Addis Ababa University

School of Commerce

The effect of supply chain resilience on organizational performance

:The moderating role of E-commerce in the case of garment exporters in Bole-Lemi Industrial Park

A thesis submitted for the partial fulfilment of the requirement of the degree of Master of Art in Logistics and Supply Chain Management

By

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This is to Certify that the thesis prepared by Habtamu Hizkiyas, entitled: *The effect of supply chain resilience on organizational performance :The moderating role of E-commerce in the case of garment exporters in Bole-Lemi Industrial Park* submitted in partial fulfillment of the requirements for the degree of Master of Arts in Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

All organizational factors combined with supply chain resilience should ultimately lead to improved organizational performance. Firms that are resilient should make proactive efforts as an essential or vital point of administrative consideration. This study tried to assess the moderation role of e-commerce between the supply chain resilience and organizational performance. A structured questionnaire was used to collect the responses to conduct an exploratory research design on selected manufacturing firms in Addis Ababa, Ethiopia. The target population for this study was 19,814, and self-administered questionnaires were distributed to the sample size calculated 392 respondents. The study employed multiple linear regression to examine the assumptions made in the hypothesis and specifically to assess the relationship between the variables and moderation role of e-commerce. The analysis found a statistically significant positive link between Supply Chain Resilience (SRC) and Organizational Performance (OP), with SRC having a moderate to strong effect ($\beta = 0.529$) and E-commerce also having a significant effect ($\beta = 0.149$). Additionally, it was discovered that E-commerce plays a moderation role in the relationship between SRC and OP, although this effect was found to be relatively weak ($\beta = 0.016$, $\rho=0.595$). Overall, the study revealed that supply chain resilience has a significant positive influence on organizational performance, with E-commerce serving as a complementary rather than critical factor. To ensure effective operations during supply chain disruptions, organizations are recommended to prioritize fundamental resilience measures.

Key Words:- Supply chain resilience: E-commerce: Organizational performance: supply chain management: supply chain agility: Digitalization

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Declaration

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

Signature: _____ Date: _____

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List of Abbreviations

SCR	**Supply Chain Resilience**
SCD	**Supply Chain Digitalization**
OP	**Organizational Performance**
Ecom	**E-commerce**
SCM	**Supply Chain Management**
SCA	**Supply Chain Agility**
SCP	**Supply Chain Performance**
SCMBP	**Supply Chain Management Best Practices**
SCRM	**Supply Chain Risk Management**
IPDC	**Industrial Park Development Corporation**

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Businesses with global operations and extensive supply chains are constantly at risk, impacting their potential for growth and profitability. The issue of supply chain risks has been a focal point for both industry professionals and researchers, who have been dedicated to devising effective solutions and strategies to mitigate and prevent adverse outcomes.

Research on supply chain resilience emerged in the early 2000s following pivotal studies by (Roberta Pereira et al., 2014). Drawing parallels from ecological systems, which demonstrate the ability of species to adjust to environmental disruptions, scholars have embraced the concept of resilience as articulated by Fiksel: "the capability of an organization to endure, adjust, and thrive amidst turbulent transformations."

Enhancing resilience often necessitates investment, and quantifying the returns can prove challenging. A resilient business may not always be aware of the crises it sidestepped or the consequences it dodged due to its investments. Utilizing traditional financial metrics like revenue or profitability to gauge the connection between resilience and performance is complex. Numerous external factors impact these metrics, making it difficult to isolate the impact of specific actions or decisions. Instead, the focus has shifted to analyzing variations in organizational performance indicators such as timeliness of deliveries, product quality, and inventory levels (Pettit et al., 2013).

Scholars have emphasized the importance of ensuring resilient supply chains to manage interdependencies. This perspective has been advocated by authors like (Carvalho, Cruz-Machado, et al., 2012; Erol et al., 2010; Sheffi et al., 2003). The lack of resilience in one segment of the supply chain can trigger a cascade of disruptions, affecting capacities across the entire chain. Instances like the Tohoku earthquake and tsunami in Japan in 2011 underscore how disruptions in one region can reverberate globally, impacting supply chains in countries such as Thailand, Taiwan, and Canada.

In today's digital era, e-commerce has become a rapidly growing phenomenon, especially in emerging markets. Businesses are increasingly opting to buy and sell online, with developing

economies like India and China transitioning from traditional brick-and-mortar operations to click-and-mortar models. E-commerce is viewed as an emerging opportunity in the business landscape, with organizations globally working towards adopting it to meet their business goals (Chandran et al., 2001).

Given the rise of the e-commerce industry and the heightened competition in both local and foreign markets, it is crucial to have appropriate performance indicators that enable managers to respond swiftly and sustain the commercial viability of their firms. These indicators serve as effective feedback on whether a company is progressing towards its ultimate goals and can help managers evaluate the effectiveness of their strategies (Migiro & Ambe, 2008). The research utilizes the idea of a balanced scorecard to assess companies' effectiveness Kaplan & Norton (1992) focusing on four key areas: financial, customer, internal business process, and learning and growth. The measurement components for each area are adjusted to incorporate the viewpoints on e-commerce technology as proposed by the author (Mohamed et al., 2018).

1.2 Statement of the Problem

The textile and apparel sector makes up 20% of the nation's overall export revenue. Over the past few years, exports from this industry have exceeded those of petroleum and natural gas, ranking second only to electronic components in global revenue. The textile industry experienced growth in 2018, with export revenue reaching around USD 36 billion, marking a nearly 20% rise from the previous year (Textile and Garment Association, 2018).

While Pettit et al., (2010) established a much-needed framework for Supply Chain Resilience (SCR), and (Kamalahmadi & Parast, 2016) contributed to defining SCR and identifying its components, a thorough examination of the existing literature on resilience theory within the context of Supply Chains reveals a gap in current comprehensive reviews of SCR that systematically outline the concept within a framework.

Various researchers (Roberta Pereira et al., 2014; Wagner et al., 2012; Wright, 2013) have explored the presence of different strategies in the supply chain management (SCM) domain to enhance effectiveness. While they have outlined diverse tactics within the supply chain, none have put forward specific metrics for supply chain resilience (SCR). Analysis of case studies from developed nations is employed to evaluate performance indicators in supply chain operations.

Previous research on SCR writing has emphasized the necessity for empirical studies (Hohenstein et al., 2015). However, it is unclear what specific progress has been achieved through observation in SCR and how this could shed light on the underlying structure of SCR. Additionally, Hohenstein et al., (2015) highlighted that the focus on subjective methods created a need for evaluating and measuring SCR performance. Here too, progress has been made to utilize quantitative methodologies, yet no concentrate exhaustively examines the impact of SCR in an organization performance specific to the garment exporters we have in Ethiopia. Ali et al., (2017), gave reasonable lucidity to the idea of SCR by featuring its three significant develops, specifically, versatility stages, flexibility procedures, and capacities should have been strong. While explaining widely on these to accomplish those abilities, they didn't cover the expansiveness of the SCR writing to reveal its different exploration regions in accordance with organizational performance moderated by ecommerce or digitalization. are highly descriptive.

Existing research indicates that the adoption of supply chain management (SCM) has a positive impact on supply chain efficiency and overall organizational performance. However, there is a scarcity of studies that examine this relationship specifically for small and medium-sized enterprises (SMEs) in underdeveloped or developing economies. While there is a wealth of literature discussing the significance of supply chain management best practices (SCMBPs), supply chain agility (SCA), supply chain risk management (SCRM), and supply chain performance (SCP) from diverse perspectives, research on these concepts in developing or underdeveloped economies is limited. Notable exceptions include studies by Bayraktar et al. (2009) and Lenny Koh et al. (2007) conducted on SMEs in Turkey, as well as the work of Mishra et al. (2016) focusing on various sectors of SMEs in India.

There are some studies on SCM within African SMEs, but none have employed an extensive empirical study involving multiple firms with the specific focus on supply chain resilience and organizational performance.

Furthermore, there is a lack of extensive research that explicitly explores the connections and effects of various significant supply chain resilience (SCR) factors on organizational performance. For instance, investigations conducted by Pretorius et al. (2022), Peristeris (2014), Adebayo (2012), Voortman & Makhitha (2014), and Migiro & Ambe (2008) have touched on this subject. Brent (2005) also delved into supply chain performance through an environmental lens. Our

literature review uncovered a gap in the empirical research landscape, specifically in terms of studying the impacts of supply chain resilience on organizational performance within an African context.

What will make this study resourceful or authentic is that no research has examined the impact of being efficient and capable to keep, respond and recover to supply chain interruption among the garment manufacturing sector in light of its cascade effect on the performance while having digitalization concept or infrastructure simultaneously was never been conducted as a point of research in Addis Ababa, Ethiopia industry park. As mentioned, the research has explored the relationship between supply chain resilience (SCR) and organizational performance (OP) in various contexts (Pezeshkan et al., 2016; Abdissa et al., 2022; Al-Dhaafri et al., 2016). However, there is a dearth of significant research focusing on SCR and OP within the Ethiopian garment sector. While literature has discussed the supply chain strategies of BRICS nations (Brazil, Russia, India, China, and South Africa), there is a notable lack of studies investigating the impact of supply chain resilience on organizational performance in Ethiopian manufacturing supply chains, particularly with regard to the moderating influence of e-commerce. This gap contrasts with existing research in humanitarian and other manufacturing sectors, as evidenced by studies conducted by (Abay, 2020; Damtie et al., 2020; Habtemariyam & Kero, 2022; Musau, 2018; Negero, 2018).

1.3 Objective of the Research

1.3.1. General Objective

The main aim of this research is to explore how the resilience of the supply chain impacts the performance of organizations in the e-commerce sector, focusing specifically on garment exporting companies located at the Bole Lemi Industrial Park.

1.3.2. Specific Objectives

The specific objectives of the study are:

1. To assess the effect of supply chain resilience on organizational performance in the case of garment exporters of Bole Lemi Industrial Park.
2. To examine the moderating role of e-commerce between supply chain resilience and organizational performance.

3. To examine the effect of e-commerce on organizational performance.

1.4 Research Hypotheses

1. Supply chain resilience has a significant effect on the organizational performance.
2. The effect of supply chain resilience on organizational performance is moderated by E-commerce.
3. E-commerce has a significant effect on organizational performance.

1.5 Significance of the study

The study aims to evaluate the effectiveness of supply chain management (SCM) in garment manufacturing firms located in Ethiopia's Bole Lemi Industrial Park. These firms could enhance their competitiveness in the global market by efficiently implementing SCM practices. The research has a tangible impact on evaluating SCM practices and identifying supply chain challenges. It potentially enables companies to make informed decisions based on the study results, improve organizational performance, and enhance supply chain resilience. Additionally, the study could offer valuable data on supply chain resilience for researchers, educators, and students.

1.6 Scope of the study

The scope of the research assessed the effect of supply chain resilience on organizational performance with the moderating role of e-commerce in the case of garment exporters in bole Lemi industrial park. In addition, the study included garment and apparel exporters located in Addis Ababa city Bole Lemi Industry Park. The study included also exporters with in the industry park and mainly engaged in the garment exporting. Furthermore, the study addressed companies that have experiences in the ecommerce either directly or indirectly.

1.7 Limitation of the study

Like so many studies, this study is also bounded to encounter some limitations. The primary focus of this study is not to encompass all supply chain players as applicable to supply chain management, but rather to examine the effect of supply chain resilience on the organizational performance of the company from garment exporters employees, logistics service providers and government offices. Future studies can take into account other players in the supply chain, such as suppliers, buyers, labels, freight forwarders, and transporters, for a more thorough analysis. It

needs more factories that are in other industrial parks to be considered an industry. Finance was a major obstacle to embracing diverse influence in the supply chain.

1.8 Definition of terms

Supply Chain Resilience - Resilience refers to a firm's capacity to recover and return to regular operations (Sheffi & Rice Jr, 2005).

Organizational Performance - Performance pertains to the extent to which an organization, functioning as a social entity, utilizes specific resources and methods to accomplish its goals (Sulea et al., 2012).

E-Commerce - Encompassing the utilization of digital technologies like big data, cloud computing, blockchain, and artificial intelligence within supply chain operations, the concept of data-driven decision-making has been discussed by several researchers (Colombari et al., 2022; Ageron et al., 2020; Büyük, 2018; Caputo et al., 2021; Hartley & Sawaya, 2019; Holmström et al., 2019).

Garment Exporters – manufacturers involved in garment making and selling the foreign market which are present in Ethiopian Bole Lemi Industrial Park.

IPDC – Industry Park Development Corporation

1.9 Organization of the study

The research is structured into five sections. The first chapter introduces the study with details on the background, statement of the problem, research questions and objectives, hypothesis, significance, scope, limitations, and definition of terms. Chapter two focuses on reviewing existing literature related to the topic, both theoretically and empirically. Chapter three provides a detailed overview of the design and methodology used. Chapter four involves the analysis and discussion of findings in relation to research objectives and hypothesis. The final chapter includes the conclusion, recommendations, and a brief discussion on the significance of the study for future research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Review of Theoretical Literature

2.1.1. The Concepts and theories of Supply Chain Resilience

Despite the ample body of literature in SCML on resilience, there are multiple interpretations for what it means to be. In certain instances, it is recognized as the capacity of a company to bounce back from disruptive occurrences Blackhurst et al., (2011) and within a satisfactory timeframe Ralston & Blackhurst, (2020). One extended perspective encompasses the capability to organize, react, and bounce back from interruptions (Ponomarov & Holcomb, 2009). Another extended perspective involves the capacity to endure and bounce back from interruptions (Park et al., 2023).

In some research, however, the capacity to endure disturbances is called robustness, instead of resilience (F. Li et al., 2019; Zhao et al., 2019). There does appear to be increasing agreement, however (Brandon-Jones et al., 2014; Zhao et al., 2019), that resilience represents the capability for companies to both "rebound" to usual operations Sheffi & Rice Jr, (2005) and occasionally to "spring ahead" to a more favorable state in response to a disturbance (Hohenstein et al., 2015). Newer studies also mention that addressing and bouncing back from interruptions necessitates reorganizing, adjusting, or reassembling the supply chain structure (Ivanov et al., 2018; Zhao et al., 2019).

Supply chain is the "capacity to sustain, carry out, and rebound (adjust) planned operations while achieving the intended (or adjusted, but still satisfactory) outcomes is thus the subsequent essential attribute of the supply chain" (Ivanov et al., 2018). One of the primary goals of supply chain management is to enhance overall supply chain productivity, commonly known as supply chain effectiveness (i.e., sales and service level) and efficiency (supply chain costs). At the same time, fulfillment of anticipated results can be impeded by interruptions in a live operational setting.

This necessitates supply chain defense against and effective response to interruptions. Thus, need to be designed to be sturdy and durable enough to (1) uphold their fundamental characteristics and guarantee implementation and (2) have the capability to modify their actions in the event of disturbances in order to achieve intended efficiency using recuperation measures (Aldrighetti et

al., 2021; Dolgui et al., 2020; Ivanov & Das, 2020; Ivanov & Dolgui, 2021; Panetto et al., 2020; Sawik, 2022; Schmitt et al., 2017). Design and management of resilience can be costly, but a lack of it can lead to even greater losses if a supply chain experiences disruptions. The issue of resilience management is highlighted by this trade-off. Supply chain resilience can be increased by high inventory, capacity reservations, and lead time reserves (Aldrighetti et al., 2021). A balanced approach to investments in resilience is needed to achieve maximum performance with disruption risk considerations at acceptable redundancy costs.

Supply chain resilience is the "capacity to uphold, carry out, and bounce back (adjust) planned implementation along with attainment of the planned (or adjusted, but still satisfactory) performance is thus the following target characteristic of the supply chain" (Ivanov et al., 2018). One of the primary goals of supply chain management is to enhance overall supply chain output performance, which is essentially known as supply chain effectiveness (i.e., sales and service level) and efficiency (supply chain costs).

At the same time, attainment of intended results can be impeded by interruptions in a live operational setting. This necessitates supply chain safeguarding and effective response to interruptions. \n Consequently, supply chains must be designed to be sturdy and durable enough to (1) uphold their fundamental characteristics and guarantee implementation and (2) have the capability to adjust their actions in the event of interruptions to attain intended efficiency through recuperation strategies (Aldrighetti et al., 2021; Ivanov & Das, 2020; Ivanov & Dolgui, 2021; Panetto et al., 2020; Peabody et al., 2014; Sawik, 2022).

While some of the disturbances experienced by organizations and supply chains are external - such as natural (e.g. wildfires, earthquakes, political, trade disputes, regulatory changes), and economic (e.g. fluctuations in currency exchange rates, market downturns) factors - many are also the result of internal challenges, such as inefficient processes, poor communication, and lack of contingency planning. These disruptions can have a significant impact on a company's operations, leading to delays, increased costs, and loss of market share. To mitigate these risks, organizations must be proactive in identifying and addressing potential vulnerabilities in their supply chains and implementing robust risk management strategies (e.g. seismic events) and anthropogenic calamities (e.g. industrial accidents) – others stem from within the confines of the supply chain.

Furthermore, the impacts of certain disruptions are amplified by the tactics companies intentionally embrace. The execution of streamlined initiatives and unique-sourcing regulations, for instance, may assist in reducing expenses and enhancing coordination, but they may also deplete a supply chain of any extra capacity to accommodate unforeseen events and thus vulnerable to interruption (Flynn et al., 2010; Tang & Tomlin, 2008). Hence, a company's internal operational choices may worsen its susceptibility to external threats. Additionally, the increasing interconnectedness of modern businesses in worldwide supply chains exacerbates the issue (Diabat et al., 2012; Finch, 2004).

Certain authors have suggested that due to this interdependence, it is essential for businesses to ensure the resilience of their supply chains (Carvalho, Maleki, et al., 2012; Erol et al., 2010; Sheffi et al., 2003; Shekarian & Mellat Parast, 2021). Without this resilience, a disruption at a single point can lead to disturbances or decreased capabilities throughout the entire supply chain (Craighead et al., 2007; Wakolbinger & Cruz, 2011). The Tohoku earthquake and tsunami in Japan in 2011 serves as a prime example, as supply chain disruptions were not limited to Japan but also affected other countries such as Thailand, Taiwan, Canada, Australia, the UK, and the USA (Reserve Bank of Australia, 2011). These disruptions had a ripple effect throughout the global manufacturing supply chain Wildgoose et al., (2012), resulting in widespread consequences worldwide.

The possible influence of interruptions on a company and its supply chain underscores the significance of constructing resilience (Carvalho, Maleki, et al., 2012) has been reported that disruptions in the supply chain can lead to substantial financial and operational setbacks for companies (Ponis & Koronis, 2012; Ponomarov & Holcomb, 2009; Stecke & Kumar, 2009). This includes decreases in stock market value, for example (Hendricks & Singhal, 2005), plus declines in operational profit, profit margin, and profitability ratios, e.g. of 107, 114, and 93%, severally (Hendricks & Singhal, 2005). Additionally, there are instances where supply chains have totally disintegrated and never regained stability after a disturbance (Tang & Tomlin, 2008; Yin & Xu, 2021).

The resilience of a system can be evaluated through the resilience triangle, which considers factors such as performance, loss assessment, and recovery time (Cimellaro et al., 2010; Falasca et al.,

2008). Decision-makers within an organization or supply chain may determine a suitable benchmark for comparison. The COVID-19 pandemic has posed a significant challenge to the resilience of supply chains. In response to increasingly frequent natural and man-made disasters over the past twenty years, many companies have implemented supply chain resilience measures. A disruption profile is utilized to enhance supply chain resilience, acknowledging that the previous norm may not suffice during major disruptions, making recovery a challenge (Aldrighetti et al., 2021).

2.1.2. The Concepts and theories of organizational performances

In order to define the firm's performance it is important to mention that "financial indicators reflect the fulfilment of an multinational enterprise's (MNE's) economic goals in financial terms" (Pishchulov et al., 2023). There are also market-based financial indicators that take the investor's view and focus on or involve risk considerations (Pishchulov et al., 2023). According to Pishchulov et al., (2023) all these indicators form "the narrowest conception of business performance", and "the border conceptualization of performance is operational performance".

Few studies use consistent definitions and measures to define organizational performance (Kirby, 2005). In management research, performance is so common that its structure and definition are rarely explicitly justified; instead, their suitability, regardless of its form, is unquestionably assumed ((March & Sutton, 1997).

Researchers hold varying views on the concept of performance. In the realm of organizational research, the notion of performance remains a subject of debate (F. Li et al., 2019). For instance, according to (Peabody et al., 2014), performance is often associated with the well-known 3Es – economy, efficiency, and effectiveness – of a particular program or activity. On the other hand, (Elleuch et al., 2016) defines organizational performance as the organization's ability to achieve its goals through the efficient utilization of resources. This definition aligns closely with the perspectives of (Elleuch et al., 2016; Iyer et al., 2009), who equate an organization's capacity to reach its objectives with its performance. The term "organizational performance" not only grapples with issues related to its definition but also faces challenges on a conceptual level.

In the context of modern management, the concept of organizational performance has encountered conceptual ambiguity across various domains (Hefferman & Flood, 2000). Key areas of concern include defining the concept accurately and measuring it effectively. It is crucial to differentiate

between performance, efficiency, and productivity, as highlighted by Abujarad & Yusof (2010). While productivity measures the amount of work completed within a specific timeframe, performance encompasses factors such as quality, consistency, and other pertinent aspects. Moreover, productivity metrics are commonly integrated into outcome-focused evaluations.

According to Iyer et al. (2009), performance indicators may involve outcome-focused actions and comparative assessments, as well as education, training, concepts, and tools, such as leadership training and management development, which are essential for fostering the necessary competencies and mindsets for performance management. The literature review mentioned above indicates that the definition of 'performance' should be expanded to include efficiency, efficacy, cost-effectiveness, quality, consistent behavior, and standardized metrics (Richard et al., 2009).

The factors that determine the performance of an organization have always been a topic of interest. Han et al. (2020) identified two main research approaches in this area. One approach, rooted in economic theory, emphasizes the role of external market forces in shaping organizational performance.

The other approach, drawing from behavioral and sociological perspectives, highlights the significance of internal organizational factors and their alignment with the external environment in driving success. The economic framework for organizational performance outlines several key determinants of profit, such as industry characteristics, competitive positioning, and resourcefulness.

On the other hand, models focusing on organizational performance delve into aspects like human resources, organizational culture, and leadership styles. Chien (2004) identified five key factors affecting organizational performance: leadership styles, organizational culture, job design, motivation models, and human resources policies.

In this latest research, organizational culture, competitive pressure, and organizational creativity are considered alongside organizational innovativeness. Several studies have endorsed the economic and organizational factors model. For instance, Han et al. (2020) revealed that economic factors accounted for merely 18.5% of the variation in business returns, whereas organizational factors played a more significant role, contributing to 38% of the variance in organizational performance. Research has centered on identifying the organizational factors that influence

organizational performance. Trovik and McGivern (1997) discovered that organizational factors had a more pronounced effect on performance compared to economic factors.

2.1.3. The Concepts and theories of e commerce

Urban lockdowns, disruptions in logistics, and changes in the workplace and market environment have sped up the supply chain digitalization process, garnering significant interest from businesses. The advancement in supply chain digitalization has been hastened by the utilization of big data analysis, blockchain, and AI technologies. Digitalization is a concept that highlights the organized utilization of data to enhance production and operational activities, achieve supply chain transformation and enhancement, and enhance overall operational efficiency and quality development.

This shift in the supply chain management approach has brought about the introduction of innovative products and business models (Yin & Xu, 2021). Companies can leverage supply chain digitalization to enhance supply chain resilience during crises, enabling them to swiftly recover from setbacks and return to their original performance levels. The application of digital technology has been a focal point in numerous pertinent studies.

The advancement of SCRs through digital technologies involves the adoption of specific digital tools to reduce risk and integrating them into the entire SCR system, along with establishing a digital resilience management framework. Utilizing a digital supply chain can enhance product quality and supply chain efficiency while promoting resilience within the supply chain. As noted by Zhao et al. (2023), the structure and processes of digitally driven supply chains are continually evolving, adapting to internal and external uncertainties, and fostering resilience during disruptions. Nevertheless, empirical studies are necessary to validate the effectiveness of this digitally driven approach to SCR enhancement and provide measurable outcomes to aid enterprise resilience management strategies.

Digitalization and Supply Chain Resilience (SCR) have the potential to enhance performance levels, as suggested in some literature. Additional empirical research is required to investigate how the implementation of Supply Chain Digitalization (SCD) and SCR impacts supply chain performance. In the contemporary digital age, digital services and the analytical algorithms supporting them have emerged as key competitive factors. Particularly post the onset of the COVID-19 pandemic, which resulted in urban blockades and logistical challenges, there has been

an increased emphasis on remote operations, paperless processes, and the restructuring of supply chain frameworks. This shift has enabled companies to better mitigate disruption risks by expediting digital supply chain development.

Core companies and various stakeholders have utilized blockchain technology for overseeing and tracking the food production process (Mendez-parra & Macleod, 2021). Digital competencies and elements are introduced to accomplish the objective of e-commerce, alongside other digital preparations like digital strategy, digital organizational structure, digital culture, and digital talent (Altay et al., 2018; Elleuch et al., 2016; L. Zhao et al., 2013). The modifications in business and supply chain operations prompted by the Supply Chain Digitalization (SCD) driven by new technologies are being monitored by academia and industry.

The integration of digital technologies such as big data, cloud computing, blockchain, IoT, and AI into supply chain operations is forming a functional process of "data-driven decision-making" (Ageron et al., 2020; Büyük, 2018; Caputo et al., 2021; Hartley & Sawaya, 2019; Holmström et al., 2019; Scott et al., 2018; Sulea et al., 2012), resulting in a substantial generation of data and information within traditional supply chain procedures.

The findings from data analysis have the potential to enhance the efficiency of particular business operations. For instance, according to N. Zhao et al. (2023), utilizing digital advancements such as intelligent contracts, electronic storage, and smart tags facilitates product traceability across the entire production cycle, starting from the creation of raw materials to the delivery of the final product. This traceability feature enhances transparency and dependability within the supply chain. SCD focuses on the specific alteration of supply chain operations and decision-making processes driven by digital technology applications, distinguishing it from related concepts such as digital transformation as discussed by Ageron et al. (2020) and Davis-Sramek & Richey (2021).

The process of achieving digital transformation within businesses can be accomplished by following the four stages of data collection, integration, processing, and analysis, as outlined by Aldrighetti et al. (2021). Zhao et al. (2023) suggest that digitalization can be classified as either internal or external, depending on its focus.

Internal digitalization aims to streamline internal operational processes, reduce costs, and enhance efficiency through the implementation of digital solutions such as video conferencing, email communication, digital training, and task support. On the other hand, external digitalization not

only minimizes communication expenses and fosters partnerships with suppliers and collaborators but also enables businesses to anticipate customer needs accurately and build customer loyalty. The integration of digital technologies and data is examined by Scott et al. (2018), emphasizing the creation of structured processes and functions through extensive data integration. Kamalahmadi & Parast (2016) posit that digitalization plays a pivotal role in transforming manufacturing companies by shifting towards service-oriented models, where customers pay for services rather than products.

This shift creates new business models and opportunities for value creation through digital services. Existing research demonstrates that digitalization significantly enhances performance levels, particularly in areas such as supply chain visibility, connectivity, innovation, real-time operations, transparency, speed, and ecommerce.

2.2. Review of Empirical Literature

2.2.1. Supply Chain Resilience practices

According to Wang et al. (2020), developing resilience in organizations depends on factors such as the nature of the disruption, the organization's position in the supply chain, and the impact on both the organization and the supply chain. Various strategies are needed to enhance resilience at different levels, whether at the company or supply chain level. Building resilience at the supply chain level is tied to the overall performance of the firms involved, with the effectiveness of this approach being limited. The resilience of a supply chain is strengthened by the presence of more companies that remain unaffected by disruptions. Understanding the interplay of supply chain disruptions can aid in resource allocation, mitigation efforts, and ultimately improve supply chain efficiency for the benefit of all stakeholders involved.

Various fields discussed resilience prior to its integration into the realm of supply chain management. Supply chain resilience is made achievable through the extensive knowledge available in these fields. An escalation in vulnerability within supply chains triggers the development of supply chain resilience. The inception of resilience in the supply chain sphere commenced in the early 2000s. Despite minor disruptions causing significant losses, organizations primarily concentrated on efficiency-related aspects regarding the supply chain itself (Mendez-parra & Macleod, 2021).

Supply chain resilience denotes the capacity to rebound from an unfavorable performance state to a predetermined performance state by initiating recovery or adaptation measures (Islam et al., 2023). Preparedness, vigilance, and agility serve as the three fundamental components of supply chain resilience (Islam et al., 2023). Their aim is to lessen the impact of disturbances and ensure swift recovery. Velocity manifests diversely in the supply chain. The supply chain management and supply chain risk management sectors define distinct types of velocity. The speed at which systems recover or readjust following a setback is deemed a marker of resilience. Swift velocities lead to expedited tactical, operational, and strategic decision-making, as well as accelerated adaptation to market alterations. Consequently, heightened velocities facilitate rapid tactical, operational, and strategic decision-making, as well as prompt adjustment to market shifts. Hence, it can be construed as a gauge of resilience within the supply chain (Mendez-parra & Macleod, 2021).

Supply chain resilience is dependent on both proactive and reactive approaches to supply chain resilience. Supply chains must develop an adaptive capacity to prepare themselves for both unexpected happenings and risky events, regardless of whether they follow a proactive or reactive approach (Mendez-parra & Macleod, 2021).

The strategies that became popular during the epidemic can be divided into two categories: proactive and reactive. Digital connectivity, supply chain automation, localization/regionalization of sourcing, collaboration, and a social supply chain focus are proactive strategies. These strategies were deployed before the Pandemic, but they were not considered in the context of the Pandemic (Y. Wang et al., 2020).

Existing research shows that the resilience of the supply chain has a positive impact on how well an organization performs (Mendez-parra & Macleod, 2021). However, when it comes to dealing with major, long-term disruptions on a global scale, like pandemics, there aren't any proactive or reactive strategies in place. Instead, the focus is on building resilience by addressing smaller, local disruptions (Mendez-parra & Macleod, 2021). Due to the lack of other options, organizations have had to adopt these strategies. Nevertheless, relying solely on inventories has its limitations in meeting demand, especially during extended disruptions like quarantines. This may render subcontracting solutions ineffective and their overall impact uncertain (Y. Wang et al., 2020).

In the current competitive environment, supply chain resilience can be an important strategic weapon (Melnik, 2019; Pettit et al., 2019). The ability of a firm to withstand a disruption and return to its original state, or even move toward a more desirable state, is known as resilience in the supply chain (Roberta Pereira et al., 2014). M. Ali et al., (2021) and Pettit et al., (2010) Resilience is defined by the 'four Rs': robustness, resourcefulness, recovery, and evaluation. Diverse strategies have been suggested in the literature to enhance SCR (Abujarad & Yusof, 2010; Aslam et al., 2020; Negri et al., 2021; Shekarian & Mellat Parast, 2021; Tang & Tomlin, 2008).

The literature recognizes that flexibility, agility, collaboration, and redundancy strategies are the most important organizational capabilities to improve a firm's responsiveness to supply chain disruptions (Asamoah et al., 2020; Ivanov & Das, 2020; Kamalahmadi & Parast, 2016; Liu et al., 2021; Memon et al., 2020; Pettit et al., 2013; Ponis & Koronis, 2012; Roberta Pereira et al., 2014; Sheffi & Rice Jr, 2005; Sutduean et al., 2019; Tang & Tomlin, 2008; Tukamuhabwa et al., 2015; Y. Wang et al., 2020; Wildgoose et al., 2012). In this context, supply chain resilience (SCR) has risen in distinction among intellectuals, and the concept is of gained evolving interest among practitioners alike (Craighead et al., 2007; Roberta Pereira et al., 2014; Sonnentag & Frese, 2002). The concept of SCR emerged in early 2000 with the studies of (Christopher et al., 2004; Jafari et al., 2023; Sheffi & Rice Jr, 2005).

SCR is defined as the adaptive capability of a supply chain to reduce the probability of facing sudden disturbances, resist the spread of disturbances by maintaining control over structures and functions, and recover and respond by immediate and effective reactive plans to transcend the disturbance and restore the SC to a robust state of operations, according to a systematic literature review by (Kamalahmadi & Parast, 2016).

2.2.2. Organizational performances

Supply Chain Management (SCM) offers fresh insights into leveraging best practices to boost a company's objectives, promoting efficiency and competitiveness (Banerjee & Mishra, 2017; Chandran et al., 2001). The assortment of SCM best practices is expanding, with examples like supply chain integration, just-in-time, and buyer-supplier collaboration (Scott et al., 2018; Singh, 2011; N. Zhao et al., 2023). Past research (Abujarad & Yusof, 2010; Randall et al., 2011; Y. Wang et al., 2020; Yanar et al., 2020) has acknowledged the significance of four Supply Chain Management Best Practices (SCMBPs): buyer-supplier collaboration, IT adoption, supply chain

integration, and total quality management. These studies highlight the diverse components that SCMBPs encompass. It has been proposed by Banerjee & Mishra (2017) that when effectively implemented, SCMBPs establish organizational flexibility. The emphasis on Supply Chain Agility (SCA) is rooted in its role as a critical driver of competitive advantage and sustainable performance enhancement (Chen et al., 2022; Eckstein et al., 2015; Mohammed et al., 2013). The affordability of agile practices is linked to better resilience against disruptions and risks that could impact supply chain operations, making it a key performance enabler in volatile markets (Altay et al., 2018; Whitten et al., 2012).

The risk management of a supply chain plays a crucial role in enhancing its resilience and reducing vulnerability, which can impact the overall efficiency and effectiveness of the supply chain (Damtie et al., 2020; Pettit et al., 2013; Singh, 2011). Effective managerial strategies are necessary to assess and steer a company's ability to fulfill the needs of both suppliers and customers through its supply chain (Lee & Choi, 2021; Liu et al., 2021). Numerous studies have highlighted the benefits of adopting supply chain management best practices and their impact on performance (AL-Shboul et al., 2018; Dametew et al., 2016; Han et al., 2020; Ozdemir et al., 2022; Remko, 2020; Wildgoose et al., 2012). It is anticipated that implementing supply chain practices will be associated with supply chain agility, leading to improved risk management and enhanced supply chain efficiency. This is particularly crucial for manufacturers, as reported in various studies (Abbas, 2020; Fabbe-Costes & Jahre, 2008; Musau, 2018; Scholten et al., 2020).

Nevertheless, it is noted that although there are fewer dissenting views in the research, the renowned study conducted by (Polyviou et al., 2020) reveals that, once accounting for companies' tendency to selectively participate in surveys, "SCR has a detrimental impact on the performance of SMEs." While there is substantial evidence in current literature supporting the positive outcomes of SCMBP implementation on supply chain operations and, subsequently, organizational success, there is a scarcity of studies that examine this phenomenon specifically in the context of manufacturers situated in developing or underdeveloped economies.

2.2.3. The role of Supply Chain resilience in Organizational performance

Redundancies, such as spare equipment or stock, can help organizations withstand disruptions to their supply chains (Sutduean et al., 2019). Much research on supply chain resilience (SCR) focuses on how individual companies can manage disruptions to their supply chains, either by

developing specific capabilities or restructuring their supply chains, and how they can interact with suppliers (Chowdhury & Quaddus, 2017).

The insights that have been offered up to this point are mainly general, which is useful, but there hasn't been much focus on particular organizational characteristics like an organization's size, culture, or nature, or how these characteristics affect resilience. The paper by (Polyviou et al., 2020) An organizational level analysis of SCR based on four case studies of industrial firms is presented in this special issue. The study is unique in that it focuses on medium-sized businesses and emphasizes the unique difficulties they have when implementing current generic SCR insights. For instance, some businesses are too big to get the assistance available to small businesses, but they also lack the finances, scale, and influence to develop many resilience-enhancing capacities in the same manner as large businesses.

In this article, the authors highlight the role of a firm's human resources and internal social capital in developing organizational-level supply chain resilience (SCR). They also provide insights into the interplay between various levels of their SCR framework. Wang et al. (2020) offer a theoretically sound and normatively focused analysis of "The Dark and Bright Sides of Complexity: A Dual Perspective on Supply Network Resilience." Blackhurst et al. (2011) examine the impact of supply network complexity on a firm's resilience and recovery capabilities by studying the Japanese automotive industry's exports to the US before, during, and after a major earthquake.

Resilience involves the ability to temporarily modify or reconfigure supply chains upon encountering a disruption and subsequently recover normal operations when conditions permit. Notably, Y. W. Park et al. (2022) provided illustrative examples of this phenomenon. During the pandemic, a juice producer pivoted to manufacturing hand sanitizer, and a garment company transitioned to producing masks.

When short-term market needs were met, there was a clear return to activities before the pandemic, although changes in these supply chains may have become permanent. Further research into these temporary adjustments could improve our understanding of resilience. Even before the pandemic, practitioners, researchers, and governments had urged supply chains to become more robust and resistant to disruptions (Aldrighetti et al., 2021; Aslam et al., 2020; Memon et al., 2019; Paul et al., 2021). Together, the four articles in this edition and earlier works in JBL (see Gabler et al.,

2017; Goldsby et al., 2019) and other journals (Memon et al., 2019; Mukucha & Chari, 2023; Paul et al., 2021; Yanar et al., 2020) contribute to a substantial body of research on SCML complexity and resilience, which are essential to developing an effective SCML strategy.

There are more interdisciplinary viewpoints that will help the field better understand resilience even though the situations may be different because resilience is also extensively studied in other areas. However, JBL acknowledges the significance of resilience research and would consider any study that adds to our understanding by having implications for theory and practice. Businesses are trying to build and be a part of more resilient SC in order to have efficient and effective organizational performance as a result of realizing this detrimental influence (Gawankar et al., 2020).

2.2.4. The moderating role of e-commerce in the relationship between supply chain resilience and organizational performances

Under the review of different studies, they have examined the impact of e-commerce and its adaptation to bust the companies performance during supply chain disruptions (Octavia et al., 2020; Onjewu et al., 2022). In addition, regarding how the impact of the e-commerce moderation strengthen was highlighted by Mohamed et al., (2018) found out that there is a significant importance of e-commerce to in determining the success of the company.

Despite the attention, growing publications, and research progress in supply chain resilience (SCR), its empirical basis and investigation remain limited (Gunasekaran & Kobu, 2007). A significant portion of the existing SCR literature is conceptual (Ponomarov & Holcomb, 2009). The scarcity of comprehensive literature reviews on the topic (Bayraktar et al., 2009; Behzadi et al., 2020; Hohenstein et al., 2015; Kamalahmadi & Parast, 2016; Memon et al., 2019; Tukamuhabwa et al., 2015) suggests that SCR research has primarily focused on the application of supply chain principles emphasizing resilience (Michelman & Sheffi, 2007; Roberta Pereira et al., 2014). Researchers have defined and explored the fundamental elements of resilience and their relationships (Brandon-Jones et al., 2014; Hendricks & Singhal, 2003; Scholten et al., 2020). Studies have examined SCR in specific contexts, such as disaster relief (Eckstein et al., 2015; Scholten et al., 2020) and the agri-food industry (Panetto et al., 2020). Furthermore, research has connected resilience to sustainability and investigated the impact of big data analytics and

emerging technologies on resilience (Altay et al., 2018; Išoraitė & Miniotienė, 2018; Y. Wang et al., 2020).

Notwithstanding ecommerce is the vending of goods and services via online means (Aslam et al., 2020), and is one of various methods available in companies digital revolution toolbox (Baryannis et al., 2019). Downturns like the COVID-19 recession make it even more important for businesses to digitize their sales process (Y. Wang et al., 2020). When businesses are under financial strain, they reevaluate and reorganize how they use digital technology to create new business models that maximize the creation and appropriation of economic value (Zavala-Alcívar et al., 2020).

In the fashion industry, (Voortman & Makhitha, 2014) found that e-commerce provides a chance for businesses to develop in two ways. They argue that the first option provides resources for supply chain network structure and service architecture for responsive delivery and product variation. Second, they reasoned that e-commerce makes it possible to build skills in logistical operations, virtual customer relationship management, managing information asymmetry, and relationship governance.

Theoretically, these assets and competencies represent some of the resilience traits that companies require in order to maneuver through the COVID-19 difficulties with flexibility and agility (C. N. Wang et al., 2022). In light of this, there is a current desire to comprehend the mechanism via which e-commerce promotes resilience and, consequently, firm performance during times of crisis more thoroughly. Scholars and the general public have a cyclical interest in company resilience, which is usually heightened during periods of economic adversity (Onjewu et al., 2022; Sulea et al., 2012).

During times such as the COVID-19 pandemic, efforts to identify the components of resilience are only surpassed by attempts to characterize the trait in ways that are more conclusive both philosophically and experimentally. The lack of clarity surrounding resilience today may be attributed to its interest from a variety of disciplinary backgrounds, including ecology, engineering, governance, and management (Remko, 2020). Resilience in the latter context is defined as the ability to overcome hardship (Fabbe-Costes & Jahre, 2008), 2002), as well as the capacity to rebuild by looking for and seizing fresh chances to move forward (Migiro & Ambe, 2008).

During the COVID-19 crisis, e-commerce has shown to be a viable means of fostering business resilience in both developed and developing environments (Paul et al., 2021), since the unstable environment has affected businesses' performance (Alraja et al., 2022). One of the advantages of e-commerce as a resource is that it helps business decision-makers collect and transform data into information that can be applied to enhance organizational performance (Xu et al., 2022). Businesses are also able to raise the likelihood that customers would make repeat purchases and refer others, especially when online interactions successfully translate into offline relationships (Xiao et al., 2020).

However, e-commerce's unique appeal during a crisis is that it gives businesses the chance to penetrate regional and international markets on a minimal operating budget, while also expanding their client base and retaining them over time, ultimately contributing to efficient organizational performance (Mohamed et al., 2018). It has been found that internet use increases export activity among manufacturers in OECD countries, including Italy, suggesting that the development of such competence is equally true in manufacturing environments (Bojnec & Fertő, 2014). Katsaliaki et al., (2022) Katsaliaki et al. (2022) expand on exports by mentioning the role those digital technologies, including e-commerce, play in facilitating entry into international markets. The body of research connecting export behavior with e-commerce is undoubtedly extensive.

Recently, Motta (2020) emphasized the significance of conducting an empirical decomposition of direct and indirect exporting, given that both activities exhaust firm resources, such as labor, in different ways. The preference for export performance over other organizational activity areas at the moment stems from earlier evidence that exporters find internationalization to be an especially difficult undertaking (A. Ali et al., 2017; Onjewu et al., 2022).

In one study, Mohamed et al., (2018) e-commerce assets directly raise a company's export intensity. Also, Mohammed et al., (2013) showed that Technological assets are among the e-commerce factors that improve export performance. Likewise, (Fabbe-Costes & Jahre, 2008) showed that businesses who participate in some e-commerce activity had a higher likelihood of exporting. However, there is a clear trend in this field of study to ignore the influence of e-commerce on indirect exports conducted through middlemen in favor of concentrating on the benefits of e-commerce for direct exports (Onjewu et al., 2022). This propensity to ignore the need of measuring

exports in both direct and indirect forms, as recommended by (C. N. Wang et al., 2022) may limit full knowledge of organizations export performance.

2.3. Summary of Gaps in the Empirical Studies

The body of research on SCR has expanded, encompassing a wide range of fields outside SC management, tackling novel subjects and difficulties, and reaching a previously unheard-of level of scholarly inquiry. However, earlier academic research has not paid enough attention to organizing this constantly growing body of knowledge, which has typically resulted in the SCR and organizational performance systemic perspective. Although M. Ali et al., (2021) acquired a much-desired conceptual framework of SCR, and Kamalahmadi & Parast, (2016) A thorough and critical analysis of the body of literature on resilience theory in the context of SC demonstrates the lack of a current systematic evaluation of SCR that frames the idea in a system, even though it has aided in defining the concept and identifying its stages. Indeed, previous SCR literature assessments stressed the need of empirical research (Hohenstein et al., 2015).By now, this requirement has been satisfactorily handled. But it's still unclear what precise developments empiricism has brought about in SCR and can help us understand the nomological structure of SCR and OP.

Furthermore, despite Hohenstein et al.'s (2015) emphasis on the use of qualitative approaches, there has been a lack of evaluation and measurement of SCR and performance. While there has been some progress in the application of quantitative methodologies in this area, A. Ali et al. (2017) underscore the importance of examining the literature to comprehensively determine how these methods contribute to our understanding of SCR. They highlight the three key components of SCR: resilience phases, resilience strategies, and the competencies necessary for resilience, which brings conceptual clarity to the concept.

Although they discussed the essential skills for SCR and the managerial techniques and elements needed to achieve those skills, they did not review the entire scope of the SCR literature to identify its various research focuses and significant advancements. Additionally, there are nomological similarities between the SCR concept and several other concepts, such as 'SC robustness,' which (Mohamed et al., 2018) conducted a systematic review. While robustness and agility appear to be components of resilience, robustness SC and SCR are not identical. Conceptually, SCR could also

overlap with risk management. However, research suggests that because risk poses a threat, organizations should strive to mitigate it (Chowdhury & Quaddus, 2017; Pettit et al., 2019).

Many articles and studies have been written on these topics, but the results of these studies are scattered throughout the literature (Ivanov et al., 2021; Sutduean et al., 2019). Further, this literature defines resilience as it relates to a positive equilibrium (A. Ali et al., 2017), claiming that an organization's ability to "bounce back" to its previous level of equilibrium is the factor that determines organizational resilience (Altay et al., 2018),

Some research suggests an alternative understanding of resilience grounded in a non-positivist perspective, drawing on ecological resilience. This perspective frames resilience as the capacity to "bounce forth," referring to an organism's ability to endure and adapt to maintain its performance. This socioecological approach encourages a more comprehensive understanding of community resilience. However, it remains unclear how this systems-like approach is implemented in community resilience literature.

Despite the heterogeneity of the findings and the scarcity of a unifying theoretical framework guiding research on SCR (Ivanov et al., 2021; Polyviou et al., 2020), the absence of a comprehensive and well-defined theoretical framework for SCR perpetuates the narrowness and conceptual muddiness surrounding the concept.

To put it briefly, the goal of this study is to close the numerous research gaps by examining how supply chain resilience affects organizational performance while utilizing digital technologies like e-commerce and having the capacity to respond and take action when a supply chain disruption occurs.

2.4. Measurements of Supply chain resilience

Scholars have explored the measurement of SCR by assessing, for instance, density (Hejazi, 2021), stock level Carvalho et al., (2012), service level, lead time and costs. However, studies on SCR performance metrics stay rare (Chowdhury & Quaddus, 2017; Kamalahmadi & Parast, 2016; Pettit et al., 2013) given that SCR measuring has only been covered in a few articles. It would be challenging to evaluate the supply chain's response and reaction to disturbances without knowing how resilient a system is.

Ponomarov & Holcomb (2009) proposed that studying supply chain resilience (SCR) is a valuable research area that can provide critical insights into SCR and its outcomes. By combining different SCR capabilities into the readiness, response, and recovery aspects using theoretically rigorous prior research, eleven capabilities were identified as crucial for defining SCR. These eleven capabilities are evenly distributed across the three categories and have drawn the most SCM research attention in recent decades. This study identified four resilience capabilities in the readiness dimension: situation awareness, visibility, security, and redundancy; four in the response dimension: agility, flexibility, collaboration, and leadership; and three in the recovery dimension: knowledge management, contingency planning, and market position. Hohenstein et al. (2015) conducted a literature review and suggested that robustness metrics (e.g., inventory holding and multiple sourcing), reaction time to disturbances, and recovery time should be used as the basis for evaluating preparedness, response, and recovery, respectively.

2.5. Measurements of E-commerce

Baršauskas et al., (2008) suggested that the subjective reaction a customer has to an online retailer's website is a manifestation of their psychological state, or online customer experience (OCE). The elements of OCE were distinguished by Rose et al.24 as an affective experiential state with antecedent variables and a cognitive experiential state. The aspects of OCE have been established by several investigations and fall into three groups. First off, research on the measurement of website quality has been conducted, (F. Li et al., 2019); Loiacono, 2022) and a number of variables or aspects that affect how well a website performs have been found (Onjewu et al., 2022; Yeniyurt et al., 2019) Six variables were identified: web appearance, entertainment, informational fit-to-task, transaction capacity, reaction time, and trust in order to evaluate the quality of websites across online clothes merchants.

Furthermore, the satisfaction of customers was significantly predicted by three aspects of website quality: response time, transaction capacity, and informational fit-to-task. Second, a lot of research has looked at how customers behave online. Numerous important variables have been studied, including risk, website speed, perceived customer service, online buying experience, attitudes, and intents to shop (Sahoo & Vijayvargy, 2020). Thirdly, studies on the experience of using internet services have significantly added to the body of knowledge (Ara et al., 2019; Bavarsad et al., 2014; Costa & Castro, 2021). N. Zhao et al. (2023) determined the five essential components of e-service

quality (e-SQ): care, reliability, product portfolio, convenience of use, and security, based on a survey completed by 235 online consumers. The primary dimensions of e-SQ, according to (Al-Dhaafri et al., 2016), were efficiency, privacy, and customer service. It was also established that e-SQ was favorably correlated with behavioral and attitudinal loyalty. Since product sales and service quality are intertwined to satisfy clients, service quality in the retail garment industry is a complex issue. In the context of apparel fashion retail, Islam et al. (2023) investigated the relationship between service quality, customer happiness, and customer loyalty.

Eight dimensions—policies, physical appearance, personal interaction, convenience, product, promise, store size, and problem solving—served as the foundation for service quality. Four (retailer image, price, quality, and brand image) and three (emotional, social, and revisit intentions) factors, respectively, supported customer satisfaction and loyalty.

2.6. Measurement of Organizational Performances

In previous research (Flamholtz, 2009) created a model for organizational growth that highlights six important variables that influence both organizational success and financial performance (Islam et al., 2023). The organizational "form" or architecture in this developmental model is comprised of six essential elements or "building blocks": the markets chosen, the products (including services) offered, the resources (including human capital) needed to support growth, the operational and managerial systems, and the culture. Markets and products, the first two of these factors, are related to the specific business that the organization is in; on the other hand, the remaining four variables make up what may be called "organizational infrastructure," which is a form of intellectual capital (Chung, 2022).

Corporate culture is considered as one of the main elements of infrastructure. This falls under the category of what is commonly referred to as "goodwill" (Kim, 2022). These six variables are simultaneously strategic building blocks of organizational performance (Xuan, 2020). (Islam et al., 2023). The organizational "form" or architecture in this developmental model is comprised of six essential elements or "building blocks": the markets chosen, the products (including services) offered, the resources (including human capital) needed to support growth, the operational and managerial systems, and the culture. Markets and products, the first two of these factors, are related to the specific business that the organization is in; on the other hand, the remaining four variables make up what may be called "organizational infrastructure," which is a form of intellectual capital

(Kosgey, 2021). Corporate culture is one of the main elements of "infrastructure." This falls within the category of what is commonly referred to as "goodwill." (Xu et al., 2022). At the same time, these six factors serve as strategic pillars supporting organizational performance (Kosgey, 2021).

2.7. Conceptual Framework of the Study

SC resilience can alter operational performance. Creating new supplier bases and markets, as well as moving manufacturing facilities, may put businesses in an unstable and fragile market where it is difficult to maintain quality standards and guarantee delivery during periods of fundamental changes in economies and marketplaces (Whitten et al., 2012), and (Whitten et al., 2012). However, creating resilience in manufacturing allows businesses to enhance organizational performance and delivery. Furthermore, to ensure consistent quality, delivery, and service in the face of political and legal changes (such as product bans), production facilities may need to relocate or suppliers may need to change. It has been proposed in the thesis's first chapter that supply chain resilience significantly affects organizational performance.

Building strength requires various systems relying upon the kind of disturbance, the place of the organization inside the store network, the impact of the interruption on the organization and the inventory network and different variables (W. Li et al., 2022). Technology advancement endeavors can happen at the organization or store network level. Each organization inside the supply chain can work on firm performance by investing the technological infrastructure and be able to compete internationally through ecommerce. As the manufacturing scenario is affected during an interruption builds, the firm’s performance turns out to be stronger in light of the ecommerce platform in use already. In addition, technology investment fosters quick development lead times, shorter design cycles, and adaptable design capabilities—all of which contribute to an organization's ability to function effectively and efficiently. According to the thesis's first chapter, there is a hypothesis that E-commerce mitigates the impact of supply chain resilience on organizational performance.

Online business has demonstrated to be a route for developing organization strength through created and creating settings during the Coronavirus emergency ((Paul et al., 2021), as firms' presentation has been undermined by the delicate climate ((Alraja et al., 2022). As an asset, internet business has the advantage of empowering firm chiefs to assemble and change over information into significant information for working on hierarchical execution ((Lee & Choi, 2021) and (Ara

et al., 2019). Especially, when online cooperations effectively transform into disconnected connections, firms are likewise ready to expand customers' repurchasing aim and reference rate (Xiao et al., 2020).

Nonetheless, during an emergency, the exact fascination of internet business is that it bears the cost of firms the potential chance to enter nearby and worldwide business sectors on a low functional financial plan while expanding client reach and maintenance in the end assisted with having compelling hierarchical execution (Chandran et al., 2001). The improvement of such capacity is similarly obvious in assembling conditions as web use still up in the air to animate product movement among makers in OECD nations [including Italy] (Bojnec & Fertő, 2014). To expand on trades, Katsaliaki et al., (2022) insinuate computerized advances, for example, internet business being facilitators of unfamiliar market passage. The flood of writing connecting online business to send out conduct is honestly immense. As formulated in chapter one of the thesis it has been hypothesized that e-commerce has a significant effect on organizational performance.

In summary, this study linked supply chain resilience with organizational performance (business performance and infrastructure), examining the role each concept has in improving organizational performance. Thereby, supply chain resilience refers to robustness, resourcefulness, and recovery. Organization performance refers to business performance and infrastructure. Furthermore, the hypotheses are developed based on the direct effect of SCR on OP. Finally, the study hypothesized the effect is moderated by the ecommerce presence between the two variables.

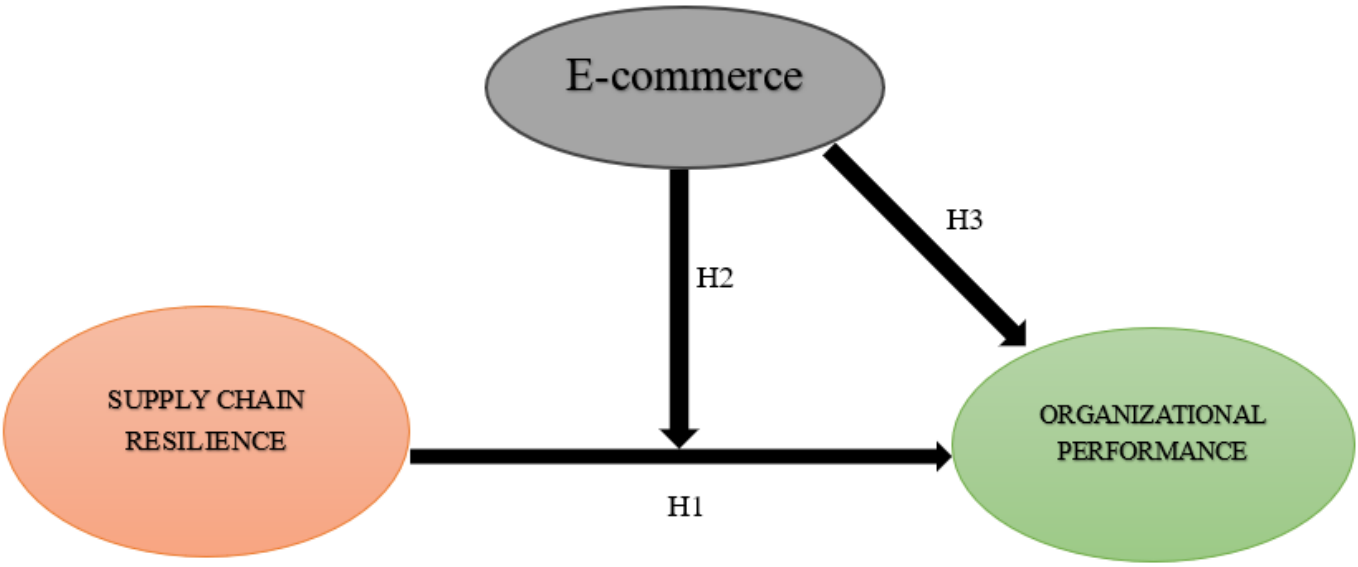

Figure 1. Theoretical framework. Source: researcher

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter briefly explain about where the study was conducted, who are the population to get the primary and secondary information, defined the geographical location of the research site, how the research paradigm, approach and design were set. In addition, the population, sampling design and sample size are discussed, the variables of the study are as well addressed. Last but not least, the data resource, collection procedures, reliability, validity and ethical considerations are defined in this chapter.

3.2. Description of the Study Area

This study was conducted in Addis Ababa, specifically at one of the industrial parks constructed in Ethiopia. Ethiopia's industrial park, Bole Lemi, was created by IPDC. All of the pre-erected industries in Bole Lemi Phase 1 (156 hectares) have already been rented out to over a dozen different firms since the project began operations in 2014. Bole International Airport is located close to Bole Lemi Phase 2, which spans 181 hectares. It comes with two pre-erected manufacturing shed samples in addition to serviced land. Its 100% exportable items and apparel and textiles are its areas of expertise (IPDC, 2024).

3.3 Research Paradigm, Approach and design

3.3.1. Paradigm

The common paradigms that show the environment in which studies can be classified which have crossed the researcher's considering this investigation. Thus, based on the researcher's discipline orientations, research communities, advisers, and mentors, as well as past experiences in light of post positivists, the researcher chose to view the study under the post positivism paradigm out of the four views (transformative, constructive, pragmatist, and positivism). This decision was made in light of the necessity to identify and evaluate the causes that influence outcomes, such as those found in experiments as study also aims to examine the connection between supply chain resilience and organizational performance using scientific methodology and empirical observation.. It is also reductionistic in that the ideas—such as the variables that make up hypotheses and research questions—are meant to be condensed into a small, distinct set to test (Hoyle, 2016). Therefore,

this led the researcher to embrace the below research approaches and design to better reach the research objectives.

3.3.2. Research Approach

According to Creswell (2014) In social science research, there are three types of study approaches: mixed, quantitative, and qualitative. Therefore, this study used quantitative research methods, which have been applied as advised by (Creswell et al., 2018). Both descriptive and inferential methods are employed in the quantitative approach. The statistical description, agglomeration, and presentation of the relevant constructs or correlations between the variables was known as the descriptive approach. In contrast, the hypothesis will be tested using the inferential approach. Ultimately, the study's findings and conclusion hinge on how well statistical data gathering and analysis are employed.

3.3.3. Study Design

Based on the purpose and the nature of the explanatory type of research design is used. This strengthened the researcher to find out the relationship and effects of the moderating variable on the predictor and result variables.

Data was collected using both primary and secondary sources. The sampling design and statistical design are mapped in reference to the target garment manufacturing companies identified from IPDC annual report and websites. For this study, a quantitative research strategy is employed, while the primary data was obtained by a closed-ended questionnaire that is designed in seven (7) point Likert-scale types. The research tools used in this study were created by the researchers and taken from a number of other investigations (Akbar & Nefrida, 2021; Almaududi Ausat et al., 2021; Fosso Wamba et al., 2018; Gawankar et al., 2017; Gunasekaran et al., 2015; Khalid et al., 2018; Loubet et al., 2017; Nguyen et al., 2017; Parra-Sánchez et al., 2021; Qalati et al., 2021; Rajesh, 2020; Sumarliah, Li, et al., 2022; Tsao et al., 2023; Y. Wang et al., 2020) however contextual adjustments were made following the study area and circumstances.

3.4. Unit of Analysis

The aforementioned garment exporters , specifically the employees in these companies are identified and chosen to fill the structured questionnaire. Furthermore, these respondents are considered to be exposed to the strategic meeting and regular updates of the top management. Also,

these respondents are already familiarized themselves with the necessary technology implemented in the companies for their daily job routines. Therefore, in a nutshell these respondents helped to understand the effect of resilience while keeping the momentum in achieving the company business success, and to highlight the e-commerce effect as a moderator as well as standing alone variable.

On the other hand, responses are segregated and entered to a statistical analysis tool called IMB SPSS v26. The main reason SPSS is to measure as well as analyze the relationship among variables where especially the moderating variable is present along with the initial statistical assumptions like normality, linearity, autocorrelation, multilinearity. Besides, reliability and validity will be applied to test the confidence and correlation.

3.5 Population and Sampling

3.5.1. Population of the Study

Following the annual report of (IPDC 2024) and (Infra Financials, 2022) there are 12 companies and 24,000 workers in Bole lemi industrial park. Out of these population only garment exporters were selected to conduct this study as shown in the below table. Nevertheless, there are recently closed garment exporters where you can see the number of employees is zero.

Table 3. 1 Bole Lemi Industrial Park Exporters Employment Data Sheet

Month	***April***
Year	***2024***

Bole Lemi Industrial Park Exporters Employment Data Sheet

Company	**New Hires**			**Lay Off**			**Employees**		
	M	F	**Sum**	M	F	**Sum**	M	F	**Sum**
Vestis Garment production PLC	54	94	**148**	5	57	**62**	56	330	**386**
Jay Jay Mills Garment PLC	12	848	**860**	9	847	**856**	755	7756	**8511**
Ever Top Sport Wear	1	13	**14**	4	10	**14**	82	518	**600**
Top NEW	6	75	**81**	7	46	**53**	131	812	**943**
Shin TS ETP Garment PLC	14	83	**97**	40	248	**288**	845	4933	**5778**
Ashton Apparel manufacturing PLC	6	132	**138**	8	149	**157**	179	1367	**1546**
Shang Tex Garment Manufacturing Ethiopia PLC	11	260	**271**	13	143	**156**	109	1941	**2050**
									19814

3.5.2 Sampling Design

For this research the study designed to use for the qualitative data collection. Based on the sample size, difference exporting manufactures are further classified using Bowley (1926) strata as below.

$$i^{th}\text{stratum}, n_{i=}\ n\ \frac{Ni}{N}\ i = 1, 2, 3.$$

Where,

- n = sample size,
- Ni = population size of the i^{th} stratum, and
- N = total population size.

Table 3. 2 Garment Manufacturing companies in Bole Lemi Industrial Park

Company	**Ni**	**ni**
Vestis Garment production PLC.	386	8
Jay Jay Mills Garment pLC,	8511	168
Ever Top Sport Wear,	600	12
Top NEW	943	19
Shin TS ETP Garment PLC,	5778	114
Ashton Apparel manufacturing PLC,	1546	31
Shangtex Garment Manufacturing Ethiopia PLC,	2050	41

3.5.3 Sample size

There are 9 manufacturing companies in the aforementioned industrial park, while there are 405 manufacturing companies in the nation overall in 2014–15 (IPCD, 2022). Kothari (2004), stated that the population happens to be infinite, then the formula is for finite population will be as per below. The ultimate test of a sample design, according to Cooper & Schindler (2008), is how effectively it captures the features of the population it purports to present. Thus, the sample size for this study is determined using Yamane's (1967) formula, which is given below.

$n=N/1+N(e)^2$

where: n = sample size;

N = population size; and

e = error (5%=0.05).

Therefore, $n = \frac{19,814}{1+19,814\ (0.05)2}$,

n=392

The respondent were chosen based on their responsibilities in relation to the study topic and the education level they possess in order to read and respond to the questionnaire. Therefore, this included high and medium level managers, team leads, officers and production team members and supervisors are selected from respective departments.

According to (Dametew et al., 2016) a total number employer of Bole Lemi Industrial Park in Addis Ababa are more than 19,814 workers. According to the data which is listed from Bole Lemi industrial park report 2024 there are nine (9) garments exporting companies are Arvind Lifestyle Apparel manufacturing PLC, Ashton Apparel manufacturing PLC, Ever Top Sport Wear, New Wide Garment Ethiopia LTD Company, Jay Jay Mills Garment pLC, Shin Ts ETP Garment PLC, Shangtex Garment Manufacturing Ethiopia PLC, SUMEC Eth. Textile & Manufacturing Plc, and Vestis Garment production PLC. However, Arvind and BGI Health are currently closed and out of our sample populations scope. Depending on the management hierarchy level or working positions of the companies the researcher stratified and allocate the number of questioners for each individual respondent from total number of sample size, whereas all of garments exporting companies received serving questionnaires according to their number of employees' in each working position.

3.6. Variables of the study

The study has three variables in total. Namely, the precedent, moderating and result variables as supply chain resilience consisting of robustness, resourcefulness, and recovery, ecommerce including website quality, customer behavior, & e-service quality, and organizational performance having business performance and infrastructure, respectively.

3.7. Measurement Design, Reliability and Validity

3.7.1 Reliability

Having valid and dependable instruments is essential to getting high-caliber research outcomes. In order to ascertain whether the instrument employed in the study is legitimate and dependable, it is important to test its validity and reliability. Reliability serves as a gauge for how good an instrument is thought to be when it comes to gathering data for the instrument. An effective tool won't pressure respondents to choose particular responses. Therefore, if you repeat anything multiple times, the result will stay the same or consistent. One tool for reliability testing is Cronbach's Alpha.

Table 3. 3 Reliability statistics of all Variables

Variables	No of Items	Alpha (α)
SCR	7	.702
OP	7	.730
E-com	7	.706

This total evaluation of the dependability of a measure is provided by the resulting α coefficient of reliability, which spans from 0 to 1. If every scale item is completely unrelated to the others (that is, uncorrelated or without covariance), then α = 0; conversely, if every item has a large correlation.

The result revealed in table that supply chain resilience with seven items α= .703. And the Organizational performance with seven item α=.730. Similarly, E-commerce with seven item α=.674. The overall Reliability results for all variables are summarized in the table has α=.844.

3.7.2 Validity Analysis

The research tools are taken from previous studies in which the questionnaires employed had a solid validity position for evaluating the intended study goals. To make sense to the responders, the phrases and question were nevertheless paraphrased. As a result, it will demonstrate that the construct is genuinely unique from other constructs and that the values of the particular theory have a high degree of similarity. In addition, the validity results has been included in the annex section to give further detail about the tabular result of significance and rxy value.

3.8. Data sources and collection procedures

The collection of data came from both primary and secondary sources. Primary data regarding the organization's performance and the effects of outside parties in the SC was gathered through questionnaires sent to the senior management, the production and logistics manager, and other relevant parties. Data collection methods included the use of structured questionnaires to assess organizational performance, supply chain resilience, and moderating variables from several departments chosen through purposive sampling.

Additionally, in order to strengthen the study's conclusions and make it better, relevant papers from the industry's factories and relevant government agencies were employed, along with articles, academic journals, and helpful literature from a variety of sources, including libraries.

3.9. Ethical Considerations

Initially, before agreeing to participate or declining, the respondents are informed about the study's goals, advantages, dangers, and funding. They are also allowed to leave the study at any moment. Furthermore, no personally identifying information is gathered, and the participants' identities will not be revealed or questioned. Although the researcher is aware of the identity of the participants, they anonymize personally identifying information to prevent third parties from connecting it to other data. In reality, the study was finished without any plagiarism, thus contact information was included in case any respondents were interested in learning the study's final outcome.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

The researcher has used SPPS v26 for data analysis for both descriptive and inferential analysis. The study was conducted in the confidence interval of 95%, and 5% of error. The results demonstrated both the descriptive as well as the inferential results from SPSS results respectively.

4.2. Response rate and demographic data

Table 4. 1 Gender of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	249	66.4	66.4	66.4
	Female	126	33.6	33.6	100.0
	Total	375	100.0	100.0	

As it can be seen from the above table 66% of the respondents are Male and the balance 34% of the respondents are Female.

Table 4. 2 Age of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35	312	83.2	83.2	83.2
	36-45	60	16.0	16.0	99.2
	46-55	3	.8	.8	100.0
	Total	375	100.0	100.0	

Table 4 shows that most of the respondents are between the age range of 25-35 followed by the 36-45 age group of 16% of the respondents. In addition, the last age range above 55 has a respondent of 8%.

Table 4. 3 Educational Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma or less	7	1.9	1.9	1.9
	Bachelor	277	73.9	73.9	75.7
	Master	91	24.3	24.3	100.0
	Total	375	100.0	100.0	

Table 5 shows that majority of the respondents are degree holders at a percent of 74. Followed by Masters degree holders at a percent of 24. The 2% of the respondents' educational background is diploma and less.

Table 4. 4 Position of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High Level	30	8.0	8.0	8.0
	Middle level	111	29.6	29.6	37.6
	Super Vision Division	17	4.5	4.5	42.1
	Production	54	14.4	14.4	56.5
	Logistics	29	7.7	7.7	64.3
	Marketing	20	5.3	5.3	69.6
	Management	50	13.3	13.3	82.9
	Other	64	17.1	17.1	100.0
	Total	375	100.0	100.0	

Table 6 shows that majority of the respondents are under middle level management (30%), followed by other departments and management team 17% and 13% respectively. Other respondents' positions are under 10% is from various hierarchical positions from high level to marketing, production and logistics.

Table 4. 5 Years of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less or Equal 5 years	181	48.3	48.3	48.3
	5-10	158	42.1	42.1	90.4
	11-15	36	9.6	9.6	100.0
	Total	375	100.0	100.0	

Table 7 shows that almost half of the respondents (48%) are having five or less years of experience. On the other side around 42% of respondents are possessing five to ten years of experiences. 9.6% of respondents are having 11-1 years of experience.

4.3. Effect of supply chain resilience on organizational performance

4.3.1. Finding

The projected change in the dependent variable when that predictor is increased by one unit while keeping all other predictors fixed is represented by the B coefficient, also referred to as a partial regression coefficient.

Table 4. 6 Coefficient Statistics

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.053	0.303		6.77	0
	SCR	0.529	0.044	0.555	12.009	0
	Ecom	0.149	0.052	0.134	2.892	0.004
a. Dependent Variable: OP						

The R, R2, adjusted R2, and standard error of the estimate are shown in the table below. These values can be used to assess how well a regression model fits the data. Furthermore, the ANOVA

table evaluates how well the total regression model fits the data. The dependent variable is statistically strongly predicted by the independent factors, as the table demonstrates.

Table 4. 7 ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.894	2	12.947	123.819	.000[b]
	Residual	38.897	372	.105		
	Total	64.791	374			

a. Dependent Variable: OP

b. Predictors: (Constant), SCR and Ecom,

Table 4. 8 Model summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.632[a]	.400	.396	.32336	1.836

a. Predictors: (Constant), SCR and Ecom

b. Dependent Variable: OP

4.3.2. Interpretation

Given that the data in Table 4.6 showed a significant value for supply network resilience of ρ <0.05, it is reasonable to conclude from the regression analysis that there is a significant impact of supply chain resilience on organizational performance. Meanwhile, the significance of e-commerce of 0.004 <0.05, it can be concluded that the e-commerce significant effect on organizational performance.

The data in Table 4.7 showed a 0.000 probability level of significance. Since the probability (0.000) is substantially smaller than the significance level (0.05), the organizational performance can be

predicted using multiple regression models. Put differently, e-commerce and supply chain resilience have a big impact on organizational success.

The value of R = 0.632 and the coefficient of determination (Rsquare) of 0.400 are displayed in table 4.8. This implies that E-commerce and supply chain resilience account for 40% of the influence on organizational performance, with other factors accounting for the remaining 60% (100% -40% = 60%). All of the predictor variables added together might account for 40% of the variations in organizational performance. Nevertheless, additional variables not addressed in account about 60% of the variance.

4.3.3. Discussion

Studies like (Aldrighetti et al., 2021; Dolgui et al., 2020; Ivanov & Das, 2020; Ivanov & Dolgui, 2021; Panetto et al., 2020; Sawik, 2022; Schmitt et al., 2017) claim that in order to achieve expected performance using recovery, supply networks must be designed to be strong and resilient enough to be able to adjust their behavior in the event of disruptions. Comparatively, it has been seen that maintaining a robust supply chain has a significant impact on the performance of the company, as per the study's findings. Nevertheless, (Aldrighetti et al., 2021) argues that supply chain resilience can be enhanced by resilience management techniques like high inventory, capacity reservations, and lead time reserves, but they can also have a negative impact on supply chain efficiency.

After the epidemic or natural disasters, SCR has recently attracted a lot of scholarly attention. In particular, incidents such as COVID-19 have brought to the attention of scholars and industry professionals the necessity of building more robust supply chains in order to reduce the potentially catastrophic consequences of disruptions. (Chen et al., 2022; Sawik, 2022; Siagian et al., 2021; Singh, 2011; Sonnentag & Frese, 2002; Tang & Tomlin, 2008). The notion of preparing for unexpected disruptions by strengthening supply chain resilience in order to recover and sturdy the garment manufacturing industry has proven to be difficult, which is one of the main reasons the researcher chose this contemporary issue. Thus, in order to gain market share and boost export performance, a firm should think about recuperating as soon as it can.

All in all most of the studies have agreed to the existence of potential impact of supply chain resilience on the overall organizational performance especially in the case of disruption. (Carvalho, Maleki, et al., 2012; Wildgoose et al., 2012).

4.4. Moderating role of E-commerce b/n SCR & OP

4.4.1. Finding

Regression model fit to data can be assessed using the R, R2, adjusted R2, and standard error of the estimate provided in this table. Furthermore, the ANOVA table evaluates how well the total regression model fits the data. The dependent variable is statistically strongly predicted by the independent factors, as the table demonstrates.

Table 4. 9 Coefficient

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.007	.043		.168	.866
	Zscore: SCR	.569	.047	.569	12.120	.060
	Zscore: E-com	.063	.048	.063	1.328	.185
	Interaction (moderator)	-.016	.031	-.024	-.532	.595
a. Dependent Variable: Zscore: OP						

4.4.2. Interpretation

As shown in table 4.9 the value of Beta is not as such significant for the moderation of e-commerce on the OP as $\beta=0.24$, $\rho<0.05$. this shows that the moderating role of e-commerce is not significant as $\rho=0.595$.

4.4.3. Discussion

The importance of empirical studies for quantifying the influence of e-commerce in SCR improvement within garment manufacturing remains underemphasized. However, several researchers (Abbas, 2020; Ageron et al., 2020; Chen et al., 2022; Hejazi, 2021; Onjewu et al., 2022; Scholten et al., 2020) have highlighted the transformative impact of digitization. When implemented effectively, digitization enhances organizational agility, enabling adaptation to unforeseen internal and external challenges, thereby fostering resilience during disruptions.

Higher performance levels can be attributed to digitalization and SCR, according to some study. Further empirical research is needed to explore how supply chain performance (SCP) is impacted when SCD and SCR are simultaneously applied to the supply chain. Similarly, this research finds that SCR and e-commerce separately have an effect on performance, but considering e-commerce as a moderator has not been seen to significantly affect the relationship between SCR and organizational performance, unlike Ivanov and Dolgui (2021), who argue that since the COVID-19 outbreak, digital services for the supply chain and the analytical algorithms that power the supply chain have emerged as key differentiators. Additionally, according to (Sumarliah, Usmanova, et al., 2022). The study concurs that the idea of e-commerce and SCR has been given more weight from a strategic standpoint in order to maintain performance and respond to situations that resulted in traffic jams and disruptions to logistics. These situations also created the demand for working remote, paperless operations, and supply chain restructuring, which sped up the process of building digital supply chains and enabled businesses to swiftly manage disruption risk.

4.5. Effect of e-commerce on OP

4.5.1. Finding

The purpose of a linearity test is to ascertain whether or not there is a linear relationship between the independent and dependent variables. For correlation and linear regression analysis, the linearity test is necessary. There should be a linear relationship between the free and dependent variables in a well-conducted regression model.

Table 4. 10 Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.053	0.303		6.77	0
	SCR	0.529	0.044	0.555	12.009	0
	Ecom	0.149	0.052	0.134	2.892	0.004
a. Dependent Variable: OP						

4.5.2. Interpretation

Table 4. 10 shows the value ρ<0.05 (0,004) means that e-commerce has a significance effect on the organizational performance while analyzing the direct effect it has an independent variable standing along.

4.5.3. Discussion

According to (Musau, 2018) the organizational performance is highly related two aspects. One is to the economic tradition and the second is behavioral and sociological paradigm. This is a different perspective for the manufacturing sector as compared with the theoretical concept of garment supply chain.

Indeed, a number of pertinent research have addressed how digital technology application might improve resilience like (Gawankar et al., 2020; Liu et al., 2021; Octavia et al., 2020). Though the finding from this study has missing the significant Empact of e-commerce towards resilience in increasing the company's performance. Still the digitalization concept in the overall supply chain has a magnificent visibility and acknowledgement. In specific to the production scenario (Scutariu et al., 2022) has only highlighted the effect of e-commerce to the product quality and efficiency.

4.6. Testing Hypothesis

Finding out if all of the independent variables together have a statistically significant effect on the dependent variable is the main goal of multiple linear regression. As a result, every hypothesis is verified using the analysis output figures and contrasted with the original theory presented in chapter one.

Table 4. 11 Coefficients

Model				Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.689	0.297		9.040	0.000
	SCR	0.506	0.041	0.573	12.467	0.000
	Ecom	0.074	0.049	0.070	1.516	0.130

a. Dependent Variable:
OP

The variable with the highest beta value contributes the most to explaining the dependent variable's variance, As shown in table 11, the Beta column beneath standardized coefficients. SCR is (0.573), followed by E-commerce (0.070 is that not yet significant factor in the standardized beta coefficients column.

H1: The supply chain resilience has effect on the organizational performance.

In light of the hypothesis 1, supply chain resilience was assumed to have an effect on organizational performance. As the beta value shown in table 4.10, SCR has more effect on organizational performance with the beta value of 0.573 and also it was seen that the is a significance effect of SCR on OP (ρ=0.000). Hence, we can conclude that the first hypothesis is meant to be true.

H2 - The relationship between supply chain resilience and organizational performance is significantly moderated by E-commerce.

Based on the beta value we have seen that the ecommerce along has an impact on organizational performance; nevertheless, as described in table 4.9 though the moderation of e-commerce between supply chain resilience and organizational performance is not significant. Nevertheless, the beta value stays at 0.16, and (ρ=0.595). Therefore, H2 can be concluded that even though the e-commerce has a moderation role between supply chain resilience and organizational performance the significance is low.

H3: There is effect of E-commerce on organizational performance.

As table 4.6 revealed that e-commerce has effect on organizational performance with (β=0.149, $p<0.05$) this can be interpreted as the more the company invests in the e-commerce platform, the more the organizational performance will be in the garment exporting companies especially in review of the significance (ρ=0.004).

In summary, reviewing the theoretical perspectives of supply chain resilience and organizational performance, it has been supported by may different studies as mentioned in chapter two and above. Like wis this study finding is illustrating the same practically in garment manufacturing

sector. when it comes to the digitalization and e-commerce impact on the supply chain, in fact it was theoretically as well as practically supported that organizations are paying attentions to the e-commerce era to cope up with the dynamic supply chain interruption and uncertainties. On the other hand, as far as the study tried to prove the theoretical stance that e-commerce has effect on organizations performance the significance that was highlighted in chapter two couldn't be seen with the same significance in the garment industry. This will lead us to an argument that even though e-commerce has effect on organizational performance the level of significance is not as strong as SCR and the moderation effect is also very less. Therefore, even if theoretically as well as practically the e-commerce plays vital role on organizational performance in the presence of interruption for garment and non-garment industries, the study found practically the e-commerce moderation role between SRC and OP is very less in the case of garment manufacturing companies in Addis Ababa Bole Lemi industrial Park.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1. Introduction

In multiple linear regression, the question of whether all of the independent variables together a statistically significant effect on the dependent variable have is the main focus. Thus, each hypothesis is verified using the analytical output figures and contrasted with the first hypothesis that was proposed in chapter one.

5.2. Summary

As a summary, from this study findings have revealed that, the supply chain resilience is considered one of the most important driving factors to keep the organizational performance (β=0.573, $p>0.05$). besides, the significance is also high ($p<0.05$) in addition, the other objective of the study is to understand the direct effects of e-commerce on OP which was proved in the study as well (β=0.07 $p>0.05$). whereas, considering the significance of e-commerce is very low. On the other hand the moderations effect of e-commerce is less between SCR and OP.

5.3. Conclusion

The primary conclusion drawn from this study is the necessity of highlighting the significance of maintaining supply chain resilience in the current competitive and dynamic landscape. For manufacturing organizations, resilience is thought to be the key to establishing a competitive advantage. Environmental dynamism offers businesses not only opportunities but also beneficial effects that provide obstacles to their ability to continue as a going concern. Managers need to assess environmental uncertainty critically in order to attain performance in their organization. Thus, a unit change in supply chain resilience is implied to result in a 0.529 unit improvement in organizational performance.

The second hypothesis postulated that relationship between supply chain resilience and organizational performance is significantly moderated by e-commerce. Results showed that there was a positive effect between supply chain resilience and organizational performance ($\beta = 0.529$; $p<0.05$), whereas the moderation role is there but the results showed that it is less significant ($\beta =$

0.016; p>0.05). This therefore implies that a unit change in supply chain resilience increases organizational performance through the moderation of e-commerce by 0.016 units.

The third hypothesis assumed that, having the e-commerce in the supply chain environment will have an impact on organizational performance. The findings revealed that e-commerce has effect on organizational performance, but the significance is less (β = 0.063; p>0.05). This therefore implies that a unit change in e-commerce increases organizational performance by 0.063 units.

So that it can be concluded that, supply chain resilience positively affects organizational performance. As organizations take measures to be resilient, the organizations over all performance will also increase. Even engaging in digitalization will also enhance the company's performance as well. Moreover, effective implementation of e-commerce flourish in today's global market share by increasing the organizational performance.

Study findings uncovered that supply chain resilience has significantly affects firm's performance though the moderation role of e-commerce is not as such significant towards to the garment manufacturing companies. Resilience suggests readiness, response and recovery upgrade to principal choices on sourcing and foundation of a more performing organization.

5.4. Recommendations

According to the report, companies should view supply chain resilience from the perspective of preparation, response, and recovery with skillful modifications made through "lean" arrangements. Nevertheless, a renewed requirement for business reconstruction following setbacks should serve as the cornerstone for maintaining steadfastness in meeting the targeted manufacturing targets. This demand is the search for supply chain approaches that encompass a significantly higher degree of adaptability. Additionally, it is advised that purchasing and supply chain managers be creative in applying new concepts to the goods, procedures, and other facets of supply chain operations, as well as gather pertinent data from the company's internal and external environments to stay prepared, respond quickly, and recuperate as soon as possible to maintain performance.

The study recommends conducting more research on the function of e-commerce as its effects have already been seen. However, the degree to which e-commerce platforms are implemented must be determined in advance and their significance must be evaluated. As a result, the strategic plans will completely embrace the adaptable and dynamic approach for the fast-paced fashion

industry. Furthermore, the results of this study could be replicated in a variety of pertinent contexts, such as global environments, production networks, or other manufacturing sectors with a focus on supply chain networks and digitalization.

5.5. Suggestion for further study

As the researcher has highlighted in chapter four the independent and moderating variables are impacting organizational performance around 40%. This means that there are other reasons to affect organizational performance which are not included in this study of which cover up to 60%. Hence, the researcher suggests that further studies can be done to find out the significant factors of organizational performance especially in specific with the garment manufacturing sector in Ethiopia.

In addition, this study was conducted under different limitations like location, product mix, garment exporting companies. Whereas the study can be broadly made with different supply chain networks and level of discipline rather than the garment sector which has better e-commerce and resilient environments.

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Annex

Questionnaire

Questionnaire of the effect of supply chain resilience on organizational Performance the mediating Role of e-commerce of garment exporters at Addis Ababa-Bole Lemi Industry Park.

Dear Sir/Madam,

This questionnaire is intended to measure the supply chain resilience on the organizational performance with the moderating role of e-commerce the garment manufacturing companies found in Bole Lemi Industrial Park. Your participation is critical to the success of the study. All responses will be kept confidential and will not be traceable to individual respondent. There are no right or wrong answer to the following questions. We are only interested in your assessment of your organization's activities.

The questionnaire is organized in two parts of total 6 pages. **Part I** is about the demographic information of the respondent, and **Part II** embraces the business operational questions. You will be asked questions concerning the company's current business practice. If you are unable to complete the questionnaire yourself, please entrust the task to another who is knowledgeable about supply chain management practices, e-commerce and organizational performance.

The questionnaire should take about 20 minutes to complete. Kindly spare a few minutes from your busy schedule to complete the questionnaire as your participation is of value to this study. Once you have completed the questionnaire, please check the pages are 4, and give back to the data collector contacted you.

Thank you in advance for your cooperation and in case of enquiry, please do not hesitate to contact the undersigned.

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Mobile phone - +251920195422

Part I

Demographic Information

Please tick the boxes to indicate the appropriate answers of yours for the following demographic questions.

1. Gender: □Male □Female
2. Age (years): □25 – 35 □Between 35 – 45 □Between 45 - 55 □above 55
3. Education: □Diploma or less □Bachelor □Master □Doctorate
4. Position: □High level □Middle level □Supervisors Division □Production □Logistics □Marketing □Management □Others
5. Years of experience: □Less or equal 5 □Between 5 – 10 □Between 10 – 15 □Above 15

Part II

The following 21 items tap into supply chain resilience and its effect on organizational performance where e-commerce is the moderating variable. Please, answer these questions based on actual and current situation and not on beliefs.

[**1** = strongly disagree, **2** = disagree, **3** = somewhat disagree, **4** = neutral, **5** = somewhat agree,

6 = agree **7**=strongly agree] based on how you feel about the statement.

Supply Chain Resilience

		1	2	3	4	5	6	7
1	The ability to adequately respond to unexpected disruptions by quickly restoring its product flow, increase business performance.							
2	The ability to quickly return to its original state after being disrupted, increases the organizational performance.							
3	If the company supply chain is well prepared to deal with financial outcomes of potential supply chain disruptions, it competes better in export market.							

4	The ability to maintain a desired level of production control over the planning and function at the time of disruption safeguard the export volume.							
5	The ability to resist the disturbing event by designing and arranging security production units or replacing critical nodes during disruption stabilize the export performance.							
6	The ability of the supply chain to maintain its functions normally without disruption after the occurrence of a disruptive event stabilize the company performance.							
7	when disruptive events caused by the environment and the proper implementation when the event occurs can be an determinant of good performance							

Organizational Performance

		1	**2**	**3**	**4**	**5**	**6**	**7**
1	Supply chain resilience increases/maintain the company production output and efficiency.							
2	Resilient company can increase its market share and its market growth.							
3	Resilient company value-adds on customer preservation compared to competitors.							
4	Resilient company enhances efficiency in production against the target plan.							
5	Resilient company will have better stock management and production material input in time.							
6	Resilient company invests in electronic commerce to increase the organizational performance.							

7	Resilient company have better technology setup and IT infrastructure to increase the organizations business performance.							

E-commerce

		1	2	3	4	5	6	7
1	E-commerce increases the data accuracy in stock management and production floor.							
2	Electronic information increases the production process and company performance.							
3	E-commerce offers adequate product information for a manufacturing company.							
4	E-commerce offers accurate product information for decision making and increased export performance.							
5	Using e-commerce increase the reliability of the production information and business relationships.							
6	I prefer using electronic information setup in my company to have better personal and organizational performance.							
7	I think e-commerce increases the organizational profit and market share with proper and stable management.							

Thank you!

Multiple Regression Assumption Test Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.894	2	12.947	123.819	.000[b]
	Residual	38.897	372	.105		
	Total	64.791	374			

a. Dependent Variable: OP

b. Predictors: (Constant), SCR and Ecom,

Coefficients[a]

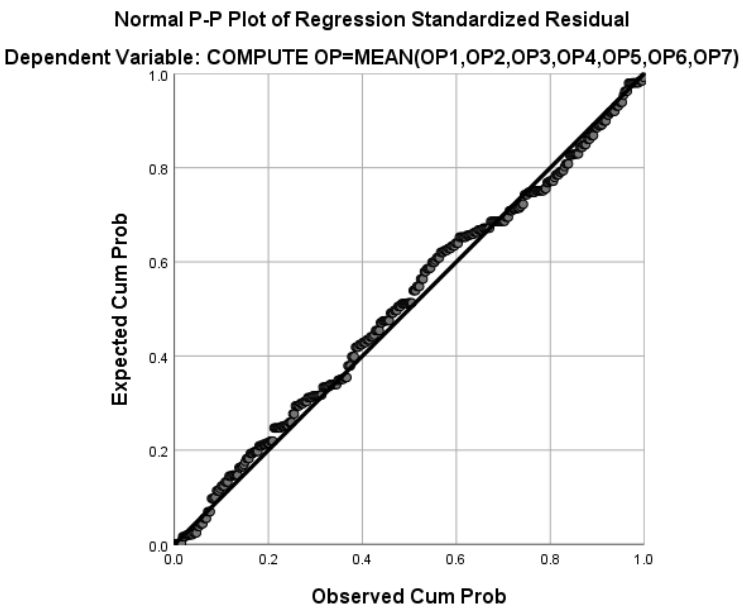
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.053	0.303		6.77	0
	SCR	0.529	0.044	0.555	12.009	0
	Ecom	0.149	0.052	0.134	2.892	0.004

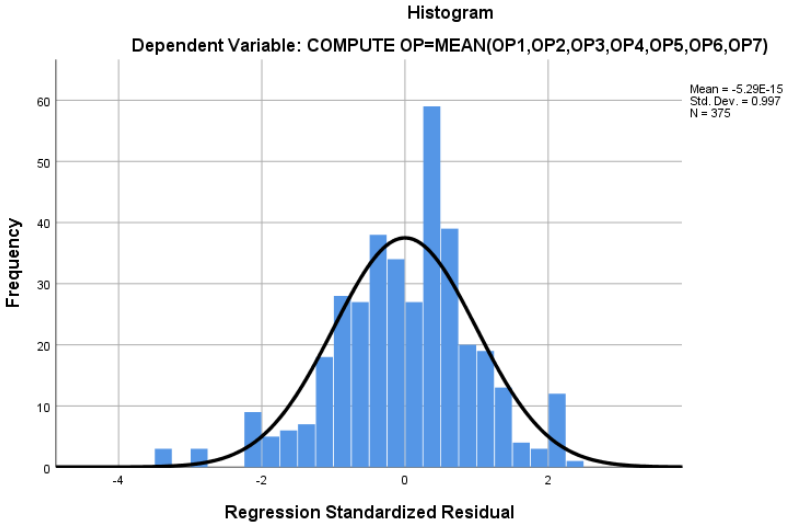
a. Dependent Variable: OP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.007	.043		.168	.866
	Zscore: SCR	.569	.047	.569	12.120	.060
	Zscore: E-com	.063	.048	.063	1.328	.185
	Interaction (moderator)	-.016	.031	-.024	-.532	.595

a. Dependent Variable: Zscore: OP



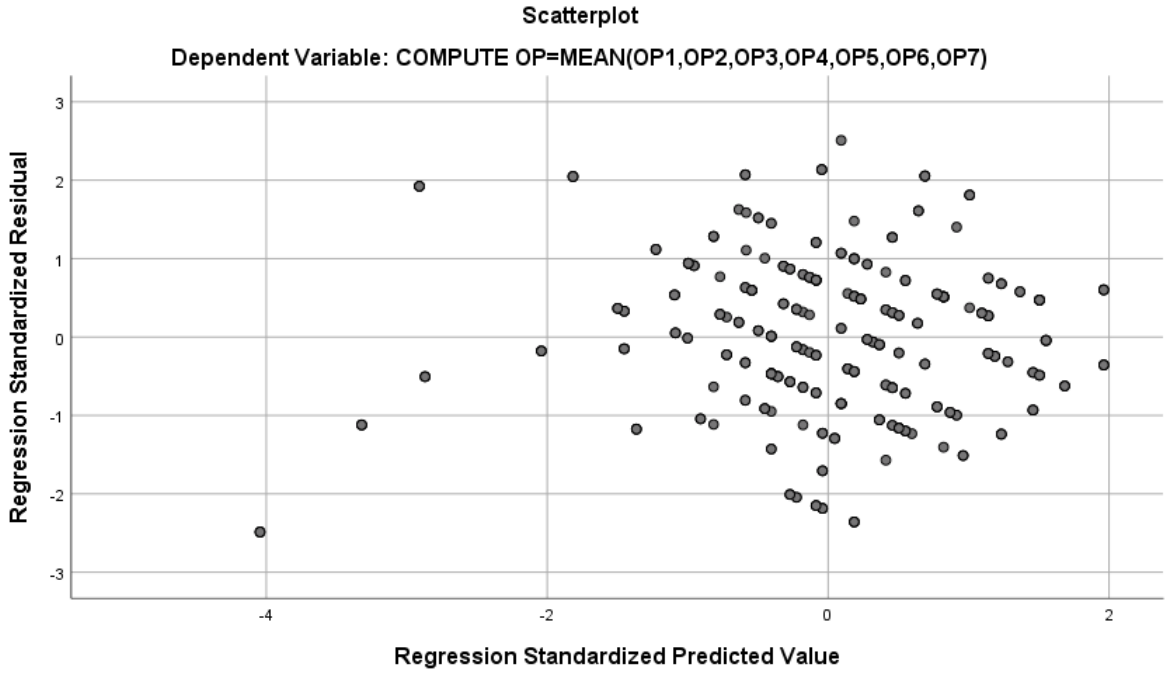


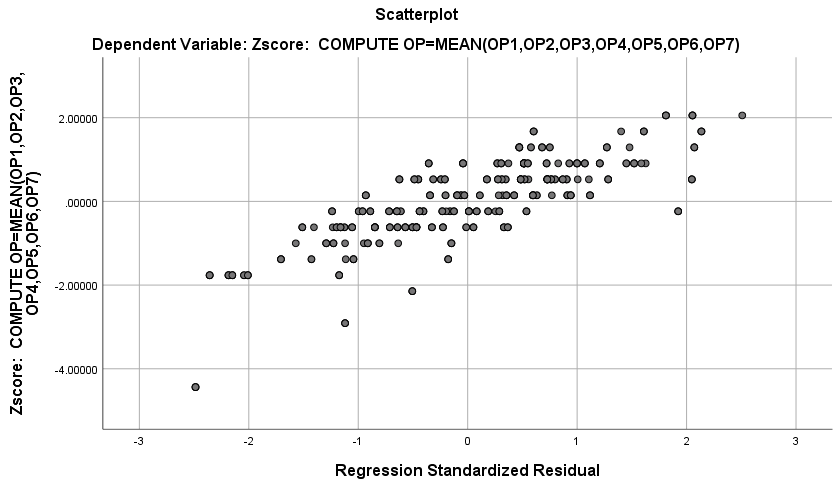
Tests of Normality

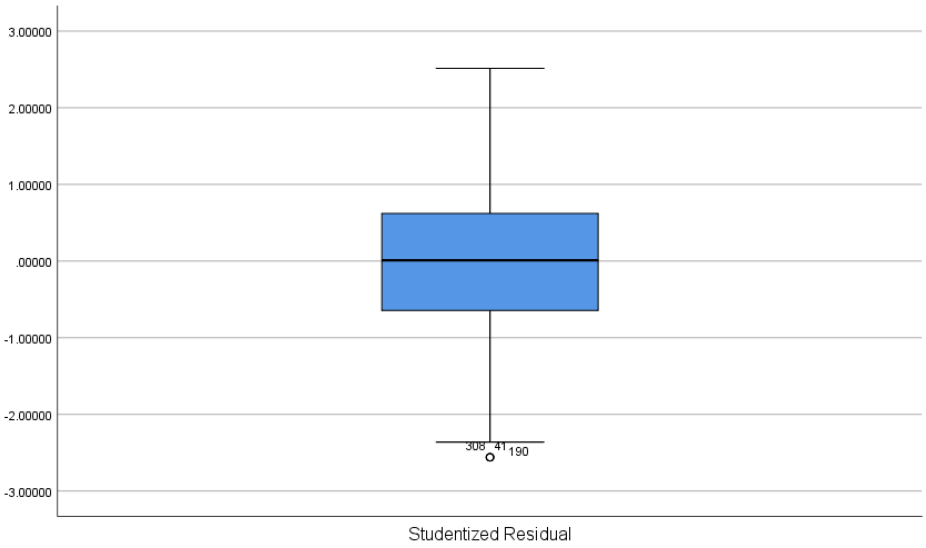
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual	.055	375	.009	.991	375	.021

a. Lilliefors Significance Correction

Coefficients[a]			
Model		Collinearity Statistics Tolerance	VIF
1	(Constant)		
	SCR	0.801	1.248
	E-com	0.801	1.248
a. Dependent Variable: COMPUTE OP=MEAN(OP1,OP2,OP3,OP4,OP5,OP6,OP7)			







Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.632[a]	.400	.396	.32336	1.836

a. Predictors: (Constant), SCR and Ecom

b. Dependent Variable: OP

		SCR	OP	Ecom
SCR	Pearson Correlation	1	.621**	.495**
	Sig. (2-tailed)		.000	.000
	N	375	375	375
OP	Pearson Correlation	.621**	1	.409**
	Sig. (2-tailed)	.000		.000
	N	375	375	375
E-com	Pearson Correlation	.495**	.409**	1
	Sig. (2-tailed)	.000	.000	
	N	375	375	375

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