SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF MOTOR ASSEMBLING FIRMS IN KENYA

VALLARY BARRACK ODHIAMBO

MASTER OF BUSINESS ADMINISTRATION IN PROCUREMENT AND SUPPLIES MANAGEMENT

KCA UNIVERSITY

2025

SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF MOTOR ASSEMBLING FIRMS IN KENYA

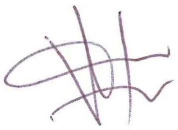
VALLARY BARRACK ODHIAMBO

A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN PROCUREMENT AND SUPPLIES MANAGEMENT TO THE SCHOOL OF BUSINESS OF KCA UNIVERSITY

DECEMBER 2025

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Signature: ……  ……...…..…… Date 21/10/2025

Vallary Barrack Odhiambo

Reg No: 17/00127

This project of

Vallary Barrack Odhiambo

has been submitted for examination with our approval as University Supervisors:

Signature: …  ……...…Date: …**22/10/2025**……

Dr. Catherine Gatari, PhD

KCA UNIVERSITY

ABSTRACT

A strong vehicle assembly industry enhances local manufacturing, reduces reliance on imports, and promotes the development of related industries, such as parts manufacturing and logistics. However, Kenyan motor vehicle assembly sector is characterized by low capacity utilization, declining market share, high operational costs, and policy uncertainties. Thus, this study aimed to analyze the effect of supply chain strategies on the performance of motor assembling firms in Kenya. The specific objectives were; leagile, digital, resilient, and sustainable supply chain strategies impact the performance of these firms. The study was anchored on several key theories, including the hybrid supply chain theory, diffusion of innovation theory, dynamic capabilities theory, and stakeholder theory. A descriptive research design was employed, with a target population of staff from 13 motor vehicle assembling firms in Kenya. The census was used, targeting a sample size of 130 individuals. Data was collected using standardized closed-ended questionnaires, with the drop-and-pick-later method employed for data collection. Both descriptive and inferential data analysis techniques was used, with the results presented in frequency tables and pie charts for clear and accessible visual representation. The findings show that leagile strategies boost efficiency and adaptability in motor assembling firms. Digital strategies improve coordination, forecasting, and real-time monitoring. Resilient strategies enhance risk management and operational continuity. Sustainable strategies promote environmental responsibility and ethical practices, strengthening overall performance. The study concluded that leagile strategies improve efficiency, customer satisfaction, and adaptability in motor assembling firms. Digital strategies strengthen coordination, forecasting, and real-time responsiveness. Resilient strategies boost resilience, risk management, and operational continuity. Sustainable strategies enhance environmental responsibility, ethical practices, and resource efficiency. Together, these approaches drive strong performance, but variations in implementation show the need for more consistent practices across the industry. The study recommends adopting standardized best practices to strengthen leagile, digital, resilient, and sustainable supply chain strategies. Firms should invest in advanced technologies, training, and collaboration systems to boost efficiency and responsiveness. Risk management, ethical practices, and environmental initiatives should be applied consistently across the industry. These measures together can enhance resilience, competitiveness, and long-term performance.

Key words: Digital Supply Chain Strategy, Leagile Supply Chain Strategy, Performance of MAF, Resilient Supply Chain Strategy, Sustainable Supply Chain Strategy

ACKNOWLEDGEMENT

I have a great deal of gratitude to God for giving me the courage and capacity to finish my research project on time. I would like to express my profound gratitude to my supervisor, Dr. Catherine Gatari, for her helpful advice, encouragement, and helpful criticism, all of which were crucial in the planning and execution of this proposal. I also want to thank the administration and library at KCA University for their assistance, which was crucial to the completion of my proposal.

TABLE OF CONTENTS

DEDICATION

This project report is dedicated to my family, whose consistent encouragement, financial support, love, and emotional support were all crucial in enabling me to finish this proposal report. I will be eternally thankful for their assistance during my academic career.

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMMS

DCT:	Dynamic Capabilities Theory
DOI:	Diffusion of Innovation Theory
EV:	Electric Vehicle
IT:	Information Technology
JIT:	Just-In-Time
MAF:	Motor Assembling Firms
SMEs:	Small and Medium-sized Enterprises

OPERATIONAL DEFINITION OF TERMS

Digital Supply Chain Strategy: It involves process automation to enhance efficiency, real-time visibility for better tracking of materials and products, system integration to streamline operations, analytics capability for data-driven decision-making, ultimately enhancing supply chain agility and responsiveness (Ngenoh, 2019).

Leagile Supply Chain Strategy: It is characterized by high collaboration levels among supply chain partners, order fulfillment efficiency, reduced lead time, improved inventory turnover, and flexibility to demand changes, ensuring firms can swiftly respond to market fluctuations while maintaining cost-effectiveness (Mathenge & Obere, 2023).

Performance of MAF: This refers to the overall effectiveness and efficiency of motor assembling firms in achieving their business objectives. Key performance indicators include market share as a measure of competitive positioning, revenue growth as an indicator of financial success, employee turnover to assess workforce stability (Li, Chen, Collignon & Ivanov, 2021).

Resilient Supply Chain Strategy: It includes risk management to identify and mitigate vulnerabilities, supply flexibility to adapt to changing demands, redundancy planning to ensure backup resources,

business continuity measures to minimize disruptions (Khattabi & Karim, (2019).

Sustainable Supply Chain Strategy: It encompasses waste reduction to minimize resource consumption, green packaging to lower environmental impact, ethical labor practices to uphold fair working conditions, supplier compliance with environmental and social standards, and sustainable procurement practices that prioritize eco-friendly and socially responsible suppliers (Wandera, Namusonge & Sakwa, 2022)

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The performance of motor assembling firms is driven by efficient production processes, technological advancements, and strong market demand. In particular, technological advancements such as automation and robotics play a crucial role in enhancing productivity and maintaining high-quality standards, which ultimately increase competitiveness (Giardili, Ramdas & Williams, 2023). Strategic partnerships with global automotive brands and suppliers provide access to innovative designs and high-quality components, further boosting operational efficiency. Additionally, government incentives and favorable policies support growth by encouraging local manufacturing and investment. With the rising demand for vehicles, especially in emerging markets, motor assembling firms continue to expand, creating employment opportunities and contributing significantly to economic development (Onyando & Naikuru, 2021).

From a global perspective, the performance of motor assembling firms is significantly influenced by supply chain strategies, which determine production efficiency, market competitiveness, and profitability. To achieve optimal performance, highly industrialized countries like Germany and Japan have refined their supply chains through just-in-time inventory management, supplier diversification, and lean manufacturing, resulting in reduced operational costs and increased output (Krzywdzinski, 2021). The United States and China have leveraged digital supply chain solutions, including blockchain and artificial intelligence, to improve transparency, traceability, and demand forecasting, further boosting firm performance (Zhang, Song & Zhang, 2023). Emerging economies such as India, Brazil, and South Africa have

experienced improvements in motor assembling firm performance due to foreign direct investment, infrastructure development, and favorable trade policies (Liu, Zhu, Yang & Chu, 2022).

The performance of motor assembling firms plays a crucial role in global industrial development, economic growth, and job creation. Leading automotive manufacturing nations such as Germany, Japan, the United States, and China have consistently recorded high production levels, driven by technological advancements, automation, and efficient production processes (Partner, 2023). The global motor vehicle industry has been expanding rapidly, with firms adopting innovative assembly techniques such as modular production, robotics, and artificial intelligence to improve efficiency and reduce costs (Reed, Gannon & Dongarra, 2022). The transition to electric and hybrid vehicles has further influenced the performance of motor assembling firms, with countries like China dominating the electric vehicle (EV) market due to extensive government support and advancements in battery technology (Liu, *et al.* 2022).

In Africa, South Africa remains the continent's largest automotive producer, with a motor assembly industry that makes a substantial contribution to GDP and employment creation (Khumalo & Zondo, 2021). The sector enjoys strong government support through the Automotive Production and Development Programme (APDP), which provides incentives such as tax allowances, production rebates, and investment grants to boost local manufacturing and export volumes (Khattabi & Karim, 2019). This environment has attracted global automotive brands including BMW, Toyota, and Volkswagen, whose operations promote technology transfer, skills development, and integration into global value chains (Anzolin & Andreoni, 2023). Additionally, the country benefits from developed infrastructure, a skilled workforce, and a network of local

suppliers that strengthen its competitive position in vehicle assembly across both domestic and international markets (Anzolin & Andreoni, 2023).

Meanwhile, in North Africa, Morocco has emerged as a fast-growing vehicle assembly hub, strategically located to serve Europe, Africa, and the Middle East (Khumalo & Zondo, 2021). The nation benefits from favorable trade agreements with key markets such as the European Union and the United States, as well as growing integration within the African Continental Free Trade Area, boosting export competitiveness (Anzolin & Andreoni, 2023). Investments in supply chain infrastructure, including modern logistics platforms like the Tanger-Med Port, have enhanced the efficiency of production and distribution networks (Khumalo & Zondo, 2021). Global manufacturers such as Renault and Peugeot have taken advantage of Morocco's integrated supplier base, renewable energy initiatives, and vocational training programs to improve operational efficiency and sustainable manufacturing performance (Khattabi & Karim, 2019).

Other African countries, including Nigeria and Egypt, have struggled to achieve optimal performance in their motor assembly industries due to weak supply chains and heavy reliance on imported components. Nigeria's automotive sector has faced persistent issues such as inconsistent government policies, poor infrastructure, and limited local content development, leading to high production costs and reduced competitiveness (Elijah & Ezeife, 2020). Similarly, Egypt's automotive industry has seen moderate growth, driven by domestic demand and foreign investments, yet remains constrained by inefficient logistics networks and limited technological capabilities (ElMelegy, Alnajem & Albuloushi, 2021).

In Kenya, the performance of motor assembling firms has played a vital role in driving industrial growth, technology transfer, and job creation, with industry leaders such as Isuzu East Africa, Simba Corporation, and Associated Vehicle Assemblers spearheading production and

innovation (Ngenoh, 2019). The government's proactive policies, notably the National Automotive Policy, have been central to promoting local vehicle assembly, which has in turn increased production capacity and reduced reliance on fully built imported vehicles (Mathenge & Obere, 2023). Tax incentives, reduced import duties on completely knocked-down (CKD) kits, and initiatives to promote local content development have strengthened the competitiveness of local assemblers (Khisa, Kariuki & Kenyatta, 2022). These measures have also attracted foreign direct investment into the automotive sector, encouraged partnerships between global manufacturers and local firms, and supported skills development in mechanical engineering and automotive technology. Furthermore, the industry has benefitted from growing regional demand under the African Continental Free Trade Area (AfCFTA), opening opportunities for Kenyan assemblers to access wider markets in East and Central Africa (ElMelegy, Alnajem & Albuloushi, 2021).

The increasing demand for commercial vehicles including buses, trucks, and light-duty vehicles has been fueled by the expansion of infrastructure projects, urbanization, and the growth of sectors such as logistics, construction, and public transportation (Chebet, Ogutu, Njeru & Njihia, 2022). This demand has encouraged assemblers to diversify their product ranges, improve production efficiency, and adopt modern manufacturing technologies to meet changing market needs. Rising consumer preference for affordable yet durable vehicles has also led to innovations in design and assembly processes, with a focus on cost-effective production without compromising quality (Khisa, Kariuki & Kenyatta, 2022). Additionally, the adoption of environmentally friendly vehicle technologies, such as electric and hybrid models, is gaining momentum in response to global sustainability trends and government interest in reducing carbon emissions (Mathenge & Obere, 2023). While the industry has recorded notable progress, challenges such as fluctuating

foreign exchange rates, high energy costs, and competition from used vehicle imports continue to affect operational efficiency. Nevertheless, with sustained policy support, technological innovation, and integration into regional and global automotive value chains, Kenya's motor assembling sector is positioned to strengthen its role as a key driver of economic transformation (Ngenoh, 2019).

The performance of motor assembling firms in Kenya remains a critical concern, as the sector faces persistent challenges that hinder its growth and competitiveness. Despite government efforts to promote local assembly through policy incentives such as tax exemptions and import duty reductions, production volumes remain low compared to regional and global benchmarks (Ireri & Deya, 2019). The dominance of imported second-hand vehicles, which account for over 80% of the domestic car market, has significantly limited the demand for locally assembled vehicles, affecting the profitability of motor assemblers.

Furthermore, high production costs due to expensive raw materials, unreliable supply chains, and energy inefficiencies have made locally assembled vehicles less affordable for consumers (Mwangi, 2019). The industry's weaknesses were further shown by supply chain interruptions, especially after the COVID-19 epidemic. Production slowed down and output decreased as a result of delays in acquiring necessary vehicle components (Mathenge & Obere, 2023).

1.1.1 Supply Chain Strategies

Companies use supply chain strategies as crucial frameworks to improve operations, enhance productivity, and build a sustainable competitive edge in dynamic business environments. According to Fernandez and Adesina (2025), the four main categories of supply chain strategies—leagile, digital, resilient, and sustainable serve different but complementary corporate goals. The

leagile supply chain strategy, which combines lean and agile principles, enables firms to balance efficiency with responsiveness, making it particularly useful in volatile markets where demand patterns change rapidly (Sanders, 2025).

Applying lean practices, businesses can minimize waste, streamline processes, and reduce costs, while agile elements allow quick adaptation to customer needs and market disruptions. This combination is especially valuable for industries like motor assembly, where customer specifications and component availability can vary significantly, requiring production systems that can switch between standardized and customized outputs without major delays. Furthermore, leagile strategies promote stronger supplier collaboration and shorten lead times, thereby supporting just-in-time (JIT) manufacturing models (Fernandez & Adesina 2025).

The digital supply chain approach, on the other hand, leverages advanced technologies such as blockchain, artificial intelligence (AI), and the Internet of Things (IoT) to improve automation, transparency, and data-driven decision-making (Ageron, Bentahar & Gunasekaran, 2020). Integrating these technologies enhances demand forecasting accuracy, strengthens real-time tracking capabilities, and increases overall supply chain agility. For example, blockchain can secure transaction records and improve trust between suppliers, AI can optimize inventory levels and production schedules, and IoT devices can monitor equipment health to prevent costly downtime. These tools not only improve manufacturing efficiency but also reduce operational disruptions, enabling businesses including motor assemblers to maintain competitiveness in both domestic and international markets (Fernandez& Adesina (2025).

Digital strategies also support predictive maintenance, sustainability tracking, and enhanced customer service by providing accurate delivery timelines. In the context of Kenya's automotive sector, the adoption of such technologies can help overcome logistical bottlenecks,

manage global supplier networks, and comply with international quality standards, thereby strengthening the industry's integration into global value chains (Sanders, 2025).

In addition to efficiency and digital transformation, supply chain strategies emphasize sustainability and resilience, two factors that are becoming more and more important in the current global business climate. By using risk mitigation techniques like supplier diversity and buffer inventory management, a resilient supply chain strategy makes sure that businesses can survive interruptions like pandemics, geopolitical unrest, and supply shortages (Yanamandra, 2019, Similarly, sustainable supply chain strategies emphasize environmental, social, and economic sustainability by promoting green procurement, ethical sourcing, and waste reduction (Ageron, *et al*.2020). With growing environmental concerns and regulatory pressures, firms that integrate sustainability into their supply chain strategies enhance corporate reputation and long-term viability. Considering the importance of these strategies in ensuring operational efficiency and market competitiveness, this study will focus on leagile, digital, resilient, and sustainable supply chain strategies. These variables have been selected because they encapsulate both traditional and modern supply chain approaches, offering a comprehensive perspective on optimizing performance in motor assembling firms.

1.1.2 Performance of Motor Assembling Firms

Supply chain strategies have a significant impact on the operation of motor assembly companies because they influence cost efficiency, manufacturing flexibility, and market response. To streamline operations and reduce costs, motor assembly companies use tactics such as lean manufacturing, just-in-time (JIT) inventory management, and global sourcing. Firms that apply JIT, for example, decrease inventory holding costs by obtaining items only when they are required, hence increasing cash flow and decreasing waste. However, such strategies require strong supplier

relationships and efficient logistics networks to prevent production delays. The use of digital technology, such as blockchain and artificial intelligence, boosts supply chain transparency and decision-making, ultimately increasing corporate performance (Khisa & Kariuki, 2022).

Supplier relationship management is a vital supply chain approach that guarantees high-quality components are delivered on time for vehicle assembly. Motor assemblers that establish long-term partnerships with suppliers benefit from improved reliability, cost savings, and innovation. For example, Toyota's close collaboration with suppliers under its keiretsu system enables the company to maintain high production efficiency and product quality. Additionally, local sourcing strategies can enhance supply chain resilience by reducing exposure to global disruptions such as trade restrictions and supply shortages. However, over-reliance on a limited pool of suppliers may pose risks in case of supplier failures or production disruptions (Ngenoh, 2019).

The performance of sustainable supply chain strategies in motor assembling firms can be measured through key performance indicators such as carbon footprint reduction, resource efficiency, regulatory compliance, cost savings, and customer satisfaction. Carbon footprint reduction can be tracked by monitoring greenhouse gas emissions across sourcing, production, and logistics, while resource efficiency is assessed through material waste, energy consumption, and recycling rates. Compliance with environmental regulations can be evaluated through audits and certifications, ensuring adherence to sustainability standards. Cost savings and operational efficiency can be measured by tracking reductions in fuel consumption, logistics expenses, and production waste. Additionally, customer satisfaction and brand reputation can be analyzed through surveys, sales performance, and media sentiment, reflecting the impact of sustainability efforts on customer loyalty. The supplier sustainability compliance can be assessed using ethical

sourcing audits and sustainability scorecards, ensuring responsible procurement of materials like lithium and cobalt (Li, Chen, Collignon & Ivanov, 2021).

1.1.3 Motor Assembling Firms in Kenya

Kenya's motor vehicle assembly industry plays a central role in the country's industrial development and job creation. As of 2023, the industry includes about 13 active vehicle assembly firms, broadly categorized into large-scale assemblers and smaller specialized units. Major players include Isuzu East Africa, Associated Vehicle Assemblers (AVA), and Kenya Vehicle Manufacturers (KVM), located in Nairobi, Mombasa, and Thika respectively. These firms primarily assemble commercial vehicles, passenger cars, and buses under licensing agreements with global brands. The workforce employed by these assemblers exceeds 10,000 workers, including both skilled technicians and casual laborers. This sector supports several allied industries such as parts manufacturing, logistics, and aftersales service, making it a significant contributor to Kenya's manufacturing value chain (Mathenge & Obere, 2023).

Despite the industry's foundational role in industrial policy, it faces key structural challenges. One of the most pressing issues is stiff competition from imported used vehicles, which flood the Kenyan market. According to 2021 registration data, only 12% (12,981 units) of the 109,751 newly registered vehicles were locally assembled, while a staggering 88% (96,770 units) were second-hand imports (Khisa, et al. 2022). Most Kenyan buyers prefer used imports due to their lower prices and wider variety. This preference suppresses domestic demand for locally assembled vehicles and limits the capacity utilization of local plants, many of which are running at just about 30% of their installed capability. This underuse reflects both inefficiencies and a weak internal market for new vehicles.

In addition to external market pressure, high production costs remain a barrier to the sector's competitiveness. Electricity costs in Kenya are among the highest in Sub-Saharan Africa, affecting energy-intensive manufacturing processes like welding and painting. Also, the reliance on imported CKD (Completely Knocked Down) kits and parts means assemblers pay high import duties and shipping charges, which further drives up the cost of production. These factors result in locally assembled vehicles being significantly more expensive than imported used cars, reducing their appeal to the cost-sensitive Kenyan consumer. The inability to localize a substantial portion of the value chain like steel panels, engine components, or electronic parts limits the economic spillovers expected from the assembly sector (Mathenge & Obere, 2023).

Quality standards and consumer trust are other concerns shaping the market. Many buyers perceive imported vehicles, particularly Japanese and European models, as being more reliable and better built than locally assembled ones. This perception is partly rooted in reality Kenya's assembly industry still lags behind global leaders in advanced robotics, precision tooling, and component testing. In many plants, processes like painting and welding are done semi-manually, which can affect consistency. The lack of a robust local components manufacturing base also means that assemblers have to compromise on some quality aspects, which affects customer satisfaction and brand loyalty (Khisa, et al. 2022).

Policy inconsistency is another major issue affecting the sector's stability. For instance, sudden tax hikes or ambiguous import rules disrupt planning for both assemblers and investors. A key example is Mobius Motors, which ceased its vehicle assembly operations in 2024 after running into financial strain worsened by increased taxation on locally assembled vehicles (Chebet, et al. 2022). The abrupt policy changes not only affected Mobius' business model but also sent negative signals to potential investors. Uncertainty over tax incentives, import duty remission schemes, and

access to affordable credit continues to make long-term investment in vehicle assembly risky. Without clear and supportive policy frameworks, Kenya's vision of becoming a regional automotive hub remains out of reach. Additionally, Kimwaki (2023) analyzed supply chain alignment in large manufacturing firms but did not address the specific dynamics of the motor assembly industry.

1.2 Statement of the Problem

In Kenya, the performance of motor assembly companies is a major factor in industrialization, economic expansion, and employment creation. A strong vehicle assembly industry enhances local manufacturing, reduces reliance on imports, and promotes the development of related industries, such as parts manufacturing and logistics. Additionally, improved performance in this sector can enhance Kenya's position as a regional automotive hub, supporting the government's Kenya Vision 2030 agenda. When motor assembling firms operate efficiently, they contribute to economic growth by generating revenue, increasing employment opportunities, and boosting the country's export potential (Khisa, *et al*. 2022).

The Kenyan motor vehicle assembly sector is characterized by low capacity utilization, declining market share, high operational costs, and policy uncertainties. As of 2021, local motor vehicle assemblers operated at only 30% of their installed capacity, a clear indication of underperformance (Mathenge & Obere, 2023). Additionally, the industry faces stiff competition from imported used vehicles, which dominate the market. In 2023, out of 109,751 newly registered vehicles, only 12% (12,981 units) were locally assembled, while 88% (96,770 units) were used vehicle imports (Khisa, *et al.* 2022). This preference for second-hand imports has negatively impacted sales, making it difficult for local assemblers to attain profitability. Furthermore, high production costs, particularly due to expensive electricity, imported raw materials, and logistical

inefficiencies, make locally assembled vehicles less competitive in pricing. Quality concerns also persist, as limited access to advanced technology and high-quality local components affects the standard of assembled vehicles. In addition, policy inconsistencies, such as sudden tax increases, create uncertainty for manufacturers, discouraging investment in the industry (Chebet, *et al.* 2022).

While previous studies have explored supply chain strategies and manufacturing firm performance, they have not sufficiently examined this relationship within the motor vehicle assembly sector in Kenya. Karani (2022) investigated how supply chain tactics affected the performance of Kenyan general manufacturing companies, excluding the motor vehicle assembly industry. Similarly, Wandera, Namusonge, and Sakwa (2022) focused on inter-supplier rivalry practices in motor vehicle assembly firms, but their study limited its scope to supplier relationships. These studies reveal a contextual gap, as existing research focuses primarily on general manufacturing firms, leaving out the unique challenges and strategic supply chain considerations of Kenya's motor vehicle assemblers. This gap highlights the need for a focused study that directly examines the relationship between supply chain strategies and the performance of motor vehicle assembly firms in Kenya.

1.3 General Objective of the Study

The study's primary goal was to analyze the effect of supply chain strategies and performance of motor assembling firms in Kenya.

1.3.1 Specific Objective of the Study

i. To examine the effect of leagile supply chain strategy on performance of motor assembling firms in Kenya.

ii. To determine the effect of digital supply chain strategy on performance of motor assembling firms in Kenya.

iii. To assess the effect of resilient supply chain strategy on performance of motor assembling firms in Kenya.

iv. To determine the effect of sustainable supply chain strategy on performance of motor assembling firms in Kenya.

1.4 Research Question

i. How does the leagile supply chain strategy effect the performance of motor assembling firms in Kenya?

ii. What is the effect of the digital supply chain strategy on the performance of motor assembling firms in Kenya?

iii. How does the resilient supply chain strategy affect the performance of motor assembling firms in Kenya?

iv. What is the effect of the sustainable supply chain strategy on the performance of motor assembling firms in Kenya?

1.5 Significance of the Study

1.5.1 Motor Assembling Firms in Kenya

Motor assembling firms in Kenya play a critical role in the country's industrialization and economic growth. The results of this study will give these businesses knowledge on efficient supply chain tactics that can improve their operational effectiveness. By analyzing supply chain procedures including technology adoption, logistics integration, inventory optimization, and supplier management, motor assemblers may put best practices into place that increase their competitiveness in local and regional markets. Additionally, the findings will help firms identify

bottlenecks and inefficiencies in their supply chains, enabling them to adopt data-driven decision-making for better performance.

1.5.2 Policy Makers

For policymakers, the study will offer empirical evidence on the role of supply chain strategies in enhancing the performance of Kenya's motor assembling sector. The findings can inform the formulation and implementation of policies that promote efficient supply chain management, reduce barriers in logistics and procurement, and enhance trade policies to boost local vehicle assembly. Moreover, insights from the study can assist in developing policies that encourage local sourcing of parts, tax incentives, and investment in infrastructure, all of which are crucial for improving the competitiveness of Kenya's motor assembling industry.

1.5.3 Future Academicians

Future researchers looking at supply chain management and the effectiveness of motor assembly companies will find the study to be a useful resource. By offering empirical data on the connection between supply chain strategy and company performance in the Kenyan environment, it adds to the body of current literature. Building on these findings, future researchers might investigate new trends including the impact of sustainability-driven policies and the incorporation of digital supply chain technologies.

1.6 The Scope of the Study

The scope of the study was supply chain strategies and performance of motor assembling firms in Kenya. The study controlling variable will be; leagile supply chain strategy, digital supply chain strategy, resilient supply chain strategy and sustainable supply chain strategy. The study target staff from were procurement/sourcing, production/ assembling, logistics/distribution inventory,

quality control/ assurance, sales & marketing, finance /accounts customer service, research & development, human resource departments from motor assembling firms in Kenya. the study was be done from January to September 2025.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two contained theoretical framework, thematic topics derived from the objectives, summary of knowledge gap and conceptual framework.

2.2 Theoretical

The study was guided by hybrid supply chain theory, diffusion of innovation theory, dynamic capabilities theory, and stakeholder theory. Hybrid supply chain theory combined lean and agile approaches to balance efficiency and responsiveness, while diffusion of innovation theory explained how new technologies were adopted in supply chains. Dynamic capabilities theory focused on a firm's ability to adapt and innovate in changing environments, and stakeholder theory emphasized managing relationships and meeting the needs of all supply chain partners.

2.2.1 Hybrid Supply Chain Theory

The hybrid supply chain theory was first introduced by Naylor and Towill (2000), who merged the principles of lean and agile supply chains into a single framework. Their research emphasized that modern supply chains, especially those dealing with both predictable and unpredictable demand, require a balanced approach to remain both cost-effective and responsive. A key concept within their model is the "decoupling point," which refers to the stage in the supply chain where the process shifts from lean (efficient and standardized) to agile (resilient and responsive). This structural division allows organizations to capitalize on the benefits of both paradigms achieving cost savings upstream while maintaining responsiveness downstream (Sundarakani, Kamran, Maheshwari & Jain, 2021). Lean elements are applied in the early stages where demand is stable

and efficiency is critical, while agile principles dominate in the later stages to handle demand variability and customization needs.

According to Sundarakani et al. (2021), the hybrid approach is particularly effective in industries where product life cycles are short, demand is volatile, or customer preferences change rapidly. For example, in the fashion industry, companies like Zara adopt lean practices in bulk fabric procurement and agile methods in final garment production to quickly adapt to seasonal trends. Similarly, in electronics manufacturing, firms use lean operations in component production while maintaining agile final assembly processes to incorporate last-minute design changes. By strategically positioning the decoupling point, businesses can optimize inventory levels, reduce lead times, and improve customer satisfaction while avoiding the cost penalties associated with maintaining full agility throughout the entire supply chain. This balance between efficiency and flexibility makes the hybrid model a practical solution for today's competitive and uncertain market environments (Naylor & Towill, 2000; Sundarakani et al., 2021).

However, simply describing lean and agile approaches separately does not fully capture the strategic value of their integration. Ho, Nguyen, Tran, and Ta (2024) provide more insight into how these two approaches can be combined in practice. They note that the lean model is best suited for parts of the supply chain where demand is stable, with a focus on reducing waste, minimizing costs, and improving efficiency. In contrast, the agile model is crucial for managing volatile and customized demand, particularly in the downstream section of the supply chain. The customer order decoupling point serves as the transition zone, ensuring that lean production can be preserved up to the point where demand variability begins to influence operations. This shift is further supported by postponement strategies, which delay product customization until after actual

demand is known minimizing excess inventory and improving customer satisfaction (Lin, Zhou, Spiegler, Naim & Syntetos, 2022).

These theoretical insights are especially relevant to the motor vehicle assembly industry in Kenya, which operates under a mix of stable production environments and volatile market conditions. The industry is heavily influenced by factors such as exchange rate fluctuations, evolving customer preferences, competition from used vehicle imports, and shifting government policies. While previous studies have explained hybrid supply chain models in general terms, there's a lack of focused application to the Kenyan context. This study addresses that gap by directly linking the hybrid supply chain theory to the operational realities of Kenyan motor assembly firms.

By adopting lean strategies in upstream processes like procurement, component sourcing, and manufacturing, these firms can reduce costs and stabilize their operations. At the same time, applying agile strategies in downstream activities such as distribution, product customization, and after-sales support allows them to respond quickly to customer demands and market disruptions (Lin et al., 2022). As Sundarakani et al. (2021) explain, this dual approach not only enhances efficiency but also boosts resilience and competitiveness qualities that are essential in the face of Kenya's unpredictable economic and regulatory environment.

This review brings them together to highlight their combined relevance to the Kenyan automotive sector. The central question, then, is not whether lean or agile is better, but how firms can strategically apply both in a coordinated manner. The hybrid model offers a practical roadmap for motor assembly firms to improve performance, manage risk, and meet customer expectations in a challenging market. This study, therefore, seeks to assess how well leagile supply chain

strategies have been implemented in Kenya's motor vehicle assembly sector, and to what extent they contribute to enhanced operational performance.

2.2.2 Diffusion of Innovation Theory

Rogers (1962) introduced the Diffusion of Innovation Theory (DOI) to explain how new ideas, technologies, and innovations spread through a social system over time. Building on this, Menzli et al. (2022) describe diffusion as a process that unfolds through specific communication channels and pathways within a community or organization, often influenced by social networks, opinion leaders, and cultural norms. Rogers' model categorizes adopters into five groups—innovators, early adopters, early majority, late majority, and laggards—each defined by how quickly they embrace change. Innovators tend to be risk-takers and visionaries, while laggards adopt only when innovations have become mainstream or necessary. This framework has become central to understanding technology acceptance across various domains, including business, healthcare, and notably, supply chain management (Acikgoz, Elwalda, & De Oliveira, 2023).

The DOI theory highlights that the rate and success of adoption depend on factors such as the perceived relative advantage of the innovation, its compatibility with existing practices, complexity, trialability, and observability. For example, in supply chain management, blockchain adoption has been faster among early adopters like Walmart, who recognized its potential for enhancing traceability and transparency, compared to smaller firms with limited resources. Similarly, in healthcare, telemedicine technologies saw rapid uptake during the COVID-19 pandemic, as their relative advantage and necessity became clear. As Acikgoz et al. (2023) note, understanding adopter categories and the diffusion process allows organizations to design targeted strategies for promoting innovation uptake, reducing resistance to change, and accelerating the transition from niche use to widespread adoption.

More than a simple classification of adopters, the theory outlines five core attributes that influence adoption: relative advantage, compatibility, complexity, trialability, and observability. These variables help predict how and when an innovation will be taken up. Relative advantage refers to the perceived improvements the new technology offers over existing methods, while compatibility assesses its fit with current practices. Complexity influences how easy or difficult the technology is to implement. Trialability allows limited testing before full-scale adoption, and observability relates to how visible the benefits are to other users (Acikgoz et al., 2023). These factors are especially relevant when looking at the adoption of technologies like blockchain, AI, IoT, and cloud systems in digital supply chains. Menzli, Smirani, Boulahia, and Hadjouni (2022) observe that companies with a clearer understanding of how digital tools enhance supply chain performance tend to adopt such technologies faster, using them as a strategic asset to build competitive advantage.

It's important to connect these insights directly to the Kenyan context. The motor vehicle assembly sector in Kenya is undergoing a period of digital transformation, marked by the increasing use of tools such as real-time tracking, predictive analytics, and automated inventory systems. However, the pace of this transformation varies significantly across firms due to differences in digital readiness, employee skill levels, and resource availability. This variation is precisely what DOI helps explain. Some firms, aligned with Rogers' innovators and early adopters, are quick to embrace digital solutions, while others remain hesitant mirroring the late majority and laggards.

The DOI framework, therefore, offers more than just a theoretical lens; it serves as a practical guide to identifying what drives or hinders digital adoption in the Kenyan motor assembly industry. Alyoubi and Yamin (2024) reinforce this point, highlighting that digital strategies, when

successfully adopted, lead to gains in efficiency, cost savings, and responsiveness. Thus, this study uses DOI not merely as a backdrop but as a tool to examine how specific factors such as trialability, compatibility, and perceived advantages either enable or block digital supply chain adoption in Kenya. It also aims to uncover actionable insights that can help local motor assemblers accelerate digital uptake, boost operational performance, and stay competitive in a fast-changing industry.

2.2.3 Dynamic Capabilities Theory

David Teece, Gary Pisano, and Amy Shuen (1997) introduced the Dynamic Capabilities Theory (DCT), arguing that in volatile and fast-changing environments, firms need more than just static resources to compete they must also be able to adapt. Dynamic capabilities are defined as a firm's ability to integrate, build, and reconfigure internal and external competences in response to shifting environments. This concept challenges traditional models that view strategy as fixed, instead placing emphasis on learning, innovation, and continual transformation as the path to long-term success (Buzzao & Rizzi, 2021). The theory suggests that having valuable resources alone is not enough; firms must also develop processes and skills to sense opportunities, seize them, and transform their resource base to sustain competitiveness over time.

Teece et al. identify three core components of dynamic capabilities: sensing market opportunities and threats, seizing them by mobilizing resources, and transforming organizational assets to stay relevant. These capabilities distinguish successful firms in industries with high uncertainty, such as technology, renewable energy, and pharmaceuticals. For example, Apple continuously redesigns its products to align with shifting consumer demands, Toyota refines its lean production system to adapt to supply chain challenges, and Pfizer rapidly adjusted its R&D to produce COVID-19 vaccines under urgent timelines. Compared to the Resource-Based View (RBV), which emphasizes acquiring unique resources, DCT focuses on the ability to continually

reconfigure these resources to maintain long-term advantage in dynamic markets (Buzzao & Rizzi, 2021).

.

The theory is anchored in three main capabilities: sensing, seizing, and transforming (Talafidaryani, 2021). Sensing refers to the firm's ability to identify emerging trends, threats, or shifts such as supply chain disruptions, changing consumer behavior, or technological shifts. Seizing is the organization's response taking timely action through innovation, investment, or strategic change. Transformation, or reconfiguration, involves reshaping existing assets and capabilities to maintain agility and resilience over time. Teece (2023) emphasizes that this ongoing renewal is what allows firms to stay relevant amid uncertainty.

What makes this theory especially relevant to this study is how it applies to the Kenyan motor vehicle assembly industry, which operates in an environment marked by global supply fluctuations, regulatory unpredictability, and logistical bottlenecks. Unlike static supply chain strategies, resilient supply chain strategies require dynamic thinking being able to adjust sourcing, logistics, and distribution in response to shocks. The DCT framework, therefore, provides a useful lens for analyzing how firms in this sector can build strategic agility.

This review goes beyond listing individual studies it connects the theory directly to the Kenyan context. Firms that can sense disruptions early (like global part shortages), seize opportunities (such as adopting local sourcing), and transform their operations (for example, shifting from just-in-time to hybrid inventory systems) are more likely to sustain performance under pressure. As Talafidaryani (2021) points out, such firms can create lasting value by embedding responsiveness and adaptability into their supply chain processes.

Thus, this study adopts the dynamic capabilities theory to explore how Kenyan motor assemblers can use flexibility in their supply chain strategies to maintain competitiveness. By focusing on how sensing, seizing, and transforming are practically applied in the industry, the research will provide insights into the drivers of resilience and high performance in uncertain environments. In doing so, it offers not just a theoretical framework but a practical approach to navigating volatility in the motor assembly sector.

2.2.4 Stakeholder Theory

Freeman (1984) argued that businesses should move beyond the narrow focus on maximizing shareholder profit and instead consider the interests of all stakeholders including the public, suppliers, consumers, employees, and regulators. This perspective, known as Stakeholder Theory, marked a significant shift from the traditional shareholder-centric model by recognizing that long-term business success depends on managing relationships with a broad range of actors who either influence or are influenced by the firm's operations (Mahajan, Lim, Sareen, Kumar & Panwar, 2023). The approach emphasizes that ethical responsibility, transparency, and fairness toward all stakeholders are not just moral imperatives but also strategic necessities for sustainable performance. In practice, firms adopting this perspective engage in activities such as corporate social responsibility initiatives, fair labor practices, and collaborative partnerships with suppliers to create mutual value rather than prioritizing short-term financial gains.

According to Mahajan et al. (2023), the stakeholder-oriented model encourages companies to adopt a more holistic approach to decision-making, balancing financial objectives with social and environmental responsibilities. For example, companies like Unilever integrate sustainability into their core strategies by addressing environmental concerns, promoting fair trade with suppliers, and ensuring product safety for consumers, thereby fostering trust and loyalty among

diverse stakeholders. This broader engagement can mitigate risks, enhance corporate reputation, and open new opportunities for innovation through stakeholder collaboration. By aligning business goals with the interests of multiple parties, firms are better positioned to navigate market uncertainties, regulatory changes, and societal expectations, ultimately ensuring both resilience and long-term profitability (Freeman, 1984; Mahajan et al., 2023).

The core idea behind stakeholder theory is that companies operate within a broader social and environmental network and must account for the expectations of multiple parties. Bridoux and Stoelhorst (2022) categorize stakeholders into two groups: primary stakeholders—those with direct involvement in the company's operations, such as workers, customers, suppliers, and investors and secondary stakeholders, such as government bodies, NGOs, and local communities, whose interests may not be financial but are still affected by corporate actions. Freeman, Dmytriyev, and Phillips (2021) extend this thinking by emphasizing that firms should balance economic performance with social and environmental responsibilities to create shared value. This approach aligns closely with sustainable supply chain practices, where ethical sourcing, environmental care, and fair labor conditions are central.

This theory is highly relevant when analyzing how sustainable supply chain strategies affect the performance of motor assembly firms in Kenya. These companies operate in a sector where environmental concerns, regulatory compliance, and stakeholder pressures are increasingly shaping business priorities. Rather than viewing sustainability as a cost, stakeholder theory frames it as a strategic response to multiple stakeholder demands, which, in turn, can improve brand reputation, build trust, and enhance competitiveness.

The value of this approach becomes clear when applied to Kenya's motor assembly industry. Sustainable supply chain strategies such as reducing carbon emissions, implementing

waste reduction practices, ensuring fair labor conditions, and fostering transparent supplier relationships are not just ethical obligations. They are also strategic tools that influence how the public, customers, regulators, and suppliers perceive and engage with a firm. As such, stakeholder theory offers a practical framework for assessing how integrating diverse stakeholder interests into supply chain decisions contributes to firm performance.

This study will use stakeholder theory not simply as a background concept but as a guiding lens to examine how Kenyan motor assemblers manage sustainability in ways that reflect stakeholder expectations. It aims to evaluate how these actions affect firm outcomes, including operational efficiency, risk reduction, and long-term competitiveness. In doing so, the research highlights how stakeholder-driven sustainability is not only morally sound but also vital for business success in a demanding and dynamic market.

2.3 Empirical Review

2.3.1 Leagile Supply Chain Strategy and Performance of Motor Assembling Firms.

Khan et al. (2022) investigated how the Leagile supply chain approach is used in the manufacturing of automobiles in Asia. The purpose of the study was to evaluate the effects of lean and agile approaches combined with Leagile principles on supply chain efficiency. Using a case study methodology and secondary data, they found that combining lean's waste-reduction focus with agile's responsiveness to change led to notable improvements in supply chain performance. Specifically, firms were able to cut production delays, reduce inventory costs, and meet customer needs more quickly. However, while the findings support the practical value of Leagile principles in large-scale manufacturing environments, the study was region-specific and did not explore how these strategies operate in developing markets like Kenya. This raises questions about the contextual factors such as infrastructure limitations, labor dynamics, and policy environments that

may affect the success of Leagile practices in Kenya's motor vehicle assembly sector. The study helps define what works in mature markets but leaves a gap in understanding whether the same benefits can be replicated locally.

Rahimi and Alemtabriz (2022) developed a framework explaining how Leagile hybrid practices impact supply chain performance. Their goal was to provide a structured model for integrating lean and agile strategies in a way that aligns with business goals. Through a large-scale survey across various manufacturing sectors and analysis using structural equation modeling, they showed that Leagile practices not only improve supply chain flexibility and efficiency but also significantly increase customer satisfaction and adaptability to market fluctuations. These results suggest that blending lean and agile elements creates a more resilient supply chain capable of navigating both cost pressures and demand uncertainty. However, their sample excluded the motor vehicle assembly industry, and the findings reflect average conditions across generalized manufacturing settings. Motor assembly involves more complex components, longer lead times, and stricter compliance standards, which can influence the effectiveness of Leagile systems. This highlights the need for sector-specific studies that consider the operational realities of vehicle assembly in Kenya, where firms face localized challenges such as erratic power supply, customs delays, and policy shifts.

Fadaki, Rahman, and Chan (2020) explored the key drivers that support the design of agile supply chains and their connection to overall business performance. Their aim was to identify the specific enablers that make it possible to successfully implement Leagile supply chain strategies. Using a mixed-methods approach that included surveys to capture broad patterns and case studies to dive into specific examples, they found that supplier collaboration, resilient production processes, and sensitivity to demand variability were all crucial. They also noted that internal

alignment within organizations, especially across procurement, production, and distribution teams, played a major role in ensuring effective execution. While their findings provide a comprehensive map of what supports Leagile success, they focused primarily on fast-moving consumer goods and electronics, industries where supply chains are shorter and more digitally integrated. They did not examine the motor vehicle assembly sector, which often involves more rigid processes and higher capital investment. As a result, the transferability of their conclusions to Kenya's automotive context remains unclear. There is still a need to explore whether these same drivers such as supplier collaboration are equally influential or whether different factors dominate in Kenya's assembly plants.

Oyombe (2023) examined how supply chains for construction enterprises in Nairobi City County, Kenya, relate to Leagile strategy, strategic alliances, company innovation, and competitive advantage. The goal was to establish how agile tactics contribute to competitiveness in the construction sector. Using a survey research design and regression analysis, the study found that firms applying Leagile strategies gained more flexibility in operations and improved their capacity for innovation. These improvements were linked to stronger partnerships with suppliers and quicker response to market changes. While these insights confirm the potential of Leagile approaches to enhance firm performance, the study was limited to the construction sector. It did not assess how such strategies might work within the motor vehicle assembly industry, where production systems, compliance requirements, and supplier dynamics differ significantly. This creates a gap in understanding how Leagile methods translate across sectors and raises the need for tailored research on motor assembling firms in Kenya.

Lengala (2022) investigated how agile tactics influenced supply chain resilience within Kenyan manufacturing companies. The study aimed to determine whether adopting Leagile

principles would enhance a firm's ability to withstand and adapt to disruptions. Drawing from cross-sectional survey data and statistical modeling, the findings showed that Leagile practices contributed to stronger supply chain systems. Companies became more adaptable, managed disruptions better, and reported fewer delays or breakdowns during periods of uncertainty. However, the research approached manufacturing as a broad category and did not differentiate between industries with unique supply chain characteristics. Motor assembly, for instance, often deals with longer lead times, complex logistics, and tighter quality standards, which may require different approaches to resilience. This omission limits the study's practical relevance for vehicle assemblers in Kenya, suggesting the need for sector-specific evaluations of how Leagile principles can improve resilience in this high-stakes environment.

Oyombe, Awino, Ogutu, and Njihia (2023) explored how agile tactics helped construction firms in Nairobi gain a competitive edge through more efficient supply chains. The study's objective was to assess the role of hybrid supply chain models, particularly those blending lean and agile principles, in driving business success. Using survey data and regression analysis, the researchers found that combining lean efficiency with agile responsiveness allowed firms to meet customer demands more effectively and reduce waste. These firms reported improved speed, better supplier coordination, and greater adaptability to fluctuating demand. Despite these valuable findings, the study was again focused on the construction sector. It overlooked the distinct conditions faced by motor assembling firms in Kenya, such as more technical production lines and a need for highly integrated supply chains. This leaves a gap in applying Leagile concepts to the automotive context, where competitive advantage may depend on a different mix of flexibility, speed, and regulatory compliance.

2.3.2 Digital Supply Chain Strategy and Performance of Motor Assembling Firms

Ning, et al. (2023) examined how digital technologies enhance supply chain resilience, with a focus on Chinese manufacturing companies during the COVID-19 pandemic. The goal was to assess how digital tools could help reduce supply chain interruptions caused by global shocks. Based on survey data and regression analysis, the study found that digitalization improved supply chain agility, adaptability, and visibility, which helped firms respond more effectively to disruptions. These findings emphasize the value of digital investments in maintaining operational continuity during crisis periods. However, the context was limited to China, where firms often have access to advanced infrastructure and government-backed digital initiatives. The study did not address the unique constraints and opportunities faced by motor assembling firms in Kenya, such as unreliable connectivity, cost barriers, or gaps in technical skills. This highlights a clear gap in understanding how digital tools function in less digitally mature environments and whether similar resilience outcomes can be achieved in Kenya's automotive industry.

Hanaysha and Alzoubi (2022) investigated how digital supply networks influence organizational effectiveness in Malaysia's industrial sector. The objective was to determine whether digital integration in supply chains leads to greater competitiveness and operational efficiency. Using structural equation modeling and a quantitative study design, the study showed that digitalization improved cost effectiveness and performance through better data-driven decision-making and streamlined workflows. These findings reinforce the broader claim that digital supply networks are key drivers of modern operational success. However, the research was region-specific and did not consider the challenges faced by motor assembling firms in Kenya, where supply chains may be more fragmented and less automated. As a result, there remains a gap in knowledge on how digital supply chain strategies can be tailored to the Kenyan automotive

context, especially considering the industry's dependence on imported parts, regulatory hurdles, and fluctuating demand patterns.

Ogah and Onuoha (2022) conducted a multi-country study to evaluate how digital transformation is affecting supply chain operations across sub-Saharan Africa. Their goal was to explore how digital tools are being adopted by various types of businesses and how this influences responsiveness and collaboration. Using a comparative case study approach, the findings showed that digitalization led to more responsive supply chains and stronger inter-firm collaboration, particularly where companies had access to affordable digital platforms. While this cross-country view provided a broader understanding of regional trends, it lacked a focused investigation into the motor vehicle assembly sector in Kenya. The absence of sector-specific insights limits the applicability of their findings to industries with complex assembly operations and highly specialized supply networks. This points to the need for deeper research into how digital transformation unfolds within Kenya's vehicle assembly plants, where supply chain needs may differ from other sectors in both scale and complexity.

Madzimure, et al. (2020) explored the relationship between supply chain performance, supplier integration, and e-procurement among South African SMEs. The study sought to understand how digital procurement systems affect supply chain efficiency and supplier engagement. Using cross-sectional survey data and regression analysis, the researchers found that e-procurement tools significantly improved supplier relationships and reduced operating expenses by increasing transparency and reducing delays. These results suggest that even smaller firms can benefit from digital transformation if the tools are properly implemented. However, the study focused entirely on SMEs in South Africa, which often have different structures, capabilities, and operational goals compared to large-scale motor assembling firms. In Kenya, motor assemblers

may face different digital adoption barriers such as higher capital requirements, stricter compliance standards, or integration challenges with global suppliers. This presents a gap in understanding how digital procurement strategies specifically impact the efficiency and cost structures of automotive manufacturers in Kenya.

Kiarie, et al. (2024) investigated how digital strategy influenced temporary competitive advantages in large-scale manufacturing enterprises in Kenya. The study aimed to determine the role of digitalization in sustaining a firm's edge in the market. Findings from a mixed-methods approach, which combined survey data with qualitative insights, revealed that digital initiatives improved market flexibility, decision-making speed, and overall operational efficiency. These results show that digital tools are becoming essential for firms seeking to respond quickly to changing market demands and reduce inefficiencies. However, the study treated large-scale manufacturing as a broad category, without zooming in on the motor vehicle assembly sub-sector. This limits the value of the findings for understanding industry-specific dynamics such as the role of digital tools in managing complex supply networks, compliance issues, or global component sourcing in motor assembly. The gap underscores the need for focused research on how digital strategies are actually being applied, challenged, or adapted in Kenya's vehicle assembly sector.

Chege, et al. (2019) explored the effect of IT innovation on firm performance in Kenya. The objective was to examine how adopting new IT systems influences competitiveness and productivity across sectors. Using a quantitative approach supported by regression analysis, the study found that IT innovation led to greater customer satisfaction, cost savings, and higher operational efficiency. The study also noted that firms embracing digital tools were better positioned to scale and adapt to market shifts. While these findings support the general value of digital adoption, the focus was broad and did not address how these innovations work specifically

in digital supply chain contexts. More importantly, the study did not isolate motor assembling firms, which operate in a highly specialized environment with distinct requirements for production planning, supplier integration, and logistics coordination. This leaves a knowledge gap in understanding how IT innovations translate into practical digital supply chain strategies for automotive manufacturers in Kenya, where sector-specific insights are crucial for meaningful transformation.

2.3.3 Resilient Supply Chain Strategy and Performance of Motor Assembling Firms

Ali, et al. (2021) investigated reactive supply chain resilience tactics used by food SMEs during the COVID-19 pandemic. The goal was to identify the key resilience strategies these businesses used to minimize disruptions. Using a qualitative approach, the researchers found that agility, collaboration, and digitalization were essential in preserving operations and ensuring supply continuity. These findings are useful in showing how small firms adapt quickly to shocks through informal networks and resilient systems. However, the study was narrowly focused on food SMEs and did not account for the operational scale, regulatory constraints, or technical demands found in motor assembling firms. This makes it unclear whether the same resilience tactics are feasible or effective in Kenya's automotive sector, where supply chains are more complex and less resilient. The study leaves a gap in understanding how large, capital-intensive industries respond to crises with resilience-focused strategies.

Nyamete, et al. (2023) examined the impact of supply chain resilience tactics on the performance of Kenyan floriculture firms. Drawing on survey data and using a descriptive research design, the study found that technology use, risk mitigation, and agility significantly boosted firm performance. These tactics enabled floriculture companies to better handle seasonal demand, export challenges, and supply fluctuations. While the findings confirm the value of resilience in

enhancing business outcomes, the sector under study differs markedly from motor assembling, which deals with longer production cycles, heavier reliance on imported inputs, and more rigid technical standards. Therefore, the study does not address how these resilience strategies might play out in an industrial context where downtime, component shortages, or quality issues can be much costlier. This presents a clear gap in research on how such resilience tactics translate into meaningful results for vehicle assembly operations in Kenya.

Kosgey (2021) explored the link between supply chain resilience and organizational performance in Nairobi's manufacturing firms. The objective was to understand how various resilience strategies affected business success. Using a mixed-methods approach combining qualitative interviews and quantitative surveys, the study found that stakeholder engagement, supply chain flexibility, and proactive risk management played a major role in improving performance. These strategies helped firms manage uncertainty and maintain delivery commitments. However, the analysis treated manufacturing as a single block without accounting for sector-level differences. Motor assembling firms may face unique vulnerabilities such as dependency on global supply chains, technical lead times, or certification requirements. Without zooming into this particular sector, it remains unclear how these resilience strategies would need to be adapted for motor assembly, leaving a knowledge gap that requires further investigation.

Juan, et al. (2022) developed a comprehensive model linking supply chain resilience tactics to supply network performance during disruptions. Their aim was to offer a theoretical and empirical framework to explain how strategies like redundancy, flexibility, and collaboration affect outcomes in times of crisis. Using structural equation modeling with actual firm data, the study confirmed that firms with built-in resilience mechanisms performed better under stress. While the model has wide relevance, it was not tested in the context of motor vehicle assembly,

particularly in emerging economies like Kenya. Automotive supply chains tend to be more sensitive to disruptions due to their dependence on specialized parts, strict compliance protocols, and long supplier lead times. This makes it unclear whether the same model would apply or require adjustments in Kenya's context. As such, a gap remains in applying this framework specifically to the motor assembling industry, which has its own structural and operational peculiarities.

2.3.4 Sustainable Supply Chain Strategy and Performance of Motor Assembling Firms

Nayal, Raut, Yadav, Priyadarshinee, and Narkhede (2022) investigated how sustainable development initiatives shape supply chain performance in the era of digital transformation. The purpose of their study was to examine the contribution of digital tools to sustainability across operations. Their quantitative analysis of firm-level data suggested that digitalization improves environmental sustainability and operational efficiency by optimizing inventory control, reducing emissions, and enhancing real-time decision-making. However, the study was later retracted, casting doubt on the reliability of its claims. Moreover, it offered no discussion specific to motor assembling firms, which face different environmental and technological constraints. This omission limits the relevance of their findings in the Kenyan context, where sustainable automotive supply chains are still evolving and may require different metrics and digital tools for success.

Junaid, et al. (2022) explored the link between supply chain sustainability, green innovation, and business performance. Their goal was to understand how embedding sustainability into supply chain operations promotes innovation and drives competitive advantage. Based on structural equation modeling of manufacturing data, the study concluded that integrated sustainability efforts encouraged green innovation, which in turn enhanced customer loyalty and market responsiveness. These findings suggest that firms benefit from aligning environmental goals with product and process innovation. However, the study did not differentiate between

manufacturing sectors or consider regional differences. Kenya's motor assembling industry has specific regulatory frameworks, high-cost barriers, and supply dependencies that may influence how green innovation can be achieved. This creates a need to investigate how such integration works within this specific and highly regulated sector.

Mutiso and Kihara (2023) examined the effect of procurement best practices on sustainable supply chain performance in Kenyan rubber and plastic manufacturing firms. The study sought to identify which procurement strategies most effectively support environmental goals. Their descriptive survey found that ethical procurement, collaborative supplier relationships, and long-term sourcing plans significantly enhanced sustainability outcomes. These practices also helped build supplier trust and reduce sourcing risks. While the research offers relevant insights for Kenyan industry, it does not reflect the complex supplier dynamics of motor assembly operations, which often involve global parts procurement, compliance with international standards, and high capital investment. This gap highlights the need to assess whether these procurement practices hold up under the operational realities of Kenya's vehicle assembly firms.

Panya, et al. (2021) analyzed the influence of sustainable supply chain management on firm performance in Kenya's sugar subsector. The study aimed to understand how sustainability efforts such as waste management, resource efficiency, and environmentally conscious sourcing affect competitiveness. Using both qualitative and quantitative methods, the study revealed that firms implementing sustainable practices saw improvements in operational cost savings, reputation, and supply consistency. However, sugar production operates within a more localized and agriculturally driven supply chain, which differs greatly from the globally integrated and technically demanding motor assembly industry. These structural differences make it difficult to

apply the study's conclusions directly to automotive firms. There's still a need for targeted research to explore how the same principles perform in the more complex ecosystem of vehicle assembly.

Mohammed, et al. (2019) evaluated the relationship between sustainable supply chain practices and the performance of Kenyan manufacturing firms. The study's goal was to determine whether green initiatives like eco-friendly production methods, waste reduction, and green procurement contributed to better competitive positioning. Through regression analysis and survey responses, they found that companies with active sustainability programs experienced increased customer retention, cost control, and supply reliability. Although informative, the study grouped all manufacturing firms together, failing to address sectoral differences. Motor assembling firms in Kenya face greater compliance costs, often deal with international brands, and must meet higher safety and environmental standards. As such, the absence of a focused look at this sector leaves a gap in understanding how sustainability initiatives might influence performance in such a tightly regulated and technology-driven environment.

2.4 Conceptual Framework

The conceptual framework posits that the supply chain strategies adopted by motor assembling firms in Kenya (independent variable) directly influence their overall Performance of motor assembling firms (dependent variable). The performance of motor assembly companies can be impacted by the integration of leagile, digital, and resilient sustainable supply chain strategies.

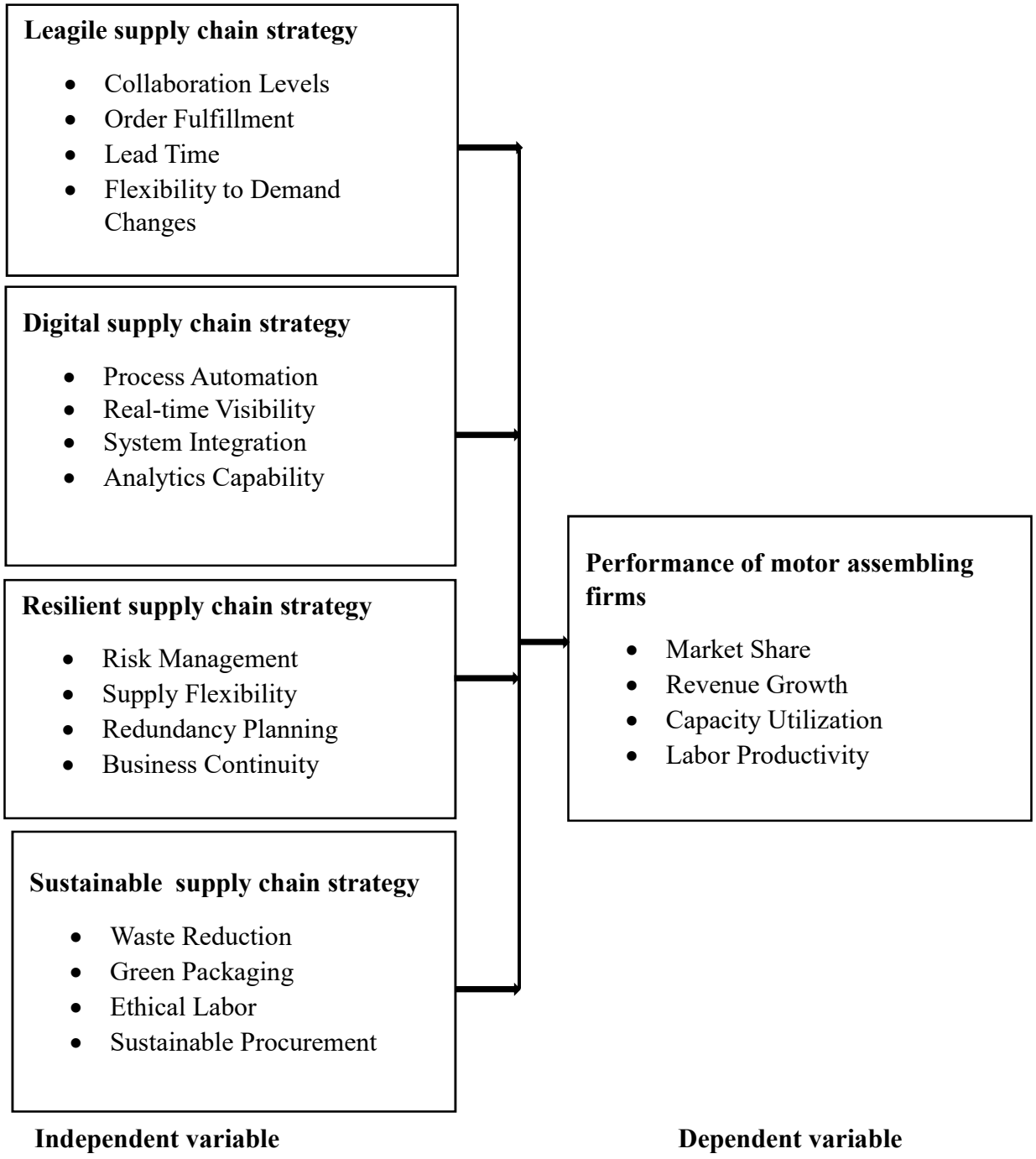


FIGURE 2.1:

Conceptual framework

2.5 Operationalization and Measurement of Variables

In order to obtain research data aspects of independent and dependent variables that indicate in measurable terms as tabulated below.

TABLE 2.1:

Measurement of variables

Construct	Variable	Indictors	Scale
Leagile supply chain strategy	Independent Variable	• Collaboration Levels • Order Fulfillment • Lead Time • Flexibility to Demand Changes	Interval scale (1-5)
Digital supply chain strategy	Independent Variable	• Process Automation • Real-time Visibility • System Integration • Analytics Capability	Interval scale (1-5)
Resilient supply chain strategy	Independent Variable	• Risk Management • Supply Flexibility • Redundancy Planning • Business Continuity	Interval scale (1-5)
Sustainable supply chain strategy	Independent Variable	• Waste Reduction • Green Packaging • Ethical Labor • Sustainable Procurement	Interval scale (1-5)
Performance of motor assembling firms	Dependent Variable	• Market Share • Revenue Growth • Capacity Utilization • Labor Productivity	Interval scale (1-5)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deliberated on the research design, target population, sample size and sampling techniques, data collection methods, data analysis procedures, and ethical considerations. It described the approach used, the population studied, and the rationale for the chosen sampling methods, as well as the tools for data collection and the techniques for analysis. It also outlined the ethical measures observed, including informed consent, confidentiality, and proper handling of data.

3.2 Research Design

This study adopted a descriptive research design, which was well-suited for systematically and pragmatically examining motor assembling firms in Kenya. This approach enabled an in-depth analysis of supply chain strategies and the performance of these firms. The design relied on numerical and statistical methods to analyze data collected through structured questionnaires, allowing for accurate measurement and comparison of variables. The main goal was to evaluate how supply chain strategies affected the performance of Kenyan motor assembly companies. As noted by Muzari, Shava and Shonhiwa (2022), a descriptive research design was particularly effective in obtaining objective insights into various variables, and in this study, it also facilitated the identification of patterns, relationships, and trends that informed meaningful conclusions and recommendations.

3.3 Population

In the context of research, a population is the total set of people or things in a certain area that is being studied (Willie, 2024). According to the Kenya Association of Manufacturers database 2025, they are 13 motor vehicle assembling firms in Kenya. The study targeted all 13-motor vehicle assembling firms in Kenya from which the study focuses on staff from their departments; procurement/sourcing, production/ assembling, logistics/distribution inventory, quality control/ assurance, sales/marketing, finance /accounts customer service, research & development, human resource in table 2

TABLE 3.1:

Target Population

Departments	Number of Firms
Procurement/Sourcing	13
Production/Assembling	13
Logistics/Distribution	13
Inventory	13
Quality Control/Assurance	13
Sales & Marketing	13
Finance/Accounts	13
Customer Service	13
Research & Development	13
Human Resources	13
Total	**130**

Source: **13 motor vehicle assembling firms in Kenya databases 2025**

3.4 Sample and Sampling Technique

In this study, a census approach was adopted at the organizational level since all 13 motor vehicle assembly firms in Kenya were included. However, within each firm, purposive sampling was applied to select one departmental head from each of the ten key functional areas procurement/sourcing, production/assembling, logistics/distribution, inventory, quality control/assurance, sales and marketing, finance/accounts, customer service, research and development, and human resources. Therefore, while the census ensured full coverage of all firms, the unit of analysis was the individual departmental head, resulting in a total of 130 respondents. This combination of census and purposive sampling ensured that data were obtained from key decision-makers directly involved in supply chain strategy and performance, allowing for comprehensive and representative findings (Ahmed, 2024).

3.5 Research Instrumentation

The researcher used standardized closed-ended questionnaires to collect data from 13 Kenyan motor vehicle assembly enterprises. These surveys were chosen because of their consistency in delivering results across multiple researchers or applications (Lim, 2024). Furthermore, they provide a cost-effective and time-saving alternative to interviews, ensuring quick access to the study population. Their standardized nature allows for easier examination of the collected data. The questionnaire will be divided into 6 sections: Part A covered demographics and respondent profiles, Parts B to E addressed the study's objectives, and Part F focused on the study's dependent variable.

3.6 Pilot Test

A preliminary research was undertaken, involving roughly 10% of the overall sample size of ten cases, to assess the data collection tool's reliability and validity. As a consequence, 10 employees from automotive distributors such as CMC Motors were selected to participate. Importantly, people who participated in the pilot study was excluded from the final study. The major goal of this pilot project is not to answer specific research questions, but to confirm that the data collection instrument is appropriate and successful before the main study begins (Teresi et al., 2022).

3.6.1 Validity of Research Instrument

The degree to which a measuring tool accurately evaluates what it is meant to measure is known as questionnaire validity. Establishing a research instrument's face, content, construct, and criterion validity prior to usage is crucial (Ahmed & Ishtiaq (2021). Expert assessments from field experts, supervisors, and business administration department faculty was sought to guarantee face validity (Lim, 2024). A thorough analysis of theoretical and empirical literature encompassing important topics like arenas, differentiators, economic logic, and customer satisfaction also used to confirm the validity of the construct, content, and criteria. This guarantees that the items on the questionnaire effectively assess the intended idea, appropriately represent the construct's domain, and conform to theoretical frameworks.

3.6.2 Reliability of research instrument

According to Ahmed and Ishtiaq (2021), reliability is the ability of a measurement to remain stable and consistent across a range of contexts, guaranteeing that remarkably identical outcomes are produced. Cronbach's alpha, which was made popular by Cronbach and is still often used, is the most prominent technique for evaluating internal consistency in behavioral sciences (Chetwynd,

2022). Both the variance attributable to the subject and the variance resulting from subject-item interaction are measured by Cronbach's alpha. Sukmawati (2023) states that a Cronbach's alpha value of 0.70 or 0.72 higher, which denotes a high degree of internal dependability, is considered acceptable. Cronbach's alpha were used in this investigation to assess the measurements' internal consistency.

3.7 Data collection

KCA University issues a research authorization letter introducing the researcher to the National Commission for Science, Technology, and Innovation. In order to process the research permission, this authorization letter and a copy of the research proposal was submitted. Through the human resources department of auto assembly companies, the researcher asked participants for their consent after receiving the permit. The drop-and-pick later approach was used to distribute the surveys and introduction letter within two working weeks. To ensure efficient administration, follow-up, and collection of questionnaires from the target staff in the table 3.2 above. According to Sukmawati, (2023) questionnaires are particularly well-suited for the collection of primary data as they provide respondents with the opportunity to carefully consider their responses without external interference, such as interviewer bias. In this study, Liker scales will be incorporated into the questionnaire to facilitate respondents' ease in answering questions, bridging the gap between open-ended queries and simple yes/no responses.

3.8 Data Analysis and Presentation

Data analysis, as explained by Younas, *et al.* (2022) involves organizing, structuring, and deriving meaning from the collected information. The data, mainly obtained from the questionnaires,were analyzed using descriptive analysis using SPSS version 20. The findings were presented in frequency tables and pie charts, providing clear and accessible visual representations.

Additionally, the researcher will use inferential analysis to assess the strength of the relationship between the independent variables and the dependent variable. This study was expressed through a multiple linear model, as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \beta_4 X_4 + \varepsilon$$

Where:

$Y =$ Performance of motor assembling firms

$\beta_0 =$Constant (coefficient of intercept)

$X_1 =$ Leagile supply chain strategy

$X_2 =$ Digital supply chain strategy

$X_3 =$ Resilient supply chain strategy

$X_4 =$ Sustainable supply chain strategy

$\varepsilon$is the error term.

$\beta_1, \beta_2, \beta_3, \beta_4,$: Regression coefficients

3.9 Diagnostic Tests

Several diagnostic tests was carried out to guarantee the precision and dependability of the regression model utilized in this investigation. By determining if the data satisfies the presumptions necessary for sound statistical analysis, these tests will improve the validity of the study's conclusions (Bayman & Dexter, 2021).

3.9.1 Normality Test

Verifying whether the gathered data adheres to a normal distribution a crucial premise in regression analysis requires a normality test. To ascertain whether the dataset is normal, statistical methods such the Shapiro-Wilk and Kolmogorov-Smirnov tests will be used, as mentioned by Alita et al. (2021). The data is normally distributed, and the null hypothesis of normality will not be rejected if the p-value of these tests is higher than 0.05. For a graphical examination of normalcy, a histogram with a normal curve will also be employed.

3.9.2 Linearity Test

As a basic premise of regression analysis, linearity testing determines if independent variables and the dependent variable have a proportionate connection (Alita et al. 2021). To statistically validate the linearity of the correlations between supply chain strategies and the performance of motor assembling companies, the ANOVA lack-of-fit test will be used.

3.9.3 Multicollinearity Test

High correlation between independent variables in a regression model causes multicollinearity, which may skew the predicted coefficients. The Variance Inflation Factor (VIF) and Tolerance Value (TV) was used in this study to evaluate multicollinearity. Multicollinearity is indicated by a tolerance value less than 0.1 and a VIF more than 10, per Bayman and Dexter (2021). If multicollinearity is found, corrective actions like eliminating redundant variables or merging correlated variables will be taken into account.

3.10 Research Ethics

Upholding the principles, rules, and ethical standards of academic research was essential in achieving the objectives of this study. Authorization to conduct the study was first obtained from the Kenya College of Accountancy University Ethical Review Committee (KCA-USERC) to

ensure compliance with institutional research ethics. A research permit was then issued by the National Commission for Science, Technology and Innovation (NACOSTI), granting permission to collect data within the motor vehicle assembly sector, while a letter of introduction from the Kenya Bureau of Statistics facilitated access to relevant organizational data. The study maintained professionalism and respect in all interactions with participants, using clear and non-discriminatory language in the questionnaire. Informed consent was obtained from all respondents, and their participation was entirely voluntary. All information collected was handled with strict confidentiality and used solely for academic purposes. Data entry and analysis were conducted impartially to ensure accuracy, transparency, and integrity throughout the research process.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presented the analysis, interpretation, and presentation of the study's findings. It included the response rate, results from the pilot test, demographic details of the respondents, descriptive statistics, and inferential analysis. The chapter also outlined the procedures followed in processing and organizing the data, highlighted key patterns and trends observed, and explained how the results addressed the research objectives. Additionally, it provided comparisons with findings from previous studies, offering context for the results, and discussed the statistical significance of the relationships identified in the data.

4.2 Response Rate

Table 4.1 shows the response rate from the distributed questionnaires. It outlines the number returned and those not received back from the targeted respondents.

TABLE 4.1:

Response Rate

Response Rate	No.	Percentages
Returned questionnaire	118	90.7
Unreturned questionnaire	12	9.3
Total	**120**	**100**

The findings in Table 4.1 show a high response rate of 90.7 percent, with 118 out of 120 questionnaires returned. This strong participation reflects active engagement from staff across various departments within motor vehicle assembling firms in Kenya, including procurement and sourcing, production and assembling, logistics and distribution, inventory management, quality

control and assurance, sales and marketing, finance and accounts, customer service, research and development, and human resource. As Ho, Nguyen, Tran, and Ta (2024) emphasize, diverse input from multiple operational areas enriches decision-making, particularly in supplier selection and operational strategy, as it captures different priorities and expertise across functions. Such a broad departmental representation ensures that the study captures diverse insights on operations and performance, making the findings more reliable and comprehensive. In line with Fadaki, Rahman, and Chan (2020), supply chain strategies benefit from cross-functional collaboration, where perspectives from procurement, production, logistics, and other units are essential for balancing cost efficiency and responsiveness. The small percentage of unreturned questionnaires (9.3 percent) has minimal impact on the validity of the results, given the wide coverage of functional areas critical to the success of motor assembling firms.

4. 3 Pilot Test Results

4.3.1 Validity of Data Collection Instrument

Establishing a research instrument's face, content, construct, and criterion validity prior to usage was crucial, as stressed by Ahmed and Ishtiaq (2021). Expert assessments from field specialists, supervisors, and faculty from the business administration department were sought to ensure face validity (Lim, 2024). A thorough analysis of theoretical and empirical literature covering key topics such as arenas, differentiators, economic logic, and customer satisfaction was also conducted to confirm the validity of the construct, content, and criteria. This ensured that the items on the questionnaire effectively assessed the intended concept, appropriately represented the construct's domain, and aligned with theoretical frameworks.

4.3.2 Reliability of Data Collection Instrument

Table 4.2 presents the reliability results for each study variable.

TABLE 4.2:

Reliability Results

Reliability Results Variable	Item	Alpha value	Recommendations
Leagile supply chain strategy	4	0.864	Good
Digital supply chain strategy	4	0.891	Good
Resilient supply chain strategy	4	0.842	Good
Sustainable supply chain strategy	4	0.815	Good
Performance of motor assembling firms	4	0.887	Good

The reliability analysis shows that all five variables in the study have strong internal consistency, with Cronbach's alpha values well above the acceptable threshold of 0.7. Leagile supply chain strategy scored 0.864, digital supply chain strategy 0.891, resilient supply chain strategy 0.842, sustainable supply chain strategy 0.815, and performance of motor assembling firms 0.887. Since all values are above 0.8, they are considered good, indicating that the four items used to measure each variable were consistent and reliable for the study. According to Fadaki, Rahman, and Chan (2020), reliable measurement of supply chain constructs such as leagile strategies is essential for accurately assessing their design drivers and performance implications. Similarly, Giardili, Ramdas, and Williams (2023) note that in automobile assembly contexts, robust and consistent measurements are key to establishing credible links between operational practices and performance outcomes, underscoring the importance of the high reliability scores obtained in this study.

4.4 Demographic Information

Table 4.3 presents the age distribution of the respondents who participated in the study. It highlights the number and percentage of individuals across different age brackets.

4.4.1 Respondents Age Bracket

TABLE 2.3:

Respondents Age Bracket

Respondents Age Bracket	Frequency	Percent
18 – 25 years	17	14.4
26 – 35 years	19	16.1
36 – 45 years	39	33.1
46 – 55 years	18	15.3
Above 55 years	25	21.2
Total	**118**	**100.0**

The age distribution of respondents shows that a majority (33.1%) fall within the 36–45 years bracket, followed by those above 55 years (21.2%) and 26–35 years (16.1%). This indicates that most participants are mid-career or senior professionals, likely with considerable industry experience. In the context of supply chain strategies and performance of motor assembling firms in Kenya, this age mix is significant. Experienced employees are more likely to understand, adopt, and influence strategic supply chain decisions such as leagile systems, digital integration, and resilient sourcing. Their insights can help align supply chain activities with performance goals, reduce inefficiencies, and drive innovation. Meanwhile, the presence of younger respondents (18–25 years at 14.4%) suggests room for fresh perspectives and openness to new technologies, which are also vital for evolving supply chain performance in a competitive industry.

4.4.2 Level of Education

Table 4.4 displays the education levels of the respondents involved in the study. It shows the distribution across certificate/diploma holders, bachelor's degree holders, and other qualifications.

TABLE 4.4:

Level of Education

Level of Education	Frequency	Percent
Certificate/Diploma	58	49.2
Bachelor's Degree	39	33.1
Other Please specify	21	17.8
Total	**118**	**100.0**

The findings show that 49.2% of respondents hold a certificate or diploma, 33.1% have a bachelor's degree, and 17.8% fall under "other" qualifications. This means that most employees in motor assembling firms in Kenya have a technical or practical education background, which supports routine supply chain functions such as procurement, logistics, and inventory handling. As Ho, Nguyen, Tran, and Ta (2024) note, workforce skills and qualifications are critical in supplier-related and operational decision-making, as the right expertise directly influences efficiency and performance outcomes. The presence of bachelor's degree holders brings in strategic thinking and broader knowledge, which is essential when implementing supply chain strategies aimed at improving efficiency and responsiveness. In line with Fadaki, Rahman, and Chan (2020), higher-level education also supports the adoption of more sophisticated models such as leagile systems, where balancing cost efficiency with flexibility requires analytical capability. However, the lower percentage of respondents with higher education may limit the depth of expertise needed for

complex supply chain decisions. These findings suggest that strengthening training programs and encouraging academic advancement can help firms improve their supply chain performance.

4.4.3 Years of Experience in the Motor Assembling Industry

Table 4.5 presents the respondents' years of experience in the motor assembling industry.

TABLE 4.5:

Years of Experience in the Motor Assembling Industry

Years of Experience in the Motor Assembling Industry	Frequency	Percent
Less than 2 years	31	26.3
2 – 5 years	24	20.3
6 – 10 years	38	32.2
More than 10 years	25	21.2
Total	**118**	**100.0**

The findings show that 32.2% of respondents have 6–10 years of experience, followed by 26.3% with less than 2 years, 21.2% with more than 10 years, and 20.3% with 2–5 years. This mix of experience suggests that the motor assembling industry in Kenya has a blend of both fresh talent and seasoned professionals. As Ahmed (2024) points out, understanding the composition of a sample in terms of experience is essential for interpreting how different groups contribute to study outcomes, as varying levels of expertise influence strategic and operational capacities. Those with over six years in the field bring practical knowledge and industry insights that support the implementation and fine-tuning of supply chain strategies. In line with Fadaki, Rahman, and Chan (2020), experienced personnel are better positioned to handle the complexities of supply chain

models such as leagile systems, where responsiveness and efficiency must be balanced. On the other hand, those with less experience represent a growing workforce that can be trained to adapt to evolving technologies and systems in the supply chain. This balance between experience and fresh perspectives creates opportunities for innovation and continuous improvement in supply chain performance.

4.4.4 Type of Motor Vehicles Assembled

Table 4.6 shows the types of motor vehicles assembled by the respondents' firms.

TABLE 4.6:

Type of Motor Vehicles Assembled

Type of Motor Vehicles Assembled	Frequency	Percent
Passenger Vehicles	20	16.9
Commercial Trucks	28	23.7
Buses	18	15.3
Motorcycles	17	14.4
Specialized Vehicles	20	16.9
Other Please specify	15	12.7
Total	**118**	**100.0**

The findings show that commercial trucks (23.7%) are the most commonly assembled, followed by passenger vehicles and specialized vehicles (each at 16.9%), buses (15.3%), motorcycles (14.4%), and other types (12.7%). This diversity in vehicle types points to a wide product range within motor assembling firms in Kenya, which directly affects supply chain strategies. As Ahmed (2024) notes, understanding the composition of the production portfolio is critical for drawing meaningful insights, as different categories require varying resource allocations and operational planning. Each vehicle category has unique parts, production timelines, and logistics needs, requiring resilient and responsive supply chain systems. In line with Bridoux and Stoelhorst's

(2022) view, such strategic diversity also reflects the influence of multiple stakeholders, whose expectations drive firms to balance customization, efficiency, and innovation. Firms that can coordinate across these varied demands are better positioned to improve performance, enhance customer satisfaction, and strengthen competitiveness in the market.

4.4.5 Size of the Organization (Number of Employees)

Table 4.7 outlines the size of the organizations based on the number of employees.

TABLE 4.7:

Size of the Organization (Number of Employees)

Size of the Organization (Number of Employees)	Frequency	Percent
Less than 50 employees	17	14.4
50 – 200 employees	39	33.1
201 – 500 employees	31	26.3
More than 500 employees	31	26.3
Total	**118**	**100.0**

The findings show that most motor assembling firms in Kenya fall within the 50–200 employee range (33.1%), while 26.3% have 201–500 employees, another 26.3% have more than 500, and 14.4% have fewer than 50 employees. This spread suggests a mix of small, medium, and large firms in the industry. According to Ahmed (2024), understanding the composition and size distribution of a study population is essential for interpreting results accurately, as size influences operational capacity and strategic potential. In the motor assembling sector, larger firms with more employees often have better resources, structured departments, and the ability to adopt complex

supply chain systems such as leagile, digital, or resilient models. In contrast, smaller firms may rely on simpler, cost-effective strategies focused on efficiency and basic coordination. As Bridoux and Stoelhorst (2022) highlight, organizational capacity and strategy are also shaped by stakeholder relationships, with larger firms often having the advantage of broader networks and influence, which can enhance supply chain maturity, performance, and long-term adaptability.

4.4.6 Location of the Firm's Main Operations

Table 4.8 presents the main operational locations of the motor assembling firms represented in the study.

TABLE 4.8:

Location of the Firm's Main Operations

Location of the Firm's Main Operations	Frequency	Percent
Nairobi County	12	10.2
Mombasa County	17	14.4
Kiambu County	16	13.6
Nakuru County	45	38.1
Other (Please specify)	28	23.7
Total	**118**	**100.0**

The findings show that most motor assembling firms operate mainly in Nakuru County (38.1%), followed by those in other locations (23.7%), Mombasa (14.4%), Kiambu (13.6%), and Nairobi (10.2%). Nakuru's dominance may be linked to its strategic position along major transport corridors, availability of space, and growing industrial infrastructure. As Chetwynd (2022) notes, incorporating contextual factors such as location into analysis strengthens the validity and reliability of research findings by ensuring that the results are interpreted within their real-world environment. Location plays a major role in shaping supply chain strategies, especially in terms of

logistics, supplier access, and distribution efficiency. Firms based in Nakuru and other emerging industrial zones may benefit from lower operational costs and easier movement of goods. On the other hand, those in urban centers like Nairobi may face space constraints and higher costs but enjoy better access to skilled labor and service providers. Acikgoz, Elwalda, and De Oliveira (2023) emphasize that environmental and infrastructural conditions significantly influence the adoption of strategic approaches, particularly when they involve new technologies or innovations, which aligns with how these regional differences affect the supply chain strategies and competitiveness of motor assembling firms.

4.5 Descriptive Results

4.5.1 Leagile supply chain strategy

Table 4.9 presents the findings related to the leagile supply chain strategy.

TABLE 4.9:

Leagile supply chain strategy

Statement on leagile supply chain strategy	Mean	Std. Deviation
The firm demonstrates a high level of collaboration across the supply chain.	4.36	1.027
The firm's order fulfillment process consistently meets customer requirements.	4.54	1.099
The firm effectively minimizes lead time in supply chain operations.	4.36	.710
The firm’s supply chain exhibits flexibility in adapting to demand changes.	4.25	1.054
Average mean	**4.38**	

The findings indicate that leagile supply chain strategies have a strong positive effect on the performance of motor assembling firms in Kenya, with an overall average mean of 4.38. The highest mean score of 4.54 (Std. Deviation = 1.099) shows that firms are highly effective in fulfilling customer orders, reflecting the lean aspect of the strategy focused on efficiency and meeting demand promptly. This aligns with Khan et al. (2022), who found in the Asian automobile manufacturing context that combining lean's waste-reduction focus with agile's responsiveness led to faster order fulfillment, reduced delays, and lower inventory costs. However, while their study demonstrates the benefits of Leagile principles in mature markets, our results extend the discussion by showing similar performance outcomes in Kenya's developing market, where factors such as infrastructure limitations, customs delays, and labor dynamics may influence execution. The higher standard deviation in our order-fulfillment results suggests that these local constraints create variability in performance across firms.

Collaboration across the supply chain and minimizing lead time both recorded a mean of 4.36, with standard deviations of 1.027 and 0.710 respectively. The lower deviation in lead time management indicates more consistency in how firms streamline processes to speed up deliveries, while the higher variation in collaboration suggests differences in how firms coordinate internally and externally. These findings mirror Rahimi and Alemtabriz (2022), who demonstrated that integrating lean and agile principles enhances flexibility, efficiency, and customer satisfaction by aligning supply chain activities with business goals. While their study did not include the motor assembly industry, our results show that the principles still hold in this sector but require adaptation to account for longer production cycles, stricter compliance requirements, and more complex supplier networks. The variation in collaboration effectiveness points to a need for stronger

integration among procurement, production, and distribution functions to maximize Leagile benefits.

Flexibility in responding to demand changes scored a mean of 4.25 (Std. Deviation = 1.054), reflecting a positive yet more varied experience across firms. This is consistent with Fadaki, Rahman, and Chan (2020), who identified supplier collaboration, resilient production processes, and sensitivity to demand variability as critical enablers of Leagile supply chains. Our findings confirm that flexibility is a key performance driver in motor assembly, particularly in managing imported components and responding to fluctuating market demands. However, the relatively high standard deviation suggests uneven capability in deploying agile responses—possibly due to disparities in technology adoption, managerial expertise, or access to responsive suppliers. While Fadaki et al. focused on industries with shorter, more digitally integrated supply chains, our results highlight the importance of building these capabilities in the capital-intensive, globally linked automotive assembly sector in Kenya, where achieving consistent agility remains a pressing challenge.

The findings from this study strongly align with the hybrid supply chain theory advanced by Naylor and Towill (2000), which emphasizes the integration of lean and agile strategies to balance cost efficiency with responsiveness. The evidence from Kenyan motor assembly firms shows that lean principles—such as waste reduction, lead time minimization, and efficiency in order fulfillment—are effective in stabilizing upstream processes, while agile elements—like flexibility in responding to demand fluctuations and resilience in managing disruptions—become critical downstream where market volatility and customization are more pronounced. This reflects the concept of the "decoupling point," where the transition from lean to agile occurs, ensuring that firms capitalize on efficiency in stable segments while remaining adaptive in volatile areas

(Sundarakani et al., 2021). For motor assembly firms in Kenya, this balance is particularly significant given challenges like customs delays, infrastructure limitations, and fluctuating customer preferences, which require both predictable efficiency and adaptive responsiveness. By situating lean practices in procurement and production, and agile strategies in distribution, customization, and after-sales, Kenyan firms demonstrate the practical application of the hybrid model in a developing market context. This not only confirms the applicability of the theory but also extends it by showing how hybrid supply chains function effectively in environments marked by regulatory uncertainty and global supply dependencies, thereby validating that the strategic integration of lean and agile approaches enhances operational performance and competitiveness in the sector.

4.5.2 Digital supply chain strategy

Table 4.10 shows views on digital supply chain strategy.

Table 4.10: Digital supply chain strategy

Statements on digital supply chain strategy	Mean	Std. Deviation
The adoption of process automation has improved operational efficiency and reduced manual tasks.	4.35	.709
Real-time visibility within the digital supply chain has enhanced decision-making and responsiveness.	4.14	.695
System integration across supply chain functions has improved coordination and workflow efficiency.	4.54	1.099
Advanced analytics capability has facilitated demand forecasting and supply chain optimization.	4.36	1.027
Average mean	**4.35**	

The findings reveal that digital supply chain strategies have a strong and positive impact on the performance of motor assembling firms in Kenya, with an overall average mean of 4.35. The

highest mean of 4.54 (Std. Deviation = 1.099) relates to system integration, showing that better coordination and workflow are key benefits. This aligns with Madzimure et al. (2020), who found that e-procurement tools significantly improved supplier relationships and reduced operating expenses by enhancing transparency and minimizing delays. The high standard deviation in our results suggests varied implementation experiences across firms, a challenge also observed in the South African SME context, where resource constraints and differing capacities affected the pace of adoption. These similarities reinforce that while integration yields substantial benefits, consistent execution remains a critical hurdle.

Adoption of process automation follows closely with a mean of 4.35 (Std. Deviation = 0.709), reflecting improved efficiency and reduced manual work. This resonates with Kiarie et al. (2024), whose study demonstrated that digital initiatives improve market flexibility, decision-making speed, and operational efficiency. The low standard deviation in our findings indicates a high level of consistency among motor assembling firms, contrasting with the broader manufacturing category in Kiarie et al.'s work, where varying industry needs led to uneven adoption patterns. The strong performance of process automation in this sector highlights its role as a foundation for eliminating repetitive tasks, streamlining workflows, and ensuring production continuity.

Advanced analytics records a mean of 4.36 (Std. Deviation = 1.027), showing strong support for its value in forecasting and optimization. This supports Chege et al. (2019), who linked IT innovation to higher competitiveness, cost savings, and operational efficiency. However, the higher deviation in our study suggests uneven capacity to fully leverage analytics tools across different firms, potentially due to differences in technical skills, investment priorities, or data quality. Real-time visibility scores a mean of 4.14 (Std. Deviation = 0.695), indicating slightly

lower perception but still strong agreement overall. This echoes the broader literature's emphasis on flexibility and responsiveness while addressing a key gap in previous studies by focusing on the motor assembly sector's unique challenges such as compliance with international standards, supplier integration, and coordination with global sourcing networks.

The findings on digital supply chain strategies in Kenyan motor assembly firms directly connect to Rogers' (1962) Diffusion of Innovation Theory, which explains the varied pace and patterns of technology adoption across organizations. The strong performance of system integration and process automation reflects the relative advantage and compatibility of these innovations, making them widely accepted and consistently implemented. In contrast, the uneven adoption of advanced analytics and real-time visibility aligns with DOI's observation that complexity and resource constraints often slow diffusion, leaving some firms as early adopters while others remain in the late majority or laggard categories. This variability mirrors what Rogers described as the adopter spectrum, where innovators and early adopters within the sector quickly embrace predictive tools and digital visibility, while others hesitate due to skills gaps, costs, or uncertainty about returns. Trialability and observability also play a role, as firms with opportunities to pilot analytics or see visible efficiency gains from competitors are more likely to adopt. These dynamics confirm DOI's relevance to Kenya's motor assembly industry by showing that digital transformation is not uniform but shaped by perceived benefits, readiness, and organizational capacity. By highlighting both successful implementations and areas of hesitation, the findings reinforce DOI as a practical framework for understanding how digital strategies diffuse in this sector and how targeted interventions can accelerate adoption to boost competitiveness and performance (Acikgoz et al., 2023).

4.5.3 Resilient supply chain strategy

Table 4.11 shows responses on resilient supply chain strategy.

TABLE 4.11:

Resilient supply chain strategy

Statements on resilient supply chain strategy	Mean	Std. Deviation
Effective risk management practices have minimized supply chain disruptions.	4.54	1.099
Supply chain flexibility has enabled quick adaptation to market and operational changes.	4.36	.710
Redundancy planning has ensured continuity in operations during supply chain disruptions.	4.25	1.054
Business continuity strategies have enhanced the firm's ability to recover from unforeseen disruptions.	4.35	.709
Average mean	**4.38**	

The findings on resilient supply chain strategies in Kenya's motor assembling sector align closely with the resilience-focused literature while revealing context-specific insights that existing studies have not fully addressed. Nyamete et al. (2023) found that risk mitigation, agility, and technology adoption improved the performance of floriculture firms by helping them cope with seasonal demand and supply fluctuations. Similarly, in the current study, risk management practices recorded the highest mean (4.54), showing their central role in sustaining performance. However, the higher standard deviation (1.099) in motor assembly indicates more variation in application compared to the relatively uniform benefits observed in floriculture. This difference reflects the sector's more complex and globally dependent production systems, where downtime or component shortages have far greater cost implications, underscoring the need for tailored resilience models for industrial contexts.

Kosgey (2021) also highlighted the role of flexibility, proactive risk management, and stakeholder engagement in strengthening manufacturing performance. The consistently high mean and low standard deviation for adaptability in the current findings (4.36, SD 0.710) supports Kosgey's assertion that flexibility is a key driver of resilience. However, unlike Kosgey's aggregated manufacturing analysis, the motor assembly sector's reliance on imported, specialized components and stringent compliance requirements means that flexibility must be supported by robust contingency plans. This is evident in the variation seen in redundancy planning (mean 4.25, SD 1.054), suggesting that while firms recognize its importance, implementation is not uniform—possibly due to cost constraints or limitations in supplier availability.

The link between redundancy, flexibility, and performance also resonates with Juan et al.'s (2022) resilience model, which confirmed that firms with built-in redundancy and adaptability outperform others during crises. The current study's business continuity strategies (mean 4.35, SD 0.709) reflect both high effectiveness and consistent application, indicating that Kenyan motor assembling firms are increasingly embedding resilience mechanisms into operations. However, Juan et al.'s model has yet to be applied in the automotive context of emerging economies, where supply chains are more vulnerable to disruptions from extended lead times and compliance-driven bottlenecks. This gap suggests that while the general principles of resilience hold, sector-specific adjustments such as more localized sourcing or strategic inventory buffers may be necessary to optimize resilience in Kenya's motor assembly industry.

The findings on resilient supply chain strategies in Kenya's motor assembly sector can be meaningfully understood through the lens of Dynamic Capabilities Theory (DCT) by Teece, Pisano, and Shuen (1997), which emphasizes the ability of firms to sense, seize, and transform in volatile environments. The strong role of risk management and flexibility in sustaining

performance reflects the sector's capacity to sense disruptions such as global part shortages and regulatory shifts, while business continuity planning demonstrates how firms seize opportunities to maintain operations despite shocks. However, the variation in redundancy planning highlights the uneven ability of assemblers to transform existing resources into more resilient structures, often due to cost or supplier constraints. This mirrors Teece's argument that resilience is not about static resource possession but about reconfiguring those resources to adapt to uncertainty. For instance, while firms in floriculture show more uniform adoption of resilience practices, motor assemblers face greater complexity due to specialized imports and compliance requirements, making transformation both costlier and more critical. Thus, DCT not only explains the sector's current variability in resilience adoption but also provides a roadmap for embedding agility, adaptability, and long-term competitiveness into Kenya's motor assembly supply chains.

4.5.4 Sustainable Supply Chain Strategy

Table 4.12 presents responses on sustainable supply chain strategy.

TABLE 4.12:

Sustainable supply chain strategy

Statements on sustainable supply chain strategy	Mean	Std. Deviation
Waste reduction initiatives have improved operational efficiency and environmental sustainability.	4.14	.695
The use of green packaging has minimized environmental impact and enhanced brand reputation.	4.36	1.027
Ethical labor practices have contributed to workforce satisfaction and overall company performance.	4.25	1.054
Sustainable procurement strategies have enhanced cost efficiency and long-term business viability.	4.36	.710
Average mean	**4.28**	

The findings on sustainable supply chain strategies in Kenya's motor assembling industry echo patterns identified in earlier studies while also revealing industry-specific distinctions that existing literature has not fully addressed. Nayal et al. (2022) argued that digitalization can enhance sustainability and operational performance by improving inventory control, reducing emissions, and enabling real-time decision-making. The consistent adoption of sustainable procurement in motor assembling firms evidenced by its high mean score of 4.36 and low standard deviation of 0.710 aligns with Nayal et al.'s argument that systematic, technology-enabled practices can yield uniform performance benefits. However, the limitations of Nayal et al.'s retracted study and its lack of focus on the automotive sector mean that its conclusions cannot be directly applied to Kenya's motor assembly context, where digital tools must be adapted to complex global sourcing networks, environmental compliance requirements, and evolving sustainability metrics.

Junaid et al. (2022) found that aligning sustainability with green innovation enhances customer loyalty and market responsiveness. This is reflected in the motor assembling findings, where green packaging recorded an equally high mean score of 4.36 but with a larger standard deviation of 1.027, suggesting varying degrees of innovation and adoption across firms. Ethical labor practices in the current study (mean 4.25, SD 1.054) also support Junaid et al.'s view that socially responsible operations strengthen market perception, though the variation in perception highlights the influence of sector-specific cost constraints, stringent regulatory frameworks, and dependency on international suppliers. The lower yet consistent impact of waste reduction (mean 4.14, SD 0.695) further underscores the need for targeted integration of sustainability and innovation strategies in a capital-intensive, safety-critical sector like motor assembly.

Mutiso and Kihara (2023) emphasized the role of procurement best practices such as ethical sourcing, collaborative supplier relations, and long-term contracts in enhancing sustainability and

building supplier trust. This resonates strongly with the present study's finding that sustainable procurement is both highly impactful and consistently implemented across Kenya's motor assembly firms. Yet, unlike the rubber and plastic manufacturing sector in Mutiso and Kihara's study, the automotive industry must navigate international sourcing dependencies, compliance with global standards, and high capital investments. These additional complexities reinforce the importance of developing sector-specific procurement frameworks to ensure that best practices translate effectively into measurable sustainability and performance gains in the Kenyan motor assembly sector.

The findings on sustainable supply chain strategies in Kenya's motor assembling industry strongly align with Stakeholder Theory, which emphasizes that firms should not only pursue profit but also meet the needs of diverse stakeholders to ensure long-term success. As Freeman (1984) explains, organizations create sustainable value when they balance the interests of employees, customers, suppliers, and the broader community. This is reflected in the adoption of ethical labor practices and sustainable procurement strategies, which address the welfare of workers and suppliers while also ensuring operational efficiency. The move toward waste reduction and green packaging demonstrates firms' responsiveness to environmental stakeholders, thereby enhancing legitimacy and reputation. Donaldson and Preston (1995) further argue that stakeholder relationships are not only instrumental for performance but also grounded in ethical obligations, a perspective evident in how these firms integrate sustainability into their business models. By embedding social and environmental responsibility within their supply chains, the motor assembling firms reinforce the idea that sustainable performance depends on creating shared value, supporting Freeman's assertion that organizations thrive when they meet stakeholder expectations collectively rather than prioritizing only shareholders.

4.5.5 Performance of motor assembling firms

Table 4.13 shows responses on the performance of motor assembling firms in Kenya.

TABLE 4.13:

Performance of motor assembling firms

Statements on performance of motor assembling firms in Kenya	Mean	Std. Deviation
The firm has experienced significant growth in market share over the past three years.	4.25	1.054
The firm has recorded consistent revenue growth due to improved operational efficiency.	4.54	1.099
Capacity utilization has improved, performance of motor assembling firms	4.14	.695
Labor productivity increased performance of motor assembling firms.	4.35	.709
Average mean	**4.32**	

The findings in Table 4.13 indicate that the overall performance of motor assembling firms in Kenya is strong, with an average mean score of 4.32. The highest mean score of 4.54 (SD = 1.099) was recorded for consistent revenue growth due to improved operational efficiency, suggesting that operational streamlining has had the greatest impact on firm performance. This aligns with Madzimure et al. (2020), who found that e-procurement systems had a strong and positive effect on supply chain performance among South African SMEs by improving supplier relationships and reducing operating costs through greater transparency and fewer delays. The

Kenyan context mirrors these efficiency benefits, though the higher capital demands, complex compliance obligations, and global supplier integration in the motor assembly sector create unique challenges that SMEs may not face. Given these differences, there is a clear need to determine whether similar digital procurement strategies could achieve equivalent gains in Kenya's capital-intensive automotive manufacturing environment.

The results also show that labor productivity, with a mean of 4.35 (SD = 0.709), and growth in market share, with a mean of 4.25 (SD = 1.054), are notable contributors to performance. This resonates with Kiarie et al. (2024), who observed that digital strategies significantly enhanced temporary competitive advantages in large-scale manufacturing enterprises in Kenya by improving market flexibility, accelerating decision-making, and boosting operational efficiency. However, since their study considered large-scale manufacturing broadly, it did not directly address the unique dynamics of the motor vehicle assembly sector, where multi-tier supply chain coordination, compliance with international standards, and reliance on imported components add layers of operational complexity. Similarly, the relatively strong score for capacity utilization (mean = 4.14, SD = 0.695) echoes Chege et al. (2019), who found that IT innovation positively influenced firm performance in Kenya by enhancing customer satisfaction, reducing costs, and improving efficiency. Yet, as with other studies, their broad sectoral scope means the specific role of IT innovations in managing digital supply chains for automotive manufacturing remains underexplored. This underlines the importance of industry-specific research to understand how digital tools and innovations can be customized to meet the operational demands of Kenya's motor vehicle assembly industry.

4.6 Diagnostic Tests

4.6.1 Normality Test

Table 4.15 shows the results of the normality test for all supply chain strategies. The findings are based on both Kolmogorov-Smirnov and Shapiro-Wilk tests.

TABLE 4.15:

Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Leagile supply chain strategy	.184	118	.200	.838	118	.132
Digital supply chain strategy	.257	118	.123	.818	118	.096
Resilient supply chain strategy	.257	118	.072	.856	118	.084
Sustainable supply chain strategy	.238	118	.119	.861	118	.077

The normality test results, based on both the Kolmogorov-Smirnov and Shapiro-Wilk statistics, indicate that the data for leagile, digital, resilient, and sustainable supply chain strategies do not significantly deviate from a normal distribution at the 0.05 significance level. This finding supports the suitability of the dataset for parametric analyses such as regression. Garland, Ochoa, and Pyrcz (2022) stress that the integrity of predictive modeling depends on ensuring balanced and unbiased data conditions prior to analysis. In their work, they highlight how addressing structural biases such as spatial autocorrelation can improve the accuracy of predictions. Similarly, confirming normality in this study ensures that statistical assumptions are met, thereby reducing the risk of skewed or unreliable results when assessing the relationship between supply chain strategies and firm performance.

From a methodological perspective, the process of testing for normality reflects the systematic approach to research design described by Muzari, Shava, and Shonhiwa (2022). They emphasize that credibility in research is built on deliberate procedural steps that safeguard validity and accuracy. In this study, normality testing acts as a foundational step, confirming that the dataset meets the prerequisites for robust parametric statistical procedures. This aligns with their argument that careful planning and methodological rigor are central to producing defensible and trustworthy findings.

In the context of the motor vehicle industry, Khisa, Kariuki, and Kenyatta (2022) demonstrate that analytical rigor is critical when examining the effects of strategic choices such as supply chain alliances on firm performance. By ensuring that the data meets normality assumptions before regression analysis, this study follows a similarly robust approach, strengthening the credibility of any inferences drawn about how leagile, digital, resilient, and sustainable strategies influence performance in Kenya's motor assembling firms.

4.6.2 Linearity Test

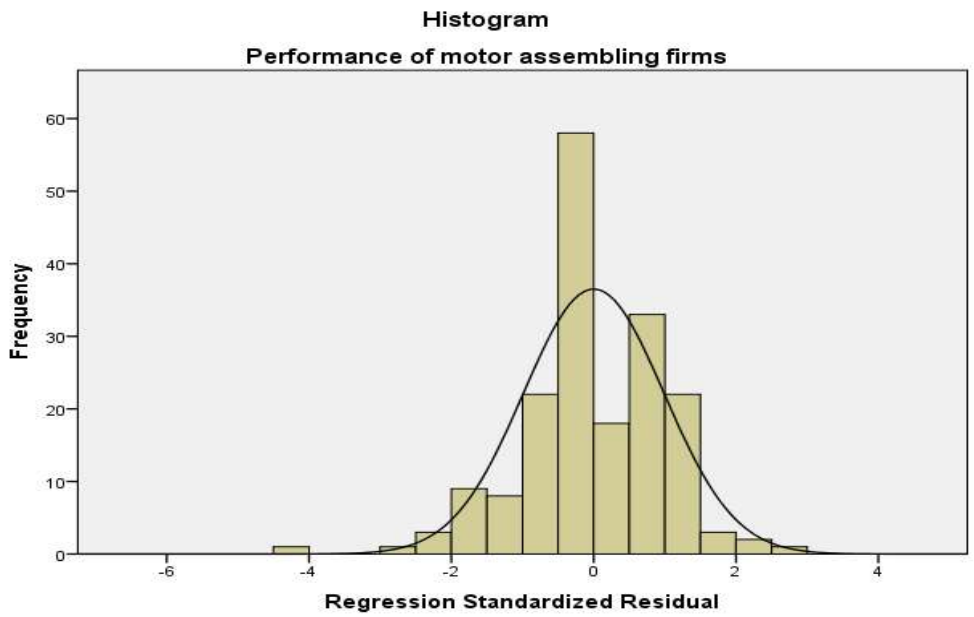


FIGURE 4.1:

Histogram

The histogram of regression standardized residuals for the performance of motor assembling firms in Kenya, showing a symmetric, bell-shaped distribution centered around zero, aligns with statistical principles that ensure model validity. Garland, Ochoa, and Pyrcz (2022) emphasize that accurate predictive modeling depends on minimizing biases and distortions, such as those caused by spatial autocorrelation in data splits. In a similar sense, verifying that residuals meet normality and linearity assumptions helps avoid systematic prediction errors, thereby improving the reliability of regression outcomes. The clustering of residuals near the mean in this study reflects a well-specified model, akin to the way fair train-test splits contribute to balanced and unbiased predictive performance.

Furthermore, the methodological attention given to testing assumptions reflects the rigorous process-oriented approach described by Muzari, Shava, and Shonhiwa (2022). They argue that robust research design whether in qualitative or quantitative contexts depends on systematically following procedures that safeguard validity and credibility. In this case, assessing

the distribution of residuals serves as a procedural checkpoint, ensuring that the model's conclusions about the link between supply chain strategies and firm performance rest on sound statistical foundations. This mirrors the structured, step-by-step research processes highlighted in their theoretical overview, where validity is built through methodical and transparent checks.

4.6.3 Multicollinearity Test

Table 4.16 presents the multicollinearity test results for the independent variables.

TABLE 4.16:

Multicollinearity Test

Variables	Collinearity Statistics	
	Tolerance	VIF
Leagile supply chain strategy		
Digital supply chain strategy	.135	5.385
Resilient supply chain strategy	.507	1.974
Sustainable supply chain strategy	.279	3.581
Leagile supply chain strategy	.376	2.659

The multicollinearity test results, with VIF values for resilient (1.974), sustainable (3.581), and leagile (2.659) strategies well below the threshold of 10, confirm minimal correlation concerns, while the digital strategy's higher VIF of 5.385 and low tolerance of 0.135 indicate moderate multicollinearity. This aligns with Garland, Ochoa, and Pyrcz's (2022) observation that correlations between variables, if not addressed, can obscure the distinct contribution of individual predictors similar to how spatial autocorrelation can distort prediction accuracy in modeling. Although the detected multicollinearity is not severe enough to compromise the model, it suggests overlapping influences between digital strategy and other supply chain approaches, which could blur interpretation. This reinforces Muzari, Shava, and Shonhiwa's (2022) argument that careful research design and thorough methodological checks are critical to ensure the reliability of

analytical findings, as controlling such overlaps helps maintain clarity in determining the unique impact of each variable on performance.

4.7 Inferential Results

4.7.1 Correlation

Table 4.17 presents the correlation results among the study variables.

TABLE 4.17:

Correlation table

		Leagile supply chain strategy	Digital supply chain strategy	Resilient supply chain strategy	Sustainable supply chain strategy	Performance of motor assembling firms
Leagile supply chain strategy	Pearson Correlation	1	.688**	.844**	.773**	.720**
	Sig. (2-tailed)		.000	.000	.000	.000
	N		118	118	118	118
Digital supply chain strategy	Pearson Correlation		1	.578**	.443**	.748**
	Sig. (2-tailed)			.000	.000	.000
	N			118	118	118
Resilient supply chain strategy	Pearson Correlation			1	.593**	.855**
	Sig. (2-tailed)				.000	.000
	N				118	118
Sustainable supply chain strategy	Pearson Correlation				1	.551**
	Sig. (2-tailed)					.000
	N					118
Performance of motor assembling firms	Pearson Correlation					1
	Sig. (2-tailed)					
	N					118

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

The correlation results, showing strong and statistically significant links between leagile, resilient, digital, and sustainable supply chain strategies and firm performance, align closely with Yanamandra's (2019) argument that integrating agility, digitalization, and sustainability into supply chains enables firms to gain a competitive edge in the digital era. The particularly high correlation between flexibility and performance (r = .855) reinforces his emphasis on adaptability as a critical driver of success. The results also resonate with Panya et al. (2021), who found that sustainable supply chain practices contribute positively to firm performance in Kenya's sugar sub-sector, even if the effect is sometimes less pronounced compared to other strategies, mirroring the current finding that sustainability has a moderate correlation (r = .551). From a methodological perspective, the statistically significant p-values (< .01) and clear reporting reflect Younas, Shahzad, and Inayat's (2022) guidance on the importance of rigorous data analysis and transparent presentation in ensuring reliable interpretation. Furthermore, the distinct performance impacts of each strategy underscore the value of careful data handling and variable separation, a principle emphasized by Garland, Ochoa, and Pyrcz (2022) in their discussion on fair data partitioning to enhance predictive accuracy, which in this context translates to isolating and evaluating the contribution of each supply chain approach for better strategic decision-making.

4.7.2 Model Summary

Table 4.18 presents the model summary.

TABLE 4.18:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.870	.15160

The model summary, with an R value of .935 and an R Square of .874, demonstrates that leagile, digital, resilient, and sustainable supply chain strategies explain the majority of performance variation among motor assembling firms in Kenya, aligning with Yanamandra's (2019) framework that emphasizes the integration of agility, digitalization, and sustainability to gain a competitive advantage in the digital era. The high explanatory power supports his view that supply chain strategies are core drivers of operational success and competitiveness. The slight drop to an Adjusted R Square of .870 reflects methodological robustness, resonating with Younas, Shahzad, and Inayat's (2022) emphasis on precise data analysis and transparent presentation to ensure credible interpretations. The remaining 12.6% of unexplained variation further underscores Yanamandra's argument that competitive performance also depends on external and organizational factors beyond supply chain design, suggesting opportunities for broader investigation in future research.

4.7. 3 ANOVA

Table 4.19 shows the ANOVA results.

TABLE 4.19:

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.014	4	4.503	195.953	.000[b]
	Residual	2.597	113	.023		
	Total	20.611	117			

The ANOVA results, showing a p-value of .000 and a high F-value of 195.953, indicate that supply chain strategies whether leagile, digital, resilient, or sustainable significantly influence the performance of motor assembling firms in Kenya. This supports Yanamandra's (2019) argument

that in the digital era, strategically integrating agility, digitalization, and sustainability enables firms to achieve a competitive edge by enhancing responsiveness and cost-effectiveness. The strong statistical significance in the present study reflects this framework, demonstrating that supply chain strategies are critical drivers of competitive performance. Methodologically, the clarity and strength of these results also align with Younas, Shahzad, and Inayat's (2022) emphasis on the value of rigorous data analysis and transparent result presentation, which ensure that statistical findings meaningfully connect to theoretical models and practical applications.

4.7.4 Coefficients of regression

Table 4.20 presents the regression coefficients.

TABLE 4.20:

Coefficients of regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.267	.167		1.604	.001
	Leagile supply chain strategy	.472	.073	.587	6.464	.002
	Digital supply chain strategy	.354	.032	.523	11.139	.004
	Resilient supply chain strategy	.822	.057	.910	14.395	.000
	Sustainable supply chain strategy	.230	.054	.233	4.279	.001

The regression results, showing that all four supply chain strategies significantly influence performance with flexibility ($p = .000$) having the strongest effect align with Yanamandra's (2019) framework that emphasizes adaptability, digital integration, and hybrid lean–agile approaches as key drivers of competitive advantage in the digital era. The strong impact of sustainability ($p = .001$) mirrors the findings of Panya et al. (2021), who observed that environmentally responsible practices enhance firm outcomes in Kenya's sugar sub-sector. The statistical significance across all strategies supports Younas, Shahzad, and Inayat's (2022) view on the importance of rigorous data analysis and transparent reporting to draw credible and actionable insights. Furthermore, the clear differentiation in the magnitude of effects between strategies reflects Garland, Ochoa, and Pyrcz's (2022) emphasis on properly handling and isolating variables similar to ensuring fair data partitioning in predictive modeling to accurately attribute performance outcomes to specific factors. The significant constant term ($p = .001$) also indicates a baseline operational capability, reinforcing that while firms may perform at a minimal level without these strategies, their adoption substantially elevates results.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter offered the summary, conclusions, and recommendations on the effect of supply chain strategies on the performance of motor assembling firms in Kenya. It highlighted the key findings, drew conclusions based on the study objectives, and provided actionable recommendations for industry stakeholders and policymakers. It also suggested areas for further research to address knowledge gaps and enhance the sector's competitiveness.

5.2 Summary of the Findings

5.2.1 Leagile supply chain strategy

The findings on the leagile supply chain strategy indicate that firms are effectively blending lean and agile practices to enhance their overall operational performance and competitiveness. Strong collaboration across the supply chain has emerged as a key element, enabling better coordination among stakeholders and improving the flow of goods and information. This collaborative approach ensures that customer requirements are consistently met through reliable and efficient order fulfillment processes, which enhance customer satisfaction and loyalty. At the same time, the emphasis on minimizing lead times allows firms to respond more quickly to market needs, reducing delays and improving responsiveness. The adaptability of the supply chain to demand fluctuations further reflects the agility aspect of this strategy, as firms can adjust operations to align with shifting customer preferences and market conditions. Together, these practices illustrate how integrating both lean efficiency and agile flexibility provides a balanced and resilient supply chain

model that supports operational excellence while maintaining the capacity to adapt to uncertainties in the business environment.

5.2.2 Digital supply chain strategy

The findings on the digital supply chain strategy show that firms are increasingly leveraging technology to streamline operations, enhance responsiveness, and strengthen competitiveness. The adoption of process automation has significantly improved efficiency by reducing reliance on manual tasks, thereby minimizing errors and speeding up workflows. Real-time visibility across the supply chain has become a crucial enabler of timely and informed decision-making, allowing firms to respond quickly to disruptions and shifts in demand. Additionally, system integration has played a vital role in improving coordination across different supply chain functions, ensuring smoother collaboration and a more cohesive workflow. The use of advanced analytics capabilities has further enhanced demand forecasting accuracy and supply chain optimization, enabling firms to align resources effectively with market needs. Collectively, these digital strategies highlight how technology not only drives operational excellence but also creates more agile, transparent, and data-driven supply chains that are better equipped to thrive in dynamic and competitive environments.

5.2.3 Resilient Supply Chain Strategy

The findings on the resilient supply chain strategy indicate that firms are prioritizing practices that safeguard operations against uncertainties and ensure long-term stability. Effective risk management has emerged as a critical factor, enabling firms to anticipate, mitigate, and minimize potential disruptions across the supply chain. Flexibility within operations allows organizations to quickly adapt to unexpected market changes or operational challenges, ensuring that customer

needs continue to be met without significant delays. Redundancy planning has also been instrumental in providing alternative pathways or backup systems that maintain the flow of goods and services even when disruptions occur. Furthermore, the incorporation of robust business continuity strategies ensures that firms are not only able to withstand unforeseen shocks but can also recover efficiently, maintaining stability and competitiveness in volatile environments. Collectively, these practices underscore the importance of resilience as a core component of modern supply chain management, positioning firms to remain reliable and competitive even in the face of increasing global uncertainties.

5.2.4 Sustainable Supply Chain Strategy

The findings on the sustainable supply chain strategy highlight that firms are increasingly embedding environmentally and socially responsible practices into their operations to support both efficiency and long-term competitiveness. Waste reduction initiatives have been particularly effective in improving operational processes while also promoting environmental sustainability, showcasing a dual benefit for business and society. The adoption of green packaging further minimizes ecological impact and simultaneously enhances brand reputation, positioning firms more favorably in the eyes of environmentally conscious consumers. Ethical labor practices have played a vital role in ensuring workforce satisfaction, which translates into improved performance and higher organizational commitment. In addition, sustainable procurement strategies have strengthened cost efficiency while ensuring long-term business viability by fostering relationships with responsible suppliers and reducing risks associated with unsustainable practices. Together, these initiatives reflect how sustainability has become a strategic priority in supply chain management, not only advancing environmental stewardship but also driving social responsibility and economic resilience for continued success in competitive markets.

5.3 Conclusions

The study concluded that the leagile supply chain strategy significantly enhanced the operational efficiency, customer satisfaction, and responsiveness to market changes of motor assembling firms in Kenya. The integration of lean principles, such as waste reduction, efficient resource utilization, and prompt order fulfillment, with agile elements like flexibility, adaptability, and rapid response to demand fluctuations, enabled firms to optimize processes while remaining responsive to dynamic customer needs. This hybrid approach also fostered improved coordination with suppliers, reduced lead times, and minimized production bottlenecks, thereby strengthening overall supply chain performance. However, variations in the consistency of collaboration, information sharing, and demand response practices indicated that some firms were more advanced in applying these strategies than others. This underscored the need for sector-wide alignment, capacity building, and continuous improvement initiatives to ensure that all players fully leverage the benefits of leagile strategies and sustain competitiveness in an increasingly volatile and globalized market.

The study concluded that the digital supply chain strategy had a strong positive effect on the performance of motor assembling firms in Kenya by enhancing coordination, operational efficiency, forecasting accuracy, and responsiveness to customer needs. System integration facilitated smooth collaboration, workflow management, and information sharing between departments and with suppliers, while process automation improved productivity, minimized human error, and reduced reliance on manual processes. Advanced analytics supported data-driven decision-making, improved demand forecasting, optimized inventory levels, and enhanced resource utilization, while real-time visibility enabled proactive problem-solving, faster issue resolution, and improved service delivery. The adoption of technologies such as IoT, AI, and

blockchain further strengthened transparency, traceability, and compliance with quality standards. However, variations in implementation, technological readiness, and resource allocation across firms indicated the importance of standardizing best practices, improving digital infrastructure, and investing in staff training to fully realize the potential benefits and ensure industry-wide competitiveness.

The study concluded that the resilient supply chain strategy had a strong positive impact on the performance of motor assembling firms in Kenya by enhancing resilience, adaptability, and operational stability. Effective risk management enabled firms to proactively identify and address potential disruptions such as supply shortages, logistical delays, or geopolitical uncertainties, reducing their vulnerability to external shocks. Rapid adaptation to market and operational changes allowed firms to respond quickly to fluctuating customer demands, regulatory shifts, and technological advancements, thereby ensuring sustained competitiveness. Redundancy planning provided essential backup resources, alternative suppliers, and contingency inventory to minimize downtime, while business continuity strategies ensured uninterrupted operations during unforeseen challenges such as natural disasters, strikes, or global supply chain disruptions. The integration of resilient procurement arrangements, modular production systems, and diversified supplier networks further strengthened the sector's ability to withstand uncertainty. However, variations in how these strategies were applied across firms highlighted the importance of harmonizing practices, investing in scenario planning, and fostering a culture of agility to ensure consistent performance improvement and sector-wide resilience.

The study concluded that the sustainable supply chain strategy had a strong positive effect on the performance of motor assembling firms in Kenya by integrating environmentally friendly practices, ethical labor standards, and efficient resource use into business operations. Green

packaging and sustainable procurement emerged as key drivers of improved performance, reducing environmental impact while enhancing brand reputation and compliance with regulatory requirements. Procurement practices were applied more consistently across the industry, ensuring responsible sourcing and promoting local supplier development. Ethical labor practices not only contributed to employee satisfaction, retention, and productivity but also strengthened the company's social responsibility profile, fostering goodwill among stakeholders. Waste reduction initiatives, though consistently implemented, played a slightly less prominent role but still contributed to cost savings and environmental sustainability. The adoption of energy-efficient production technologies, recycling programs, and carbon footprint monitoring further reinforced operational efficiency and long-term competitiveness. However, differences in application across firms highlighted the importance of harmonizing sustainable practices, investing in sustainability training, and embedding environmental and social governance principles into corporate strategy to fully leverage their potential benefits across the sector.

5.4 Recommendations

The study recommends that leagile supply chain strategy performance of motor assembling firms in Kenya should be strengthened through the adoption of more standardized best practices that balance efficiency with flexibility. For example, firms should invest in advanced supply chain management systems that enhance real-time collaboration with suppliers and distributors, ensuring better coordination across the chain. Additionally, continuous training in agile response methods can help production teams quickly adjust to fluctuating customer demand without compromising efficiency. Lean process improvement initiatives, such as Just-In-Time inventory management, can further reduce waste while maintaining the flexibility to meet urgent orders. By embedding

these approaches consistently across the industry, firms can achieve both operational excellence and market responsiveness.

The study recommends that digital supply chain strategy on performance of motor assembling firms in Kenya should be strengthened through wider adoption of integrated technological solutions and targeted capacity building. For example, firms should invest in enterprise resource planning (ERP) systems integrated with supplier and distributor platforms to enhance end-to-end visibility and coordination. Expanding process automation to include automated inventory control, procurement processes, and production scheduling can further improve efficiency and reduce errors. Companies should also adopt advanced analytics tools to better forecast market trends, optimize logistics, and improve resource allocation, supported by specialized training for supply chain teams. Additionally, implementing IoT-enabled tracking devices and centralized digital dashboards can ensure real-time monitoring of supply chain activities, enabling faster decision-making and problem resolution. In consistently applying these measures, motor assembling firms can achieve higher competitiveness, meet customer expectations more effectively, and respond swiftly to changing market conditions.

The study recommends that resilient supply chain strategy on performance of motor assembling firms in Kenya should be strengthened through the adoption of standardized best practices and investment in capacity-building initiatives. For example, firms should establish comprehensive risk assessment frameworks supported by predictive analytics to anticipate potential disruptions more effectively. Redundancy planning can be enhanced by creating alternative sourcing arrangements with multiple suppliers, ensuring that critical components are available during supply shortages. Companies should also develop robust business continuity plans that include remote operations capabilities and emergency response protocols to maintain

production during crises. Additionally, fostering a culture of agility through continuous staff training and cross-functional collaboration can improve the speed and effectiveness of adaptation to market shifts. By embedding these strategies consistently, motor assembling firms can achieve greater resilience, operational stability, and long-term competitiveness.

The study recommends that sustainable supply chain strategy on performance of motor assembling firms in Kenya should be enhanced through more uniform adoption of green, ethical, and resource-efficient practices. For example, firms can standardize the use of biodegradable and recyclable packaging materials to strengthen environmental impact and brand appeal. Sustainable procurement policies should prioritize sourcing from suppliers who meet environmental and social responsibility standards, ensuring a consistent approach across the industry. Ethical labor practices can be reinforced by providing fair wages, safe working conditions, and opportunities for employee development, thereby improving retention and productivity. Waste reduction initiatives could be expanded by adopting circular economy principles, such as reusing manufacturing by-products and implementing energy-efficient production processes. Applying these strategies consistently, motor assembling firms can improve environmental performance, strengthen stakeholder trust, and maintain long-term competitiveness.

5.5 Limitations of the Study

While the study successfully achieved its objectives, a few limitations were noted. First, the study focused exclusively on 13 motor vehicle assembly firms in Kenya, which limits the generalizability of the findings to other sectors or countries with different operational contexts. Second, data collection relied on self-reported information from departmental heads, which may have been influenced by personal bias or organizational confidentiality concerns. Third, some respondents were occasionally unavailable due to their demanding work schedules, causing minor

delays in data collection. Despite these limitations, the study maintained methodological rigor, and the results remain reliable and valuable for understanding the effect of supply chain strategies on firm performance. Overall, no major challenges were encountered that could have compromised the validity or completeness of the findings.

5.6 Recommendations for Future Research

Future research should explore in greater depth the contextual factors that influence the effectiveness of leagile, digital, resilient, and sustainable supply chain strategies in the motor assembling industry. While the current findings confirm the positive impact of these strategies, variations in implementation across firms suggest the need for studies examining the role of organizational culture, technological readiness, and managerial competence in shaping adoption levels. Comparative studies between motor assembling firms in Kenya and those in other emerging economies could provide insights into how regional economic, infrastructural, and regulatory conditions influence supply chain strategy performance.

REFERENCES

Acikgoz, F., Elwalda, A., & De Oliveira, M. J. (2023). Curiosity on cutting-edge technology via theory of planned behavior and diffusion of innovation theory. *International Journal of Information Management Data Insights*, *3*(1), 100152.

Ageron, B., Bentahar, O., & Gunasekaran, A. (2020, July). Digital supply chain: challenges and future directions. In *Supply chain forum: An international journal* (Vol. 21, No. 3, pp. 133-138). Taylor & Francis.

Ahmed, I., & Ishtiaq, S. (2021). Reliability and validity: importance in medical research. *Methods*, *12*(1), 2401-2406.

Ahmed, S. K. (2024). Research Methodology Simplified: How to Choose the Right Sampling Technique and Determine the Appropriate Sample Size for Research. *Oral Oncology Reports*, 100662.

Ali, M. H., Suleiman, N., Khalid, N., Tan, K. H., Tseng, M. L., & Kumar, M. (2021). Supply chain resilience reactive strategies for food SMEs in coping to COVID-19 crisis. *Trends in food science & technology*, *109*, 94-102.

Alita, D., Putra, A. D., & Darwis, D. (2021). Analysis of classic assumption test and multiple linear regression coefficient test for employee structural office recommendation. *IJCCS (Indonesian Journal of Computing and Cybernetics Systems)*, *15*(3), 295-306.

Alyoubi, B. A., & Yamin, M. A. Y. (2024). Investigating the role of diffusion of innovation theory, environmental pressure, and organisational capabilities towards adoption of digital technologies. *International Journal of Business Information Systems*, *46*(1), 32-55.

Anzolin, G., & Andreoni, A. (2023). Robotising, but how? Evidence from the automotive sector in South Africa. *Journal of Manufacturing Technology Management*. https://doi.org/10.1108/jmtm-06-2022-0242.

Bayman, E. O., & Dexter, F. (2021). Multicollinearity in logistic regression models. *Anesthesia & Analgesia*, *133*(2), 362-365.

Bridoux, F., & Stoelhorst, J. W. (2022). Stakeholder theory, strategy, and organization: Past, present, and future. *Strategic Organization*, *20*(4), 797-809.

Buzzao, G., & Rizzi, F. (2021). On the conceptualization and measurement of dynamic capabilities for sustainability: Building theory through a systematic literature review. *Business Strategy and the Environment*, *30*(1), 135-175.

Chebet, H., Ogutu, M., Njeru, W., & Njihia, J. (2022). Effect of Export Strategy on the Performance of Large Export Manufacturing Firms in Kenya. *Journal of Marketing and Communication*. https://doi.org/10.53819/81018102t2076.

Chege, S., Wang, D., & Suntu, S. (2019). Impact of information technology innovation on firm performance in Kenya. *Information Technology for Development*, 26, 316 - 345. https://doi.org/10.1080/02681102.2019.1573717.

Chetwynd, E. (2022). Critical analysis of reliability and validity in literature reviews. *Journal of Human Lactation*, *38*(3), 392-396.

Elijah, P., & Ezeife, N. (2020). Challenges of the Automobile Industry and Performance Analysis of an Assembly Plant in Nigeria. *Journal of Engineering and Technology*, 5, 337-342. https://doi.org/10.36348/sjet.2020.v05i09.003.

ElMelegy, A., Alnajem, M., & Albuloushi, N. (2021). Assessment of quality performance in the Egyptian manufacturing industry. *The TQM Journal*. https://doi.org/10.1108/tqm-06-2021-0161.

Fadaki, M., Rahman, S., & Chan, C. (2020). Leagile supply chain: design drivers and business performance implications. *International Journal of Production Research*, 58, 5601 - 5623. https://doi.org/10.1080/00207543.2019.1693660.

Fernandez, A. E., & Adesina, I. A. (2025). Factors Affecting Supply Chain Operational Performance in Automotive Companies in the UK.

Freeman, R. E., Dmytriyev, S. D., & Phillips, R. A. (2021). Stakeholder theory and the resource-based view of the firm. *Journal of management*, *47*(7), 1757-1770.

Giardili, S., Ramdas, K., & Williams, J. W. (2023). Leadership and productivity: A study of US automobile assembly plants. *Management science*, *69*(3), 1500-1517.

Hanaysha, J. R., & Alzoubi, H. M. (2022). The effect of digital supply chain on organizational performance: An empirical study in Malaysia manufacturing industry. *Uncertain Supply Chain Management*, *10*(2), 495-510.

Ho, N. N. Y., Nguyen, P. M., Tran, C. T., & Ta, H. H. (2024). Determinants for Supplier Selection Based on Hybrid Grey Theory: Case Study of the Vietnamese Coffee Industry. *Processes*, *12*(5), 901.

Ireri, A., & Deya, J. (2019). Influence of strategic plan implementation drivers on the performance of automobile companies in Kenya. *International Academic Journal of Human Resource and Business Administration*, *3*(5), 279-295.

Juan, S. J., Li, E. Y., & Hung, W. H. (2022). An integrated model of supply chain resilience and its impact on supply chain performance under disruption. *The International Journal of Logistics Management*, *33*(1), 339-364.

Junaid, M., Zhang, Q., & Syed, M. W. (2022). Effects of sustainable supply chain integration on green innovation and firm performance. *Sustainable Production and Consumption*, *30*, 145-157.

Karani, A. M. (2022). *Effect of supply chain strategies on the performance of manufacturing firms in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Khan, S. A. R., Yu, Z., & Shah, A. (2022). Leagile Supply Chain Strategy in Asian Automotive Production.

Khattabi, H., & Karim, M. (2019). Attractiveness of Foreign Direct Investment and Export Performance in Morocco: The Case of the Automotive Industry. *Journal of Economics and Public Finance*. https://doi.org/10.22158/JEPF.V5N2P147.

Khisa, J. W., & Kariuki, P. (2022). Strategic Alliances and Performance of Firms in the Motor Vehicle Industry in Nairobi County. *Journal of International Business and Management*, *5*(2), 01-18.

Khisa, W., Kariuki, P., & Kenyatta, J. (2022). Strategic Alliances and Performance of Firms in the Motor Vehicle Industry in Nairobi County. *Journal of International Business and Management*. https://doi.org/10.37227/jibm-2022-02-5310.

Khumalo, P., & Zondo, R. (2021). Perception of the influence of cultural diversity on business performance in the automotive component manufacturing in South Africa. *Sa Journal of Human Resource Management*, 19, 7. https://doi.org/10.4102/SAJHRM.V19I0.1451.

Kiarie, N., Muraguri, C., & Wambalaba, F. (2024). Effect of Digital Strategy on Transient Competitive Advantages of Large-scale Manufacturing Companies in Kenya.. *The University Journal*. https://doi.org/10.59952/tuj.v6i1.306.

Kimwaki, B. M. (2023). *Supply Chain Alignment and Performance of Large Manufacturing Firms in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Kosgey, P. (2021). Effect of Supply Chain Resilience on Organizational Performance among Selected Manufacturing Firms in Nairobi, Kenya. *International Journal of Research and Innovation in Social Science*. https://doi.org/10.47772/ijriss.2021.5922.

Krzywdzinski, M. (2021). Automation approaches in the automotive industry: Germany, Japan and the USA in comparison. *International Journal of Automotive Technology and Management*, *21*(3), 180-199.

Lengala, E. (2022). *Leagile Strategies and Supply Chain Robustness in Manufacturing Firms in Kenya* (Doctoral dissertation, University of Nairobi).

Li, Y., Chen, K., Collignon, S., & Ivanov, D. (2021). Ripple effect in the supply chain network: Forward and backward disruption propagation, network health and firm vulnerability. *European Journal of Operational Research*, *291*(3), 1117-1131.

Lim, W. M. (2024). A typology of validity: content, face, convergent, discriminant, nomological and predictive validity. *Journal of Trade Science*, *12*(3), 155-179.

Lin, J., Zhou, L., Spiegler, V. L., Naim, M. M., & Syntetos, A. (2022). Push or Pull? The impact of ordering policy choice on the dynamics of a hybrid closed-loop supply chain. *European Journal of Operational Research*, *300*(1), 282-295.

Liu, P., Zhu, B., Yang, M., & Chu, X. (2022). ESG and financial performance: A qualitative comparative analysis in China's new energy companies. *Journal of Cleaner Production*, *379*, 134721.

Madzimure, J., Mafini, C., & Dhurup, M. (2020). E-procurement, supplier integration and supply chain performance in small and medium enterprises in South Africa. *South African Journal of Business Management*, 51, 12. https://doi.org/10.4102/SAJBM.V51I1.1838.

Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R. (2023). Stakeholder theory. *Journal of Business Research*, *166*, 114104.

Mathenge, N., & Obere, E. (2023). Operational Strategies and Performance of Kenya Vehicle Manufacturers Limited Thika, Kiambu County, Kenya. *International Journal of Business Management, Entrepreneurship and Innovation*. https://doi.org/10.35942/wxs3es62.

Menzli, L. J., Smirani, L. K., Boulahia, J. A., & Hadjouni, M. (2022). Investigation of open educational resources adoption in higher education using Rogers' diffusion of innovation theory. *Heliyon*, *8*(7).

Mohammed, Z., Lagat, C., & Ngeno, V. (2019). Sustainable Supply Chain Practices and Performance of Manufacturing Firms in Kenya. , 5, 106-118.

Mutiso, S., & Kihara, A. (2023). Procurement Best Practices and Sustainable Supply Chain Performance of Plastic and Rubber Manufacturing Firms in Kenya. *International Journal of Supply Chain and Logistics*. https://doi.org/10.47941/ijscl.1506.

Muzari, T., Shava, G. N., & Shonhiwa, S. (2022). Qualitative research paradigm, a key research design for educational researchers, processes and procedures: A theoretical overview. *Indiana Journal of Humanities and Social Sciences*, *3*(1), 14-20.

Mwangi, N. W. (2019). *Influence of supply chain optimization on the performance of manufacturing firms in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Nayal, K., Raut, R. D., Yadav, V. S., Priyadarshinee, P., & Narkhede, B. E. (2022). Retracted: The impact of sustainable development strategy on sustainable supply chain firm performance in the digital transformation era. *Business Strategy and the Environment*, *31*(3), 845-859.

Ngenoh, H. (2019). Determinants of Enterprise Resource Planning Intergration on Supply Chain Performance in Motor Vehicle Assembly in Kenya: A Case of Toyota Kenya. .

Ning, Y., Li, L., Xu, S. X., & Yang, S. (2023). How do digital technologies improve supply chain resilience in the COVID-19 pandemic? Evidence from Chinese manufacturing firms. *Frontiers of Engineering Management*, *10*(1), 39-50.

Nyamete, L., Gudda, P., & Keitany, P. (2023). Effect of supply chain resilience strategies on the performance of floricultural firms in Kenya. *EPRA International Journal of Economics, Business and Management Studies*. https://doi.org/10.36713/epra14606.

Nyamete, L., Gudda, P., & Keitany, P. (2023). The Impact of Supply Chain Resilience Strategies, Technology and the Floricultural Firms Performance, the Nakuru Kenya Story. *International Journal of Research and Innovation in Social Science*. https://doi.org/10.47772/ijriss.2023.7011002.

Ogah, M., & Onuoha, R. (2022). Digital supply chain in sub-Saharan Africa: A multi-country study. In *Digital Service Delivery in Africa: Platforms and Practices* (pp. 107-132). Cham: Springer International Publishing.

Onyando, E. M., & Naikuru, S. (2021). Influence of Inventory Control on Performance of Kenya Vehicle Manufacturers Limited.

Oyombe, G. G. (2023). *Leagile Strategy, Strategic Partnership, Firm Innovation and Competitive Advantage of Construction Companies Supply Chains in Nairobi City County, Kenya* (Doctoral dissertation, University of Nairobi).

Oyombe, G. G., Awino, Z. B., Ogutu, M., & Njihia, J. M. (2023). Realizing Competitive Advantage Through Leagile Strategy: A Survey of Construction Companies' Supply Chains in Nairobi-Kenya. *Journal of Business Strategy Finance and Management*, *5*(1), 40.

Panya, K., Ochiri, G., Achuora, J., & Gakure, P. (2021). Sustainable supply chain management and its effects on the performance of sugar sub-sector in Kenya. *Strategic Journal of Business & Change Management*. https://doi.org/10.61426/sjbcm.v8i3.2054.

Partner, S. (2023). *Assembled in Japan: electrical goods and the making of the Japanese consumer*. Univ of California Press.

Rahimi, A., & Alemtabriz, A. (2022). Providing a model of LeAgile hybrid paradigm practices and its impact on supply chain performance. *International journal of lean six sigma*, *13*(6), 1308-1345.

Reed, D., Gannon, D., & Dongarra, J. (2022). Reinventing high performance computing: challenges and opportunities. *arXiv preprint arXiv:2203.02544*.

Salazar, J. J., Garland, L., Ochoa, J., & Pyrcz, M. J. (2022). Fair train-test split in machine learning: Mitigating spatial autocorrelation for improved prediction accuracy. *Journal of Petroleum Science and Engineering*, *209*, 109885.

Sanders, N. R. (2025). *Supply chain management: A global perspective*. John Wiley & Sons.

Sukmawati, S. (2023). Development of quality instruments and data collection techniques. *Jurnal Pendidikan Dan Pengajaran Guru Sekolah Dasar (JPPGuseda)*, *6*(1), 119-124.

Sundarakani, B., Kamran, R., Maheshwari, P., & Jain, V. (2021). Designing a hybrid cloud for a supply chain network of Industry 4.0: a theoretical framework. *Benchmarking: An International Journal*, *28*(5), 1524-1542.

Talafidaryani, M. (2021). A text mining-based review of the literature on dynamic capabilities perspective in information systems research. *Management Research Review*, *44*(2), 236-267.

Teece, D. J. (2023). The evolution of the dynamic capabilities framework. *Artificiality and sustainability in entrepreneurship*, *113*, 238.

Teresi, J. A., Yu, X., Stewart, A. L., & Hays, R. D. (2022). Guidelines for designing and evaluating feasibility pilot studies. *Medical care*, *60*(1), 95-103.

Wandera, R. W., Namusonge, G. S., & Sakwa, M. M. (2022). The effect of inter-supplier rivalry practices on the performance of motor vehicle assembly companies in Kenya. *American journal of supply chain management*, *7*(1), 42-60.

Willie, M. M. (2024). Population and target population in research methodology. *Golden Ratio of Social Science and Education*, *4*(1), 75-79.

Yanamandra, R. (2019, November). A Framework of Supply Chain Strategies to achieve competitive advantage in Digital era. In *2019 International Conference on Digitization (ICD)* (pp. 129-134). IEEE.

Younas, A., Shahzad, S., & Inayat, S. (2022). Data analysis and presentation in integrative reviews: A narrative review. *Western Journal of Nursing Research*, *44*(12), 1124-1133.

Zhang, X., Song, Y., & Zhang, M. (2023). Exploring the relationship of green investment and green innovation: Evidence from Chinese corporate performance. *Journal of Cleaner Production*, *412*, 137444.

APPENDIX

Appendix I: Research Letter

Thika Road, Ruaraka
P.O. Box 56808-00200 Nairobi Kenya
Pilot Line: +254 20 8070408/9

Tel: +254 20 3537842
Fax: +254 20 8561077
Mobile: +254 734 888022, 710 888022
Email: kca@kca.ac.ke
Website: www.kca.ac.ke

BOARD OF POSTGRADUATE STUDIES

KCAU/BPS/2025 *Date: Wednesday, July 23, 2025*

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: VALLARY BARRACK ODHIAMBO- REG NO. 17/00127

It is my distinct pleasure to introduce Vallary Barrack Odhiambo, a student at our institution pursuing a Master of Business Administration in Procurement and Supplies Management degree within the School of Business.

Barrack is conducting research on the topic "***Supply chain strategies and performance of motor assembling firms in Kenya***" which is part of the requirements of the program he is pursuing. The research as well as the data procured thereof shall be used for academic purposes only.

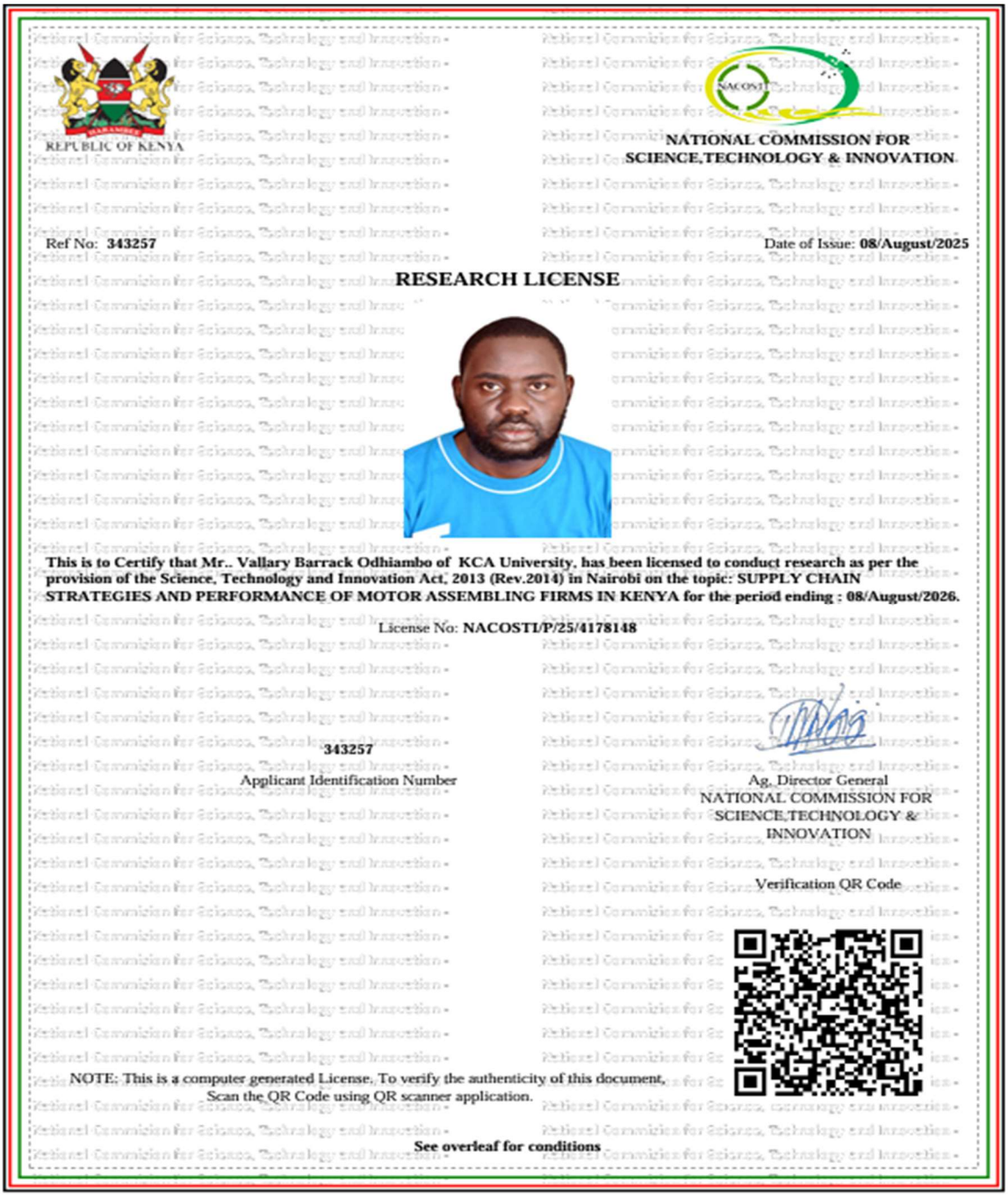
Any assistance accorded to him is highly appreciated.

In case of further inquiry, do not hesitate to contact the undersigned.

Yours faithfully,

DR. JACKSON NDOLO
DIRECTOR, BOARD OF POST GRADUATE STUDIES

Appendix II: NACOSTI authorization letter



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **343257**

Date of Issue: **08/August/2025**

RESEARCH LICENSE

This is to Certify that Mr.. Vallary Barrack Odhiambo of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: SUPPLY CHAIN STRATEGIES AND PERFORMANCE OF MOTOR ASSEMBLING FIRMS IN KENYA for the period ending : 08/August/2026.

License No: **NACOSTI/P/25/4178148**

343257

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix III: Research Questionnaire

Introduction

This questionnaire is designed to collect information relevant to the study on the effect of supply chain strategies on the performance of motor assembling firms in Kenya. The information gathered will be used for academic purposes only and will remain confidential.

Section A: Demographic Information

1. **Age Bracket**
   ☐ 18 – 25 years
   ☐ 26 – 35 years
   ☐ 36 – 45 years
   ☐ 46 – 55 years
   ☐ Above 55 years
2. **Level of Education**
   ☐ Certificate/Diploma
   ☐ Bachelor's Degree
   ☐ Other (Please specify): _____
3. **Years of Experience in the Motor Assembling Industry**
   ☐ Less than 2 years
   ☐ 2 – 5 years
   ☐ 6 – 10 years
   ☐ More than 10 years
4. **Type of Motor Vehicles Assembled** (Check all that apply)
   ☐ Passenger Vehicles
   ☐ Commercial Trucks
   ☐ Buses
   ☐ Motorcycles
   ☐ Specialized Vehicles (e.g., Agricultural, Construction)
   ☐ Other (Please specify): _____
5. **Size of the Organization (Number of Employees)**
   ☐ Less than 50 employees
   ☐ 50 – 200 employees
   ☐ 201 – 500 employees
   ☐ More than 500 employees
6. **Location of the Firm's Main Operations**
   ☐ Nairobi County
   ☐ Mombasa County
   ☐ Kiambu County
   ☐ Nakuru County
   ☐ Other (Please specify): _____

Section B: Effect of Leagile Supply Chain Strategy on Performance of Motor Assembling Firms in Kenya

Below is the Likert scale questionnaire table for assessing the effect of leagile supply chain strategy on the performance of motor assembling firms in Kenya. Please indicate your level of agreement with each statement by marking the appropriate response (1 = Strongly Disagree, 5 = Strongly Agree).

Statement	1	2	3	4	5
The firm demonstrates a high level of collaboration across the supply chain.	☐	☐	☐	☐	☐
The firm's order fulfillment process consistently meets customer requirements.	☐	☐	☐	☐	☐
The firm effectively minimizes lead time in supply chain operations.	☐	☐	☐	☐	☐
The firm’s supply chain exhibits flexibility in adapting to demand changes.	☐	☐	☐	☐	☐

SECTION C: Effect of Digital Supply Chain Strategy on Performance of Motor Assembling Firms in Kenya

Please indicate the extent to which you agree or disagree with the following statements regarding the effect of Digital Supply Chain Strategy on the performance of motor assembling firms in Kenya, where (1 = Strongly Disagree, 5 = Strongly Agree).

Statements	**1**	**2**	**3**	**4**	**5**
The adoption of process automation has improved operational efficiency and reduced manual tasks.	☐	☐	☐	☐	☐
Real-time visibility within the digital supply chain has enhanced decision-making and responsiveness.	☐	☐	☐	☐	☐
System integration across supply chain functions has improved coordination and workflow efficiency.	☐	☐	☐	☐	☐
Advanced analytics capability has facilitated demand forecasting and supply chain optimization.	☐	☐	☐	☐	☐

Section D: Effect of Resilient Supply Chain Strategy on Performance of Motor Assembling Firms in Kenya

Respondents are requested to indicate the extent to which they agree or disagree with the following statements regarding the effect of Resilient Supply Chain Strategy on the performance of motor assembling firms in Kenya, where (1 = Strongly Disagree, 5 = Strongly Agree).

Statements	1	2	3	4	5
Effective risk management practices have minimized supply chain disruptions.	☐	☐	☐	☐	☐
Supply chain flexibility has enabled quick adaptation to market and operational changes.	☐	☐	☐	☐	☐
Redundancy planning has ensured continuity in operations during supply chain disruptions.	☐	☐	☐	☐	☐
Business continuity strategies have enhanced the firm's ability to recover from unforeseen disruptions.	☐	☐	☐	☐	☐

Section E: Effect of Sustainable Supply Chain Strategy on Performance of Motor Assembling Firms in Kenya

Respondents are requested to indicate the extent to which they agree or disagree with the following statements regarding the effect of Sustainable Supply Chain Strategy on the performance of motor assembling firms in Kenya, where (1 = Strongly Disagree, 5 = Strongly Agree).

Statements	1	2	3	4	5
Waste reduction initiatives have improved operational efficiency and environmental sustainability.	☐	☐	☐	☐	☐
The use of green packaging has minimized environmental impact and enhanced brand reputation.	☐	☐	☐	☐	☐
Ethical labor practices have contributed to workforce satisfaction and overall company performance.	☐	☐	☐	☐	☐
Sustainable procurement strategies have enhanced cost efficiency and long-term business viability.	☐	☐	☐	☐	☐

Section F: Performance of Motor Assembling Firms in Kenya

Respondents are requested to indicate the extent to which they agree or disagree with the following statements regarding the performance of motor assembling firms in Kenya, where (1 = Strongly Disagree, 5 = Strongly Agree).

Statements	**1**	**2**	**3**	**4**	**5**
The firm has experienced significant growth in market share over the past three years.	☐	☐	☐	☐	☐
The firm has recorded consistent revenue growth due to improved operational efficiency.	☐	☐	☐	☐	☐
Capacity utilization has improved, performance of motor assembling firms	☐	☐	☐	☐	☐
Labor productivity increased performance of motor assembling firms.	☐	☐	☐	☐	☐

The end thank you

Appendix II: list of motor vehicle assembling firms in Kenya

1. Isuzu East Africa Ltd
2. Simba Corporation Ltd
3. Toyota Kenya Ltd
4. Kenya Vehicle Manufacturers (KVM)
5. Associated Vehicle Assemblers (AVA)
6. DT Dobie Kenya
7. Hino Motors Kenya
8. Tata Africa Holdings (Kenya) Ltd
9. Ashok Leyland Kenya
10. Mobius Motors
11. Foton East Africa
12. Volkswagen Kenya
13. Honda Motorcycle Kenya Ltd