KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

SUPPLY CHAIN PRACTICES ON THE PERFORMANCE OF MULTINATIONAL CORPORATIONS THROUGH TECHNOLOGICAL ADOPTION: A CASE OF CARGILL KOKOO SOURCING LTD

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DECLARATION

I hereby declare that this thesis is the result of my original work towards the MSc. in Logistics and Supply Chain Management, and to the best of my knowledge, it does not contain any materials that have been published by another person or materials that have been approved for the award of any other degree from the University, except for those instances where appropriate citations have been made in the text.

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DEDICATION

I express my gratitude to my wife and child for their unwavering support throughout the whole of my educational journey.

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ABSTRACT

Companies now face a challenging competitive climate because of the increasingly dynamic and customer-demanding business conditions of today. To adapt to this demanding climate, supply chains have grown significantly more dependent on stakeholder trust, integration, cooperation, and flexibility. The objective of this study sought to assess the impact of supply chain management on the performance of multinational corporations through technological adoption: The Case of Cargill Kokoo Sourcing Ltd. Cross-sectional survey data was solicited via self-delivered questionnaire from 100 respondents associated with Cargill Kokoo Sourcing Limited. With the help of a Structural Equation Model (SEM), this study established that through a mediation (technological adoption), it is statistically insignificant for supply chain management practices to make improvement in firm performance. Furthermore, the findings have revealed that adopting technological tools alone is not enough for Cargill to improve its performance. This study has proven that adopting technological tools in SCMP tend to have a positive relationship, but this relationship does not improve the performance of Cargill Kokoo Sourcing Limited. This study has indicated that when management of Cargill Kokoo Sourcing Limited invest in supply chain management practices and adopt technological tools, they tend to positively affect the relationship between supply chain management practices and technological adoption. But this positive relationship does not necessarily improve the performance of Cargill Kokoo Sourcing Limited. Hence, management of Cargill should invest in technological tools and supply chain management practices as a way of improving operations which may affect performance of the firm in some way.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CRM	Customer Relationship Management
EID	Electronic Identification
FDI	Foreign Direct Investments
KM	Knowledge management
LIS	Level of information sharing
MNC	Multinational Corporation
RFID	Radio-frequency Identification
SCM	Supply Chain Management
SCMP	Supply Chain Management Practices
SCP	Supply Chain Performance
SEM	Structural Equation Model
SSP	Strategic supplier partnership
TQM	Total Quality Management

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

As Companies are more dynamic and customer-focused, facing fierce competition. This tough climate requires cooperation, integration, adaptability, and stakeholder trust in current supply chains. Supply chain management techniques must be updated to address new concerns including complexity, transparency, and flexibility to stay competitive (Helo and Hao, 2019). Tampering in transit, delays, fraud, identity assurance, and poor information handling, including precision and authenticity, are major difficulties for conventional supply chain management (Dwivedi et al., 2020).

A supply chain is a complicated network of organizations in a product or service value chain. Most organizations recognize supply chain management as essential to creating a sustainable competitive edge in the global market with their clients for their goods and services (Lagat et al., 2016). Textile and supply chain management enterprises are Malaysia's fastest growing, contributing to economic growth (Pang and Abdullah, 2016). Emerging technologies offer organizations a strategic advantage in management, notably supply chain management. The right technology, infrastructure, culture, and management practices make the application successful. Information technology, communication, and automation have greatly improved logistics data identification, collection, processing, analysis, transfer, and reliability. Technology boosts company performance and competitiveness. It boosts logistics system performance and efficiency, helping the supply chain succeed. (Bhandari, 2018). The 2020 COVID-19 pandemic highlighted the need to digitize supply networks. The digital revolution has changed supply chain realities and connections (Queiroz and Wamba 2019). As a

result, firms have created information technology to optimize supply chain procedures, making new engineering applications more important and competitive.

Although EID, RFID, and IoT devices have been utilized to improve supply chain efficiency for years, transparency, visibility, adaptability, and dependability remain unaddressed. Meidute-Kavaliauskiene et al. (2021). With its robust technology, blockchain may solve supply chain difficulties. By managing and protecting shared data, blockchain installations improve supply chain security, traceability, and efficiency. Blockchain technology may improve stakeholder communication and cooperation, cutting costs and enhancing performance. Blockchain technology also boosts consumer confidence by tracing products across the supply chain. To satisfy client expectations, supply chain management must optimize and streamline operations with the latest technology. Customers and organizations need faster and cheaper goods and services than ever before. Technology enables quick data transfer, accurate analysis, and massive processing. Effective supply chain management needs IT. Communication, data and information collecting and transmission, and supply chain performance can combine internal and external operations, suppliers, and customers with IT. This study explores how technology adoption affects Cargill Kokoo Sourcing Limited performance and supply chain management.

1.2 Motivation and Justification

1.2.1 Motivation

The market has become more dynamic and demanding. Therefore, enterprises face a tough competitive landscape. To handle the complexity of the current environment, supply chains need stakeholder cooperation, integration, adaptation, and trust. Supply chain management is a key approach for cost reduction and economic efficiency in

competitive industry (Helo & Hao, 2019). Companies are gradually investing in and integrating diverse technologies to meet supply needs and improve supply chains to gain information (Chen) et al., 2017). Technology use in today's corporate environment helps optimize supply chains.

Recently, supply technology has helped organizations compete in a fast-changing industry. In addition, corporations have created information technology to optimize supply chain processes, making new engineering applications more important (Tambe, 2018; Kunc and O' Brian, 2018).

Technology can improve stakeholder communication and cooperation, decreasing costs and enhancing performance. Technology enhances consumer trust via product traceability, fraud prevention, real-time product data management, and supply chain quality monitoring. Companies seek solutions to keep and grow customers as technology changes. Supply chain technology boosts customer service and competitiveness. Better customer connections and happiness, lower costs, increase communication, reduce transaction times, assure security, and boost efficiency and performance (Analytics-Insight, 2019). Research on how technology adoption improves supply chain management is encouraged.

1.2.2 Justification

Current research benefits industry and academia. This study is crucial for governments, business, and academics. This study solves a research gap by examining how technology adoption affects Cargill Kokoo Sourcing Limited's supply chain management. Supply chain management performance studies have revealed

intermediates to be relevant (Al-Shboul et al., 2017; Quynh and Huy, 2018). Thus, this study studies technology use and conciliatory relationships.

The study will demonstrate how technology adoption influences supply chain management and business performance through empirical and theoretical reasoning and research results. Supply chain management helps organizations obtain strategic advantage, market share, and profits (Zhu et al. 2020).

Research should help corporate management decide to adopt technology. The research will add to the literature on the relationship between technology, supply chain management practices, and corporate performance since empirical data is scarce.

The report will also encourage policymakers to focus on implementing supply chain management technologies that optimize performance and results. Finally, this study will provide a research void for academics to investigate Ghana's development.

Technology is vital to many firms' supply lines. Supply chain performance depends on technology adoption. Supply chain management and IT must be connected. Successful companies use supply chain tech. Technology is essential for supply chain efficiency (Moberg et al., 2002). Businesses want strategic advantage, market share, and profitability (Zhu et al. 2020). Businesses realize that customer needs drive competitiveness; effective supply chain management provides high-quality products and services at reasonable rates.

1.3 What We Know

Businesses today are competitive and globalized. Business operations needed technology change to introduce new products faster and cheaper and compete or survive (Kumar et al., 2020). Technology has greatly impacted many companies'

supply chains. Many supply chain innovations have improved efficiency and accuracy. Corte-Real et al. (2017) highlighted that many competitive organizations are investing in big data to find new ways to stand out.

Technology can impact supply chain roles and information and action coordination at low cost and competitive benefit (Bäckstrand and Fredriksson, 2022). Many companies use supply chain technology to boost market competitiveness and shareholder value (Yang et al., 2020). Therefore, supply chain technology is crucial for corporate sustainability. Information technology's role in Roberts' (2000) report. He showed that supply chain expenses dropped from 8% to 35%, 22% at 85% inventory warehousing, 12% at 42% delivery, and 17% at 68% cycle time. Managers must learn new strategies to better coordinate with suppliers and consumers to achieve their aims. Despite these benefits, many Ghanaian organizations fail to upgrade and implement this technology in their supply chain processes (Johnson et al., 2017), while others have trouble 'integrating into their systems' (Ghasemaghaei et al., 2017; Kwon, 2021).

1.4 Problem Statement.

The research at hand seeks to address a critical relationship between supply chain practices, technological adoption, and the performance dynamics of multinational corporations (MNCs), with a specific emphasis on the case study of Cargill Kokoo Sourcing Ltd. In the contemporary global business environment, the intricate interplay between these elements is paramount for the sustained success of MNCs, particularly those engaged in complex and globally dispersed supply chains, such as Cargill Kokoo Sourcing Ltd in the cocoa industry (Simchi-Levi et al., 2018). The core problem that motivates this research lies in the ambiguity surrounding the impact of technological adoption within the supply chain on the overall performance metrics of MNCs (Chopra

& Meindl, 2022). While there is a growing recognition of the significance of technology in streamlining supply chain processes, the intricate dynamics and contextual nuances involved in its integration remain underexplored, especially in the specific context of Cargill Kokoo Sourcing Ltd (Ivanov et al., 2019). This research aims to bridge this knowledge gap by dissecting the multifaceted relationships among supply chain practices, technological adoption, and performance outcomes in a comprehensive manner.

The complexity of the problem is further compounded by the global nature of Cargill Kokoo Sourcing Ltd.'s operations, which span various countries and cultures (Wieland & Wallenburg, 2013). The influence of diverse regulatory environments, cultural factors, and unique challenges inherent in the cocoa sourcing industry adds layers of intricacy to the research problem (Linton et al., 2021). Understanding how technological innovations in supply chain management impact not only efficiency and cost-effectiveness but also how they navigate through these cultural and regulatory landscapes is paramount (Swink et al., 2019). Moreover, the case of Cargill Kokoo Sourcing Ltd provides an excellent vantage point for examining how technology interfaces with procurement, logistics, and distribution within the cocoa supply chain, shedding light on industry-specific challenges and opportunities (Kumar et al., 2017).

The implications of this research extend beyond academic discourse, offering actionable insights for industry practitioners and policymakers involved in the management of global supply chains (Fawcett et al., 2015). By uncovering the specific mechanisms through which technological adoption shapes the performance of MNCs, particularly in the cocoa industry, this study seeks to contribute practical knowledge that can inform strategic decision-making (Giannakis & Croom, 2019). Ultimately, the

findings aim to enhance the competitiveness and resilience of multinational corporations operating in today's dynamic and technology-driven business landscape (Mentzer et al., 2020).

1.5 Research Questions

The study answers the following questions:

1. What are the effects of technology adoption (Farm Force Enterprise Application) on the performance of Cargill Kokoo Sourcing Ltd?
2. How does technology adoption (FarmForce software Application) mediate between supply chain management practices and the performance of Cargill Kokoo Sourcing Ltd?

1.6 Objectives of the Study

The main objectives of the study are:

1. To assess the effect of supply chain management on the performance of multinational corporations through technological adoption: The Case of Cargill Kokoo Sourcing Ltd.
2. To examine what effects technology adoption (Farm Force Enterprise Application) has on the performance of Cargill Kokoo Sourcing Limited.
3. To examine the supply chain management practices on the performance of Cargill Kokoo Sourcing Limited.
4. To examine the relationship that exists among supply chain management practices, technology adoption (FarmForce Enterprise Application), and the performance of Cargill Kokoo Sourcing Limited.

1.7 Scope of the study

This study studied how technology adoption affects Cargill Kokoo Sourcing Limited's supply chain management and success. This study will examine supply chain management techniques, technology adoption, and company success, as well as technology adoption's mediating role. This case study examines Cargill Kokoo Sourcing Ltd. Thus, Ghanaian Cargill Kokoo Sourcing Limited management and personnel will provide data for useful and credible findings.

1.8 Significance of the Study

Supply chain management (SCM) activities affect an organization's competitive edge and performance, according to Cao & Zhang (2011). Price/quality ratio, delivery reliability, speed to market, and product innovation are expected to help a business compete. This study will enhance Cargill Kokoo Sourcing Limited's supply chain management understanding and demonstrate its effectiveness after adopting the technology. The research benefits Cargill Kokoo Sourcing Limited and others. Business, consumer, and logistical organizations will profit from this study. The study will also examine supply chain management, technology adoption, and firm performance. This study may encourage Ghanaian enterprises to use tech.

Industry managers can assess technology adoption's impact on performance with this research. The insights will help managers choose technology and business performance strategies.

1.9 Organization of Study

The study has 5 chapters. The first chapter introduces the research's history, problem description, aims, research questions, importance, scope, limitations, and layout. The second chapter reviews pertinent literature. Chapter three covers study design, demographic, sample size, sampling strategy, data collecting, and research tools. Data analysis and presentation are in chapter four. Chapter five summarizes findings, conclusions, and limitations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter deals with literature review in relation to theoretical overview, empirical review, conceptual overview, and conceptual framework.

2.2 Supply Chain Management

Studies like Mentzer et al. (2001), Chopra and Meindl (2007), Hugos (2018), and the Council of SCM Experts have defined SCM (2013). Valaand and Heide (2007) categorized SCM definitions into three. The first SCM group oversees goods, information, and money from source to consumer. The second category investigates supply chain linkages, while the third covers activities and processes. Although viewpoints vary, SCM integrates the supply chain to create value. Supply chain integration of corporate processes is efficient and effective. The SCM definition evolves. Previously focused on cost reduction, SCM now increases income (Chandra and Kumar, 2000). Simchi-Levi et al. (2003) say consumer satisfaction has supplanted service quality. Customer value promotes internal quality assurance to outward customer enjoyment and compliance to value-added service, connections, and experiences.

Supply Chain Management (SCM) engages suppliers, manufacturers, and customers in strategic and management theory and practice. Performance, competitiveness, and customer satisfaction increase with SCM. This study defines SCM as “a process of coordination of the business functions across the businesses within the firm and across businesses within other firms in supply chain for providing and improving products and

information flows from suppliers to end customers to enhance firm performance and satisfy customer needs, wants, and requests." The integrated SCM flow follows this.

2.3 Supply Chain Management Practices

Supply Chain Management Practices (SCMPs) improve supply chain performance. Successful organizations need internal cross-functional integration and external integration with suppliers and consumers (Kannan and Tan, 2010; Kim, 2006). Supply chain management (SCM) is essential for global competitiveness and profitability, according to Moberg et al. (2002).

Scholars see SCMPs differently, yet they all agree they improve corporate performance (Li et al., 2005, 2006; Tan et al. 1998; Chen and Paulraj, 2004; Min and Mentzer, 2004). This search's SCMP structure consolidates results in all eight dimensions. An explanation of the eight SCMP structural elements follows.

2.3.1 Strategic supplier partnership (SSP)

Li et al. (2006) described SSP as "a long-term relationship between an organization and its suppliers". Long-term direct alignment, cooperative planning, and problem-solving are aims (Agus & Zafaran, 2008). It aims to strengthen each company's operational and strategic ability to attain its goals (Li et al., 2005). Advanced supply chains require supplier alli**ances (Agus and Zafaran, 2008).**

2.3.2 Level of information sharing (LIS)

Li et al. (2006) defined LIS as "the degree to which material and private information is disclosed to its supply chain partners". Data may be strategic, tactical, logistical, or consumer/market (Min and Mentzer, 2004). Information integration boosted strategic

SC ties (Zhou and Benton, 2007). This structure was confirmed by Li and Wong (2005, 2006). Industrial organizations and their supply networks may benefit from knowledge management (KM). KM learns from each other's issues and exchanges experiences amongst supply chain levels via their SC network. Document MFP and SCP measurements track a business's knowledge, abilities, and behavior. The company will achieve harmony via internal integration and supply chain needs through external integration.

This involves information exchange accuracy, completeness, and dependability (Li et al., 2006). Li and Lin (2006) state that successful SCM relies on the quality of shared information, therefore companies should communicate information rapidly and properly. Scholarly research on SCM's influence stress quality information sharing in SCMP (Li et al., 2006; Li and Lin, 2006).

2.3.3 Customer relationship management (CRM)

CRM "plans, implements, and evaluates effective supplier-recipient interactions inside or outside the supply chain" (Lee et al., 2007). CRM provides product information and interacts with customers to suit their requirements. It involves taking orders, placing customers, and updating them on order progress throughout product purchase and delivery (Lee et al., 2007). CRM is crucial to SCM success, hence academic literature has extensively studied it.

2.3.4 Internal lean practice

Lean ideas have spread beyond manufacturing to other industries (Garza-Reyes et al., 2012). It is the most important new manufacturing model (Foerstl et al., 2010), boosting organization competitiveness (Hines et al., 2004). Lean eliminates waste

throughout a product's value stream, including its supply chain (Boyle et al. Scherrer, 2009). Thus, academic literature has extensively investigated lean supply chain (Chen et al., 2013; Qrunfleh and Tarafdar, 2013). Most research implies lean ideas and practices enable effective supply chain management. This evidence helped include this feature in the SCMP idea for this study.

2.3.5 Postponement

Li et al. (2006) defined postponement as "the practice of moving forward one or more operations or activities (e.g., making, sourcing, and delivering) to a much later point in the supply chain". Its main purpose is to finish products as close to the customer as possible to reduce stockpiles and unsold goods (Ferreira et al., 2015). In SCM literature, Ferreira et al. (2015) and Li et al. (2005, 2006) have extensively explored, examined, and confirmed this component. The SC practices architecture includes this component due of the market's very uncertain demand environment. Thus, delay may be crucial to commercial supply chain management.

2.3.6 Total quality management (TQM)

Al-Khalifa and Aspinwall (2000) define TQM as a holistic management paradigm that emphasizes meeting internal and external customer needs and delivering high-quality results on the first try. Though TQM definitions vary, benchmarking, supplier relations, continuous improvement, customer happiness, empowerment, and top management accountability are the most mentioned components in academics (Garza-Reyeset al., 2011). SCMPs emphasize quality management (Jraisat and Sawalha, 2013), notwithstanding the debate about TQM's impact on corporate success (Mosadeghrad, 2014). TQM was included to SC practices' dimensions for this reason.

2.3.7 Sustainable Packaging

According to James et al. (2005a), sustainable packaging is made entirely of recyclable materials, uses resources and energy efficiently, does not harm ecosystems or humans, and adds real value to society by protecting products throughout their journey to the consumer. This research used sustainable packaging as a supply chain management technique since it affects consumer and industrial packaging and the entire supply chain, including buying, inbound, outbound, and reverse logistics.

2.4 Technological Adoption

Smith (2010) believes that adopter groups' racial, ethnic, and psychological features affect technology adoption. New technologies help product firms compete. They often save organizations money or attract new clients (Kathuria et al., 1999). Wenger (2010) believes new technology's economic growth impact is only understood when widely used. The new technology diffuses when numerous people accept it at once, usually after weighing its pros and cons. Rapid technological progress, especially in information and computer technology, makes new technologies vital in competitive economies. Today's tech-driven company demands managers to embrace new tech. To defeat competition, companies acquire cutting-edge tech. Response to competition spurred 21% of technology CEOs' Internet-based technology investment (Sachs, 2000). Tech CEOs stressed competitive advantage 50% of the time.

A breakthrough technology by one company might transform oligopolistic market structure and equilibrium. Recent study suggests altering the viable competitive balance stimulates tech investment (Mendelson, 1998; Zhu, 1999). New technologies are investigated for their immediate productivity and operational efficiency benefits. Multi-firm oligopoly inhibits tech adoption. Some think companies should wait to use new

technology until they know its costs and benefits. New tech uncertainties cause this. Technology investments may include standard-setting, economies of scale, brand recognition, early mover benefits, and other factors, so another business may embrace it before (Rayna, 2009). Preemption by competitors drives fast action. It's crucial in uncertain markets and new technology performance. Leader-follower dynamics are stressed by early acceptance or waiting for additional information.

2.5 The Nature of Multinational Corporations

A firm’s performance measures their overall business. It's how well a corporation meets financial and market goals, said Li et al (2006). Tzokas et al. (2015) define corporate performance as meeting external and internal goals. Hussain et al. (2018) suggest increasing productivity, minimizing costs, and maximizing profit to boost company performance. SCM's short-term objectives are to reduce inventory, increase productivity, and speed up turnaround time, while its long-term goals are to increase profitability, expand into new markets, enhance quality, and increase market share for all SC units (Tan et al., 1998). Fraser (2006) advocates integrating SC activities to financial data to strengthen firm. Fraser (2006) argues better financial and operational monitoring improves a company's finances and operations. SCMPs' influence on manufacturing profitability must be examined. According to corporate market and financial success research, this component is part of performance (Li et al., 2006; Zhang, 2001). Most organizations monitor revenues, operational costs, and product type turnover. Financial performance measures, notably profitability, drive a manufacturing company's survival and supply chain connection, but non-financial variables are important for SCP and MFP assessment.

Balanced scorecards assess enterprises. MP and SCP balanced scorecards may include non-financial criteria including long-term, short-term, and operational goals and financial indicators that show the manufacturing firm's success or failure based on prior financial data. Balanced scorecards evaluate manufacturing supplier-consumer interactions.

Global conglomerates invest and manage value-added enterprises worldwide (Dunning and Lundan, 2008). Multinational firms operate in wholly owned, minority-owned, or joint venture subsidiaries. Transnational small corporations become global conglomerates with foreign headquarters. MNCs and their environs are unclear (Mayrhofer, 2012). Foreign subsidiaries usually collaborate with local businesses and economic players (suppliers, distributors, clients, government, etc.). Thus, MNCs are members of regional ecologies-changing networks (Hennart, 2009).

2.6 Multinational companies' supply chain performance

Delaney et al. (2006) said that organization's performance can be measured by market performance, customer satisfaction, high-quality products and services, service innovations, and employee relations. In contrast, Hoque et al. (2000)'s balanced scorecard research measures an organization's success by profit margin, capacity utilization, satisfied customers, and high-quality products. Profit, sales, market expansion, and ROI were also listed by Greene et al. (2007) as major organizational effectiveness elements. All these performance measures showed that SCM procedures positively affected organizational performance.

Chong and Ooi (2008) suggest that a well-implemented SCM will help enterprises reduce inventories, improve customer service, cut costs, and rotate goods quickly. SCM's ability to enhance output, lower inventory, and minimize lead times helps meet short-term goals. Long-term goals require increasing a company's market share and externally integrating the SCM (Li et al., 2006; Lyons, 2004).

2.7 Empirical Review

2.7.1 Multinational supply chain practices and performance

Al-Shboul et al. (2017) developed a seven-dimensional model of supply chain management methods to study their effects on manufacturing company performance and supply chain performance. Effective supply networks may also impact industrial success. Polling 249 Jordanian industrial firms provided the data. ANOVA, linear regression, and Pearson correlation assessed research hypotheses. Supply chain management solutions boost manufacturing business performance by improving supply chain efficiency. Supply chain management boosts industrial performance.

Out al. examined SCM and business financial and non-financial performance in 2010. This study included HR management, procedure, design, quality data, and reporting. Financial performance, customer happiness, and internal processes determine business success. A structural model was created utilizing external SCM, internal SCM contextual components, and firm performance. A structural model was developed using external SCM, internal SCM contextual components, and firm performance. Taiwan's information-related firms use SCM to compete worldwide. External customer, corporate, and supplier relationship management increases internal contextual aspects and firm performance. This research showed that SCM enhances operational efficiency,

customer satisfaction, and financial performance. Customer value increases with customer satisfaction, boosting financial success.

Gandhi, Shaikh, and Sheorey (2017) examined how supply chain management theories impact corporate and supply chain performance in emerging nations like India. In empirical study, 125 Indian organized retail supply chain directors responded. To test the idea, multiple regression with mediation was done. Results showed SCP and FP enhance SCMPs. Customer and supplier relationship management SCMPs had the greatest influence on FP in India's organized retail business.

SME SCM techniques, operational performance, and organizational success were evaluated by Kohet al. (2007). The survey includes 203 Istanbul, Turkey-based SMEs that make metal and general-purpose equipment. Partial least squares, a variance-based structural equation model, assessed the research framework. The findings show that SCLP and OMS components boost operational performance. SCM SCLP and OMS do not directly affect organizational performance. The direct relationship between SCM practice components and OPER improves ORG indirectly.

SCM, operational, and innovation performance of Malaysian manufacturing and service businesses were investigated by Chong et al. in 2010. The survey included 163 Malaysian industrial and service firms. Evaluating research models using structural equation modelling. SCM techniques greatly affect Malaysian enterprises' upstream and downstream supply chain organizational and innovation performance. Innovation in SCM boosts organizational performance. The findings also imply Malaysian industrial and service enterprises adopt comparable SCM methods.

Competitive advantage and organizational performance were crucial to Li et al. (2006) while studying SCM methods. Structured equation modelling examined 196 business data. Competitive strategy, resource-dependent and resource-based theories, and social-political ideas were examined. The data imply SCM boosts organizational performance and competitiveness. Furthermore, a company's competitive advantage may enhance performance swiftly.

Rajamma and Shivalingam (2020) studied supply chain management's business effect. The 196 associations' data was tested for reliability, second-order construct validity, convergent validity, and discriminating validity. Higher-level SCM practice increased advantage and authority. Advantages enhance hierarchy fast.

2.7.2 Technological Adoption and corporate performance

Sheel and Nath (2019) showed how blockchain technology may increase supply chain agility, alignment, and adaptation, enhancing business performance and competitiveness. Sample data from 397 Indian supply chain specialists validated the basic model. For this, a structural model was used to evaluate the conceptual framework, and confirmatory A factor analysis verified the data. Blockchain technology may improve supply chain adaption, alignment, and agility, offering organizations a competitive edge and greater performance, according to new studies. Trust from blockchain deployment improves company performance.

Lakhwani et al. studied organizational efficiency and technology adoption in 2020. Data was collected online and offline using a self-administered questionnaire. We used quantitative and explanatory research. Snowball sample selected 300 IT managers and senior executives (Production and service team) from Malaysia's largest IT companies.

SPSS 22 performed initial normality and reliability assessments. The maximum likelihood estimates of Confirmatory Factory Analysis (CFA) analyzed internal consistency, convergent validity, and discriminant validity. Technological innovation and IT infrastructure enhance Malaysian IT enterprises' efficiency, while IT knowledge management has a significant yet detrimental impact.

Francis et al., (2012) examined innovation management apps. The study uses qualitative and quantitative data from university R&D, marketing, administrative, and technology transfer organizations that produce and commercialize ideas. The study identifies factors that affect innovation process effectiveness and IMA acceptance, bolstering IMAs' perceived utility and adaptability for varied work styles.

2.7.3 Supply chain management practices and technological innovation

Patterson et al. (2003) modelled US supply chain technology adoption factors. The questionnaire and quantitative and qualitative analysis showed that larger staff bases employ more technology, possibly to improve information management and activity coordination. Researchers identified favorable and negative connections between decentralization and technology adoption.

Kamble et al. (2018) examined Indian supply chain blockchain adoption. The recommended model was evaluated by 181 Indian supply chain practitioners using structural equation modelling. The findings showed that supply chain practitioners expected blockchain technology to be easy to use and improve supply chain efficiency.

Manufacturing technology has altered engineer-to-order supply chain management (SCM), according to Oettmeier and Hofmann (2016). Two hearing system case studies analyses how addictive manufacturing technology influences SCM components and

operations. A contingency technique and general systems theory underpin it. The results demonstrated that SCM, internal management, and process activities control firm supply and demand. AM technology may alter SCM processes and components due to endogenous and AM technology-related factors.

2.8 Rogers' Diffusion of Innovation Theory

Rogers' 1962 book "Diffusion of Innovations" established his innovation diffusion idea. Due to its popularity for analysing technological innovation uptake, five editions (1962, 1971, 1983, 1995, and 2003) have been published. Rogers divides diffusion into innovators, early adopters, early majority, late majority, and laggards with population proportions of 2.5%, 13.5%, 34%, 34%, and 16%. Rogers says invention, communication, channels, time, and social structure affect innovation adoption. Stage differences are studied in financial situation, personality values, and communication behaviour. Organisations and individuals gain from Rogers' theory.

The three empirical investigations related to Rogers' DOl theory are the operationalization of innovativeness, innovation adopters' characteristics and behaviours during diffusion phases, and Rogers' elements that facilitate innovation adoption. Researchers categorise innovation adopters using the innovation construct, consumer habits, and "years to adopt". The research finds the former to be a more accurate way to cluster adoption groups. Rollins (1993) says Roger and Shoemaker operationalized an early 1971 innovativeness scale. After reading and assessing the literature, Goldsmith and Hofacker created the "Respondents' Innovativeness Scale" in 1991 to address the limitations of previous assessments. (Park and Jun. 2003; Rochrich, Valette-Florence, and Ferrandi, 2003) have used their scale in their studies. They are easy management, reliability, and domain-wide flexibility. Rogers' hypothesis that

communication behaviours (credit, social and business travel, etc.), personality values (sympathy, curiosity), and other factors positively correlate with innovation attitudes has been supported by research. Benefits, compatibility, trialability, observability, and complexity are commonly studied to validate innovation uptake. This study would use Roger's idea as its foundation.

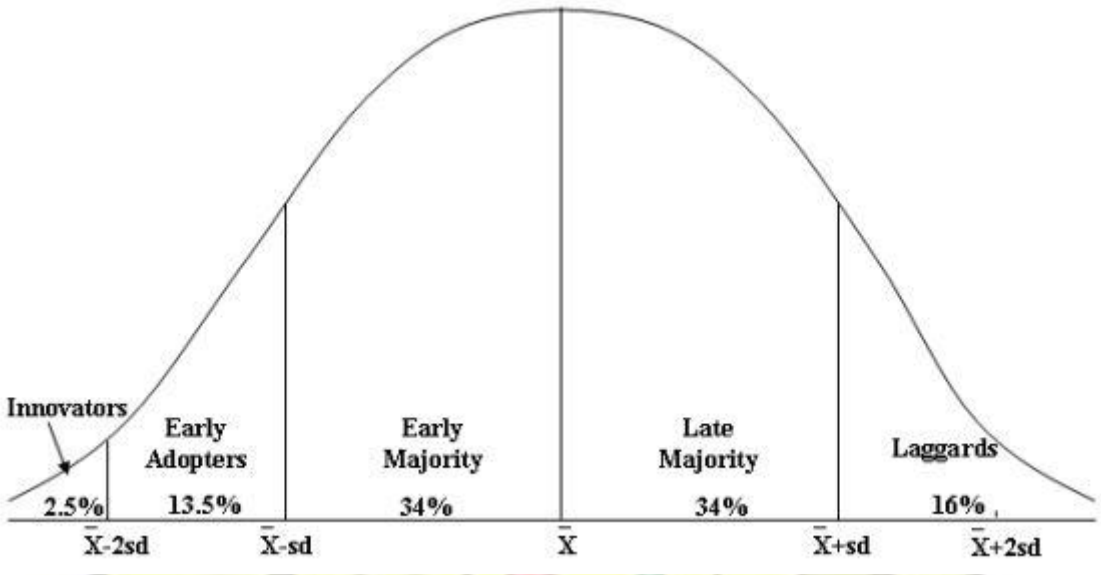

Figure 1.1: Innovativeness-Based Adopter Categorization

Everett M. Rogers, Diffusion of Innovations, fifth edition. Copyright (c) 2003 by The Free Press. Free Press: A Division of Simon & Schuster reprints.

2.8.1 Elements of the Roger's theory of diffusion

2.8.1.1 Innovators

Rogers (2003) claimed innovators were open to latest ideas. They must expect innovation failure and uncertainty. Rogers says innovators control system inventiveness outside the framework. A social institution may not respect them due to their daring and intimate relationships with outsiders. Entrepreneurs need complex technical skills to innovate.

2.8.1.2 Early adopters

Early adopters have less social freedom than innovators. Rogers (2003) claimed early adopters are more likely to lead the social structure and offer latest ideas. Light (1998) says leaders "Leaders are critical in practically every step of innovation, from idea to implementation, notably in mobilising resources for further innovation. The views of early adopters on technical improvements are better role models. Their opinions on the innovation are shared online. Early adopters' leadership reduces uncertainty about an idea's dissemination. Finally, early adopters "place their stamp of approval on a legislation" (Rogers, 2003).

2.8.1.3 Early majority

According to Rogers (2003), the early majority, despite having advantages social links, does not lead like early adopters. However, their social networks continue to spread inventions. The early majority adopts the innovation before half their contemporaries. Rogers stressed that current humans are not the first or last to accept technologies. This group needs more time than innovators and early adopters to accept a new alternative.

2.8.1.4 Late majority

Like the early majority, the late majority waits until most of their peers have adopted the innovation. A third of social system members are late majority. Despite their worries, they may accept the concept due to economic necessity or peer pressure. To decrease uncertainty, close peer networks should persuade the late majority to accept the innovation. Thus, the late majority considers adoption safe (Rogers, 2003).

2.8.1.5 Laggards

Rogers (2003) contends that late adopters' conventional views make them less adaptive. Their social networks are mostly made up of members of the same group because they are the most specialist. There are no leaders either. Their social networks are mostly made up of members of the same group because they are the most specialist. Thus, laggards often judge innovations by whether other social system members have embraced them. All these variables prolong laggards' innovation-decision times.

2.8.2 Linking theory to study.

Rogers (2003) divided his five categories by technological adoption date. Unlike early adopters, laggards or the late majority accept things later. Rogers examines these two groups' income, psychological qualities, and communication methods, which are associated to creativity. Rogers (2003) states that "the individuals or other units in a system who most need the advantages of a new concept (the less educated, less affluent, and the like) are frequently the last to adopt an innovation". Rogers noticed no age difference between early and late adopters. The research would address this category's qualities. Global company Cargill Kokoo Sourcing Limited has many partners and suppliers. According to Patterson et al. (2003), larger organizations and suppliers use more technology to improve information management and activity coordination. Employees and suppliers are accepting more. Roger's theory of innovation diffusion can help explain Cargil Kokoo Sourcing Limited's technology's adoption rate.

2.9 Conceptual Framework

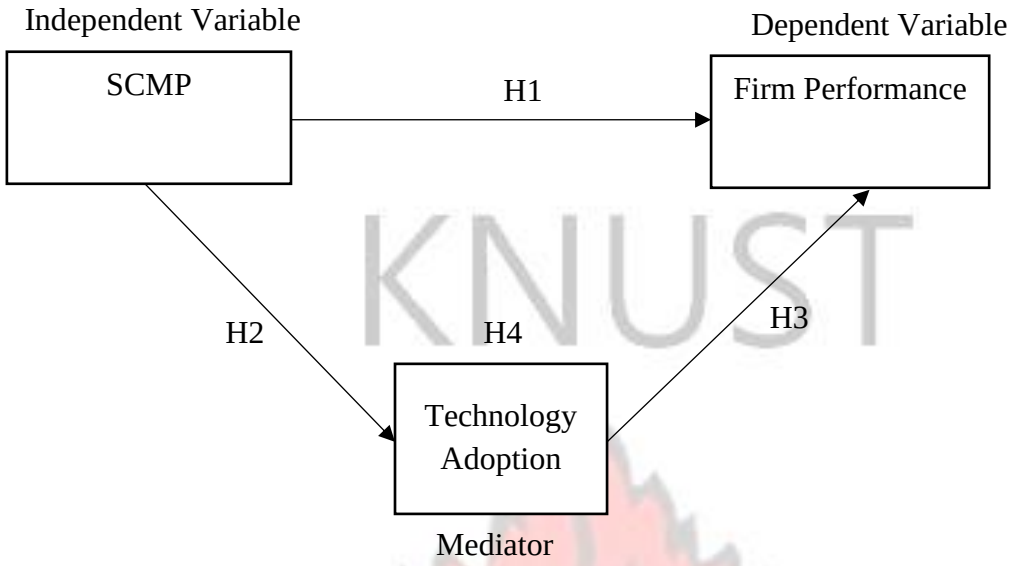

Figure 2.1: Researcher's Construct

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

A robust and well-structured research technique is needed to grasp and unravel our study objectives. This chapter lays the groundwork for the study by describing the methodical structure for Statistics, data mining, and interpretation.

3.2 Research Design

The research design is the plan for the whole investigation (Saunders et al., 2009). Cooper and Schindler (2003) A research design may be thought of as a researcher's method for answering a study subject. A research design is the approach for testing preset study hypotheses, according to Pinsonneault and Kraemer (1993).

The researcher used an explanatory research design to properly examine the study's hypotheses. Saunders et al. (2009) define "explanatory research approach" as an analytical study that identifies and evaluates relevant components of the research issue. Explanatory strategy should show the link between supply chain management, technology adoption, and company success. Survey, experimental, descriptive, and correlational designs are accessible for quantitative research.

Survey research was chosen for this study. Pinsonneault and Kraemer (1993) define survey research as one that advances scientific knowledge. However, a survey "collects data on the qualities, habits, or attitudes of a portion of a population" (Mcadams et al., 1982). Ideas and relationships are analysed using surveys. It follows theoretical assumptions about how and why variables must be connected (Pinsonneault and Kraemer, 1993). Survey designs may be cross-sectional or longitudinal depending on

whether time is expressly addressed (Pinsonneault & Kraemer, 1993). Thus, subject and research questions define ideal study design. Cross-sectional design describes the existing status. This study is used to identify demographic features at a certain period. Pinsonneault and Kraemer (1993) say it is safe to apply the sample's results to the overall population at the time.

Cross-sectional research methods were used for this analysis to examine the influence and relationship between concepts/variables by collecting construct data at a given period.

3.2 Research Method

Researchers study many phenomena using quantitative, qualitative, and mixed methodologies. The study subject, goals, and phenomena determine the approach. Each method has pros and cons.

Through rigorous data gathering and analysis, quantitative research quantifies linkages and patterns. Numerical data and statistical analysis inform its conclusions. This method collects data from a large sample using standardized questionnaires, surveys, or experiments. Statistics like correlation, regression, and hypothesis testing are usually employed to evaluate data.

Qualitative research explores social phenomena and people's experiences. Instead of quantitative measures, it emphasizes human perceptions, meanings, and context. Qualitative researchers use document analysis, observations, and interviews to gather descriptive data. Data is analyzed using thematic or content analysis to uncover patterns and topics.

Mixed methods research uses quantitative and qualitative methodologies to understand a study topic. This method allows several perspectives on a phenomenon, providing a more complete view. It involves collecting and analyzing numerical and descriptive data, and one approach's findings may inform and verify the other.

A quantitative research technique is needed to analyze the study's goals. Quantitative evidence must be quantified and statistically examined to support or disprove conflicting knowledge claims (Creswell, 2013). The quantitative data uses many participants rather than individual information to generalize the findings (Blessing & Chakrabarti, 2009). Babbie (2010) states that research that emphasizes numerical data either generalizes across populations or provides a credible explanation for a phenomena or occurrence. The three study objectives were evaluated using simple statistical methods such as correlation, regression, and mean and standard deviation.

3.3 Population of the Study

"Population" is defined by Creswell (2013) as all things, topics, or participants meeting the criteria provided. According to Saunders et al. (2009), the target demographic is the total collection of instances (individuals, groups, or objects) from which a sample is taken. It examines how suppliers, managers, and employees see supply chain management, technology, and company efficiency. The Cargill Kokoo Sourcing Limited was selected for this research because of its supply chain management strategies and technology adoption. The Cargill Ghana website states that this branch employs an average of 240 persons, who will be the study's population.

3.4 Sampling Techniques and Sample Size

Due to changes in the target group's physical attributes, the expected cost of the study, the period, the location, and the degree of measurement reliability required to generalize, it is almost impossible to investigate the complete study population. This helps respondents' facts help us understand a theoretical framework (Bernard, 2002). Accuracy and dependability depend on good sampling. Choosing an appropriate sample size is crucial to research, but there is no formula (Hair et al., 2014). The sample size for this study was based on two important characteristics. Generalization is still important, but the study's theoretical model's complexity in proportion to the statistical analysis needed to estimate its hypotheses is more important. For complex models with several association variables or causative factors to evaluate or regress, Hair et al. (2014) recommends a "higher" sample size. Again, Hair et al. (2014) states inferential statistics study should have a minimum sample size of 100 to create strong generalizations. The sample, being a representative subset of the population, allows for significant conclusions. Under these conditions, the research sampled 100 Cargill workers.

Non-probability and probability sampling are subgroups of sampling methods (Saunders et al., 2009). Saunders et al. list probability sampling methods as simple random, cluster, stratified, and systematic (2009). Convenient, purposeful, and snowball sampling are non-probability methods (Saunders et al., 2009). The research used convenient and purposeful sampling. Purposeful sampling is the planned and non-random selection of a sample size to achieve a goal, according to Creswell (2013). Researchers acquainted with population aspects utilize it. This strategy lets the researcher choose a population sample carefully. In purposive sampling, not everyone in the population has the same probability of being selected.

Since he knew the target group and who can provide the necessary information, the researcher employed convenient and purposeful sampling. Thus, 100 people were selected using a simple and planned selection method. The suppliers, managers, and workers of Cargill Kokoo Sourcing Limited are appropriate research participants because they have the necessary knowledge, information, and abilities. The study's variables sampled these people. Targeted respondents are experts in their domains and the best suppliers of reliable and useful research data.

3.5 Types and Sources of Data

Facts or numbers may be utilized to make conclusions. Before presenting and analyzing data, collect and sort it. Mesly (2015) says data is the basis of information. In its widest meaning, data is knowledge or information that has been represented or codified for easier use or processing (Mesly, 2015). Data is collected, examined, and then used to make choices. The researcher obtains data from a primary or secondary source (Mesly, 2015).

The research included supplier and employee survey data from Cargill Kokoo Sourcing Limited. Self-administered structured questionnaires are used because they match with supply chain management studies on company performance (Koh et al., 2007; Gandhi, Shaikh, and Sheorey 2017; Zhou & Li 2020). Survey questionnaires are also the greatest approach to generalize findings from a smaller sample size to a larger one, according to Campana (2010).

The researcher was able to ask more questions to better evaluate supply chain management methods, technology adoption, business performance, and respondents' characteristics (age, gender, position, and experience level).

The respondents worked at Cargill Kokoo Sourcing Limited's logistics, purchasing, supply chain, and IT departments. These professionals are familiar with their businesses' variables.

3.6 Data Collection Method

Leary (2005) suggested using telephone, internet, face-to-face, or postal systems to conduct research surveys. The sampled suppliers and personnel were surveyed in-person during delivery and pickup. The research encouraged in-person contacts because Zhou & Li agreed (2020). De Vaus (2002) defines a questionnaire as any form of data collection in which participants must answer the same questions in a preset sequence to ensure the findings are within the researcher's boundaries. Survey respondents had seven days to answer. Within the timeframe, questionnaires were completed. Informants were informed about the experiment before surveys. The researcher recruited two field assistants due to the large response. Note that these aides are trustworthy and provide well-researched material. Three individuals collected data from all sampled employers and suppliers.

Table 3.1: Summary of Measurement Variables

Variables	No. of Items	Source
Supply chain management practices		
Strategic supplier partnership	5	Quynh and Huy (2018), Al-Shboul et. al., (2017), Li et. al., (2006)
Level of information sharing	6	Quynh and Huy (2018), Al-Shboul et. al., (2017), Li et. al., (2006)
Quality of information sharing	5	Al-Shboul et. al., (2017), Li et. al., (2006)
Customer relationship management	5	Quynh and Huy (2018), Al-Shboul et. al., (2017), Li et. al., (2006)
Internal lean practice	5	Quynh and Huy (2018), Al-Shboul et. al., (2017)
Postponement	4	Quynh and Huy (2018), Al-Shboul et. al., (2017), Li et. al., (2006)
Total quality management	6	Al-Shboul et. al., (2017)
Sustainable packaging	5	Carter and Jennings (2002), Sonneveld (2005)
Technological adoption	4	Lakhwani et. al., (2020)
Firm performance	7	Quynh and Huy (2018), Al-Shboul et. al., (2017)

3.7 Data Analysis Method

Correlation and regression analyses descriptively and inferentially summarized the requested data. The analysis considered study objectives and hypotheses.

Inferential analysis sought to ascertain whether the independent variable affected the result. To determine regression analysis strength, the variables' correlation was investigated. Regression analysis examined cause-outcome relationships. The descriptive analysis focused on tables. This made it simpler to observe how often the variables were utilized. Descriptive and inferential data analysis helped the research achieve its goals and hypotheses. The research utilized SPSS 23 for data analysis. Along with SPSS, Excel and SmartPls were utilized. Analysis mostly employed tables

and graphs to illustrate results. This helped the researcher organize data into tables for better understanding.

3.8 Validity and Reliability of Constructs

The validity and reliability of the study's constructs were examined. SPSS was used to assess reliability and validity tests and collect primary data from most surveys. The Cronbach's Alpha test assessed data reliability, consistency, and quality. Dependability of dimensions and constructs was investigated. The Pearson correlation coefficient assessed concept validity.

External validity, or generalizability, is more important than internal validity, or how well a study's conclusions mirror reality (Rönkkö, & Evermann, 2013). Data collecting techniques' validity depends on how well they measure variables. Two research professionals assessed the questionnaire before publication to accomplish this. These professionals carefully reviewed the questionnaire to ensure every question measured the appropriate thing. Restating the questionnaire's various components and ideas with minor language changes improved readability and reliability. To collect meaningful data for analysis, the research instrument was validated wherever possible.

3.9 Ethical Considerations

Reliable research and excellent data analysis necessitate ethical methods (Zikmund, McLeod, & Gilbert, 2003). Leedy and Ormrod (2001) state that researchers must follow ethical criteria including anonymity, confidentiality, and informed permission and seek lawful data gathering channels. The researcher's two main ethical issues needed to be addressed for this investigation. Reliability and validity were used to reduce the researcher's impact on respondents while collecting and analysing data. To

address the issue of addressing professionally sensitive issues, the researcher instructed respondents not to answer privacy-invading questions. Thus, respondents' research participation was voluntary.

3.10 Profile of Cargill Kokoo Sourcing Limited

Since more than 40 years, Cargill has been importing cocoa from Ghana. In 2008, it opened one of the most cutting-edge cocoa processing plants in the world in Tema. The company's cocoa processing operations, which supply local and foreign customers in the food and confectionary industries, currently employ about 240 people. The same year, Cargill established a Licensed Buying Company (LBC) to increase its footprint in Ghana. The LBC operations open new channels of communication with our farmers while highlighting our continued efforts to be sustainable and traceable. As a result, Cargill takes part in the following activities. This leads to the production of items made from cocoa, such as cocoa butter, cocoa cake, and cocoa powder, as well as the running of authorized buying firms that deal directly with farmers to buy cocoa beans. In addition, Cargill has made several investments, one of which is a $3.2 million contribution to sustainability initiatives in association with CARE and the International Cocoa Initiative. Additionally, Cargill opened its cocoa processing factory in Tema, which cost the firm $100 million and was expanded in 2019, as well as built new schools and school infrastructure.

In 2007, Cargill opened a cocoa processing facility at the Tema, Ghana, port, which marked the company's first physical presence in the country. One of the most cutting-edge facilities in the world is this one. It was built using the most up-to-date technology, and to ensure the highest standards of food safety, it processes 65,000 metric tons of cocoa beans per year. Because of this, it has become an invaluable

resource for the global trade of quality cocoa powders and cocoa butter, which are used by manufacturers of chocolate, biscuits, chocolate beverages, and ice cream. More than 400 people (including permanent and contract staff) are directly employed by the plant, which has been fully operational since 2008, and many more people are indirectly employed by it, helping to support Ghana's growing economy. Ghanaian cocoa beans have always been recognized for their exceptional quality, positioning them as one of the finest varieties globally. The utilization of these beans, together with Cargill's extensive knowledge and long-standing involvement in the cocoa processing industry, contributes to the production of superior quality goods.

The Gerkens global line of cocoa powders includes the cocoa powders from Ghana. These powders are prepared for use anywhere in the world and don't need any additional processing. They have a unique flavor all their own that is well-rounded and mellow.

Ghanaian cocoa powders are advertised with the tagline "The good taste of Ghana," which reflects the superior cacao beans produced there. Customers can now purchase natural, mildly alkalized, and strongly alkalized versions of cocoa powder with a wider range of color and flavor options.

3.10.1 Sustainability

Our mission is to create the world's most responsible and environmentally friendly food supply systems. Cargill makes a concerted effort every day to implement cutting-edge sustainable practices across the organization, from local family farms to global shipping lanes, to lessen our impact on the planet and keep people safe.

Over the course of human history, we have seen agriculture contribute to the resolution of some of the world's most pressing problems. We are aware that to battle climate change, safeguard water and forest resources, and meet the rising need for food, we must do all these things at once. These tasks are difficult, but we have overcome many obstacles to ensure the stability of our food system, and we will continue to do so. To leave a more pristine and secure planet for future generations, we are painfully conscious of the enormous responsibility that comes with defending the globe and all its inhabitants.

3.10.2 Our Priorities

We have set priorities that consider the numerous negative effects that our business has on society, the economy, and the environment. We are aware, however, that no one company can successfully navigate all these challenges by itself. In our opinion, the resilience of our food system may be preserved by fostering relationships with and cooperating with local and international communities, farmers, and consumers.

3.10.3 Openness to the Public and Effective Governance

We believe that accountability is the key to growth. Until we have achieved our ambitious but attainable sustainability targets, we will keep pushing ourselves to the highest standards of openness.

Cargill's Chief Sustainability Officer and member of the Executive Team, Pilar Cruz, is responsible for overseeing the company's policies and operations to ensure they are compliant with Cargill's global responsibilities. Status reports on the project are sent annually to all relevant parties. Our Board of Directors also frequently receives briefings on the key ESG risks and opportunities that our company is facing. The

comments we've gotten from our major stakeholders have helped shape these improvements. You may access our Environmental, Social, and Governance report, as well as dashboards for tracking supply chain complaints and other information sharing on our Reporting Hub.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

SmartPLS 3 and SPSS statistics analyses support interpretations of the results in the fourth part of the study. This chapter covers respondent profiles, descriptive data on the SCMP, technology adoption, and company performance, hypothesis testing using regression and the Structural Equation Model (SEM), and analysis of those findings based on the study's objectives, objectives, and conceptual framework.

4.2 Response Analysis and Profile Information

4.2.1 Response Rate

Chapter three collected data on supply chain management, technology adoption, and company performance from Cargill Kokoo Sourcing Ltd. suppliers, managers, and employees. This gave 100 surveys to carefully chosen research subjects. The high response rate of face-to-face data collection helped its acceptance. The 10-day experiment with four field officers recovered 95 surveys. Following extensive informant data processing for data quality, two questions emerged fast. Only two of 95 questionnaires were incomplete. Therefore, 93 surveys were correctly obtained. This resulted in 93% questionnaire responses. The response rate is good since 7% of informants did not respond on time.

4.2.2 Demographic Information of Informants and Firms

This section of the findings report shows informant demographics. Data about respondents considered prudent for the research is collected. The information include

gender, job title, and years at the present business. Table 4.1 captures information in that regard.

Table 4.*1:* Demographics

		Frequency	Percent
Gender	Male	64	68.8
	Female	29	31.2
Job title	Manager	9	9.7
	Logistics manager	14	15.1
	Procurement manager	49	52.7
	IT personnels	11	11.8
	Supplier	2	2.2
	Warehouse supervisor	6	6.5
	Supervisor	2	2.2
Year of experience at the current firm	Under 2 years	21	22.6
	2 - 5 years	22	23.7
	6 - 10 years	34	36.6
	Over 10 years	16	17.2

Table 4.1 provides respondent demographics. The survey has 64 male respondents. This represents 68.8% valid responses. 29 female informants provided 31.2% of verified responses. The survey was not gender biased because Cargill Kokoo Sourcing Limited has several female employees.

Managers comprised 9 informants (9.7% of valid responses). 14 (15.1%) were logistics managers and 49 (52.7%) procurement managers. IT experts made up 11 informants (11.8%), suppliers 2 (2.2%), warehouse supervisors 6 (6.5%), and supervisors 2 (2.2%).

Table 4.1 shows that 21 informants (22.6%) worked for the organisation less than 2 years. 22 respondents had 2–5 years of organisation experience, 23.7%, 34 had 6–10 years, 36.6%, and 16 had more than 10 years, 17.2%. According to the survey's specialists, information was collected from experts who understand how supply chain

management methods affect corporate success. Thus, survey respondents were actively involved in the company's supply chain, making them perfect study subjects.

4.2.3 Reliability and Validity Testing

The study analyzed 51 items and 10 constructs. The EFA study decided on 10 components after several steps. Two of 51 items were deleted due to inadequate loadings. The finished model included 49 parts and 10 structures. Cronbach's alpha and composite reliability assessed measurement construct internal consistency and reliability. Table 4.2 shows that all constructions' Cronbach's alpha and composite reliability values exceeded 0.8, indicating good reliability. Larcker (1981) and Nunnally (1984) are two important scholars who have contributed to the field.

Factor loadings and AVE statistical significance assessed convergent validity (Fornell and Larcker, 1981; Anderson and Gerbing, 1988; Hair et al., 2010). Table 4.2 shows that all indicators have significant statistical loadings on their components, validating their construct assessment and convergent validity. From 0.5 to 0.9, loadings. Table 4.3 demonstrates that each construct's AVE is > 0.5, proving convergence (Fornell and Larcker, 1981).

Comparing the squared correlation of any two constructs to their average variance extracted (AVE) values can thoroughly assess discriminant validity. Hair et al. (2010). AVE values greater than the squared correlation indicate discriminant validity, indicating that a latent concept explains more item measurement variance than another construct. Table 4.2 revealed discriminant validity by showing that the square root of the AVE for each idea is greater than the correlation between any two concepts (Hair et al., 2010).

Table 4.*2*: Measurement Model Results

Constructs and reflective indicators	Loadings
Strategic Partnership (Cronbach's alpha =0.947; Composite reliability = 0.959; AVE = 0.825)	
SSP1	0.900
SSP2	0.915
SSP3	0.913
SSP4	0.876
SSP5	0.935
Customer Relationship Management (Cronbach's alpha =0.918; Composite reliability = 0.942; AVE = 0.803)	
CRM1	0.893
CRM2	0.900
CRM3	0.884
CRM4	0.927
Postponement (Cronbach's alpha =0.768; Composite reliability = 0.849; AVE = 0.584)	
POS1	0.767
POS2	0.740
POS3	0.732
POS4	0.816
Internal Lean Practices (Cronbach's alpha =0.908; Composite reliability = 0.932; AVE = 0.732)	
ILP1	0.797
ILP2	0.867
ILP3	0.898
ILP4	0.869
ILP5	0.845
Total Quality Management (Cronbach's alpha =0.890; Composite reliability = 0.916; AVE = 0.645)	
TQM1	0.804
TQM2	0.806
TQM3	0.788
TQM4	0.814
TQM5	0.773
TQM6	0.835
Quality of Information Sharing (Cronbach's alpha =0.920; Composite reliability = 0.942; AVE = 0.766)	
QIS1	0.919
QIS2	0.900
QIS3	0.916
QIS4	0.924
QIS5	0.692

Level of Information Sharing (Cronbach's alpha =0.918; Composite reliability = 0.937; AVE = 0.716)	
LIS1	0.905
LIS2	0.654
LIS3	0.878
LIS4	0.889
LIS5	0.871
LIS6	0.855
Sustainable Packaging (Cronbach's alpha =0.871; Composite reliability = 0.907; AVE = 0.662)	
SP1	0.856
SP2	0.849
SP3	0.853
SP4	0.767
SP5	0.737
Technological Adoption (Cronbach's alpha =0.926; Composite reliability = 0.947; AVE = 0.818)	
TA1	0.860
TA2	0.926
TA3	0.925
TA4	0.905
Firm Performance (Cronbach's alpha =0.936; Composite reliability = 0.951; AVE = 0.797)	
FP1	0.882
FP2	0.885
FP3	0.854
FP4	0.941
FP5	0.899

Table 4.3: Inter-Constructs Correlations

	SSP	CRM	POS	ILP	TQM	QIS	LIS	SP	TA	FP
SSP	1									
CRM	.558**	1								
POS	.508**	.536**	1							
ILP	.551**	.503**	.727**	1						
TQM	.570**	.811**	.478**	.587**	1					
QIS	.655**	.567**	.658**	.776**	.651**	1				
LIS	.560**	.549**	.528**	.701**	.832**	.711**	1			
SP	.593**	.805**	.674**	.631**	.836**	.748**	.682**	1		
TA	.600**	.542**	.573**	.636**	.617**	.817**	.632**	.606**	1	
FP	.520**	.490**	.481**	.624**	.712**	.541**	.744**	.615**	.475**	1
**. Correlation is significant at the 0.01 level (2-tailed).										

Note: AVE's square root is on the diagonal; Customer Relationship Management (CRM) and Strategic Partnerships (SSP), Postponement: POS; Internal Lean Practices: ILP; Total Quality Management: TQM; Quality of Information Sharing: QIS; Level of Information Sharing: LIS; Sustainable Packing: SP; Technological Adoption: TA; Firm Performance: FP

4.3 Descriptive Statistics

Table 4.*4:* Descriptive Statistics of Strategic Partnership

	Mean	Std. Deviation
SSP1	4.13	1.10
SSP2	4.16	1.06
SSP3	4.11	1.09
SSP4	4.08	1.07
SSP5	3.95	1.08
Overall	4.08	1.08

Table 4.4 shows how much Cargill Kokoo Sourcing Limited practices strategic partnership, according to research participants. The informants acknowledged that their organization practices strategic collaboration (mean=4.08; Std=1.08). Specific items respondents agreed that quality is the most essential criteria when choosing vendors

(mean=4.13; Std=1.10). Mean=4.16; Std=1.06) also found that they sometimes work with vendors to resolve concerns. The respondents also reported working with vendors to improve product quality (mean=4.11; Std=1.09). Further, Cargill Kokoo Sourcing Ltd.'s continuous improvement activities include important suppliers (mean=4.08; Std=1.07). Finally, they involve important suppliers in planning and goal setting (mean=3.95; Std=1.08).

Table 4.5: Descriptive Statistics of Customer Relationship Management

	Mean	Std. Deviation
CRM1	3.97	1.10
CRM2	4.14	1.02
CRM3	3.94	1.06
CRM4	4.05	1.05
Overall	4.02	1.06

According to Table 4.5, study respondents think the organization practices customer relationship management. A total score of 4.02 (Std=1.06) indicated that informants' organization practices customer relationship management. Respondents' interactions with specific things often set customers' expectations for dependability, attentiveness, and other criteria (mean=3.97; Std=1.10). Client satisfaction surveys were also found to be conducted regularly (mean 4.14; Std 1.02). The respondents also indicated that they typically predict client expectations (mean=4.05; Std=1.05). Finally, they help clients get help (mean=4.02; Std=1.06).

Table 4.6: Descriptive Statistics of Postponement

	Mean	Std. Deviation
POS1	3.78	1.13
POS2	3.72	1.25
POS3	3.77	1.18
POS4	4.09	1.02
Overall	3.84	1.15

Table 4.6 shows study respondents' views on the firm's postponement. After scoring 3.84 (Std=1.15), informants agreed that their organization postpones. Products, according to respondents, are modular (mean=3.78; Std=1.13). The study (mean=3.72; Std=1.25) also showed that they delay final product assembly until customer orders are received. The respondents also delayed final product assembly to the last possible point (or closer to clients) in the supply chain (mean=3.77; Std=1.18). Finally, they said their products are strategically stored near consumers. mean=4.09; std=1.02).

Table 4.7: Descriptive Statistics of Internal Lean Practices

	Mean	Std. Deviation
ILP1	4.02	1.12
ILP2	3.95	1.13
ILP3	3.86	1.12
ILP4	3.76	1.31
ILP5	3.88	1.22
Overall	3.89	1.18

This illustrates how respondents felt Cargil Kokoo Sourcing Ltd. practices internal lean. Cargill Kokoo Sourcing Ltd. generally practices internal lean (mean=3.89; Std=1.18), according to respondents. Respondents stated that the firm always tries to reduce set-up time (mean=4.02; Std=1.12). Again, the informant said their company

promotes suppliers to reduce lead times (mean=3.95; Std=1.13). Informants also said their firm streamlines supplier ordering, receiving, and other tasks (mean=3.86; Std=1.12). Respondents were confident in their suppliers' warehouses and factories' closeness (mean=3.76; Std=1.31). Finally, the informant reported that entering material/component/product inspection time has decreased (mean=3.88; Std=1.22).

Table 4.8: Descriptive Statistics of Total Quality Management

	Mean	Std. Deviation
TQM1	4.08	1.08
TQM2	4.06	1.00
TQM3	3.90	1.08
TQM4	3.98	1.08
TQM5	4.10	1.02
TQM6	4.09	1.04
Overall	4.03	1.05

As shown in table 4.8, Cargill Kokoo Sourcing Ltd.'s top management is evolving rapidly, has an integrated quality plan to meet business needs (mean=4.08; Std=1.08), encourages employees to participate in quality management and improvement activities (mean=4.06; Std=1.00), and provides all resources for employee education and training. With scores (mean=4.03; Std=1.05), informants agreed their activities used whole quality management.

Table 4.9: Descriptive Statistics of Quality of Information Sharing

	Mean	Std. Deviation
QIS1	3.96	1.10
QIS2	4.05	0.94
QIS3	4.03	1.03
QIS4	4.10	1.03
QIS5	4.02	0.93
Overall	4.03	1.01

Table 4.9 shows how Cargill Kokoo Sourcing Limited shares information quality according to research respondents. Informants agreed that their company shares information well (mean=4.03; Std=1.01). On specific subjects, respondents said the company communicates with business partners quickly and accurately. Short (mean=3.96; Std=1.10). They also found that their firm and partners share accurate information (mean=4.05; Std=0.94). The respondents also found that their firm and partners exchange information to some extent (mean=4.03; Std=1.03). Further, their firm and partners share enough information (mean=4.10; Std=1.03). Finally, their company and partner information exchange are dependable (mean=4.02; Std=0.93).

Table 4.10: Descriptive Statistics of Level of Information Sharing

	Mean	Std. Deviation
LIS1	3.98	1.01
LIS2	3.98	1.09
LIS3	4.10	1.02
LIS4	4.00	1.06
LIS5	3.91	1.04
LIS6	3.84	1.09
Overall	3.97	1.05

Table 4.10 shows the study's respondents' opinions on Cargill Kokoo Sourcing Limited's information sharing. With a mean=3.97; Std=1.05, informants agreed that Cargill gives a lot of information. On specific topics, respondents said they notify their partners of changes in advance (mean=3.98; Std=1.01). Their firm also shares confidential information with trading partners (mean=3.98; Std=1.09). The respondents also found that their trading partners will advise them of any difficulties that may affect their firm (mean=4.10; Std=1.02). Further, Cargill Kokoo Sourcing Ltd. trading partners share firm knowledge to improve key firm processes (mean=4.00; Std=1.06). Further, Cargill Kokoo Sourcing Ltd. exchanges information with trading partners to organize their operations (mean=3.91; Std=1.04). Finally, Cargill keeps its trade partners informed (mean=3.84; Std=1.09).

Table 4.11: Descriptive Statistics of Sustainable Packaging

	Mean	Std. Deviation
SP1	3.91	1.11
SP2	4.06	1.05
SP3	4.04	1.12
SP4	3.98	1.12
SP5	4.06	1.04
Overall	4.01	1.09

Table 4.11 shows how much Cargill Kokoo Sourcing Limited practices sustainable packaging, according to research respondents. Informants rated Cargill's sustainable packaging as 4.01 (Std=1.09). For specific goods, respondents agreed that their offerings maximize resources and efficiency (mean=3.91; Std=1.11). It was also found that Cargill's product life cycle stages help people and communities. mean=4.06; Std=1.05). The respondents also found that Cargill's production procedures are ecologically friendly (mean=4.04; Std=1.12). It was also disclosed that Cargill uses

mostly sustainable or repurposed raw materials. mean=3.98; std=1.12). Finally, they state that Cargill's raw ingredients, completed commodities, and recyclable packaging are powered by renewable energy. Short (mean=4.06; Std=1.04).

Table 4.12: Descriptive Statistics of Technological Adoption

	Mean	Std. Deviation
TA1	4.27	0.99
TA2	4.26	1.04
TA3	4.18	0.95
TA4	4.08	1.02
Overall	4.20	1.00

The table above shows informants' views on Cargill Kokoo Sourcing Ltd.'s technology adoption. With a mean rating of 4.20 and a standard deviation of 1.00, respondents agreed that Cargill Kokoo Sourcing Ltd. had effectively integrated technology into its operations. The interviewees agreed that technology speeds up their professional work (mean=4.27; Std=0.99). The informant again agreed that technology improves job performance, with a mean score of 4.26 and a standard deviation of 1.04. The informants also agreed that using technology at work boosts productivity (mean=4.18; Std=0.95). Again, participants were confident that technology enhances workplace productivity (mean=4.08; Std=1.02).

Table 4.13: Descriptive Statistics of Firm Performance

	Mean	Std. Deviation
FP1	4.04	1.11
FP2	4.13	1.01
FP3	3.82	1.07
FP4	4.28	1.00
FP5	4.25	1.02
Overall	4.10	1.04

Cargill Kokoo Sourcing performance as perceived by informants is shown above. The respondents said Cargill had a larger market share than competitors. Mean=4.04; Std=1.11). Informants also agreed that Cargill has a higher ROI than competitors (mean=4.13; Std=1.01). The informant again agreed that Cargill had outperformed competitors in return on investment (mean=3.82; Std=1.07). Informants likewise agreed that Cargill had a higher sales profit margin than competitors (mean=4.28; Std=1.00). Again, respondents said Cargill has improved its market position (mean=4.25; Std=1.02). Overall, the informant agreed that Cargill's performance had improved (mean=4.10; Std=1.02).

Table 4.14: Hypothesis table

Path	**Beta**	**P value**	**Results**
Direct Effects			
Supply Chain Management Practices -- > Firm Performance	0.903	0.000	Supported
Technological Adoption -- >Firm Performance	-0.159	0.250	Not supported
Supply Chain Management Practices -- > Technological Adoption	0.774	0.000	Supported
Indirect Effects			
Supply Chain Management Practices -- > Technological Adoption -- > Firm Performance	-0.123	0.271	Not supported

4.5 Structural Equation Model Results

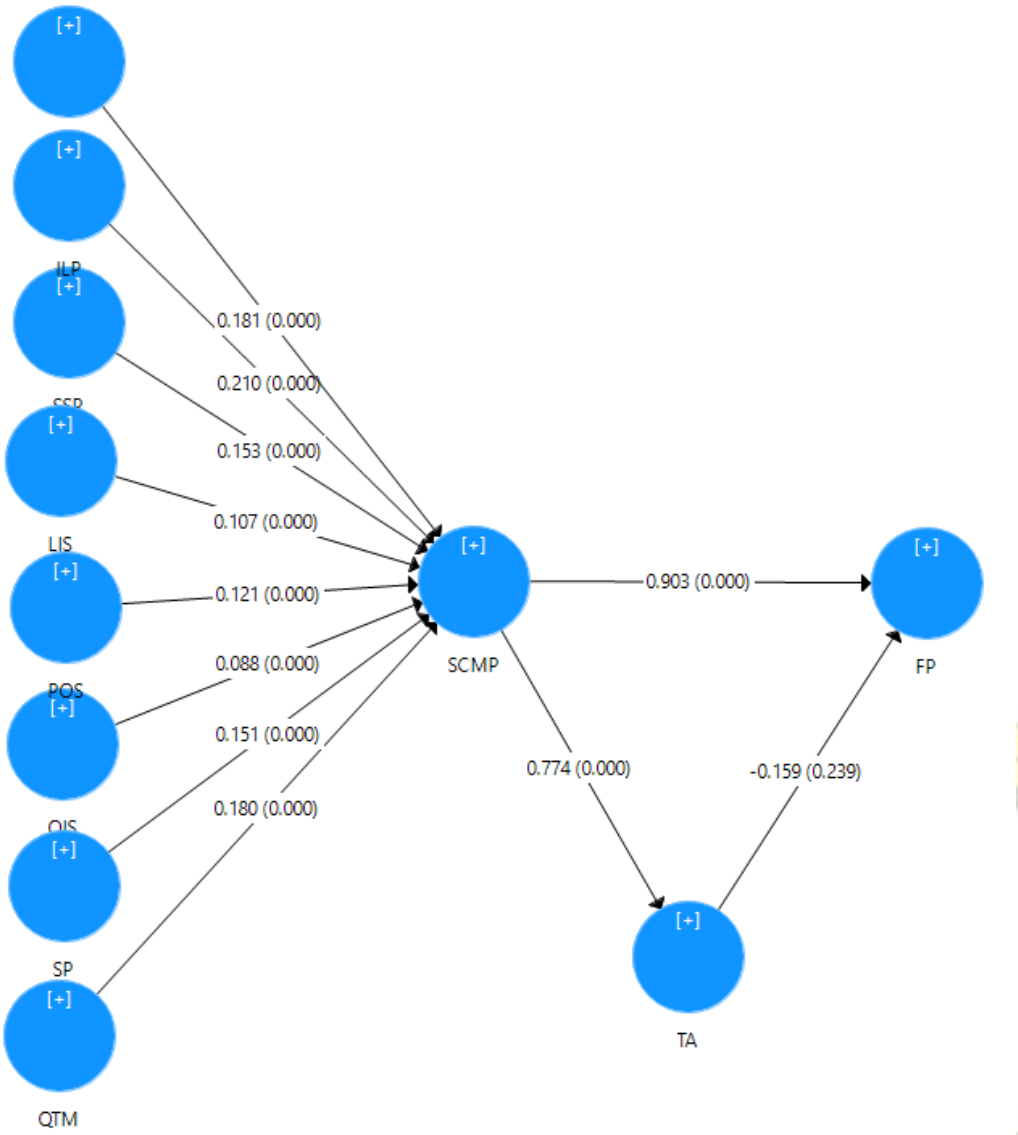

Figure 3.1: Structural Equation Model

A Structural Equation Model (SEM) was created to analyses direct and mediated effects. SmartPLS 3. SCMP, technological adoption, and business performance where the study's three main variables for the SEM. SCMP was the independent variable, and corporate performance was the dependent variable. SCMP and business performance were mediated by technological adoption. The SEM fit values in Table 4.14 met the

standards in the previous subsection. The SEM analysis supported only H1 and H3, not H2 or H4 (Table 4.14).

Table 4.14 lists SCMP, technological adoption, and business performance as the primary variables. The structural equation model showed varying direct and indirect impacts. It found that supply chain management practices affect business performance (beta=0.906, p=0.000) and technological adoption (beta=0.774, p=0.000). A negative and negligible connection between technological adoption and firm was found (beta=-0.159, p=0.250). SEM results show a weak negative connection between supply chain management practices and company performance through technological adoption (beta=-0.123, p=0.271). Thus, the second and fourth hypotheses failed. The SEM analysis shows that technology deployment does not mediate the link between supply chain management practices and company performance.

4.6 Discussion of Results

Logic is used to analyses each hypothesis' study results. This research had four aims, and each hypothesis answered them. The study focused on SCMP's impact on business outcomes. The second and third goals explored how technology adoption influences company performance and supply chain management methods. The fourth and final aim examined how technology deployment affects SCMP-firm performance. A self-delivered questionnaire was issued to 100 Cargill Kokoo Sourcing Ltd. workers for cross-sectional survey data. The Structural Equation Model examines SCMP and firm performance, technological adoption and firm performance, supply chain management practices and technological adoption, and technological adoption's mediation effect on SCMP and firm performance.

4.6.1 SCMP and firm performance

The study examined supply chain management's impact on firm performance. Al Shboul et al. (2017) and Zhou & Li (2020) supplied literature on supply chain management methods' impact on company performance, which constituted the study's purpose and hypothesis. Previous research established a strong correlation between the factors under discussion, but this study's goal is different. Thus, this study explored how supply chain management practices affect underdeveloped nation corporate performance. The eight supply chain management components investigated include strategic partnership, customer relationship management, delay, internal lean practices, total quality management, information sharing quality, level, and sustainable packaging. Supply chain management may enhance a company's bottom line, the study found. Previous study supports this (Ou et al., 2010). Adding to the literature by addressing contradictory findings about supply chain management techniques and business performance. Because no study has examined as many green supply chain management approaches as this one.

4.6.2 Technological adoption and firm performance

Another study goal evaluated how technology adoption affects company performance. The study hypothesized that technology adoption boosts company performance. Similar ideas have been offered earlier, but this study's purpose is different (Anjum, 2018; Lakhwani et al., 2020). This study examined first-order variables in a developing economy. Technology adoption didn't affect corporate performance. The findings contradict prior research (Anjum, 2018; Lakhwani et al., 2020). New technology improves company performance.

4.6.3 Supply chain management practices and technological adoption

The third research goal examined supply chain management and technology adoption. Supply chain management approaches and technology adoption research (Oettmeier and Hofmann 2016; Kamble et al. 2018) informed this study's goal and hypothesis. This earlier study employed different parameters. Their research showed that supply chain management processes improve technology adoption. Current and past investigations vary in scope. Different supply chain management practices affect how quickly organizations adopt technology. The study concluded that supply chain management improves technology adoption. This study shows that supply chain practices affect technology uptake.

4.6.4 The mediating effect of technological adoption on the relationship between SCMP and firm performance

The study's fourth and final purpose was to determine how technology adoption affects SCMP and company performance. Previous research informed this study's purpose and hypothesis (Gandhi et al., 2017; Li et al., 2006). Gandhi et al., (2017) explored how supply chain management practices (SCMPs) effect SCP and FP in organized retail in India, a developing nation. The present study found that supply chain performance mediates the association between supply chain management methodologies and corporate performance. Li et al. (2006) examined how supply chain management (SCM) affects competitive advantage and organizational performance. Following examination, a competitive advantage improves the relationship between supply chain management strategies and organizational performance.

Both studies found a link between supply chain management practices and business success, and this research used technology adoption to evaluate the independent variable's effect on the dependent variable. Results demonstrated that technology adoption hurts supply chain management and firm success. The statistics show the connection is statistically insignificant. Gandhi et al., 2017 and Li et al., 2006 found different results. This study adds to literature by measuring supply chain management approaches.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND IMPLICATIONS

5.1 Introduction

The research examined how SCMP, and technology adoption affect corporate performance. Chapter five of this research summarized the results, conclusion, and implications.

5.2 Summary of Findings

This research investigates the impact of supply chain management and technology adoption on company performance. The objectives were examined to accomplish the specified aim. The study aimed to investigate four main objectives: 1) Assess the influence of supply chain management practices (SCMP) on firm performance, 2) Evaluate the impact of technological adoption on firm performance, 3) Analyze the relationship between supply chain management practices and technological adoption, and 4) Investigate the potential mediating role of technological adoption in the relationship between supply chain management practices and firm performance. A total of 100 workers from Cargill Kokoo Sourcing Limited participated in a cross-sectional survey that was self-administered. The use of Structural Equation Model (SEM) is employed to elucidate the study outcomes pertaining to the interplay between Supply Chain Management Practices (SCMP), technology adoption, supply chain management methodologies, and the mediating impact of technological adoption on both SCMP and firm performance.

5.2.1 SCMP and firm performance

To reach the study's primary aim, SEM was leveraged to assess the impact of SCMP on firm performance. The findings submit that, the relationship between SCMP and firm performance is positive and statistically significant (beta=0.903, p=0.000). The said finding supports prior SCMP and firm performance relationships established by empirical findings.

5.2.2 Technological adoption and firm performance

To address the second objective of the study, SEM was employed to assess the impact of technological adoption on firm performance. The results suggest that the use of technology has a statistically negligible and negative impact on company performance (beta=-0.159, p=0.250). The said findings do not support prior technological adoption and firm performance relationships but contributes to literature.

5.2.3 Supply chain management practices and technological adoption

To fulfil the third purpose of the study, the researchers have used Structural Equation Modelling (SEM) to evaluate the correlation between supply chain management practises and technology adoption. The results indicate that there is a strong and statistically significant correlation between supply chain management practises and business performance. (beta=0.774, p=0.000). The said finding supports prior supply chain management practices and technological adoption relationships.

5.2.4 Mediating role technological adoption on the relationship between SCMP and firm performance

The fourth goal of the research is to investigate how technology adoption influences the connection between SCMP and company performance. A SEM is used to achieve this goal. According to the results of this investigation, SCMP influences firm performance, but this effect is mediated by technology adoption rather than being direct (beta=-0.123, p=0.271). Since technology adoption was not shown to moderate the connection between SCMP and business performance, the theory was disproved.

5.3 Conclusion

It has always been statistically evaluated by several studies that methods of supply chain management, including strategic alliances, customer relationship management, etc. improves firm performance and this study contributes to that voice. However, this study has further established that through a mediation (technological adoption), improvements in company performance attributable to supply chain management methods are statistically negligible. Furthermore, the findings have revealed that adopting technological tools alone is not enough for Cargill to improve its performance. This study has proven that adopting technological tools in SCMP tend to have a positive relationship, but this relationship does not improve the performance of Cargill Kokoo Sourcing Limited. 100 employees of Cargill Kokoo Sourcing Limited were asked to fill out a cross-sectional survey form and mail it in on their own time.

Using SEM, the study identified that: 1) SCMP had a positive and significant effect on firm performance, 2) technological adoption resulted in a bad and negligible outcome relationship on firm performance, 3) supply chain management practices had a positive and significant relationship on technological adoption and 4) technological adoption

does not necessarily have a moderating role in how supply chain management techniques affect company success. The first and third research results match earlier literature, while the second and fourth add to it. The study's main theoretical finding is that Cargill must employ technology tools to enhance supply chain management, although performance improvement is not essential.

5.4 Implications

This section presents the researcher's conclusions based on the study's results. The implications are focused on academics and business. The part is divided into two sub-sections: management implications and future research implications.

5.4.1 Implications for Managers

Our empirical results provide useful suggestions for executives.

This study indicates that when management of Cargill Kokoo Sourcing Limited invest in the methods used in supply chain management and adopt technological tools, they tend to positively affect the relationship between supply chain management practices and technological adoption. But this positive relationship does not necessarily improve the performance of Cargill Kokoo Sourcing Limited. Hence, management of Cargill should invest in technological tools and supply chain management practices as a way of improving operations which may affect performance of the firm in some way.

5.4.2 Implications for Future Research

However, the research does have some limitations. that should be considered in future studies. Initially, cross-sectional data were used in this investigation. Nonetheless, longitudinal data should be used in future studies. Second, only Cargill Kokoo

Sourcing Ltd was the subject of this study. Future research should consider various industries to offer more details. To improve business performance, this research also examined supply chain management techniques and technological adoption. The focus of future studies should be on the main forces behind supply chain management techniques and should incorporate additional mediating or moderating variables, such as value co-creation, etc., into this model.

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