive relationship with FP in more munificent environments than in less munificent environments.

2.5.1. Supply chain resilience and financial performance

Previous research has placed SCR as a dynamic capability that can be used to anticipate unavoidable risk events as well as to respond to and recover from unexpected disruptions (Dabhilkar et al., 2016; Brusset and Teller, 2017; Golgeci and Ponomarov, 2013; Ponomarov and Holcomb, 2009; Scholten et al., 2014; Purvis et al., 2016;). Other conceptualizations of dynamic capabilities define dynamic capabilities as attained and persistent patterns of behaviour that help organizations build the capabilities to confront and adapt to environmental challenges, making them more efficient in generating optimal performance (Ambrosini et al., 2009; Zollo and Winter, 2002). But closely related to this study are Yu et al. (2019), Li et al. (2017) and Ruel and El Baz (2021) use of dynamic capability view in their respective works to show the relationship between SCR and FP. In these studies, SCR has a positive relationship with FP so as to identify adequate opportunities for growth.

SCR seeks to resume SC operations as soon as possible after an interruption, making it a strong option for the identification of a crucial dynamic capability (Gligor and Holcomb, 2012). As a result of growing disruptions brought on by unforeseen events, resilience has become tremendously essential within the SC domain, (Chowdhury and Quaddus, 2017; Ambulkar et

al., 2015; Purvis et al., 2016; Jain et al., 2017; Kim et al., 2015; Dolgui et al., 2018; Ivanov, Dolgui, and Sokolov 2018a, 2018b). More so, as a way of reducing the influence of these unpredictable events, a firm with resilience capabilities can respond quickly to environmental changes and actively modify its reaction plans to prevent future SC disruption (Wong et al., 2020). Therefore, having a cooperative SC relationship with the mutual purpose of sustaining business operations. To support the desired performance outcome among SC member businesses, SCR fosters information sharing, cooperative decision-making, and building trust across functions and among SC members (Bakshi and Kleindorfer, 2009) to promote a desirable performance outcome among SC member firms.

Continuously high performance is made possible through dynamic capabilities (Teece et al., 1997). Also, the high level of performance might bring about financial benefits (; Hohenstein et al., 2015; Blackhurst et al., 2011; Craighead et al., 2007) which is mostly achieved by adjusting the resource mix for the purposes of maintaining and securing competitive advantage. Further, Schilke (2014) finds that per DCV, FP can be considered as the quantitative dimension of competitive advantage.

This study is of the view that manufacturing firms can reap desirable performance benefits (i.e., financial benefit) from SCR, develop via the use of dynamic capabilities to avoid the central business value from being damaged (Carvalho et al., 2012), and via the creation of interest alignment across SC partners to collectively reject risks and improve value creation at the SC level (Cao and Zhang, 2011). In contrast, a firm (i.e., manufacturing firms) without SCR bears undesirable outcomes caused by SC hitches (Hendricks and Singhal, 2003). Thus, companies can make more efforts to create their SCR capability, which in return improves their FP

(Hendricks et al., 2009; Lee and Rha, 2016; Yang and Hsu, 2018). This study hypothesizes, based on these arguments, and the DCV that:

H1: *Supply chain resilience has a positive relationship with financial performance.*

2.5.2. Moderating role of environmental munificence

The availability or lack of significant resources required by organisations operating within the environment is referred to as EM (Dess and Beard, 1984; Aminu and Shariff, 2015). The availability of resources within the environment usually influences the survival and expansion in terms of growth of businesses operating in the external environment (Dess and Beard, 1984; Jaiyeoba, 2013). More precisely, munificence is determined by the lack or abundance of resources, the availability of growth opportunities, and the strength of competition (e.g., Castrogiovanni, 1991; Aldrich, 1979; Miller and Friesen, 1983). As a consequence, munificence boosts organisational heterogeneity and multiplies the number of profitable strategic possibilities (Terjesen, Patel and Covin, 2011).

Munificence and hostility (i.e., less munificence environment) have been seen as the two opposing extremes of a continuum (e.g., Aragon-Correa and Sharma, 2003). A hostile environment poses threats and dangers and presents limited opportunities for business growth (Thanos et al., 2017). More so, firms operating in hostile environment are particularly vulnerable to intense threat brought on by intense rivalry, demand constrains and resource shortages (Covin and Slevin, 1989; Miller, 1987). Due to scarcity of resources, market size is diminishing and environmental resources are decreasing, which has a negative impact on organisational profitability and slack resources (Castrogiovanni, 1991).

The CRBV claims that the external environment affects how businesses develop over time (Li et al., 2019). Since the CRBV aids in comprehending contextual implications on resources and capabilities that ultimately influence an organization's performance (Brandon-Jones et al., 2014). It is within this stream that Cyert and March (1963) encourage firms to operate in a highly munificent environment since munificence depicts the degree of underutilised capacity as well as the growth of this capacity in the environment (Castrogiovanni,1991). In addition, Keats and Hitt (1988) emphasised that a munificence environment can also create opportunities for growth and can grant a firm the leverage and the ability to generate slack resources in support of growth. Confirmed with prior studies, firms can build slack resources (Cyert and March, 1963) and capacity buffers by utilising these untapped capacities (Ivanov and Dolgui, 2019; Puchkova et al., 2020). As a result, these capacity buffers and slack resources (uncommitted resources that can be used with discretion) can be transformed into resilience (Vogus and Sutcliffe, 2007) for firms and their SC members. During SC uncertainty and disruptions, SCR aid in assisting firms to manage change successfully thereby allowing operations to be restored to the earlier or even more enhanced performance level (Christopher and Peck, 2004; Pereira et al., 2014; Scholten et al., 2014; Sheffi and Rice, 2005) resulting in higher FP (Blackhurst et al., 2011; Craighead et al., 2007; Hohenstein et al., 2015). This establishes the ground for the second hypothesis that:

H2: *Supply chain resilience has a stronger positive relationship with financial performance in more munificent environments than in less munificent environments.*

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methodological approach and the research design process for the study are both covered in greater depth in this chapter. The methods for testing the study model and hypotheses defined in the previous chapter were established in this chapter. The techniques employed to increase the research's reliability and validity are also described in depth. Also, included in this chapter are empirical settings, data, approach to data analysis, ethical considerations and chapter summary.

3.2 Research Philosophy

Research philosophy denotes a set of ideas and assumptions that guide researchers' perception and understanding of the environment in which they live (Saunders et al., 2016). There are three distinct schools of thought when it comes to studying philosophy: ontology, epistemology, and axiology (Saunders et al., 2016).

3.2.1 Ontology

Ontology is defined as the study of "reality." (O'Gorman and Macintosh, 2014). Using this study as an example, the moderating role of EM on the link between SCR and FP exist and can be established by analysing data collected from manufacturing firms in Ghana that operate in diverse contexts: food &beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. Objectivism and subjectivism are the two most important parts of ontology, and they are complementary concepts (O'Gorman and Macintosh, 2014). Table 3.1 shows the differences between the two groups as follows:

Table 3.1 Difference between the two forms of ontology.

Objectivism	Subjectivism

The reality does not dependent on the researcher's thoughts and observation.	The reality is dependent on the researcher's thoughts and observation.
The reality is measured and quantifiable.	The reality can be understood by interacting with alive objects.
The Standpoint of view is from the researcher.	The Standpoint of view is from the participants of the study

Source: Saunders et al., (2016)

The researcher in this investigation adhered to objectivism throughout the course of the work. The objectivism approach was chosen since the reality "SCR and FP" and "the moderating effect of EM" was tested theoretically by examining previous findings in the literature, which were further verified by existing SC theories (dynamic capability theory, and contingent resourcebased view). Thus, the reality is not dependent on the researcher's thought and observation. But the collected data was analysed using statistical approaches, it is reasonable to infer that objectivism is the most appropriate philosophical framework used for the study.

3.2.2 Epistemology

Epistemology studies how researchers get reliable knowledge (Saunders et al., 2016). This principle of knowledge can be categorised into three: positivism, interpretivism, and realism (Saunders et al., 2016). Table 3.2 shows the summary of research epistemologies.

Table 3.2 Types of research Epistemology

Type	Description

Positivism	❖ It is based on the premise that the outcome of reality does not depend on the researcher. ❖ It is deductive in nature. ❖ It is associated with the philosophy of objectivism.
Interpretivism	❖ It is based on the premise that the outcome of reality can be understood by interacting with alive objects. ❖ It is inductive in nature. ❖ It is associated with the philosophy of subjectivism.
Realism	❖ It asserts that researchers' perceptions of reality are influenced by historical events, which can include cultural, social, and political events that occurred in the past.

Source: Saunders et al., (2016)

For the sake of this investigation, positivism is the most appropriate epistemological method to use. This decision was made for a specific reason, which is consistent with the study's objective; to examine the contingency role of EM in the relationship between SCR and FP. This will be accomplished by developing hypotheses to test theory which made this study deductive in approach.

3.2.3 Axiology

Axiology is defined as the philosophical study of value (O'Gorman and Macintosh, 2014). This field of study is constituted by ethics and/or morals. "In moral philosophy, the emphasis is upon searching out fundamental norms of practice or conduct" (Singh, 2006: 127). This study relied on primary data, and hence the researcher ensured that issues of confidentiality and anonymity of respondents were protected. Since this is a collaborative effort on the part of the researcher and study participants. Therefore, the moral philosophy of this study is both objective and subjective.

3.3 Research design

Research design is a strategy or blueprint that is implemented by a researcher which aims to integrate the different elements of research into a cohesive whole, so that the research objective can be answered as accurately and precisely as possible (Kumar, 2019). Thus, the objective of this study's research design is to establish a framework for the study that will enable an accurate assessment of the causal linkages between SCR and FP, as well as the moderating role that EM plays in this relationship. More so, the study design establishes the procedures for collecting the necessary data, the technique to be applied in collecting and analysing data, and how these will help to answer the research question (Grey, 2014). Bryman (2012) identified many prevalent design types, including cross-sectional designs (also known as survey designs), comparative designs, longitudinal designs, case study designs and experimental designs. A survey design entails collecting data (typically, quantitative) on a large scale (typically including multiple cases and multiple variables) so as to assist in testing, and generalising results (Malhotra and Grover, 1998; Cohen et al., 2007). In addition, survey design provides a faster means of gathering data; does not involve much contact with respondents and saves time, because the researcher can administer the questionnaire and return any day to collect it (Kumar, 2019). This study employed a cross-sectional survey design. This design involves collecting data on multiple variables from a large number of cases at a single point in time (Bryman, 2012; Malhotra and Grover, 1998). Besides, a cross-sectional survey design is suitable for examining the association between variables (SCR, FP and EM) and enhances external validity/generalization (Scandura and Williams, 2000; Rindfleisch et al., 2008; Malhotra and Grover, 1998). This study's use of a cross-sectional survey is in line with prior studies on SCR (Gu et al., 2021; Laguir et al., 2022;

Wong et al., 2020), FP (Li et al., 2017; Yu et al., 2019; Ruel and El Baz, 2021) and EM (Shepherd et al., 2021).

A Cross-sectional survey design is suitable for explanatory research (Rindfleisch et al., 2008; Malhotra and Grover, 1998). Researchers adopted exploratory research when less or enough is not known about a phenomenon and a challenge that has not been clearly defined (Saunders et al., 2016). Again, an exploratory study aims to respond to queries like "what," "how much," and "to what extent" (Saunders et al., 2016). To ascertain whether there is a correlation between SCR and FP as well as the moderating role of EM, the explanatory design can be applied. As a consequence, the explanatory design works best for achieving this study's objective.

3.3.1 Research Method

Creswell (2018) defined research methods as an organised process for the collection and analysis of data and identify three types; quantitative, qualitative, and mixed-method research methods. In difference to qualitative research, which focuses on "text," quantitative research is concerned with the use of "numbers" to establish relationships (Saunders et al., 2016). This study will make use of quantitative research methods to ascertain whether or not two or more variables of interest are connected in a causal manner. This becomes necessary because only with the use of "numbers" is it possible to arrive at an accurate correlation among the three variables under investigation. The current research used a quantitative research approach. This method enables the collection of more precise and quantitative data concerning a phenomenon under study, as mentioned by Tull and Hawkins (1990). In light of this, the author's method will enable him to collect quantifiable data and statistically examine the interaction impact of EM in the

relationship between the SCR and FP. It is also simpler to carry out quantitative research due to the fact that its results can be reliably reproduced (Saunders et al., 2016).

3.4 Population of the study

The study's population is made up of manufacturing firms in Ghana that operate in diverse contexts: food &beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. Data about the firms was taken from Ghana Yellow online directory of which the researcher identified a total of 305 firms, forming the target population for this study. At least two reasons make the choice of manufacturing firms and those firms within the various capital cities within the sub-Saharan African Economy (Ghana for that matter) an appropriate and important empirical context for the study of the effect of SCR on FP. First, In West Africa, Ghana's economy is one of the fastest-growing and most significant business environments (African Development Bank Group, 2018). Particularly, Ghana's regional capitals are developing industrial and commercial hubs for emerging businesses, and as a result, they are densely inhabited by businesses (Ghana Statistical Service, 2016). Secondly, Due to the unstable economic, institutional and market settings in sub-Saharan African countries, including Ghana, as well as the underdeveloped SC infrastructure and financial/capital markets in the region, SCs and businesses in the county are enormously vulnerable. A study of SCR of manufacturing firms in the Ghanaian business context is crucial because the region's business operations are frequently disrupted by challenges with the transportation network, technology and communication breakdowns, energy shortages, outsourcer failures, loss of personnel and skills, and currency exchange rate instability (Business Continuity Institute, 2018).

3.4.1 Sampling techniques and sample size

Tabachnik and Fidell (2007) developed a method for calculating the sample size required for regression analysis. The formula is given by:

$N \geq 50 + 8m$ ………………………….. (1)

Where,

N = total number of respondents in the research

m = number of independent variables

Substituting the values into equation (1) gives:

$N \geq 50 + 8(6) = 98$ were the number of independent variables in this study.

The study will use a sample size of 98 manufacturing firms to be appropriate for this study. The number will allow for 302 sample size to be achieved. On the other hand, Aguinis et al. (2017) found that the statistical power of a moderation analysis may be improved by utilizing a larger sample size and carrying out the investigation in an environment that controls for confounding factors. It has been proposed that the need for sample size varies depending on the complexity of the model, such that more complicated models demand a "larger" sample size (Hair et al., 2014). The model of this study is made up of one independent variable (SCR), one dependent variable (FP), and one moderator (EM). Thus, the researcher deemed a sample size of 302 manufacturing firms is enough for the study. However, it is possible that some firms will not return their responses or give inaccurate responses. Therefore, the priori expectation is that the final responses should be greater than or equal to 98.

These manufacturing firms will be selected using the convenience sampling technique. This technique will allow for the researcher to use manufacturing firms that are at his convenience in

terms of logistical reasons, therefore the concentration on those operating in major cities within the country listed or registered on ghanayello.com directorate.

3.5 Data collection

Primary data was the most important preferred source of data for this study. The questionnaire served as the primary data gathering tool for this study. It is generally agreed that the questionnaire is the most effective method for data collection, particularly when the data to be collected is quantitative. The study explicitly made use of closed-ended, pre-defined questions that have been used by previous researchers in research of a similar nature. It was top and middle management such as CEOs, executive of firms (i.e., one per firm) and senior managers such as; managing directors, general managers, production and operations managers, logistics and SC managers, marketing managers, and purchasing managers who filled out the research questionnaire provided the necessary data for the study.

3.5.1 Measure Development

Primary data was acquired through surveys (Creswell, 2018). A questionnaire is a type of data gathering process that requires each responder to answer the same set of questions in the same sequence (Cooper & Schindler, 2011; Burns & Burns, 2012). There are two distinct approaches to questionnaire design: open-ended and closed. Likewise, there are two methods of data collection that are utilized as part of a closed-ended questionnaire; Multiple-choice questions and Likert scales (Saunders et al., 2016). On the other hand, open-ended questions provide respondents with the option to express their opinions in a particular space provided for that purpose (Kumar, 2019). This study adopted both open and close-ended questionnaire to collect

data. Due to the enormous number of responders, using a closed-ended questionnaire would make it easier to analyze the data.

A survey of existing literature was conducted to identify relevant measures for the study's constructs (SCR, EM and FP). After a series of review, four items each were used to measure SCR and EM while six items were used to measure FP.

3.5.1.1 Independent Variable

The study's independent variable is SCR. The adaptive capacity of the SC to anticipate unforeseen events, respond to interruptions, and recover from them while upholding operations' continuousness at the necessary degree of connectivity and control over structure and function is known as SCR (Yu et al., 2019). Thus, SCR is seen as the capability to respond to unexpected disruptions and disturbances. The four measuring indicators used to measure SCR include: Our company's SC (1) can quickly return to its original state after being disrupted, (2) has the ability to maintain a desired level of connectedness among its members at the time of disruption, (3) has the ability to maintain a desired level of control over structure and function at the time of disruption and (4) is able to recover from disruptions and unexpected events quickly. These items were adapted from Yu et al. (2019). Each item was measured with a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)". Using this scale, the respondents were asked to indicate the extent to which their company's SC have performed on each item.

3.5.1.2 Dependent variable

FP which measures the degree of a firm's FP relative to the industry average (Schilke, 2014), is the study's dependent variable. These items were adapted from Schilke (2014). The six items

used to measure these variables are: (1) Overall profitability, (2) Net profit margin, (3) Return on investment (ROI), (4) Return on assets (ROA), (5) Return on equity (ROE), and (6) Overall FP. These items were adapted from Schilke (2014). Each item was measured with a seven-point scale that ranged from "far below industry average (=1)" to "far above industry average (=7)". Using this scale, the respondents were asked how well their company perform in each of the following areas in the past financial year on each item.

3.5.1.3 Moderating variable

EM defines as the degree to which a given environment is capable of sustaining growth of businesses (Dess and Beard, 1984; Starbuck, 1976; Pfeffer and Salancik, 1978). The four measuring indicators used to measure these variables are: (1) There are ample opportunities for growth in our business environment, (2) Our business environment supports continued growth of our organisation, (3) Prospects for growth of manufacturing firms in our current business environment are good, and (4) Our business environment is rich with opportunities for growth of manufacturing firms. These items were adapted from Jambulingam and Doucette (2005). Each item was measured with a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)". Using this scale, the respondents were asked to what extent do they disagree or agree with each of the following statements.

3.5.1.4 Control Variable

Control variables also known as covariates are control factors that are held constant in a study. The study controlled for the potential effects of firm size, firm age, firm industry, market dynamism, and technological turbulence on operational resilience and EM.

Firm size – operationalised as how small or large a firm is, in terms of its sales volume, scale and scope of operations, number of employees, etc. In this study, it is measured by indicators such as; how many full-time staff are currently employed by your company? And how many years has your company operated in Ghana (Only consider those on your Ghana payroll). ***Firm age*** (i.e., number of years of existing in an industry) - is often used as a proxy for business/organisational experience. Knowledge and experience in a business environment can be critical for successful operations. The more exposure to disruptions a firm has, the better it can learn and respond to them. Moreover, older firms can also lever on experience to source and extract external resources when faced with disruptions. In this study, it is measured by indicators such as; how many years has your company operated in Ghana?

Firm industry - The operational setup for manufacturing firms differs in many ways. Greater inter-dependency in operations or difficulty in decoupling operations within a manufacturing plant can make little disruptions spread into giant ones which may be difficult to contain. In this study, firm industry is operationalised in terms of the core product the firm manufactures or produces. For example, industrial machinery, machine, tools, chemicals, plastics & rubber, food, beverages, drinks, metals, metal working, pharmaceuticals, health care, paper and packaging, engineering, construction, textiles and clothing and electronics.

Market/ customer dynamism – market/customer dynamism refers to the frequency of significant changes in the market, such as new goods or services provided by competing suppliers or changes in consumer preferences (Homburg et al., 1999; Stock, 2006). Measuring indicators for this variable are adapted from Stock and Zacharias (2011). Each item was measured with a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)". Using this scale, the respondents were asked to indicate the extent to which they disagree or agree with the statements below. The four measuring indicators used to measure these variables are: (1) Our customers' product preferences

change quite a bit over time, (2) Our customers tend to look for new products all the time, and (3) We are witnessing changes in the type of products demanded by our customers.

Technological turbulence – Also referred to as the rate of technological change, represents the degree of technological change in the industry (Jaworski and Kohli, 1993). Thus, firms working with nascent technologies that are undergoing rapid change. The four measuring indicators used to measure these variables are: (1) Digital technologies used in our industry change rapidly, (2) Existing digital technologies in our industry are quickly replaced by new ones, (3) There are major digital technological developments occurring in our industry, and (4) New businesses emerging in our industry highly deploy digital technologies. These items were adapted from Jaworski and Kohli (1993). Each item was measured with a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)". Using this scale, the respondents were asked to indicate the extent to which they disagree or agree with the statements above. Below is the summary of the sources of measuring indicators for this study in Table 3.1

Table 3.3: Sources of measurement for the study's variables

Construct	Measure	Source
Supply Chain Resilience	Supply chain returning to its original state after being disrupted	Yu et al. (2019)
	Supply chain maintaining a desired level of connectedness among at the time of disruption.	Yu et al. (2019)
	Supply chain maintaining control over structure and function at the time of disruption.	Yu et al. (2019)
	Supply chain recoverability from disruptions.	Yu et al. (2019)
Environmental Munificence	Opportunities for growth in our business environment.	Jambulingam, Kathuria and Doucette (2005)

	Environment supports continued growth of our organisation.	Jambulingam, Kathuria and Doucette (2005)
	Growth of firms in our current business environment are good.	Jambulingam, Kathuria and Doucette (2005)
	Business environment is rich with opportunities for growth.	Jambulingam, Kathuria and Doucette (2005)
	Our business environment supports continued growth of our organisation.	Jambulingam, Kathuria and Doucette (2005)
Financial Performance	Overall profitability	Schilke (2014)
	Net profit margin	Schilke (2014)
	Return on investment (ROI)	Schilke (2014)
	Return on assets (ROA)	Schilke (2014)
	Return on equity (ROE)	Schilke (2014)
	Overall financial performance	Schilke (2014)
	Overall profitability	Schilke (2014)
Customer dynamism	Our customers' product preferences change quite a bit over time	Stock and Zacharias (2011)
	Our customers tend to look for new products all the time	Stock and Zacharias (2011)
	We are witnessing changes in the type of products demanded by our customers	Stock and Zacharias (2011)
	Our customers tend to have stable product preferences	Stock and Zacharias (2011)
	Our customers' product preferences change quite a bit over time	Stock and Zacharias (2011)
Technological turbulence	Digital technologies used in our industry change rapidly	Jaworski and Kohli (1993)
	Existing digital technologies in our industry are quickly replaced by new ones	Jaworski and Kohli (1993)
	There are major digital technological developments occurring in our industry	Jaworski and Kohli (1993)
	New businesses emerging in our industry highly deploy digital technologies	Jaworski and Kohli (1993)

Source: Author's construct

3.6 Data Analysis

After data collection, activities such as grouping the data, editing, categorizing the data, summarizing and adding meaning to the data were conducted to help ensure that the data was accurate (Sullivan, 2001). Both inferential and descriptive analyses were performed. Specifically, the descriptive analyses cover the means, standard deviations, Kurtosis and skewness of data. Also, the analysis of the respondents' demographic traits will be conducted to create a "data-description" under the descriptive statistics. Further, the inferential analysis, involves the use of correction and multiple regression analyses to establish the relationship between the constructs of interest in the study or to test the hypothesis in order to find answers to proposed research objectives and questions. This study used SPSS software version 25, Mplus verse 7.4, and Hydes Process version 4.0

3.7 Validity and reliability

Validity denotes the degree to which a data collection method or procedure properly measures what they were meant to measure (Saunders et al., 2018). A test is considered valid when it succeeds in measuring what it purports to measure (Fawcett, 2013). Scholars such as Hair et al., (2016) have outlined some fundamental assumption that needs to be considered in ensuring the validity and reliability of measurements such as Cronbach Alpha, Average Variance Extracted (AVE), and Composite reliability (CR). To ensure appreciable validity of the measurement instruments, factor loadings were expected to be 0.60 or better, Cronbach alpha values were expected to be 0.70 or better, and AVEs scores were expected to be 0.50 or better (Henseler et al., 2015; Hair et al., 2017). The summary is presented in Table 3.2 as follows;

Table 3.4 Measurement Model Criteria

Measurement	Recommended Threshold	Source	The result from the study
Factor loading	≥ 0.70	Henseler et al. (2015)	0.776 to 0.915
AVE	≥ 0.50	Henseler et al. (2015)	0.650 to 0.834
CR	≥ 0.60	Henseler et al. (2015); Hair et al. (2017)	0.922 to 0.963
Cronbach Alpha and Rho_A	≥ 0.70	Nunally (1978); Hair et al. (2017)	0.893 to 0.958
Variance Inflation Factor (VIF)	< 10	O'brien (2007)	4.637
Heterotrait-Monotrait (HTMT) ratio	≤ 0.85 ≤ 0.90	Henseler et al. (2015); Gold et al. (2001)	0.762 to 0.915
P value	< 0.05	Henseler et al. (2015); Hair et al. (2017)	0.000 to 0.199

Source: O'brien (2017); Henseler et al. (2015); Hair et al. (2017)

3.8 Model Specification

The association between the variables in this study will be discovered through the application of the ordinary least square (OLS) regression, in particular, multiple linear regression. Multiple linear regression is frequently used to determine the effect of one or more independent variables (such as SCR) on an outcome variable (FP). It aids in making decisions by accurately forecasting the link between two variables of interest (Field, 2018). The linear regression formula is given by:

$$Y = \beta_0 + \beta_1 X_i + \ldots + \beta_n X_n + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where,

Y = the dependent variable

$X_{i \ldots} X_n$ = set of independent variables

$\beta_{1 \ldots} \beta_n$ = the coefficients of the independent variables

ε = the error term

The interpretation of equation (1) is that a unit increase in an independent variable will result in a percentage increase (based on the value of the coefficient) in the dependent variable, holding other variables constant in the model. The model corresponding to each of the research hypotheses is presented in the succeeding subsections.

3.8.1 Supply Chain Resilience

The relationship between SCR and FP is modeled using the formula below:

$$FP = \beta_0 + \beta_1 SCR + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where,

FP = Financial Performance

SCR = Supply Chain Resilience

β_1 = Coefficient of SCR

3.8.2 Moderating Effect of Environmental Munificence

The moderating effect of EM in the relationship between SCR and FP is modeled using the formula below:

$$FP = \beta_0 + \beta_1 SCR + \beta_2 EM + \beta_3 (EM*SCR) + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots$$

(3)

Where,

FP = Financial Performance

SCR = Supply Chain Resilience

EM = Environmental Munificence

EM*SCR = Interaction of EM and SCR

□□□□□□□□□□□□□□1, □2, □3□= The coefficients of SCR, EM, and EM*SCR respectively

3.9 Ethical issues

The researcher is committed to doing the study using high-quality data and ethical principles (Saunders et al., 2016). Since following ethical guidelines is crucial to performing reliable research and guaranteeing that good data are produced for analysis (Zikmund, et al., 2003). Kumar (2019), specifies that scholars are obliged to follow ethical standards such as confidentiality, anonymity and informed permission. They should also look for legal entry points for data collection. Also, seek permissible entry for data collection. Therefore, care was taken when designing the data-gathering instruments to ensure that they did not violate any applicable research ethics guidelines.

In compliance with ethical issues in conducting this research, approval was sought from the ethical committee of the Kwame Nkrumah University of Science and Technology (KNUST), which was subsequently given and that allowed the researcher to carry on with the research. Again, respondents were informed about the methods, aims, anticipated benefits and potential hazards of the research. Then, the researcher made sure every one of them had their consent obtained before given the questionnaire to fill. All the participants agreed to participate in the filling of the questionnaire. Additionally, they were informed that in the course of filling the

questionnaire, if they feel they are no longer interested in participating further they can withdraw from it without any difficulties. Participants were also informed that the information gathered would be used solely for academic use and issues of privacy will also be strictly adhered to

Table 3.5: Summary of Key Methodology Choices

Key Methodological Issue	Methodological Choice
Empirical setting	Ghana
Data type and source	Quantitative and primary
Research design	Cross-sectional survey
Data collection instrument and method of administration	Close-ended and open-ended questionnaire
Target population	manufacturing firms in Ghana that operate in diverse contexts: food &beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc.
Sampling approach	Convenience sampling technique
Target informant	senior managers and executives of firms (i.e., one per firm)
Source of measure for construct	Extant literature
Data analysis software package	SPSS 25, Mplus 7.4 and Hayes Process 4.0

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The chapter highlights the result of the data collected from respondents in the manufacturing firms in Ghana that operate in diverse contexts: food & beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. The chapter is made up of three sections namely; demographic characteristics of the respondent, descriptive and

inferential analysis. The first section presented data on the demographic characteristics of the respondents, the second section analysed the descriptive statistics, which contained the mean, minimum, maximum, skewness, kurtosis and standard deviation of the variables under study. The final section presented the results of the inferential analyses determining the relationship between the study variables.

4.2 Demographic Characteristics of Respondents and Industry Profile

Out of the 350 questionnaires administered to the 305 manufacturing firms, 224 valid responses were received. This represents 74% response rate. Presented in Table 5.1 are the results. In terms of education, majority of the respondents (45.5%) hold a first degree, followed by Diploma/HND holders representing a percentage of 27.2%, SHS/O'level/A'level holders equating to 20.1%, and finally second-degree holders with a percentage of 7.1%. This shows that within the manufacturing firms, the respondents are well educated. In terms of the position of the respondents within their respective firms, 28.6% were marketing/sales manager as the highest. Followed by operations/procurement manager representing 24.6%, CEOs of 24.1%, general managers of 14.7% and accountant/finance managers, logistics/SC managers and others representing 2.7% each. In terms of industry's profile, respondents in the food, beverage and drinks industry dominate with 26.3%. Closely followed by other industries not listed in the survey (20.1%), metal, metal working (17.4%), engineering, construction (8.9%), paper and packaging (6.3%), textiles and clothing, plastics and rubber sharing the same percentage margin (5.4%), industrial machinery, machines, tools and pharmaceuticals, healthcare sharing the same percentage margin (3.6%), electronic (2.2%) and chemicals (0.9%), respectively in that order.

Table 4.1 Demographics Characteristics of Respondents

Respondents' profile	Sample size (n= 224)		Industry's profile	Study sample (n= 224)	
	Frequency	Percentages		Frequency	Percentages
Education			**Industry**		
SHS/A-Level/O-level	45	20.1	Industrial machinery/machine/tools	8	3.6
Diploma/HND	61	27.2	Chemicals	2	0.9
1st Degree	102	45.5	Plastics & rubber	12	5.4
2nd Degree	16	7.1	Food, beverages, and drinks	59	26.3
			Metals, metal working	39	17.4
Position			Pharmaceutical, healthcare	8	3.6
CEO	54	24.1	Paper and packaging	14	6.3
General Manager	33	14.7	Engineering, construction	20	8.9
Marketing/Sale Manager	64	28.6	Textile and clothing	12	5.4
Operations/Production Manager	55	24.6	Electronics	5	2.2
Accountant/Finance Manager	6	2.7	Others	45	20.1
Logistics/Supply chain Manager	6	2.7			
Others	6	2.7			

Source: Field data (2022)

4.3 Descriptive Statistics

To get a preview of how participated firms score on the key concepts of the study, the conduct of descriptive statistics was deemed imperative. As such, descriptive analysis of all three key concepts; SCR, EM and FP was conducted to enhance the researcher's understanding regarding the performance of facilities that took part in the survey. Again, the descriptive statistics summarizes the features of the data set by examining the minimum, maximum, mean and standard deviation for each of the study variables. Table 4.2 below represents the descriptive statistics:

Table 4.2: Descriptive Statistics

Variables	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Firm age (log)	224	2.71	1.10	3.81	2.6108	.46459	.064	.234
Firm size (log)	224	4.16	1.79	5.95	2.6655	.74605	1.449	2.490
Industry (food = 1, others = 0)	224	1.00	.00	1.00	.2634	.44146	1.082	-.838
Industry (metals = 1, others = 0)	224	1.00	.00	1.00	.1741	.38005	1.730	1.003
Customer dynamism	224	6.00	1.00	7.00	3.8423	1.50995	.016	-.962
Technological turbulence	224	6.00	1.00	7.00	3.4018	1.61546	.637	-.531
Supply chain resilience	224	5.50	1.50	7.00	5.1128	.92235	-.633	.877
Environmental munificence	224	5.75	1.25	7.00	5.1596	1.16514	-.890	1.256
Financial performance	224	5.50	1.50	7.00	4.3185	1.28869	-.194	-.840

Source: Field data (2022)

The firm age is found by taking the log of the number of years the respondents' company has been in operations in Ghana. This gives a value between 1.10 and 3.81, with 1.10 being the lowest and 3.81 being the highest. The corresponding mean is 2.6108, with skewness of .064, kurtosis of .234, and a standard deviation of 0.46459. In addition, the firm size is found by taking the log of the number of full-time staff in the respondents' company, resulting in a minimum value of 1.79 and a maximum value of 5.95. The corresponding mean is 2.6655, skewness of 1.449, kurtosis of 2.490, and a standard deviation of 0.74605. The industry (food) is attained by using dummy codes of 1 if the respondent is in the food, beverage, and drinks

industry and 0 if otherwise. This gives rise to a minimum value of 0 and a maximum value of 1. The corresponding mean is 0.2634, skewness of 1.082, kurtosis of-.838, and a standard deviation of 0.44146. Likewise, industry (metal) is arrived at using dummy codes of 1 if the respondent is in the metal industry and 0 if otherwise. This resulted in a minimum value of 0 and a maximum value of 1.00. The corresponding mean is 0.1741, skewness of 1.730, kurtosis of 1.003, and a standard deviation of 0.38005. Customer dynamism complexity is arrived at by taking the natural log of the number of responses. This resulted in a minimum value of 1 and a maximum value of 7. The corresponding mean is 3.84, with skewness of .016, kurtosis of -.962, and a standard deviation of 1.51. Technological turbulence is arrived at by taking the average of the responses. This brings about in a minimum value of 1 and a maximum value of 7. The corresponding mean is 3.40, with skewness of .637, kurtosis of -.531, and a standard deviation of 1.62. SCR is arrived at by taking the average of the responses, resulting in a minimum value of 1.5 and a maximum value of 7. The corresponding mean is 5.11, with skewness of -.633, kurtosis of .877, and a standard deviation of 0.922. EM is arrived at by taking the average of the responses, resulting in a minimum value of 1.25 and a maximum value of 7. The corresponding mean is 5.16, with skewness of -.890, kurtosis of 1.256, and a standard deviation of 1.17. Finally, FP is arrived at by taking the average of the responses, resulting in a minimum value of 1.50 and a maximum value of 7. The corresponding mean of 4.32, with skewness of -.194, kurtosis of -.840, and a standard deviation of 1.29.

4.4 Inferential Statistics

This section presents the main results of the data focusing on exploratory factor analysis, confirmatory factor analysis, correlation analysis, regression analysis as well as reliability and validity analysis.

4.4.1 Exploratory Factor Analysis and Reliability Analysis

To check the validity and reliability of items and constructs, the study leveraged exploratory factor analysis (EFA). Prior to the EFA analysis, Cronbach's Alpha test as a preliminary way of assessing the internal consistency of items tapping into FP, technological turbulence, EM, SCR, and customer dynamism was conducted. Results for the said test are presented in table 4.3. One of the items for customer dynamism was dropped in this test since its presence affected the internal consistency of latent variables. Thus, after dropping the said item, constructs for customer dynamism demonstrated high level of internal consistency. More so, analysisleveraging EFA generated five components with each item loading high on their respective latent variables. Even though EFA confirms the reliability and validity of items and constructs together with Cronbach's Alpha test it fails to account for measurement errors. Thus, the need to conduct a covariance-based CFA in the next section in order to check for measurement errors.

Table 4.3: Exploratory Factor Analysis Result

Exploratory Factor Analysis						**Reliability Analysis**				
Components and Loading						**Evs**	**%V**	**C/a**	**CC**	**C/A if item deleted**
Item Code	1	2	3	4	5					
Customer dynamism										
CDYM 1	-.035	.106	.157	.039	**.891**				.722	.582
CDYM 2	.078	.037	.104	.036	**.892**				.687	.603

CDYM 3	-.023	.091	.056	.002	**.923**	**7.429**	**33.769**	**.749**	.692	.551
CDYM 4	-.164	.295	-.084	-.166	**.121**				.028	.900
Technological turbulence										
TTB 1	.095	**.855**	.042	.155	.041				.78 9	.936
TTB 2	.179	**.897**	.065	.112	.080	**2.954**	**13.426**	**.936**	.86 8	.910
TTB 3	.193	**.889**	.121	.092	.010				.86 4	.911
TTB 4	.163	**.900**	.154	.087	.060				.87 7	.908
Supply chain resilience										
SCR 1	.219	.066	.128	**.791**	.008				.68 5	.771
SCR 3	.195	.036	.049	**.729**	.062	**2.524**	**11.474**		.58 8	.812
SCR 2	.115	.092	.130	**.795**	.013	**.828**			.44 4	.783
SCR 4	.182	.107	.118	**.801**	.002				.488	.765
Environmental munificence										
EM 1	.130	.055	**.783**	.251	.058				.72 2	.582
EM 2	.222	.088	**.820**	.078	.103	**1.901**	**8.643**	**.886**	.68 7	.603
EM 3	.212	.018	**.848**	.129	.090				.785	.551
EM 4	.311	.136	**.816**	.020	.128				..08 7	.900
Financial Performance										
FPEF 1	**.856**	.087	.085	.130	-.037				.80 9	.939
FPEF 2	**.839**	.083	.195	.199	.041	**1.952**	**7.508**	**.946**	.83 9	.935
FPEF 3	**.816**	.035	.236	.223	.040				.82 4	.937

FPEF 4	**.870**	.100	.132	.153	.013		.845	.934
FPEF 5	**.841**	.119	.196	.158	.002		.829	.936
FPEF 6	**.848**	.187	.246	.146	-.012		.756	.932
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.								
a. Rotation converged in 5 iterations.								

Note: Evs = Eigenvalues; %V = Percentage of variance explained; C/α = Crombach's Alpha; CC = Items total correlations; α if deleted = Cronbach's Alpha value if item deleted

Source: Field data (2022)

4.4.2. Confirmatory Factor Analysis

The EFA is used to confirm the reliability and validity of items and constructs together with Cronbach's Alpha test but fails to account for measurement errors. Due to this reason, covariance-based CFA was leveraged using Mplus version 7.4 to ascertain the measuring errors among the items and construct together. The first covariance-based CFA test results saw one items - CDYM 4 load poorly on its latent variables – customer dynamism. This item was dropped to improve the study's theorized three-factor model given; x2 = 245.521, degree of freedom (df) = 179, normed x2 = 1.372, root mean square error of approximation (RMSEA) = .041, comparative fit index (CFI) = 0.981, Tucker-Lewis's index (TLI) = 0.977, standardized root mean square residual (SRMR) = 0.0.036 (Bagozzi and Yi, 2012; Hair et al., 2014). As depicted in Table 4.4, all factor loadings are above .50 and statistically significant at 1%.

Table 4.4: Confirmatory Factor Analysis Result

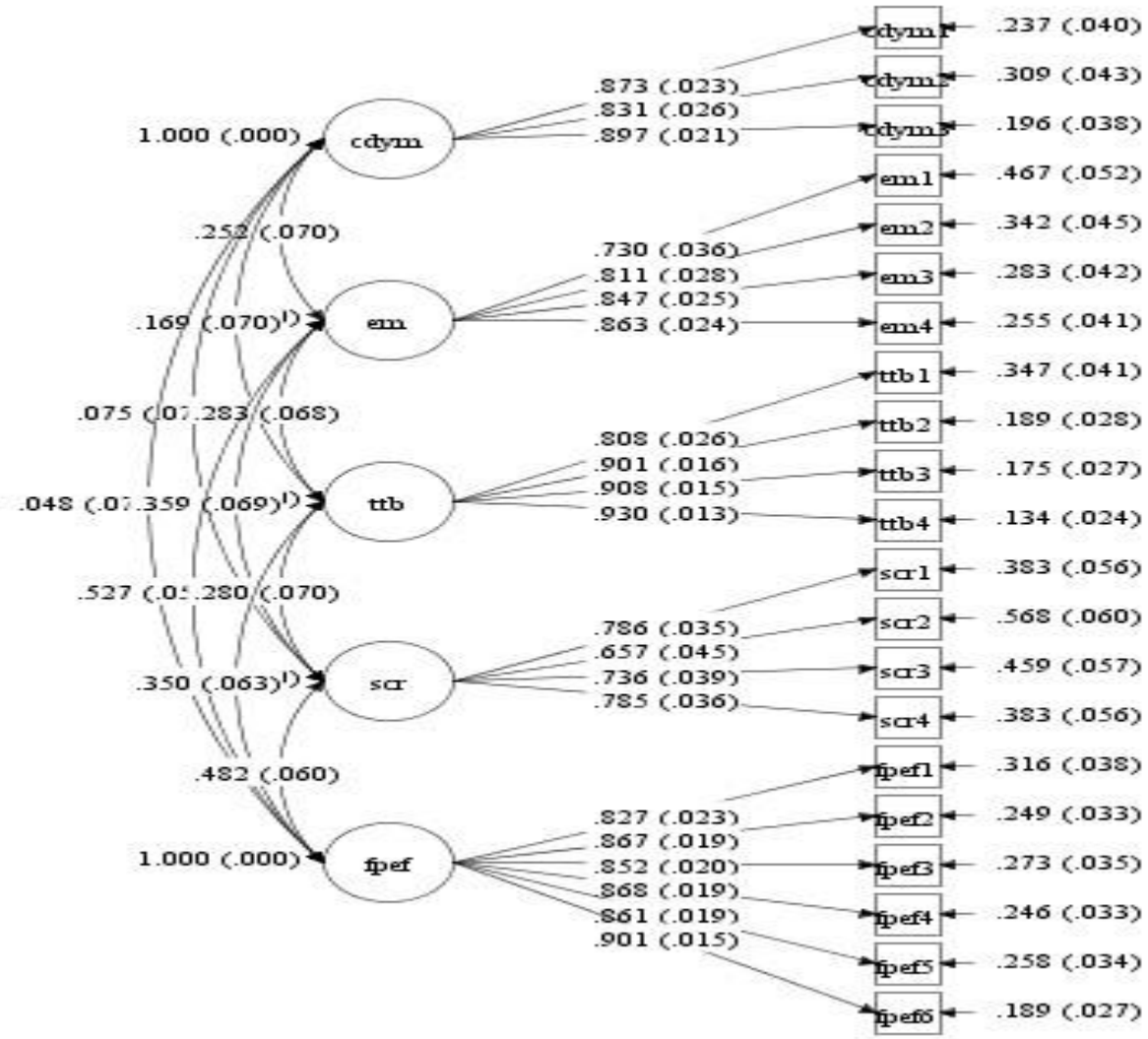
Constructs/Items/Composite reliability (CR) and average variance extracted (AVE)	Std. Loadings
Customer dynamism (CR =.93 , AVE= .81)	
CDYM1: Our customers' product preferences change quite a bit over time.	0.873 (Fixed)

CDYM2: Our customers tend to look for new products all the time.	0.831 (15.344)
CDYM3: We are witnessing changes in the type of products demanded by our customers.	0.897 (16.761)
Technological turbulence (CR = .89, AVE= .66)	
TTB1: Digital technologies used in our industry change rapidly.	0.730 (Fixed)
TTB2: Existing digital technologies in our industry are quickly replaced by new ones.	0.811 (11.775)
TTB3: There are major digital technological developments occurring in our industry.	0.847 (12.270)
TTB4: New businesses emerging in our industry highly deploy digital technologies.	0.863 (12.257)
Supply chain resilience (CR = .94, AVE= .79); Our company's supply chain…	
SCR1: can quickly return to its original state after being disrupted.	0.808 (Fixed)
SCR2: has the ability to maintain a desired level of connectedness among its members at the time of disruption.	0.901 (16.563)
SCR3: has the ability to maintain a desired level of control over structure and function at the time of disruption.	0.908 (16.603)
SCR4: is able to recover from disruptions and unexpected events quickly.	0.930 (17.015)
Environmental Munificence (CR = .83, AVE= .55)	
EM1: There are ample opportunities for growth in our business environment.	0.786 (Fixed)
EM2: Our business environment supports the continued growth of our organisation.	0.657 (9.202)
EM3: Prospects for growth of manufacturing firms in our current business environment are good.	0.736 (10.789)
EM4: Our business environment is rich with opportunities for growth of manufacturing firms.	0.785 (10.966)
Financial Performance (CR = 95, AVE= .74); Relative to industry average, how well did your company perform in each of the following areas in the past financial year?	
FPEF1: Overall profitability.	0.827 (Fixed)
FPEF2: Net profit margin.	0.867 (16.247)
FPEF3: Return on investment (ROI).	0.852 (15.810)

FPEF4: Return on assets (ROA).	0.868 (16.362)
FPEF5: Return on equity (ROE).	0.861 (16.021)
FPEF6: Overall financial performance.	0.901 (17.167)

Note: Std = standardized, CR = composite reliability, AVE = average variance extracted, CDYM= customer dynamism, EM = Environmental munificence, TTB = technological turbulence, SCR= supply chain resilience, FPEF = financial performance.

Figure 4. 1 Confirmatory Factor Analysis



4.4.3 Unidimensionality, Convergent Validity and Discriminant Validity

The recomputed Cronbach's Alpha and computed composite reliability and average variance extracted values are all above .70, .60 and .50 respectively (Bagozzi and Yi, 2012; Hair et al., 2014). Together, these test results depict that, not only is unidimensionality attained, but also scale reliability as well as convergent and discriminant validity. Table 4.3 and 4.4 displays exploratory factor analysis, Cronbach's Alpha and confirmatory factor analysis test results

respectively. Figure 4.1 is the CFA diagram, which highlights the factor loadings and standard errors for each item on their respective latent variables.

4.4.4 Correlation Analysis

Correlation analysis or inter-construct correlation is done to examine the level of interrelationship among the key variables; control variables, independent, dependent, and moderator variables. The findings for the correlation analysis is presented in Table 4.5 below:

Table 4.5: inter-construct correlations Result

		1	2	3	4	5	6	7	8	9
1	Firm age (log)	1								
2	Firm size (log)	**.407****	1							
3	Industry (food = 1, others = 0)	.109	**.310****	1						
4	Industry (metals = 1, others = 0)	-.055	**-.178****	**-.275****	1					
5	Customer dynamism	.125	-.019	-.025	-.035	1				
6	Technological turbulence	-.111	**.142***	-.003	**.205****	**.154***	1			
7	Supply chain resilience	.059	**.219****	.011	-.072	.074	**.252****	1		
8	Environmental munificence	.121	**.226****	.105	.089	**.231****	**.243****	**.322****	1	
9	Financial performance	.057	**.296****	**.237****	-.120	.054	**.315****	**.429****	**.473****	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Field data

Drawing interpretations from table 4.5 indicates that, most variables inter-correlate. For example, firm age significantly correlates with firm size (Coefficient = .407; p-value<.01). In addition, firm size inter-correlated with industry (food) (Coefficient = .310; p-value<.01); industry (metal) (Coefficient = .178; p-value<.01); technological turbulence (Coefficient = .142; p-value<.05); supply chain resilience (Coefficient = .219; p-value<.01); environmental munificence (Coefficient = .226; p-value<.01) and financial performance (Coefficient = .296; pvalue<.01). More so, industry (food) significantly correlates with industry (metal) (Coefficient = .275; p-value<.01) and financial performance (Coefficient = .237; p-value<.01). Industry (metal) inter-correlate with only technological turbulence (Coefficient = .205; p-value<.01). Further, customer dynamism inter-correlate with technological turbulence (Coefficient = .154; p-value<.05) and environmental munificence (Coefficient = .231; p-value<.01). Technological turbulence significantly correlates with supply chain resilience (Coefficient = .252; pvalue<.01); environmental munificence (Coefficient = .243; p-value<.01) and financial performance (Coefficient = .315; p-value<.01). Supply chain resilience inter-correlates with environmental munificence (Coefficient = .322; p-value<.01) and financial performance (Coefficient = .429; p-value<.01). Lastly, environmental munificence significantly correlates with financial performance (Coefficient = .473; p-value<.01).

4.5 Regression Analysis

As highlighted previously, hierarchical regression model analysis was leveraged to assess and evaluate the study's hypotheses.

4.5.1 Hierarchical Regression

Encompassing four models, the first model of the hierarchical regression (Model 1) regressed the control variables (firm age, firm size, industry – food and metal, customer dynamism, and technological turbulence) on the financial performance-the outcome variable. Model 2 included the independent variable in SCR. The third model (Model 3) added the moderating variable (EM) into the previous variables captured in model 2. The fourth and final model (Model 4) saw the addition of an interaction term (SCR*EM). The analysis leveraged on the procedures for conducting hierarchical regression by IBM, SPSS guide. Table 4.6 presents the results of the hierarchical regression analysis.

Table 4.6: Hierarchical Regression Result

Model										Collinearity Statistics	
	R. Square	Adjt. R. Square	F-Statistics	R. Square Change	Durbin Watson	Significant	Beta Weight	Tvalue	Pvalue	Tolerance	VIF
Model 1: Control Paths											
Firm age							-.031	-.161	**.873**	.774	1.292
Firm size							.331	2.649	**.009**	.701	1.427
Industry (Food)							.438	2.287	**.023**	.853	1.172
	.202	.180	9.171	.202		**.000**					
Industry (Metal)							-.365	-1.64	**.102**	.855	1.170
Customer dynamism							.010	.187	**.852**	.934	1.071
Technological turbulence							.245	4.679	**.000**	.851	1.175
Model2: Main Effect											

Firm age						-.068	-.409	**.683**	.773	1.294
Firm size						.139	1.246	**.214**	.671	1.491
Industry (Food)						.411	1.435	**.016**	.839	1.192
Industry (Metal)						-.414	-2.095	**.037**	.825	1.212
Customer dynamism						-.059	-1.234	**219**	.889	1.125

Technological turbulence						.152	3.214	**.002**	.797	1.255
Supply Chain Resilience (SCR)						.348	4.273	**.000**	.825	1.212
Environmental Munificence (EM)	.396	.374	34.511	.194	**.000**	.379	5.735	**.000**	.785	1.273
Model3: Interaction Effect										

Firm age							-.064	-.385	**.701**	.773	1.294
Firm size							.139	1.245	**.214**	.671	1.491
Industry (Food)							.432	2.542	**.012**	.828	1.207
Industry (Metal)							-.411	-2.076	**.039**	.825	1.212
Customer dynamism							-.058	-1.215	**.226**	.889	1.125
Technological turbulence	.399	.374	1.165	.003	2.086	**.282**	.147	3.076	**.002**	.787	1.270
Supply Chain Resilience (SCR)							.354	4.334	**.000**	.822	1.217
Environmental Munificence (EM)							.379	5.737	**.000**	.785	1.273
SCR × EM							.076	1.079	**.282**	.969	1.031

a. Dependent Variable: Financial performance

Notes: n=224, Regression is significant at $p \leq .05$*, and unstandardized regression coefficients are reported.

Source: Field data (2022)

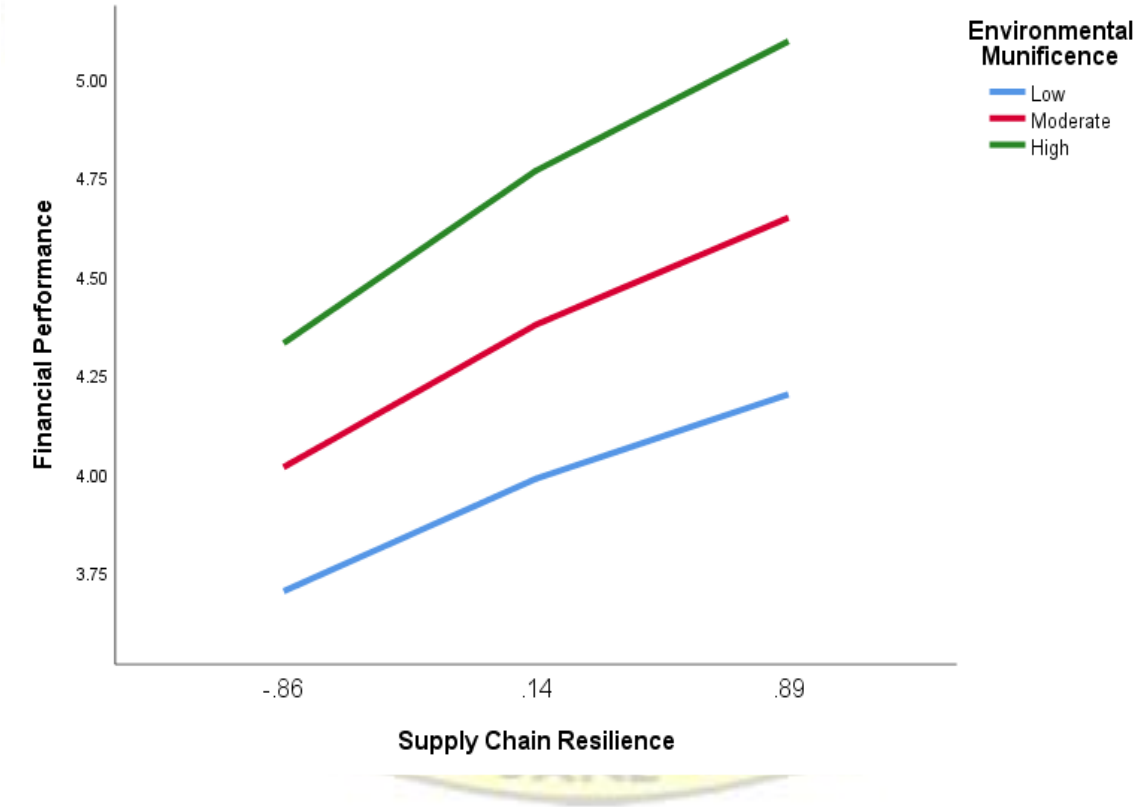
In preparing the data for the regression analysis, the study followed the recommendation of Aguinis et al. (2017, p.672), which suggests that, mean centering be done on the predictor and moderator variables "for the sole purpose of interpreting coefficients on lower-order terms when interactions are present. More so, the interaction term was created by multiplying the meancentered variables of SCR and information sharing. As indicated, all substantive variables including firm characteristics – firm age and size were mean-centered. In addition, no multicollinearity problem is detected in the correlation analysis, the regression analysis is performed to determine whether there exists a relationship between the independent and dependent variables as well as the moderator and dependent variable.

Before proceeding to interpret the results based on the study's hypotheses, the check for model fit is the fundamental thing to do. Considering the p-values from all four models, it is evident that, all models are deemed fit except model 4. With scores of: (p-value =.000); (p-value =.000); (p-value =.000) and (p-value =2.086) for model 1, model 2, model 3, and model 4 respectively, it is evident, there model 1, 2 and 3 did pass the model fit check. Concerning the regression analysis in Table 4.6, it revealed that; Firm size (β= .331; t-value= 2.649; p-value=.009); industry (food) (β=.438; tvalue= .2.287; p-value= .023) and technological turbulence (β= .245; t-value= .4.346; p-value= .000) are positive predictors of financial performance. Meanwhile, firm age (β=-.031; t-value=.161; p-value=.873); industry (metal) (β= -.365; t-value= -1.643; p-value=.102) and customer dynamism (β= .010; t-value= .187; p-value= .852) have no prediction. Again, environmental munificence (β= 379; t-value= 5.735; p-value=.000) was empirically proven as a predictor of financial performance, as depicted in the conceptual model. Addressing the first hypothesis (H1), using the regression analysis results from Table 4.6, SCR (the independent

variable) was regressed on financial performance (the dependent variable). Findings indicated that SCR (β= .472; t-value=

5.611; p-value=.000) drives financial performance, thereby empirically supporting the study's first hypothesis – H1. Again, the second hypothesis (H2) of the study was assessed by regressing the interaction term (SCR x EM) on financial performance. Results revealed that supply chain resilience and environmental munificence interaction terms (β= 0.76; t-value= 1.079; p-value= .282) do not moderate supply chain resilience and financial performance path.

Figure 4. 2: Moderating Effect of EM on the link between SCR and FP



4.5.2 Further Analysis - Mplus Regression Analysis

The study depended on regression analysis using Mplus version 7.4 to further evaluate the slope of supply chain resilience on financial performance. This helped to bring clarity of interpretation and provide further insights into the boundary conditions. Table 4.7 summarizes the Mplus results, which are broadly in agreement with those of the hierarchical regression analysis using SPSS. While supply chain resilience (Effect= .3539; t-value= 4.3343; p-value=.0000; LLCI= .1929; ULCI=.5148) was identified as pertinent driver of financial performance, environmental munificence (Effect= 0758; t-value= 1.0792; p-value= .2817; LLCI= -.0627; ULCI= .2443) was found not to moderate the relationship between SCR and FP. This justifies the findings of the regression analysis using the SPSS.

Table: 4.7 Mplus regression result

	Effect	T-Value	P-Value	LLCI	ULCI
Direct Paths:					
Supply chain resilience	.3539	4.3343	**.0000**	**.1929**	**.5148** ***Conditional***
Paths*:*					
Moderation effect of EM	.0758	1.0792	**.2817**	**-.0627**	**.2143** on
the SCR → FP path					

Note: Covariates for this model include; firm size, firm age, industry (food), industry (metal), customer dynamism, and technological turbulence. SCR >> Supply chain resilience, EM >> Environmental munificence, FP >> Financial performance.
Source: Field data, (2022)

Table 4.8: Summary of Hypothesis Test

No.	Hypothesis	Result
H1	Supply Chain Resilience has a positive and significant relationship with financial performance.	Supported
H2	Environmental munificence positively and significantly moderates the relationship between supply chain resilience and financial performance.	Not supported

Source: Author's construct (2022)

4.5.3 Robustness Checks - Endogeneity

Additional test to reinforce the robustness of the results was conducted. The paper specifically tested for endogeneity biases (Sarstedt et al., 2022). Endogeneity bias arises in research models with several hypotheses having the risk of omitting a construct (Ketokivi and McIntosh, 2017; Peel, 2018).

Therefore, we explored the possibility of endogeneity confounding our results for the main effects of SCR and FP using a two-stage least squares (2SLS) regression estimator with instrumental variables (IVs). Based on theoretical and empirical considerations (Lu et al., 2018), and following Gligor (2018), we identified potential IVs by conducting OLS regression analysis to select variables in the study that meet the instrumental exclusion condition.

Comparing the findings of hierarchical regression (β= .472; t-value= 5.611; p-value=.000) and 2SLS (β = 1.610, t = 6.232, and p-value= 0.000, indicates no potential endogeneity bias between

financial performance and supply chain resilience. Since both results are statistically significant and has no much difference.

4.6 Discussion of Results

The discussion component of the study discusses the key findings of the study in consonance with the study's objectives and hypotheses. As submitted earlier, the study observed the moderating role of EM in the relationship between SCR and FP. To help address the study's aim, two specific objectives based on which empirical review, conceptual framework, and hypothesis were developed and drafted. While objective one looks at the effect of SCR on FP, the second objective observes the moderating effect of EM on the link between SCR and FP.

By soliciting cross-sectional survey data via self-delivered questionnaires from 224 manufacturing firms in Ghana that operate in diverse contexts: food &beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc., hierarchical regression analysis was leveraged in analysis. The results of the study are discussed in consonance with the objectives of the study precisely; SCR and FP and the moderating role of EM on the SCR-FP relationship.

4.6.1 Supply Chain Resilience and Financial Performance.

Indication from the regression analysis depicted a positive and significant relationship between SCR and FP, which provided support for H1. This positive relationship is expected because SCR makes it possible for manufacturing firms within the Ghanaian context to bounce back their operational activities after a disruption or a catastrophic event making it possible for them to reap a desirable financial standing. Thus, despite the cost implication of building resilience, its

impact on FP must always be taken into account (Jüttner and Maklan, 2011). Again, the strong positive correlation between SCR and FP is consistent with DCV, which explains that companies build SCR as a dynamic capability for tackling and responding to their external environmental challenges, increasing their efficiency in producing ideal performance (Zollo and Winter, 2002; Ambrosini et al., 2009).

The findings of this study are of the view that a resilient SC can gain competitive advantages by absorbing unexpected disruptions and returning to a robust state of operational activities leading to competitive benefits (Kamalahmadi and Parast, 2016; Pettit et al., 2013; Ali et al., 2017; Hohenstein et al., 2015; Pereira et al., 2014). In particular, SCR helps businesses operating in highly dynamic environments to effectively manage risks that may be unexpected and difficult to quantify, bounce back quickly from interruptions, and enhance business performance (Ponomarov and Holcomb, 2009). Implying that some manufacturing firms can become bankrupt or even collapse due to the high impact of disruptions happening to both their internal and external SCs as in the case of Ericsson (Lee, 2004). Since the commercial activities of any manufacturing firm entail an inherent risk of unanticipated disruptions that might cause revenue losses and, in some cases, the company's collapse (Skipper and Hanna, 2009).

On the contrary, the claim by some scholars that, building SCR yields no financial benefit or there is no link between SCR and FP (Liu et al., 2018; Abeysekara et al., 2019) is not supported by this study's findings. Instead, this study is of the view that an investment in SCR will yield a commensurate financial benefit to manufacturing firms (Li et al., 2017; Yu et al., 2019). Thus, building resilience around the SC of manufacturing firms will reduce the effects of disruptions to their internal and external SCs and return them to their pre-disrupted condition after

disruption, which will in the long run increase their FP. It is on this account that, manufacturing companies need to comprehend the changes and risks that come with SCs in today's turbulent and fast-paced world to develop the necessary resilience capabilities to either stop them or resume their operations quickly. As part of efforts to swiftly adapt and respond to fluctuations, it is crucial that manufacturing companies spend quality time scanning and learning from their business environment (Yu et al., 2019).

4.6.2 Moderating Effect of Environmental Munificence on the Link between Supply Chain Resilience and Financial Performance.

An indication from the regression analysis depicted a negative and non-significant moderating role of EM on the relationship between SCR and FP, which does not support H2. Thus, the findings indicated that merely operating in a munificence environment neither guarantees profitability (Abiodun et al., 2019) nor support SCR to enhance FP of manufacturing firms. The finding also indicates that there is no existence of such external resources known as EM within the manufacturing industry or put in another context, manufacturing firms in Ghana have not recognised such a pool of external resources known as EM if it exists. This implies that the external environment of the manufacturing firms in Ghana does not make resources available to sustain the growth of these firms, and this limits the opportunity for such firms to grow and prosper.

It can also be inferred from the findings that manufacturing firms in Ghana operate within an environment that is threatening and dangerous (Thanos et al., 2017), offering limited growth opportunities (Wiersema and Bantel, 1993) as well as intensified challenges (Chassé and Courrent, 2018) and poses numerous threats (Goll and Rasheed, 2005). These are all

characteristics of a hostile or low-munificence environment. Subsequently, in a business environment where the ability of firms to exploit opportunities is limited by resources (hostile environment), businesses will observe a higher risk of entrepreneurial failure (Zhao et al., 2020). The reason why most manufacturing firms in the Ghanaian context fail so many times with some collapse when faced with little disruption and challenges, making the Ghanaian context difficult for manufacturing firms (especially the local manufacturing firms) to survive. Since international manufacturing firms depend on international EM from their home country to survive during difficult and turbulent times (Tang et al., 2012).

The study also posits that manufacturing firms may also lack a market or have a diminishing market size (Yasai-Ardekani, 1989) to sell their products since the lack of available markets is an attribute of low EM. This culminates in a negative impact on organizational profitability and slack resources (Castrogiovanni, 1991). From prior submission, slack resources are sources of resilience to a firm (Cyert and March, 1963; Castrogiovanni, 1991). While a hostile environment (less munificence) may not contribute to the FP of the business as per this study, it may also have a negative influence on the building of SCR in manufacturing firms (for example, Castrogiovanni, 1991) in terms of resources.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATION

5.1 Introduction

This chapter includes an overview of the results, a recommendation, a theoretical contribution, a managerial contribution, and suggestions for further study. The results are summarised in the main section. SCR, its influence on manufacturing companies' FP, and the moderating role of EM on the link between SCR and the FP of manufacturing companies are all explored.

5.2 Summary of Findings

The study investigated two specific objectives: (1) to examine the relationship between SCR and FP, and (2) to examine how EM moderates the relationship between SCR and FP in the context of manufacturing firms in Ghana that operate in diverse contexts: food &beverages, chemicals, industrial machinery, plastic & rubber, paper & packaging, textile & clothing, etc. These objectives were addressed using survey data from 244 manufacturing firms in Ghana; those operating in major cities (https://www.ghanayello.com). Consistent with the objectives, the findings from the study are as follows.

5.2.1 The Relationship between Supply Chain Resilience and Financial Performance

To determine the relationship between SCR and FP, the construct, of SCR was mean-centered and tested against FP using the SPSS software. The result shows that SCR has a positive and significant relationship with FP (β= .472; t-value= 5.611; p-value=.000). This supported H1.

5.2.2 The Moderating Role of the Relationship between Supply Chain Resilience and Financial Performance

To determine the moderating effect of EM ON SCR-FP relationship, the construct of EM and SCR was mean-centered and a product term was created and tested against FP using the SPSS software. The result shows that EM does not significantly moderate the relationship between SCR and FP (β= 0.76; t-value= 1.079; p-value= .282 or p-value > 0.05). This did not support H2.

5.3 Theoretical Contribution

This work offers some novel theoretical implications for understanding the relationship between SCR and FP. First, the performance implication of SCR in Ghanaian manufacturing firms is one of the objectives of this study. This supports the recommendation made by Chowdhury and Quaddus (2017) for more empirical research to examine the link between SCR and performance outcomes across different countries. It also supports the findings of earlier studies (Ortiz-DeMandojana and Bansal, 2016; Dubey et al., 2019a; Chowdhury and Quaddus, 2017; Yu et al., 2019; Ruiz-Benitez et al., 2018) thus, extending and contributing to both SCR and FP literature by revealing the relevance of SCR in having a desirable FP in the manufacturing industry of Ghana. Confirmed by the study's results, businesses must comprehend the dynamics and risks associated with SCs to succeed in today's turbulent and fast-paced external environment, otherwise, there might be implications for their financial performance. In a similar vein, businesses must invest a significant amount of time and resources in scanning and learning from their external environment to swiftly adapt and respond to changes when the need arises.

Second, this study examined the moderation effect of EM on the SCR-FP relationship considering manufacturing firms in Ghana. This echoes an argument for the use of environmental

contingency variables (i.e., EM) as a boundary condition for the relationship between SCR and their respective performance outcomes (Shepherd et al., 2021). Moreover, prior studies in the domain of SCR and their corresponding performance outcomes relied on dynamic context variables (i.e. environmental uncertainty, operational disruption, and catastrophic disruption) as boundary conditions to the said relationship. Thus, this study to the best of the author's understanding is the only study that considers such boundary condition on SCR-FP relations in the manufacturing industry of Ghana. The study, therefore, extends and contributes to SCR, FP and EM literature by exposing the relevance of such environment deprived of EM in having a desirable financial performance in the manufacturing firms in Ghana.

Confirmed with the study's findings shows that manufacturing firms in Ghana operate in a low munificence (i.e., hostile) environment. Therefore, their financial performance has nothing to do with the availability of external resources known as EM.

Last, the study extends the dynamic capability theory (example, Laguir et al., 2022; Abeysekara et al., 2019; Li et al., 2017) by showing that SCR is a dynamic capability, which helps firms to prepare for inevitable risk events and to respond to and recover from unexpected disruptions to enhance FP. The study also emphasized that the reactive aspect of SCR (as proposed by Chowdhury and Quaddus, 2017) is also a good way of building resilience to fight disruption which culminates in improved financial performance.

5.4 Managerial Implications

Gaining knowledge of financial performance implication of SCR is of strategic importance in that building resilience is typically known as a resource consuming activity. However, such knowledge will be less useful and possibly mislead managers and decision makers if the financial

improvements and consequence remains unknown in the manufacturing industries in Ghana. The findings of this study with regards to the influence of SCR on FP (i.e., H1) of manufacturing firms in Ghana has proven to be positively significant. This is an indication that when manufacturing firms in the Ghanaian context invest in resilience building, their financial performance will significantly improve. Therefore, it is of great essence for operations and SC managers to invest a great number of resources in building and maintaining resilience within and around their SC. More so, to achieve better performance, SC managers should be trained and well equipped on issues of resilience building, the various forms of resilience and how to build both capabilities in the form of slack resources and buffers as a way of resilience to mitigate most SC disruptions and greatly limit the consequences of those that occur.

Again, the result from the conditional effect of EM on the relationship between SCR and FP (i.e., H2) is not significant. This shows the lack of positive influence of building resilience on manufacturing firms' financial performance. In light of this, two suggestions or reasons come into play, (1) there exists low level of external resources (i.e., munificence) within the operational environment of manufacturing firms in Ghana or (2) manufacturing firms are unable to identify those external resources constituting environmental munificence in order to put them into use. Therefore, manufacturing firms should pay attention not only to the disruptive nature of their operating (i.e., external) environment but the resources (i.e., environmental munificence) the external environment can provide to their benefit. Government should as well support manufacturing firms with the necessary resources (i.e., as this constitutes munificence) amidst disruption in order to boost their financial performance.

In a nutshell, manufacturing firms in Ghana should invest greatly in building resilience in and around their operational activities. This will help to avoid the impact of disruptions in addition to reaping the desired financial performance. Moreover, these firms should as well scan the environment in order to identify the availability of some level of external resources (i.e., EM) to their benefit.

5.5 Conclusion

In conclusion, this research demonstrates the financial benefit of manufacturing firms building resilience in and around their SCs. This study shows that manufacturing firms in the Ghanaian context will face challenges if they don't pay attention to their SCR structure. A major implication from this study is that the FP of these manufacturing firms do not depend on any form of environmental munificence. This is because their operations are done in low level of munificence. In other words, the improved financial performance of these manufacturing firms cannot be attributed to the availability of external resources (i.e., environmental munificence) within the business environment.

5.6 Limitations and Avenue for Future research

As in any research, this study has some limitations, which set grounds for future studies. First, our analysis of the relationship between SCR and FP used the growth and/or decline facet of EM as a moderator and ignored the other two distinct facets of EM - environmental capacity and opportunity and/or threat (Castrogiovanni, 1991; Goll and Rasheed, 2004). Thus, other future researchers can leverage other environmental contingencies to moderate the relationship between SCR and FP. Moreover, as a measure of financial success, this research uses a few characteristics of performance indicators. Future researchers can focus on other dimensions of

firm performance including market performance; operational performance and environmental performance as outcome variables.

Finally, only some aspect of both the proactive and reactive part of resilience was included in this study. Meanwhile, other aspect of resilience may even end up saving manufacturing companies money. Therefore, other aspects of resilience, such as preparedness for disasters, integration, flexibility, market strength, redundancy/reserve capacity, efficiency, and financial strength, can also be studied in the future.

REFERENCES

Abeysekara, N., Wang, H. and Kuruppuarachchi, D. (2019). Effect of supply-chain resilience on firm performance and competitive advantage. *Business Process Management Journal*, *25*(7), pp.1673-1695. https://doi.org/10.1108/BPMJ-09-2018-0241

African Development Bank Group. (2018). 2018 African economic outlook: Ghana. Available:

https://www.afdb.org/fileadmin/uploads/afdb/.../Generic.../Ghana_country_note.pdf [accessed 22/9/2022].

Aguinis, H., Edwards, J.R., and Bradley, K.J. (2017). Improving our understanding of moderation and mediation in strategic management research. *Organizational Research Methods, 20*(4), pp.665-685

Ali, A., Mahfouz, A. and Arisha, A. (2017). Analysing supply chain resilience: integrating the constructs in a concept mapping framework via a systematic literature review. *Supply Chain Management: An International Journal, 22*(1), pp.16-39. https://doi.org/10.1108/SCM-06-2016-0197

Ambrosini, V. and Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management?. *International journal of management reviews, 11*(1), pp.29-49. https://doi.org/10.1111/j.1468-2370.2008.00251.x

Ambrosini, V., Bowman, C. and Collier, N. (2009). Dynamic capabilities: An exploration of how firms renew their resource base. *British journal of management, 20*, pp.9-24. https://doi.org/10.1111/j.1467-8551.2008.00610.x

Ambulkar, S., Blackhurst, J. and Grawe, S. (2015). Firm's resilience to supply chain disruptions: Scale development and empirical examination. *Journal of operations management, 33*, pp.111-122. https://doi.org/10.1016/j.jom.2014.11.002

Astley, W.G. (1985). The two ecologies: Population and community perspectives on organizational evolution. *Administrative science quarterly*, *30*(2) pp.224-241. https://doi.org/10.2307/2393106

Bakshi, N. and Kleindorfer, P. (2009). Co‐opetition and investment for supply‐chain resilience. *Production and Operations Management, 18*(6), pp.583-603. https://doi.org/10.1111/j.1937-5956.2009.01031.x

Barbero, J.L., Di Pietro, F. and Chiang, C. (2017). A rush of blood to the head: Temporal dimensions of retrenchment, environment and turnaround performance. *Long Range Planning, 50*(6), pp.862-879. https://doi.org/10.1016/j.lrp.2017.02.004

Barbosa, S.D., Fayolle, A. and Smith, B.R. (2019). Biased and overconfident, unbiased but going for it: How framing and anchoring affect the decision to start a new venture. *Journal of Business Venturing, 34*(3), pp.528-557. https://doi.org/10.1016/j.jbusvent.2018.12.006

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), pp.99-120. https://doi.org/10.1177/014920639101700108

Barney, J.B. (1986). Organizational culture: can it be a source of sustained competitive advantage?. *Academy of management review, 11(*3), pp.656-665. https://doi.org/10.5465/amr.1986.4306261

Barney, J.B., (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of management, 27*(6), pp.643-650. https://doi.org/10.1177/014920630102700602

Bhatia, G., Lane, C. and Wain, A. (2013). *Building Resilience in Supply Chains*. Geneva: World Economic Forum (pp. 1-44).

Blackhurst, J., Dunn, K.S. and Craighead, C.W. (2011). An empirically derived framework of global supply resiliency. *Journal of Business Logistics, 32*(4), pp.374-391. https://doi.org/10.1111/j.0000-0000.2011.01032.x

Brandon‐Jones, E., Squire, B., Autry, C.W. and Petersen, K.J. (2014). A contingent resource‐based perspective of supply chain resilience and robustness. *Journal of Supply Chain Management*, *50*(3), pp.55-73. https://doi.org/10.1111/jscm.12050

Bryman, A. (2012). *Social research methods* (4th Ed.). New York: Oxford University Press.

Business Continuity Institute (2017). *BCI Supply Chain Resilience Report 2017*. Available: https://www.thebci.org/news/bci-supply-chain-resilience-report-2017.html [accessed 29/5/2019].

Business Continuity Institute (2018). *BCI Supply Chain Resilience Report 2018*. Available: https://www.thebci.org/uploads/assets/uploaded/c50072bf-df5c-4c98a5e1876aafb15bd0.pdf [accessed 22/9/2022].

Business Continuity Institute (2018). *BCI Supply Chain Resilience Report 2018*. Available:

https://www.thebci.org/uploads/assets/uploaded/c50072bf-df5c-4c98a5e1876aafb15bd0.pdf [accessed 29/5/2019].

Cao, M. and Zhang, Q. (2011). Supply chain collaboration: Impact on collaborative advantage and firm performance. *Journal of operations management, 29*(3), pp.163-180. https://doi.org/10.1016/j.jom.2010.12.008

Carvalho, H., Azevedo, S.G. and Cruz-Machado, V. (2012). Agile and resilient approaches to supply chain management: influence on performance and competitiveness. *Logistics research, 4*(1), pp.49-62. https://doi.org/10.1007/s12159-012-0064-2

Castrogiovanni, G.J. (1991). Environmental munihcence; a theoretical assessment. *Academy of management review, 16*(3), pp.542-565. https://doi.org/10.5465/amr.1991.4279475

Chassé, S. and Courrent, J.M. (2018). Linking owner–managers' personal sustainability behaviors and corporate practices in SMEs: The moderating roles of perceived advantages and environmental hostility. *Business Ethics: A European Review, 27*(2), pp.127-143. https://doi.org/10.1111/beer.12176

Chowdhury, M.M.H. and Quaddus, M. (2017). Supply chain resilience: Conceptualization and scale development using dynamic capability theory. *International Journal of Production Economics*, *188*, pp.185-204. https://doi.org/10.1016/j.ijpe.2017.03.020

Cohen, L., Manion, L., and Morrison K. (2007). *Research methods in education* (6th Ed.). New York: Routledge.

Covin, J.G. and Slevin, D.P. (1989). Strategic management of small firms in hostile and benign environments. Strategic management journal, 10(1), pp.75-87. https://doi.org/10.1002/smj.4250100107

Craighead, C.W., Blackhurst, J., Rungtusanatham, M.J. and Handfield, R.B. (2007). The severity of supply chain disruptions: design characteristics and mitigation capabilities. *Decision sciences, 38*(1), pp.131-156. https://doi.org/10.1111/j.1540-5915.2007.00151.x

Creswell, J.W. (2018) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches,* 3rd edition, SAGE Publications, London.

Darvishmotevali, M., Altinay, L. and Köseoglu, M.A. (2020). The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry. *International Journal of Hospitality Management*, *87*, p.102499. https://doi.org/10.1016/j.ijhm.2020.102499

Dess, G.G. and Beard, D.W. (1984). Dimensions of organizational task environments. *Administrative science quarterly*, 29(1), pp.52-73. https://doi.org/10.2307/2393080

Edwards, J. (2020). *The wildfire crisis is starting to hurt Australian companies*. [online] Bloomberg.com. Available at: <https://www.bloomberg.com/news/articles/2020-0112/the-wildfire-crisis-is-starting-to-hurt Australian-companies> [Accessed 5 May 2022].

Eisenhardt, K.M. and Martin, J.A. (2000). Dynamic capabilities: what are they?. *Strategic management journal, 21*(10_ 11), pp.1105-1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3C1105::AID-SMJ133%3E3.0.CO;2-E

Elbanna, S. (2012). Slack, planning and organizational performance: Evidence from the Arab Middle East. *European Management Review, 9*(2), pp.99-115. https://doi.org/10.1111/j.1740-4762.2012.01028.x

Elbanna, S. and Child, J. (2007). The influence of decision, environmental and firm characteristics on the rationality of strategic decision_ making. *Journal of Management Studies*, *44*(4), pp.561-591. https://doi.org/10.1111/j.1467-6486.2006.00670.x

Elbanna, S. and Fadol, Y. (2016). The role of context in intuitive decision-making. *Journal of Management & Organization*, *22*(5), pp.642-661. https://doi.org/10.1017/jmo.2015.63

Essuman, D., Boso, N. and Annan, J. (2020). Operational resilience, disruption, and efficiency: Conceptual and empirical analyses. *International journal of production economics*, *229*, p.107762. https://doi.org/10.1016/j.ijpe.2020.107762

Field, A. (2018). *Discovering statistics using IBM SPSS Statisitcs*, 5th edition, Sage: London

FM Global Resilience Index Report (2019). *2019 Resilience Index Annual Report*. FM Global, Pentlan Analytics. Available: https://www.fmglobal.mobi/research-and-resources/tools-andresources/resilienceindex [accessed 5/8/2019].

Ghana Statistical Service. (2016). Integrated business establishment survey: Regional spatial business report. Available: http://www.statsghana.gov.gh/gssmain/fileUpload/pressrelease/REGIONAL%20SPATIAL%20BUSINESS%20REPORT.pdf [accessed 22/9/2022].

Gligor, D.M. and Holcomb, M.C. (2012). Understanding the role of logistics capabilities in achieving supply chain agility: a systematic literature review. Supply Chain Management: *An International Journal, 17*(4), pp.438-453. https://doi.org/10.1108/13598541211246594

Golgeci, I. and Y. Ponomarov, S. (2013). Does firm innovativeness enable effective responses to supply chain disruptions? An empirical study. *Supply Chain Management: An International Journal*, *18*(6), pp.604-617. https://doi.org/10.1108/SCM-10-2012-0331

Goll, I. and Rasheed, A.A. (2004). The moderating effect of environmental munificence and dynamism on the relationship between discretionary social responsibility and firm performance. *Journal of business ethics, 49*(1), pp.41-54. https://doi.org/10.1023/B:BUSI.0000013862.14941.4e

Goll, I. and Rasheed, A.A. (2005). The relationships between top management demographic characteristics, rational decision making, environmental munificence, and firm performance. *Organization studies*, *26*(7), pp.999-1023. https://doi.org/10.1177%2F0266242616641749

Gu, M., Yang, L. and Huo, B. (2021). The impact of information technology usage on supply chain resilience and performance: An ambidexterous view. *International Journal of Production Economics, 232*, p.107956. https://doi.org/10.1016/j.ijpe.2020.107956

Guha-Sapir, D., Vos, F., Below, R., Penserre, S. (2012). *Annual disaster statistical review 2011: the numbers and trends.* [online] Available at: http://hdl.handle.net/2078.1/132628 Hair, J. F. J., Black, C. W., Babin, J. B., and Anderson, E. R. (2014). *Multivariate data analysis* (7th Ed.). Edinburgh Gata, Harlow: Pearson Education Ltd.

Hair, J.F., Hult, G., Tomas, M., Ringle, C.M. and Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 2 ed., Sage, Thousand Oaks, CA.

Hair, J.F., Sarstedt, M., Hopkins, L., and Kupperlwieser, V.G. (2014). Partial least squares structural equation modelling (PLS-SEM): An emerging too in business research. *European Business Review, 26*(2), pp.106-121. https://doi.org/10.1108/EBR-10-20130128

Handfield, R., Blackhurst, J., Elkins, D. and Craighead, C. (2022). *A Framework for Reducing the Impact of Disruptions to the Supply Chain: Observations from Multiple Executives*. [ebook] Availablehttps://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.515.944&rep=rep1&type=pdf [Accessed 15 May 2022]

Hendricks, K.B. and Singhal, V.R. (2003). The effect of supply chain glitches on shareholder wealth. *Journal of operations Management, 21*(5), pp.501-522. https://doi.org/10.1016/j.jom.2003.02.003

Hendricks, K.B., Singhal, V.R. and Zhang, R. (2009). The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions. *Journal of operations management, 27*(3), pp.233-246. https://doi.org/10.1016/j.jom.2008.09.001

Hendricks, K.B., Singhal, V.R. and Zhang, R. (2009). The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions. *Journal of operations management*, *27*(3), pp.233-246. https://doi.org/10.1016/j.jom.2008.09.001

Henseler, J., Ringle C.M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Sciences, 43*(1), 115-135

Hohenstein, N., Feisel, E., Hartmann, E. and Giunipero, L. (2015). Research on the phenomenon of supply chain resilience: a systematic review and paths for further investigation. *International Journal of Physical Distribution and Logistics Management, 45*(1/2), pp.90-117. https://doi.org/10.1108/IJPDLM-05-2013-0128

Homburg, C., Workman, J. P., Jr., and Krohmer, H. (1999). Marketing's influence within the firm. *Journal of Marketing, 63*(2), 1–17.

Jambulingam, T., Kathuria, R. and Doucette, W.R. (2005). Entrepreneurial orientation as a basis for classification within a service industry: the case of retail pharmacy industry. *Journal of operations management, 23*(1), pp.23-42. https://doi.org/10.1016/j.jom.2004.09.003

Jambulingam, T., Kathuria, R., and Doucette, W. R. (2005). Entrepreneurial orientation as a basis for classification within a service industry: the case of retail pharmacy industry. *Journal of operations management, 23*(1), 23-42.

Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequences. *Journal of Marketing, 57*(3), 53-70.

Jaworski, Z. and Zakrzewska, B. (2011). Towards multiscale modelling in product engineering. *Computers & chemical engineering, 35*(3), pp.434-445. https://doi.org/10.1016/j.compchemeng.2010.05.009

Jüttner, U. and Maklan, S. (2011). Supply chain resilience in the global financial crisis: an empirical study. *Supply chain management: An international journal*, *16*(4), pp.246-259. https://doi.org/10.1108/13598541111139062

Kamalahmadi, M. and Parast, M.M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics, 171*, pp.116-133. https://doi.org/10.1016/j.ijpe.2015.10.023

Karimi, J. and Walter, Z. (2015). The role of dynamic capabilities in responding to digital disruption: A factor-based study of the newspaper industry. *Journal of Management Information Systems, 32*(1), pp.39-81. https://doi.org/10.1080/07421222.2015.1029380

Koberg, C.S. (1987). Resource scarcity, environmental uncertainty, and adaptive organizational behavior. *Academy of Management Journal, 30*(4), pp.798-807. https://doi.org/10.5465/256161

Kolinski, A., Dujak, D. and Golinska-Dawson, P. (2020). *Integration of information flow for greening supply chain management*. Cham: Springer. https://doi.org/10.1007/978-3-03024355-5

Kolinski, A., Dujak, D. and Golinska-Dawson, P. eds. (2020). Integration of information flow for greening supply chain management. Springer. https://doi.org/10.1007/978-3-030-24355-5

Kownatzki, M., Walter, J., Floyd, S.W. and Lechner, C. (2013). Corporate control and the speed of strategic business unit decision making. *Academy of Management Journal, 56*(5), pp.1295-1324. https://doi.org/10.5465/amj.2011.0804

Kumar, R. (2019) *Research methodology: a step-by-step guide for beginners,* 5th edition, London: Thousand Oaks, California.

Laguir, I., Modgil, S., Bose, I., Gupta, S. and Stekelorum, R. (2022). Performance effects of analytics capability, disruption orientation, and resilience in the supply chain under environmental uncertainty. *Annals of Operations Research*, pp.1-25. https://doi.org/10.1007/s10479-021-04484-4

Lee, H.L. (2004). The triple-A supply chain. *Harvard business review*, *82*(10), pp.102-113.

Lee, S.M. and Rha, J.S. (2016). Ambidextrous supply chain as a dynamic capability: building a resilient supply chain. *Management Decision*, 54(1), pp.2-23. https://doi.org/10.1108/MD-12-2014-0674

Li, C., Xiumei, Z., Qiguo, C. and Di, Z. (2010). Research on the affecting mechanism of entrepreneurial environment on new firm performance. *Journal of Chinese Entrepreneurship, 2*(2), pp.116-128. https://doi.org/10.1108/17561391011051117

Li, X., Wu, Q., Holsapple, C. and Goldsby, T. (2017). An empirical examination of firm financial performance along dimensions of supply chain resilience. *Management Research Review*, *40*(3), pp.254-269. https://doi.org/10.1108/MRR-02-2016-0030

Liu, C.L., Shang, K.C., Lirn, T.C., Lai, K.H. and Lun, Y.V. (2018). Supply chain resilience, firm performance, and management policies in the liner shipping industry. *Transportation Research Part A: Policy and Practice*, *110*, pp.202-219. https://doi.org/10.1016/j.tra.2017.02.004

Malhotra, M. K., and Grover, V. (1998). An assessment of survey research in POM: from constructs to theory. *Journal of Operations Management, 16*, 407–425.

Mandal, S. (2017). An empirical competence-capability model of supply chain resilience. *International Journal of Disaster Resilience in the Built Environment*, *8*(02), pp.190-208. https://doi.org/10.1108/IJDRBE-02-2015-0003

Mathivathanan, D., Kannan, D. and Haq, A.N. (2018). Sustainable supply chain management practices in Indian automotive industry: A multi-stakeholder view. *Resources, Conservation and Recycling*, *128*, pp.284-305. https://doi.org/10.1016/j.resconrec.2017.01.003

Mayer, K.J. and Sparrowe, R.T. (2013). Integrating theories in AMJ articles. *Academy of Managem ent Journal, 56*(4), pp.917-922. https://doi.org/10.5465/amj.2013.4004

Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic management journal, 8*(1), pp.55-76. https://doi.org/10.1002/smj.4250080106

Miller, D. and Friesen, P.H. (1983). Strategy‐making and environment: the third link. *Strategic management journal, 4*(3), pp.221-235. https://doi.org/10.1002/smj.4250040304

Min, H. (2019). Blockchain technology for enhancing supply chain resilience. *Business Horizons, 62*(1), pp.35-45. https://doi.org/10.1016/j.bushor.2018.08.012

O'Gorman, K.D. and MacIntosh, R. (2014). *Research methods for business and management: a guide to writing your dissertation*. Wolvercote, Oxford: Goodfellow Publishers Limited.

Ortas, E., Moneva, J.M., Burritt, R. and Tingey-Holyoak, J. (2014). Does sustainability investment provide adaptive resilience to ethical investors? Evidence from Spain. *Journal of Business Ethics, 124*(2), pp.297-309. https://doi.org/10.1007/s10551-013-1873-1

Pereira, C.R., Christopher, M. and Da Silva, A.L. (2014). Achieving supply chain resilience: the role of procurement. Supply Chain Management: *An International Journal, 19*(5/6), pp.626-642. https://doi.org/10.1108/SCM-09-2013-0346

Petrou, A.P., Hadjielias, E., Thanos, I.C. and Dimitratos, P. (2020). Strategic decision-making processes, international environmental munificence and the accelerated internationalization of SMEs. *International Business Review*, *29*(5), p.101-735. https://doi.org/10.1016/j.ibusrev.2020.101735

Pettit, T.J., Croxton, K.L. and Fiksel, J. (2013). Ensuring supply chain resilience: development and implementation of an assessment tool. *Journal of business logistics, 34*(1), pp.46-76. https://doi.org/10.1111/jbl.12009

Pettit, T.J., Croxton, K.L. and Fiksel, J. (2019). The evolution of resilience in supply chain management: a retrospective on ensuring supply chain resilience. *Journal of Business Logistics, 40*(1), pp.56-65. https://doi.org/10.1111/jbl.12202

Pondeville, S., Swaen, V. and De Rongé, Y. (2013). Environmental management control systems: The role of contextual and strategic factors. *Management accounting research, 24*(4), pp.317-332. https://doi.org/10.1016/j.mar.2013.06.007

Ponomarov, S. and Holcomb, M. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management*, *20*(1), pp.124-143. https://doi.org/10.1108/09574090910954873

Priem, R.L. and Butler, J.E. (2001). Is the resource-based "view" a useful perspective for strategic management research?. *Academy of management review, 26*(1), pp.22-40. https://doi.org/10.5465/amr.2001.4011928

Priem, R.L. and Butler, J.E., (2001). Tautology in the resource-based view and the implications of externally determined resource value: Further comments. *Academy of Management review, 26*(1), pp.57-66. https://doi.org/10.5465/amr.2001.4011946

Randolph, W.A. and Dess, G.G. (1984). The congruence perspective of organization design: A conceptual model and multivariate research approach. *Academy of Management review, 9*(1), pp.114-127. https://doi.org/10.5465/amr.1984.4278106

Revilla, E. and Saenz, M. (2017). The impact of risk management on the frequency of supply chain disruptions: a configurational approach. *International Journal of Operations and Production Management, 37*(5), pp.557-576. https://doi.org/10.1108/IJOPM-03-20160129

Rindfleisch, A., Malter, A. J., Ganesan, S., and Moorman, C. (2008). Cross-Sectional versus longitudinal survey research: Concepts, findings, and guidelines. *Journal of Marketing Research*, *45*(3), 261–279.

Rosenbusch, N., Rauch, A. and Bausch, A. (2013). The mediating role of entrepreneurial orientation in the task environment–performance relationship: A meta-analysis. *Journal of management, 39*(3), pp.633-659. https://doi.org/10.1177%2F0149206311425612

Saunders, M., Lewis, P. and Thornhill, A. (2016). *Research methods for business students*, 6th ed, Harlow: Pearson Education

Sawik, T. (2013). Selection of resilient supply portfolio under disruption risks. *Omega, 41*(2), pp.259-269. https://doi.org/10.1016/j.omega.2012.05.003

Scandura, T. A., and Williams, E. A. (2000). Research methodology in management: Current practices, trends, and implications for future. *The Academy of Management Journal, 43*(6), 1248–1264.

Schilke, O. (2014). On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism. *Strategic Management Journal, 35*(2), 179-203.

Schilke, O. (2014). Second-order dynamic capabilities: How do they matter?. *Academy of Management Perspectives, 28*(4), pp.368-380. https://doi.org/10.5465/amp.2013.0093

Scholten, K., Scott, P.S. and Fynes, B. (2014). Mitigation processes–antecedents for building supply chain resilience. Supply Chain Management: An International Journal, 19(2), pp.211-228. https://doi.org/10.1108/SCM-06-2013-0191

Scrlc.com. 2022. *Supply Chain Risk Leadership Council*. [online] Available at: <http://scrlc.com/> [Accessed 17 August 2022].

Sheffi, Y. and Rice Jr, J.B. (2005). A supply chain view of the resilient enterprise. *MIT Sloan management review, 47*(1), p.41.

Shepherd, N.G., Mooi, E.A., Elbanna, S. and Rudd, J.M. (2021). Deciding fast: Examining the relationship between strategic decision speed and decision quality across multiple environmental contexts. *European Management Review, 18*(2), pp.119-140. https://doi.org/10.1111/emre.12430

Skipper, J. and Hanna, J. (2009). Minimizing supply chain disruption risk through enhanced flexibility. *International Journal of Physical Distribution & Logistics Management*,

39(5), pp.404-427. https://doi.org/10.1108/09600030910973742

Sodhi, M.S., Son, B.G. and Tang, C.S. (2012). Researchers' perspectives on supply chain risk management. *Production and operations management, 21*(1), pp.1-13. https://doi.org/10.1111/j.1937-5956.2011.01251.x

Soni, U., Jain, V. and Kumar, S. (2014). Measuring supply chain resilience using a deterministic modeling approach. *Computers and Industrial Engineering, 74*, pp.11-25. https://doi.org/10.1016/j.cie.2014.04.019

Stock, R. M. (2006). Interorganizational teams as boundary spanners between supplier and customer companies. Journal of the Academy of Marketing Science, 34(4), 588–599.

Stock, R. M., and Zacharias, N. A. (2011). Patterns and performance outcomes of innovation orientation. *Journal of the academy of marketing science, 39*(6), 870-888.

Stoel, M.D. and Muhanna, W.A. (2009). IT capabilities and firm performance: A contingency analysis of the role of industry and IT capability type. *Information and Management, 46*(3), pp.181-189. https://doi.org/10.1016/j.im.2008.10.002

Tabachnik, B.G. and Fidell, S.L., 2007. Discriminant analysis. *Using multivariate statistics*, *201*(3), pp.377-438.

Tang, J. (2008). Environmental munificence for entrepreneurs: entrepreneurial alertness and commitment. *International Journal of Entrepreneurial Behavior & Research*, *14*(3), pp.128-151. https://doi.org/10.1108/13552550810874664

Teece, D.J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal, 28*(13), pp.13191350. https://doi.org/10.1002/smj.640

Teece, D.J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of management studies, 49*(8), pp.1395-1401. https://doi.org/10.1111/j.14676486.2012.01080.x

Teece, D.J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of management perspectives, 28*(4), pp.328352. https://doi.org/10.5465/amp.2013.0116

Teece, D.J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal, 18*(7), pp.509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

Terjesen, S., Patel, P.C. and Covin, J.G. (2011). Alliance diversity, environmental context and the value of manufacturing capabilities among new high technology ventures. *Journal of Operations Management, 29*(1-2), pp.105-115. https://doi.org/10.1016/j.jom.2010.07.004

Thanos, I.C., Dimitratos, P. and Sapouna, P. (2017). The implications of international entrepreneurial orientation, politicization, and hostility upon SME international performance. *International small business journal, 35*(4), pp.495-514. https://doi.org/10.1177/0266242616641749

Treffers, T., Klarner, P. and Huy, Q.N. (2020). Emotions, time, and strategy: The effects of happiness and sadness on strategic decision-making under time constraints. *Long Range Planning, 53*(5), p.101954. https://doi.org/10.1016/j.lrp.2019.101954

Tull, D.S. and Hawkins, D.I. (1990). *Marketing Research, Measurement, and Method.* Macmillan, New York, NY

Tushman, M. L., & Anderson, P. (1986). *Technological discontinuities and organizational environments. Administrative Science Quarterly, 31*(3), pp.439-452.

Verbeke, A. and Yuan, W. (2013). The Drivers of Multinational Enterprise Subsidiary Entrepreneurship in C hina: A New Resource‐Based View Perspective. *Journal of Management Studies, 50*(2), pp.236-258. https://doi.org/10.1111/joms.12001

Voss, M.D., Whipple, J.M. and Closs, D.J. (2009). The role of strategic security: internal and external security measures with security performance implications. *Transportation journal, 48*(2), pp.5-23. https://doi.org/10.2307/25702520

Walter, S.G. and Block, J.H. (2016). Outcomes of entrepreneurship education: An institutional perspective. *Journal of Business venturing, 31*(2), pp.216-233. https://doi.org/10.1016/j.jbusvent.2015.10.003

Wernerfelt, B., 1984. A resource‐based view of the firm. *Strategic management journal, 5*(2), pp.171-180. https://doi.org/10.1002/smj.4250050207

Wiersema, M.F. and Bantel, K.A. (1993). Top management team turnover as an adaptation mechanism: The role of the environment. *Strategic management journal, 14*(7), pp.485504. https://doi.org/10.1002/smj.4250140702

Wilden, R., Gudergan, S.P., Nielsen, B.B. and Lings, I. (2013). Dynamic capabilities and performance: strategy, structure and environment. *Long range planning, 46*(1-2), pp.72-96. https://doi.org/10.1016/j.lrp.2012.12.001

Winter, S.G. (2003), Understanding dynamic capabilities. *Strategic Management Journal, 24(10)*, pp. 991-996.

Wong, C.W., Lirn, T.C., Yang, C.C. and Shang, K.C. (2020). Supply chain and external conditions under which supply chain resilience pays: An organizational information processing theorization. *International Journal of Production Economics, 226*, p.107610. https://doi.org/10.1016/j.ijpe.2019.107610

Wu, T., Blackhurst, J. and O'grady, P. (2007). Methodology for supply chain disruption analysis. *International journal of production research, 45*(7), pp.1665-1682. https://doi.org/10.1080/00207540500362138

Xie, X., Huo, J., Qi, G. and Zhu, K.X. (2015). Green process innovation and financial performance in emerging economies: Moderating effects of absorptive capacity and green subsidies. *IEEE Transactions on Engineering Management*, *63*(1), pp.101-112. https://doi.org/10.1109/TEM.2015.2507585

Yang, C.C. and Hsu, W.L. (2018). Evaluating the impact of security management practices on resilience capability in maritime firms—A relational perspective. *Transportation Research Part A: Policy and Practice*, *110*, pp.220-233. https://doi.org/10.1016/j.tra.2017.06.005

Yasai-Ardekani, M. (1989). Effects of environmental scarcity and munificence on the relationship of context to organizational structure. *Academy of management Journal, 32*(1), pp.131156. https://doi.org/10.5465/256423

Yu, W., Jacobs, M.A., Chavez, R. and Yang, J. (2019). Dynamism, disruption orientation, and resilience in the supply chain and the impacts on financial performance: A dynamic

capabilities perspective. *International Journal of Production Economics, 218*, pp.352-362. https://doi.org/10.1016/j.ijpe.2019.07.013

Zajac, E.J., Kraatz, M.S. and Bresser, R.K., 2000. Modeling the dynamics of strategic fit: A normative approach to strategic change. Strategic management journal, 21(4), pp.429-453. https://doi.org/10.1002/(SICI)1097-0266(200004)21:4%3C429::AIDSMJ81%3E3.0.CO;2-%23

Zollo, M. and Winter, S.G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization science, 13*(3), pp.339-351. https://doi.org/10.1287/orsc.13.3.339.2780