DRIVERS AND CONTINGENT FACTORS FOR THE ADOPTION INTENTION OF JOINT CROSS-DOCKING THIRD-PARTY LOGISTICS BY FMCG MANUFACTURERS IN KENYA

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SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MSC. DEVELOPMENT FINANCE AT STRATHMORE UNIVERSITY

STRATHMORE BUSINESS SCHOOL
STRATHMORE UNIVERSITY
NAIROBI, KENYA

2025

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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ABSTRACT

The aim of this study was to investigate the drivers and boundary conditions of joint cross-docking adoption intention of Fast-Moving Consumer Goods (FMCG) manufacturers in Kenya. This research is motivated by the insufficient understanding on organizational motivations that can drive organizations intention to adopt joint cross-docking as well as the enabling conditions that can facilitate this relationship. The study employs a quantitative approach to research design, utilizing quantitative data from surveys. The study through a literature review identifies two drivers of adoption intention, which are efficiency motivation and legitimacy motivation for adoption intention and presents a research model that examines how organizational readiness, and inter-organizational trust condition the extent to which these organizational motivations drive cross-docking 3PL adoption intention among FMCG manufacturers in Kenya. A purposive sampling approach was used to obtain a sample of 176 FMCG companies and analyzed using SPSS version 27.0 and a Covariance Structural Equation Modelling (CB-SEM) through LISREL 8.8. The study revealed that both organizational motivations have significant positive relationship with joint cross-docking adoption intention. The study also found that inter-organizational trust positively moderates the relationship between organizational motivations and joint cross-docking adoption intention. Contrary to expectations, organizational readiness negatively moderates the relationship between efficiency motivation and joint cross-docking adoption intention, whereas it failed to significantly moderate the relationship between legitimacy motivation and joint cross-docking adoption intention. Managers should therefore prioritize efficiency improvements by emphasizing the potential benefits of joint cross-docking, including lower transportation expenses and enhanced delivery timelines. Firms need to promote open communication by encouraging transparent and consistent dialogue among partners to foster trust. Policymakers should also consider offering incentives for adoption. They might provide inducements, such as tax reductions or subsidies, to motivate organizations to embrace joint cross-docking.

Keywords: *Efficiency motivation; Legitimacy motivation; Joint Cross-docking; Inter-organizational trust; Organizational readiness*

DEFINITION OF TERMS

Efficiency Motivations

Efficiency connotes the capacity of an operational process to utilize resources wisely, thereby reducing waste. On the premise of the TCE, the study defines efficiency motivation for adopting joint cross-docking as the company's aim to lower operational expenses in its distribution process by improving inventory management, optimizing transportation routes, consolidating loads, and enhancing response speed to achieve a competitive advantage (Gegeleso et al., 2021).

Legitimacy Motivations

A company's drive for legitimacy is referred to as a widespread understanding or belief that the actions of the company align with the accepted societal norms, values and beliefs (Suchman, 1995). Predominantly, firms can establish their legitimacy in various ways, such as by executing tasks that are considered appropriate by institutional stakeholders, like supply chain partners. Another approach is to emulate the practices or actions of a successful organization that has been used as a benchmark (Liu et al., 2016).

Joint Cross-Docking

Intention refers an individual's desire, resolute determination, or strong inclination to carry out a specific action. Adoption often follows a careful assessment of the pros and cons of the predetermined action. At the organizational level, firms may have to perform SWOT analysis before making the final decision (Benrqya & Jabbouri, 2023).

Inter-organizational Trust

Inter-organizational trust involves assessing the dependability of the counterpart (Ashnai et al., 2016). Specifically, it makes reference to the trust one has in the dependability and honesty of a person involved in a transaction (Ashnai et al., 2016). In supply chain partner relationships, it plays a crucial role in establishing mutual confidence within supply chain partner relationships (Bettis-Outland et al., 2021).

Organizational Readiness

Organizational readiness is defined as the level of preparedness and willingness of individuals or groups to embrace and execute change (Vaishnavi et al., 2019). In organizational change management literature, organizational readiness indicates both the psychological and behavioural preparedness to take action, thus, taking into consideration, their willingness and abilities (Lokuge et al., 2019). The readiness in this case includes all resources that enable goal achievement (Su et al., 2023).

DEDICATION

This research dissertation is dedicated to my wife, Ruth Mumbua and our children Tendai and Vinya who have always been my biggest support and source of inspiration. I could not have come this far without their love and support. This also goes to my parents Julius, Idah, Amos and Mary as well as my brothers, sisters, nephews and nieces from whom I drew a lot of inspiration.

ACKNOWLEDGEMENT

I am deeply grateful to the Almighty God for His grace, provision, and favor throughout the course of this study. My sincere appreciation goes to Strathmore University Business School for the opportunity to pursue my studies and for the continued support from its community. I extend special thanks to my supervisor, Prof. Jonathan Annan, for his invaluable guidance and encouragement during the development of this dissertation. I also thank my fellow students at Strathmore University for their camaraderie, intellectual engagement, and unwavering support throughout this journey.

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ABBREVIATIONS AND ACRONYMS

3PL	Third-Party Logistics
AVE	Average Variance Extracted
CA	Cronbach Alpha
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMB	Common Method Bias
CR	Composite Reliability
DC	Distribution Centre
DSD	Direct Store Delivery
EFA	Exploratory Factor Analysis
EM	Efficiency Motivation
FMCG	Fast-Moving Consumer Goods
GDP	Gross Domestic Product
IFI	Incremental Fit Index
IOT	Inter-Organizational Trust
JCXD	Joint Cross-Docking
JCXDAI	Joint Cross-Docking Adoption Intention
KAM	Kenya Association of Manufacturers
KIPPRA	Kenya Institute for Public Policy Research and Analysis.
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)
LM	Legitimacy Motivation
MoITED	Ministry of Industrialization, Trade & Enterprise Development
NFI	Normed Fit Index
NNFI	Non-Normed Fit Index
OR	Organizational Readiness
PAT	Principal-Agent theory
RBV	Resource-Based Value Theory
RFI	Relative Fit Index
RMSEA	Root Mean Square Error of Approximation
SKU	Stock Keeping Units
SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Error
TCE	Transactional Cost Economics Theory

TW	Traditional Warehousing
VRI	Variance Inflation Factor
XD	Cross-Docking
XDPL	Cross-Docking Pick by Line
XDPS	Cross-Docking Pick by Store
$\chi 2$	Chi-Square

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Over the years, logistics and supply chain management have experienced numerous transformations, from being a sheer cost hub to a value driver for organizations (Faster Capital, 2024; Kokilam et al., 2016). Today, due to the increasingly fierce competition among firms, it is essential for firms to adopt appropriate practices that promote an efficient supply chain and ensure quick product delivery to customers (Shahram fard & Vahdani, 2019). There is intense pressure to reduce the distribution time of products as customers' demands for swift and reliable product delivery are escalating (Gallo et al., 2022; Jayant, 2013). As a result, firms are increasingly seeking novel ways of increasing efficiency through cost minimization and elimination of inefficiencies to maintain competitiveness in the market (Chandak & Kumar, 2019).

Traditionally, firms have subscribed to the belief that large-scale warehousing strategies enhance quick response to customer uncertain demands, however, large-scale inventory increases inventory management costs and operational risks (such as losses, and spoilage of perishable products) (Liu & Li, 2023). Therefore, warehousing appears less of an efficient and effective strategy for product distribution management, especially for Fast-Moving Consumer Goods (FMCG).

Third Party Logistics (3PL) providers are external companies engaged to deliver services that enhance a shipper's business operations beyond what the shipper could accomplish independently (Marchet et al., 2017). Among the emerging solutions capturing the attention of third-party logistics (3PL) providers and FMCG manufacturers, joint cross-docking emerges as a promising approach (Benrqya et al., 2020). Recently, cross-docking is fast becoming one of the product distribution strategies firms are considering to manage their product distribution (Shahram fard & Vahdani, 2019). Joint cross-docking proposes a centralized distribution model, whereby products from diverse FMCG manufacturers are consolidated at a strategically positioned facility before being swiftly sorted and dispatched to their respective destinations (Benrqya et al., 2020). By eschewing the traditional warehousing approach, this supply chain technique aims to minimize handling and storage times, optimizing transportation routes and load consolidation, thereby

ushering in potential cost savings and operational efficiencies for all stakeholders involved (Gegeleso et al., 2021).

Joint cross-docking, as a product distribution strategy is an "*efficient logistics operation method in which goods from various manufacturers are sorted, replaced, assembled, and shipped directly without entering the warehouse for storage*" (Liu & Li, 2023, p. 1). Statistics on cross-docking indicate that the elimination of warehousing alone saves about 70% of costs (Vahdani & Zandieh, 2010), making it more efficient for handling perishable goods (Gallo et al., 2022). Extant literature reiterates that cross-docking, in contrast to conventional warehousing methods, results in lower inventory expenses, shorter time to get goods to the markets and thereby reducing the handling costs (Agustina et al., 2014; Assadi & Bagheri, 2016; Benrqya, 2020; Benrqya et al., 2020; Liu & Li, 2023; Shahram fard & Vahdani, 2019).

Despite these benefits, adoption and utilization of cross-docking among firms have been low (Liu & Li, 2023), particularly in Africa. Meanwhile, the adoption of joint cross-docking third-party logistics within Africa has the potential to revolutionize the supply chain logistics of FMCGs and bring significant benefits to the African Continental Free Trade Area (AfCFTA) region (World Economic Forum, 2023). According to this report, streamlining trade, reducing costs, and enhancing supply chain efficiency can accelerate regional economic growth and foster closer cooperation among member countries, fostering a more interconnected and prosperous African market. The establishment of joint cross-docking facilities in Africa has been instrumental in fostering regional trade and integration, supporting local industries, and promoting sustainable logistics practices (World Economic Forum, 2023).

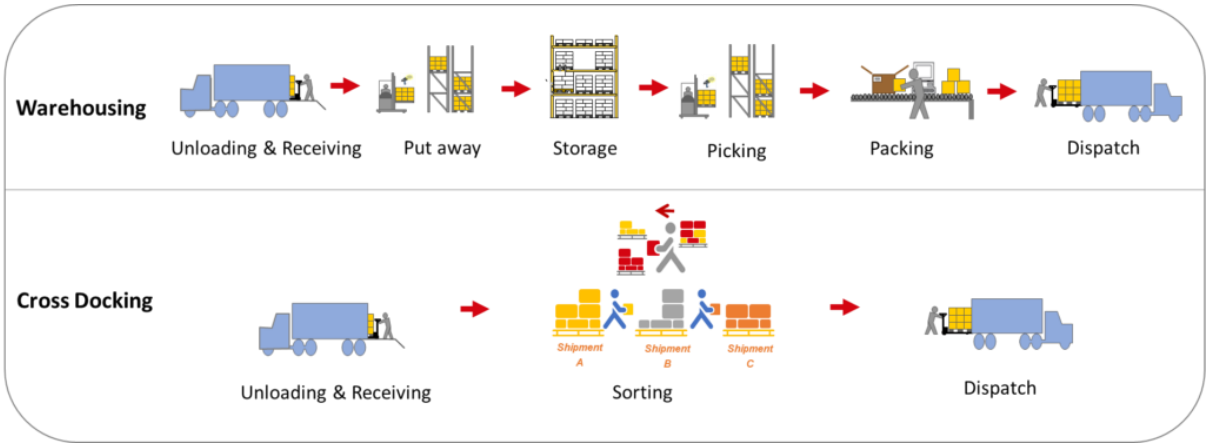

Figure 1.1: Traditional and Cross-docking schematic (Cross Dock - warehouse-design.com, 2020)

As economic growth surges across the African continent and consumer demand escalates, these facilities serve as essential conduits for the seamless flow of goods, bolstering supply chain efficiency for FMCG manufacturers both within and beyond the AfCFTA. Considering the earlier established low adoption and utilization rate of joint cross-docking third-party logistics (Liu & Li, 2023), particularly in the developing economy, a comprehension of the various organizational incentives that drive adoption would be a stepping stone for championing this practice. Drawing from Transaction Cost Economics (TCE) Theory (Williamson, 1981) and Institutional Theory (DiMaggio & Powell, 1983), the research delineates two driving forces within organizations for adoption: a pursuit of economic efficiency and a quest for normative legitimacy (Liu et al., 2016). Arguing from the TCE theory, firms will adopt joint cross-docking 3PL if it has the potential to minimize their transactional costs, including various costs such as inventory, inventory holding, transportation, processing of documents, tracking and tracing, warehousing, etc. From the normative tenets of the institutional theory, the study argues that firms would adopt the joint cross-docking 3PL for competitive reasons if their competitors benefited from the adoption.

The study however, is framed from the contingency theory that the extent to which the identified organizational motivations drive firms' intention to adopt the joint cross-docking 3PL is contingent upon certain internal and external factors (Lawrence & Lorsch, 1967; Luthans et al., 1976). This study argues that the organizational motivations would be more potent to drive the adoption of the joint cross-docking 3PL when there is strong inter-organizational trust among the supply chain partners.

Similarly, depending on the firms' readiness to initiate a change, the identified organizational motivations would be more potent to drive the adoption of joint cross-docking.

This study seeks to explore the motivational elements within organizations that influence the inclination towards adopting joint cross-docking third-party logistics as well as internal and external factors such as inter-organizational trust and organizational readiness among FMCG manufacturers and 3PL providers in Kenya. The study delves into various dimensions, beginning with a comprehensive literature review that traverses the intricate terrain of joint cross-docking 3PL practices, and the dynamic landscape of FMCG logistics. Building on this theoretical groundwork, the research methodology embraces a quantitative research method to obtain quantifiable data to establish empirically, the association among the study variables.

The implication of this research is threefold. The study enhances our comprehension of the organizational factors (i.e., whether efficiency or legitimate motivations or both) that would drive firms' adoption intention of joint cross-docking among FMCG manufacturers. In effect, the study explains how the TCE and the institutional theory can shape firms' responses to various organizational motivations to drive the adoption intention of joint cross-docking among FMCG manufacturers. Second, the study explains the roles played by inter-organizational trust and organizational readiness in shaping the extent to which organizational motivations drive joint cross-docking adoption intention.

In summary, this dissertation embarks on a journey to seek opportunities in the vast potential of joint cross-docking for FMCG manufacturers in Kenya. The study is grounded in real-world logistics practices but tailored to the unique challenges and opportunities in Kenya. The insights offered herein aim to empower logistics practitioners and researchers with a wealth of knowledge that transcends theoretical bounds, providing practical guidance to optimize supply chain performance and drive transformational change in the FMCG industry. As the study delves into the depths of joint cross-docking, it sets the stage for a supply chain landscape marked by greater efficiency, sustainability, and a resilient landscape that holds the promise of shaping the future of FMCG logistics in Kenya and beyond.

1.1.1 The significance of the retail and manufacturing sector in Kenya

According to Kenya National Bureau of Statistics (2022), the economy expanded by 7.5% GDP compared to a contraction of 0.3% in 2020 following the impacts of Covid 19. It further reports that the manufacturing, wholesale, and retail sectors together with the transport and storage sectors contributed an estimated 22% to the GDP. Vision 2030 projects to have the manufacturing and retail sector alone contributing 15% of Kenya's GDP by the year 2030 (Kenya Vision 2030, 2007). The informal sector employed 14.9 million people, the bulk of whom worked in wholesale and retail, and manufacturing with a labor force of 8.9 million and 3.0 million respectively (Kyalo & Waithaka, 2020).

Enhanced effectiveness and increased productivity in wholesale and retail trade offer significant opportunities for mutual benefits to producers and consumers, as well as for enhancing the distribution of both local and imported goods. When appropriately optimized, wholesale and retail trade hold the promise of reducing costs for consumers and intermediary producers, thereby fostering national savings and enhancing the overall welfare of the population (Kenyan Association of Manufacturers (KAM), 2024). The report further indicates that the value of manufactured goods increased from KES 2.11 trillion in 2017 to 2.69 trillion despite a decline in the sector contribution from 8.7% to 7.24% over the same period. With this appreciation, deliberate strategic policies and government interventions have targeted growing these sectors as key drivers of the economy. Recognizing the pivotal role of industrialization in fostering economic growth and equitable prosperity, the parent ministry formulated a comprehensive strategic plan (2018-2022) with a dedicated emphasis on advancing this vital sector. The ministry's overarching strategic deliverable is to facilitate the sector's growth in the value of domestic trade by 25% by 2022 (Kenya Vision 2030, 2007).

The rapid expansion of Kenya's fast-moving consumer goods (FMCG) sector has significantly propelled industrial growth, primarily fueled by robust consumer demand for food and beverage (F&B) items and personal care products (Oxford Business Group, 2016). A report by KPMG (2014) on FMCG in Africa suggests that Kenya is one of ten African nations with a particularly high potential for FMCG expansion due to rising demand in the food and beverage and personal care products. According to the Oxford Business Group (2016), the growth of the FMCG sector is

fueled by several causes, including Kenya's growing middle class; according to the African Development Bank, 17% of Kenyans can spend $2-20 per day.

The above highlights the sector's significance and essential role in the country's economic growth, stressing the need to assess methods that enhance its productivity. Despite the sector's current contribution in Kenya, it is believed to be more profound when 3PL joint cross-docking is adopted. Joint cross-docking optimizes transportation routes, consolidating loads, and enhancing response speed to gain a competitive edge (Gegeleso et al., 2021). Benrqya et al. (2020) suggest employing the joint cross-docking 3PL strategy within the supply chain, which not only addresses logistical challenges but also minimizes supplier handling expenses. With a majority of FMCG manufacturers and retailers in Kenya adopting the traditional DSD supply, this research seeks to find out what motivations would motivate FMCG manufacturers to adopt the joint cross-docking 3PL distribution approach.

1.1.2 Third-Party Logistics (3PL)

By definition, 3PLs provide specialized warehousing and distribution services in the logistics sector with a focus on manufacturers, suppliers, and retailers with the key value proposition being efficiency, improved customer service, and cost-effectiveness (Akbari, 2018). Businesses utilize joint cross-docking 3PL services for an array of purposes, such as accessing optimal practices, enhancing service excellence, managing logistical expenses, accelerating operations, efficiently allocating resources, mitigating risks, and prioritizing matters crucial for their sustainability and future expansion (Zacharia et al., 2011).

Logistics is the most commonly outsourced non-core company function at the moment, as it frees up resources and allows businesses to focus on their core capabilities (Akbari, 2018). The decision to outsource is often driven by a desire to increase productivity and cut costs, while also ensuring the continued ability of the company to effectively execute its core functions, thereby leveraging labor, capital, skills, and resources more efficiently (Gegeleso et al., 2021).

There are broadly two distinct models of distribution systems that dominate the modern FMCG supply chain: Direct Store Delivery and Centralized Distribution. A more traditional distribution model, Direct Store Delivery (DSD), also known as a decentralized distribution, is widely used by FMCG manufacturers, suppliers, and

wholesalers (Dujak, 2019). The centralized approach to distribution has evolved as organizations sought to achieve competitive advantage. Fernie et al. (2010) noted a rising trend in the significance of outsourcing and centralization of logistics activities in recent years. This shift aims to bolster cost efficiency, enhance logistical operations, and streamline supply chain networks.

Across the globe, third party logistics (3PL) approach to distribution networks has over time continued to gain traction (Lieb & Bentz, 2005). Organizations seek ways to stay competitive in an increasingly global environment, allowing several organizations to outsource their logistics tasks to an external logistics company (3PL). There has been a growing trend globally, especially in the developed world, where a majority of manufacturers, retailers, cross-border traders are progressively outsourcing their logistics and distribution networks to 3PLs taking advantage of the improved technologies and which have contributed heavily to the firm's strategic competitive advantages (Wambua, 2017).

Globalization has enhanced the prominence of Supply Chain Management (SCM) among many scholars and practitioners significantly after 1980 (Akbari, 2018). The supply network has over time grown in strength, complexity, and cost. Third-party logistics (3PL) firms have continued to receive acceptance by manufacturers and suppliers as vital stakeholders in the supply chain (Shi et al., 2020).

Some organizations in Kenya conduct in-house logistics, while others outsource their supply chain management to several logistics providers, which is not only expensive to run but also difficult to manage (Esther & Katuse, 2013). In Kenya, the informal sector employed 14.9 million people, the bulk of whom worked in wholesale, retail, and manufacturing with a labor force of 8.9 million and 3.0 million respectively (Kyalo & Waithaka, 2020). Even with the obvious advantages that come with 3PL service providers, its adoption in the developing world is sensitive especially because it leads to unemployment and the perception of workforce shrinkage as companies move from the traditional DSD to less intensive 3PL cross-docking distribution models (Gegeleso et al., 2021). Among the 3PL providers present in Kenya are Bollore Africa Logistics, Kuehne & Nagel, DB Schenker, and Acceler Global Logistics, among various others (Wambua, 2017). It is however important to highlight that the above global players largely operate in export commodities rather than the local distribution of FMCG products (Esther & Katuse, 2013).

1.1.3 Joint Cross-docking (XD)

Joint Cross-docking (XD) in retail supply chain is a distribution approach that involves consolidating products from multiple supplier distribution centers (DCs) for direct delivery to various destinations, such as retail stores (Lieb & Bentz, 2005). This strategy eliminates the necessity of storing inventory at the retailer DC by facilitating immediate transfer upon reception. Retail stores do not have any storage spaces between receiving products and loading them (Benrqya, 2019). This approach is facilitated using specialized warehouses designed for cross-dock abilities and dock-levelers to accommodate trucks of different heights. Joint cross-docking is instrumental in lowering the levels of inventory, working capital, and associated inventory costs (Benrqya et al., 2020).

With joint cross-docking, there is seldom storage of goods in the distribution centers, and in light of the divergence in the traditional distribution approaches by the retailers and suppliers. Benrqya et al. (2020) suggest employing the joint cross-docking 3PL strategy within the supply chain, which not only addresses logistical challenges but also minimizes supplier handling expenses.

This study focuses on manufacturers engaging joint cross-docking 3PL service providers for both warehousing and distribution of FMCG goods. Packaging from the joint cross-docking warehousing facility are made onto store-ready pallets and delivered directly to stores thus avoiding intermediary handling (Benrqya, 2019). According to Lieb & Bentz (2005) in physical sorting, products are physically matched and organized based on their intended destinations.

1.2 Problem Statement

Notwithstanding the benefits of joint cross-docking, its adoption and utilization among firms remain low and studies to address the low adoption of joint cross docking is lacking in literature (Liu & Li, 2023). A market research by HealthGenix Dynamics (2024) suggests that cross docking services market was valued at approximately USD 35 billion in 2022 and is projected to experience a compound annual growth rate (CAGR) of 8.5% from 2023 to 2030. These huge projections of cross docking services encompass a diverse range of regions, including North America, Europe, Asia-Pacific, Latin America, and the Middle East & Africa. In Africa, Egypt, Nigeria and South Africa were the countries known for joint cross-docking (HealthGenix Dynamics,

2024), thus, evidence of joint cross-docking adoption in Kenya is lacking. While there have been numerous research studies on cross-docking, majority of them have focused on using optimization models to solve vehicle routing issues related to cross-docking (Cen et al., 2023; Liu & Li, 2023; Serrano et al., 2021), with limited empirical and theoretical understanding on what could potentially drive firms to adopt the cross-docking (Dudukalov et al., 2020). Therefore, this research suggests that understanding different organizational motivations for adoption can serve as a basis for encouraging its implementation. From the Institutional Theory (DiMaggio & Powell, 1983) and Transaction Cost Economics (TCE) (Williamson, 1981), the study identifies two incentives for adoption by firms: the economic goal of improving efficiency and the normative goal of gaining legitimacy (Liu et al., 2016) and argues that the extent to which these organizational motivations drive the adoption intention of joint cross-docking is contingent upon organizational factors, such as organizational readiness and inter-organizational trust (Francisco & Swanson, 2018).

Although existing studies provide insights on how organizational readiness (e.g., Marei et al., 2023) and inter-organizational trust (e.g., Lu et al., 2019) condition various relationships, evidence is still lacking in relation to adoption of joint crossdocking 3PL. For instance, Marei et al. (2023) considered organizational readiness to explain the differences in the impact of technology, organizational, and environmental factors on Fintech adoption. To the best of the author's knowledge, no study provides evidence on how these two concepts can condition the extent to which organizational motivational factors drive adoption of joint crossdocking 3PL. Delbufalo (2012) argues that for lean and agile supply chains to be effectively adopted and put into practice (e.g., joint cross-docking 3PL) organization must foster high levels of trust which is essential in shortening cycle time, minimize transactional cost, and improve supply chain responsiveness. However, there is a scarcity of studies exploring various levels of interorganizational trust that contributed to strengthening organizational relationships (Johnston et al., 2004; Roehrich et al., 2020). The consequence is the continuous low adoption of joint cross-docking in the developing economies due to lack of literature on the factors that can drive the adoption of such an important lean supply chain practice, that has been heavily recognized in the developed economies. Accordingly, the study argues that the extent to which

organizational motivational factors drive adoption of joint crossdocking 3PL depends upon organizational readiness and inter-organizational trust.

1.3 Research Objectives

1.3.1 General Research Objective

The main objective of this study is to investigate the factors that motivate organizations to adopt joint cross docking and to assess how organizational factors act as boundary conditions in this process.

1.3.2 Specific Research Objectives

Below are the three objectives that this study seeks to achieve, and which will also guide the research on the data to be collected.

i. To examine the association between organizational motivations for adopting joint cross-docking 3PL and the adoption intention among FMCG manufacturers in Kenya.
ii. To examine the moderating role of inter-organizational trust in the association between the organizational motivations and the adoption intention of joint cross-docking 3PL.
iii. To examine the moderating role of organizational readiness in the association between organizational motivations and the adoption intention of joint cross-docking 3PL.

1.4 Research Questions

The three questions hereunder are structured to guide the researcher in data collection and which data will be instrumental in achieving the objectives of this study.

i. What is the association between organizational motivations for adopting joint cross-docking 3PL and the adoption intention among of FMCG manufacturers in Kenya?
ii. What is the moderating role of inter-organizational trust in the association between the organizational motivations and the adoption intention of joint cross-docking 3PL?
iii. What is the moderating role of organizational readiness in the association between organizational motivations and the adoption intention of joint cross-docking 3PL?

1.5 Scope of Study

The scope of this study will be limited to the following.

1.5.1 Geographical Scope

This study will concentrate on the Fast-Moving Consumer Goods (FMCG) sector, with a specific focus on manufacturers operating within Kenya. By narrowing the scope to manufacturers within Kenya, the study aims to provide a detailed analysis of the dynamics, challenges, and opportunities unique to this geographic context. Kenya, as a prominent and emerging market in East Africa, offers a distinct set of challenges and opportunities for FMCG manufacturers.

1.5.2 Industry Scope

The study will specifically target the FMCG sector. The FMCG industry encompasses businesses engaged in manufacturing products that have a rapid turnover and are affordably priced, including consumables like food and beverages, household essentials and personal care commodities. Investigating the application of joint cross-docking and third-party logistics in this sector is relevant due to the industry's time-sensitive nature and the potential for supply chain optimization.

1.5.3 Supply Chain Scope

The study will focus on the supply chain operations of FMCG manufacturers, with an emphasis on inbound and outbound logistics. The scope will cover the movement of goods from manufacturers to retailers or distributors. Special attention will be given to the joint cross-docking process and the involvement of 3PL providers to FMCG manufacturers in facilitating these operations.

1.6 Significance of the Study

This research holds significant value as it has the potential to transform supply chain operations for FMCG manufacturers in Kenya. By investigating the various motivations that drive joint-cross-docking adoption among FMCG manufacturers, this research can offer valuable insights into enhancing supply chain efficiency, reducing lead times, minimizing inventory costs, and improving overall customer satisfaction. The research findings can offer a framework for FMCG manufacturers in Kenya to adopt more agile and cost-effective supply chain strategies, leading to

increased competitiveness and sustainable growth. Additionally, the study's advancements in the domain of supply chain management can be used to help 3PL providers in tailoring their services to better support FMCG manufacturers' specific requirements, fostering mutually beneficial partnerships, and fostering economic development in the region.

1.6.1 Policymakers and Regulators

This study will offer research information to the policymakers, regulators, and lobby groups in the manufacturing, distribution, and retail sectors. With the previously witnessed collapse of four leading supermarket chains in Kenya which caused unprecedented losses to suppliers, this research will expose some vital information that will facilitate new strategies that the government of Kenya has been proposing to cushion suppliers from such losses such as the prompt settlement of suppliers. The Competition Authority of Kenya is a key regulator in this sector, especially considering that it is proposed to have competitor goods being distributed by a considerably large consolidator. The Kenya Revenue Authority is also another key stakeholder especially considering that such a facility would be a large tax collection point.

1.6.2 Key Stakeholders

The key stakeholders include FMCG manufacturing companies, 3PL providers operating in the region, government agencies responsible for regulating logistics and transportation, supply chain practitioners, and consumers who are the end-users of FMCG products. These stakeholders play vital roles in understanding firm motivations that can drive joint cross-docking 3PL adoption within the FMCG industry in Kenya.

1.6.2 Academicians and Researchers

The study will review various pieces of research that have been done in this field. Over time, there has been continuous improvement and evolution of smart supply management systems which have been adopted more in the developed world. Considering the continued impact of globalization, both developing and developed worlds continue to compete in the same global space and as such, the developing world has a lot of catchups to do by borrowing from research knowledge established by researchers in the development world (Rocco & Plakhotnik, 2009). This research

enhances the existing knowledge of supply chain management in the fast-moving consumer goods (FMCGs) industry in Kenya. Its findings also offer insights applicable to Kenya and other developing regions, particularly regarding distribution methods, which have predominantly adhered to traditional practices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Several research papers have been done on the general aspect of 3PL both within Kenya and other parts of the world and which have exposed various empirical data established from the various data collected during the studies. There are similarities that can be drawn to offer some basis and guidance for this study. In addition, there are established theories developed over time that offer some predictions in the adoption of the proposals to the main players and stakeholders. This study will therefore examine these research, theories, and empirical conclusions considering the topic at hand.

2.2 Theoretical Review

The theoretical framework establishes a fundamental basis for constructing and validating the research, while also defining the philosophical, epistemological, methodological and analytical viewpoints that direct the study's methodology (Grant & Osanloo, 2014). A theory enables precise forecasting, and its predictive power guides the researcher in formulating relevant research questions. It builds a platform for future theory creation by synthesizing existing theories, relevant concepts, and empirical data (Rocco & Plakhotnik, 2009). The three key theories that underpin this study include Transaction Cost Economics (TCE), institutional theory and the contingency theory.

2.2.1 Justification for the use of the multiple theories

Although using a lesser number of theories in research is highly encouraged for parsimony, it becomes less useful if the same theory cannot be used to better explain different relationships between variables. When this happens, the researcher would have to fall on a different theories that can best describe the relationship between the variables in the study (see Ashnai et al., 2016; Liu et al., 2016; Lu & Shang, 2017; Shi et al., 2022; Um & Oh, 2020; Zhao et al., 2015). Consistent with this study, a single theory is unable to better describe the underlying phenomenon, hence, following a similar study by Liu et al. (2016), the researcher falls on three theories: Transaction Cost Economics (TCE), institutional theory and the contingency theory to explain how various organizational factors drive firms to adopt joint crossdocking 3PL under

two contingent internal factors: organizational readiness and inter-organizational trust. In a study by Liu et al. (2016), the authors utilized these three theories to establish the relationship between the variables in the research. Specifically, Liu et al. (2016) used the TCE theory to establish the nexus between efficiency motivation for supply chain technology (SCT) adoption and its utilization. They employed institutional theory to explain the nexus between the motivation for legitimacy in SCT adoption. Additionally, they applied contingency theory to explain that SCT utilization and performance might differ depending on the two organizational factors: information sharing and logistics integration. This study thus, resonate well with Liu et al. (2016), with respect to the efficiency motivations and legitimacy motivations for adoption and how organizational factors – organizational readiness and inter-organizational trust condition the baseline relationship.

2.2.2 Transaction Cost Economics (TCE) Theory

TCE is widely used in studies related to operations and supply chain management. Despite being a widely applicable theory of governance, TCE specifically focuses on whether to go for an in-house production or external acquisition decision (Williamson, 1981). This aligns well with pressing research problems surrounding outsourcing in supply chain management in various organizations (Ketokivi & Mahoney, 2020).

The TCE theory was formally proposed by Coase (1937) and refined later by Williamson (1975). The TCE theory views transaction as the most fundamental unit of measurement, focusing on how much work, resources, or investments required for two parties to accomplish an exchange (Williamson, 1981). Sarkis et al. (2011) define the transaction costs as the extra expenses incurred while exchanging goods or services between two parties, in addition to the cost of the good or service itself. The goal of the TCE is to maximize transaction performance and minimize costs.

The transaction costs economics, according to Halldórsson et al. (2015), aids in assessing whether an activity should be handled in-house or outsourced to a third party. The authors also argue that close collaboration can lead to opportunistic behavior, and the 3PL can include safeguards and strong commitments such as fine provisions for bad shipments, collaborative investments in specialized warehouses or equipment, joint educational initiatives and staff exchanges.

The idea that TCE can be applied directly as a theory for supply chain efficiency is well-founded. (Ketokivi & Mahoney, 2020). The efficiency viewpoint contrasts sharply with viewpoints that emphasize competence and power, which are both more well-established perspectives in supply chain studies. As an example, instead of producing car seats in-house, General Motors (GM) decided to buy their car seats from Adient, which is the global leader in the supply of automotive seating industry across America, Europe, and China.

The necessity for efficiency within organizations arises from market competition and limited resources, and is fundamentally grounded in TCE (Williamson, 1981). From the TCE perspective (Williamson, 1981), firms may adopt cross-docking 3PL as a means of reducing the transactional cost associated with in-house logistical activities that can be better handled by a 3PL service at a reduced cost. Due to the high transactional costs associated with the traditional warehousing, distribution, and transportation systems, firms would want to adopt the joint cross-docking 3PL as a strategic cost minimization approach to gain a competitive edge.

Based on this, the research utilized Transaction Cost Economics (TCE) to examine the economic motivations behind the adoption of joint cross-docking third-party logistics (3PL). It also explored how the drive for increased efficiency influences the decision to adopt joint cross-docking practices. Despite the applicability of this theory to the study, TCE has some weaknesses. For instance, TCE neglects the impacts of relational factors that are needed to build trust and confidence (Li et al., 2024; Wang et al., 2020). Thus, TCE overemphasizes economic and contractual arrangements, which are not solely sufficient to drive responsive actions. It is possible that firms may engage in cross-docking to minimize transaction costs based on strong relational ties between them, which the TCE does not account for relational factors. In this case, the social exchange theory (SET) can provide a better explanation.

2.2.3 Institutional Theory

Institutional theory, as proposed by DiMaggio and Powell's (1983), suggests that organizational practices and managerial decisions are influenced by regulatory, normative, or mimetic forces. In the context of this study, insights are drawn from the normative and the mimetic tenets of the institutional theory to argue that firms may intend to adopt cross-docking third-party logistics to attain legitimacy.

Normative pressures stem from widely recognized norms and standards that align with the cultural expectations of a particular setting (Khalifa and Davison, 2006; Saeed et al., 2018). These pressures can be exerted by diverse entities such as academic institutions, industry, professionals, NGOs and the society at large (DiMaggio & Powell, 1983). Additionally, organizations may experience normative influences from suppliers and customers, shaping their practices and decision making (Chu et al., 2017; Zhu et al., 2013).

Mimetic pressures emerge when a firm perceives the need to replicate the successful strategies and practices of other companies to mitigate cognitive uncertainty (DiMaggio & Powell, 1983). Mimetic pressures refer to the influence exerted by competing firms in the same industry, compelling a firm to adopt the best practices observed in those competitors' operations (Ahmed et al., 2019). Therefore, the phenomenon of mimetic pressure compels businesses to observe and acquire knowledge from their rivals who are successfully utilizing optimal strategies in order to maintain competitiveness within the market. Ahmed *et al.* (2020) assert that organizations under the influence of mimetic pressures establish their objectives based on the standards of their competitors to enhance their performance.

The theory suggests that organizations are motivated to justify their actions based on social factors, providing a logical and significant explanation for their behavior (DiMaggio & Powell, 1983). In line with this viewpoint, a company's drive for legitimacy is determined by society and commonly understood as the belief that its actions align with the accepted norms, values, beliefs, and definitions within a social system (Suchman, 1995). Hence, companies can gain social acceptance, known as legitimacy, by either engaging in activities approved by key institutional stakeholders (such as supply chain partners) or emulating the practices or behaviors of a successful organization that serves as a benchmark (DiMaggio & Powell, 1983; Liu et al., 2016).

Based on this comprehension, the research delineates legitimacy motivation regarding the adoption of cross-docking third-party logistics as the extent to which an organization's actions correspond with those of competitors, suppliers, and customers in embracing this logistical approach. Accordingly, the study draws insights from the normative and mimetic tenets of the institutional theory and proposes that in an

attempt to attain legitimacy, firms may adopt practices that are perceived acceptable by their institutional stakeholders, including supply chain partners or behaviors exhibited by successful benchmarked firms.

Accordingly, the study utilized the mimetic and normative principles of institutional theory to interpret the connection between efficiency-driven motivation for joint crossdocking implementation and its adoption. One major limitation of institutional theory is the confusion about what defines an institution. This problem arises because of the multiple understandings of what an institution is, and about the factors that shape behavior within institutions. One central issue that arises here concerns the source of preferences, and the ways in which individuals and institutions interact in making decisions and forming judgements about "good" policies (Peters, 2000).

2.2.4 Contingency theory

This theory was proposed by Fiedler (1964) who states that leadership effectiveness is as a result of two main factors: leader's personality and the situation in which the leader is operating. The theory suggests that no universal approach to process management exists, as various contexts demand different strategies. (Fiedler, 1964; Lawrence & Lorsch, 1967; Luthans et al., 1976). This theory has been refined and extended to organizational levels as well. For instance studies (Flynn et al., 2016; Liu et al., 2016; Sillince, 2005) suggest that organizational outcome is as a result of a fit between a firm's structure and the internal and external contingencies. The idea of fit is pivotal in contingency theory, proposing that specific organizational structures and practices are better suited to particular organizational contexts (Romero-Silva et al., 2018).

Researchers who have applied contingency theory propose that contextual factors might be responsible for the inconsistent or unsuccessful adoption and implementation of supply chain management practices and their results (Lu et al., 2019; Romero-Silva et al., 2018). These contextual factors can be internal or external. The contingency theory proposes that the best course of action for a company is based on its unique internal and external factors (Lawrence & Lorsch, 1967; Luthans et al., 1976). Thus, internal and external exigencies could contribute to firms' differing in response to actions. This study argues from the contingency theory that, in an uncertain environment, firms with an internal resource (i.e., organizational readiness

to adopt a change and inter-organizational trust) are better positioned to respond to a change (Essuman et al., 2022; Tan & Peng, 2003; Tognazzo et al., 2016). Carvalho et al. (2012) assert that an organization can reap some benefits from their preparedness (including organizational readiness), which can be achieved by creating contingency plans. This study argues that the extent to which efficiency and legitimacy motivations drive firms to adopt cross-docking 3PL is contingent upon inter-organizational trust and organizational readiness to adopt the change.

Based on this, the study employed the contingency theory to explain inter-organizational trust and organizational readiness as contingent factors that can account for the extent to which organizational motivations drive the adoption of joint cross-docking 3PL. Despite the prospects of contingency theory, there are few weaknesses. First, contingency theory relies on a few assumptions that have been explicitly stated, and these guide contingency research. The first explicit assumption is that there is no one best way to organize; the second is that any way of organizing is not equally effective under all conditions (Galbraith, 1973). The theory then asserts that, in order to be most effective, organizational structures should be appropriate to the work performed and/or to the environmental conditions facing the organization. Although the overall strategy is reasonably clear, the substance of the theory is not clear (Schoonhoven, 1981).

2.3 Organizational Motivations to Cross-docking Adoption

Considering the low adoption of cross-docking by FMCG manufacturers in Kenya, it becomes critically important to establish organizational factors motivating the intention to adopt joint cross-docking. This study delineates two primary organizational drivers for adoption, echoing earlier discussions: a drive for economic enhancement, aimed at bolstering efficiency, and a drive for normative legitimacy, focused on attaining social acceptance (Liu et al., 2016).

2.3.1 Efficiency Organizational Motivations to Cross-docking Adoption

An important goal of every organization is to reduce the transactional costs associated with business operations, which aligns with the organizational efficiency goals (Liu et al., 2016). Efficiency connotes the capacity of an operational process to utilize resources wisely, thereby reducing waste. Organizational efficiency motivation seeks to understand whether firms' attempts to implement strategies and policies are mainly

driven by the cost minimization goals that the strategy can enable the organization to attain. The TCE establishes that organizational strategies and policies are economically driven, making the essence of cost reduction an utmost goal since the economic gains from TCE are primarily on cost advantage (Williamson, 1981).

On the premise of the TCE, the study defines efficiency motivation for adopting joint cross-docking as the company's aim to lower operational expenses in its distribution process by improving inventory management, optimizing transportation routes, consolidating loads, and enhancing response speed to achieve a competitive advantage (Gegeleso et al., 2021). The organizational efficiency motivation for joint cross-docking 3PL is explained that when firms are made known of the cost-saving benefits associated with cross-docking, then it would increase their intention to adopt cross-docking.

As it has been demonstrated in literature that cross-docking decreases inventory management costs, including decreases handling costs, holding costs (Agustina et al., 2014; Assadi & Bagheri, 2016; Benrqya, 2020; Benrqya et al., 2020; Liu & Li, 2023; Shahram fard & Vahdani, 2019), firms become more willing to align their strategic resources and capabilities to adopt cross-docking to attain such efficiency. The TCE theory supports the economic efficiency rationale for why firms may adopt a strategy to reduce costs. Thus, the TCE provides the theoretical basis for explaining the need for efficiency in adopting joint cross-docking for economic reasons.

2.3.2. Legitimacy Organizational Motivations to Cross-docking Adoption

Another fundamental reason firms may implement a strategy is to get recognition from various stakeholders (Liu et al., 2016). While the TCE accounts for the economic justification of organizational actions and strategies, the institutional theory provides a social perspective of organizational actions and strategies that are deemed as suitable (Chu et al., 2017; Lin & Ho, 2015; Liu et al., 2016; Sarkis et al., 2010).

Institutional theory emphasizes that the behavior of organizations is shaped by the pursuit of social validation, as actions tend to gain support when they are credibly justified (DiMaggio & Powell, 1983; Scott, 2004). In terms of society, a company's drive for legitimacy is referred to as a widespread understanding or belief that the actions of the company align with the accepted societal norms, values and beliefs (Suchman, 1995). Predominantly, firms can establish their legitimacy in various ways,

such as by executing tasks that are considered appropriate by institutional stakeholders, like supply chain partners. Another approach is to emulate the practices or actions of a successful organization that has been used as a benchmark (DiMaggio & Powell, 1983; Liu et al., 2016; Scott, 2004).

Additionally, the institutional theory suggests that a firm's motivation to adopt joint cross-docking for legitimacy is determined by the extent to which it conforms to institutional influences, including the strategies of competitors, suppliers, and customers, in its decision-making process. The institutional theory argues that firms are not standalone entities; rather, they function within institutional frameworks shaping the firm's strategic decisions and actions (DiMaggio & Powell, 1983). Accordingly, adherence to cultural conventions (e.g., the need to minimize transport intensity to minimize vehicle emissions) related to strategy adoption (e.g., joint cross-docking), and imitating best practices of proven benchmarked firms can increase a firm's legitimacy (Liu et al., 2016).

2.3.3. Joint Cross-Docking Adoption Intention

Intention refers an individual's desire, resolute determination, or strong inclination to carry out a specific action. Adoption often follows a careful assessment of the pros and cons of the predetermined action. At the organizational level, firms may have to perform SWOT analysis before making the final decision. Adoption of joint cross-docking is a strategic decision, which requires a holistic assessment (Benrqya & Jabbouri, 2023). This study argues from both the TCE and institutional theories that a company's intention to adopt cross-docking is driven by the efficiency and legitimate motivations of joint cross-docking, in that, firms become determined to adopt joint cross-docking for economic efficiency goals and to attain legitimacy through social obligations.

2.3.4. Inter-organizational Trust

Inter-organizational trust involves assessing the dependability of the counterpart (Ashnai et al., 2016; Zaheer et al., 1998). Specifically, it makes reference to the trust one has in the dependability and honesty of a person involved in a transaction (Ashnai et al., 2016; Squire et al., 2009). In supply chain partner relationships, it plays a crucial role in establishing mutual confidence within supply chain partner relationships (Bettis-Outland et al., 2021; Jain et al., 2014; Johnston et al., 2004). Trust plays a role

in deterring opportunistic behavior and the pursuit of self-interest, traits that are frequently observed in supply networks (Ali & Larimo, 2016; Hawkins et al., 2008; Liu et al., 2010; Lumineau et al., 2022; Tran et al., 2021; Wang et al., 2021; Yen & Hung, 2017). Building trust between organizations is crucial for enhancing collaboration among partners, particularly by facilitating the exchange of information to boost the transparency of physical product transfers (Wei et al., 2012).

It is imperative for an organization which intends to adopt joint cross-docking to build trust with trading partners. This is because, in cross-docking 3PL, the many trivial activities in the traditional system of warehousing and distribution are eliminated, keeping only the few vital activities. Hence, it becomes essential for firms who intend to adopt cross-docking 3PL to build and maintain a considerable level of inter-organizational trust among their business partners to keep the vital few activities functioning effectively to minimize delivery delays and failures.

It is important to acknowledge that cross-docking's impact on supply chain can be both beneficial and detrimental (Benrqya, 2020; Benrqya & Jabbouri, 2023; Hasani Goodarzi et al., 2022). The negative aspect of cross-docking is its inherent risk due to the absence of storage for products in between incoming and outgoing trucks. This can lead to products damage or loss in transit as products are moved quickly from truck to truck. Cross-docking relies heavily on its transport carriers since products are shipped promptly and not stored. As a result, inadequate transport carriers may affect the smooth functioning of cross-dock product distribution strategy. Therefore, there is the need to build strong inter-organizational trust with supply chain partners to ensure the smooth functioning of the cross-dock system. Accordingly, the study contends that building strong inter-organizational trust can strengthen the degree to which firms' efficiency and legitimacy motivations drive the adoption intention of cross-docking.

2.3.5. Organizational Readiness

Organizational readiness is defined as the level of preparedness and willingness of individuals or groups to embrace and execute change (Vaishnavi et al., 2019; Weiner et al., 2008). In organizational change management literature, organizational readiness indicates both the psychological and behavioural preparedness to take action, thus, taking into consideration, their willingness and abilities (Lokuge et al., 2019; Weiner,

2009). The readiness in this case includes all resources that enable goal achievement (Su et al., 2023).

These resources can be technological, skilled labour, etc. Literature posits that when organizational readiness increases, people become better equipped better equipped to exert more effort and stay committed, resulting in the successful completion of tasks (Sanders et al., 2017). Organizational readiness is suggested to be a crucial factor in successfully implementing a change, without that implementation is likely to be jeopardized (Vaishnavi et al., 2019). Therefore, the inability to give attention to organizational readiness and examine the readiness of an organization for a change before implementation contribute significantly to unsuccessful change implementation (Lokuge et al., 2019; Salim et al., 2022; Salleh et al., 2011).

Organizational readiness, in this study, describes a firm's willingness and capacity to adopt joint cross-docking 3PL strategy for products delivery management. This study conceptualizes readiness to measure the degree at which indicators including firm culture, staff competence and behaviours, resources, strategic goals, etc. (Hussain & Papastathopoulos, 2022) support joint cross-docking adoption. The study argues that the extent to which organizational motivations (efficiency and legitimacy motivations) drive intention to adopt cross-docking would be contingent upon their readiness as far as adoption of joint cross-docking is concerned, such that they become more prepared and willing to adopt joint cross-docking given they have an enabling environment, such as enabling culture, positive staff behaviours, staff competence and enabling technology.

2.4 Empirical Review

Third-party logistics (3PL) services are described as the delegation of a firm's storage and logistics tasks, either in full or in part, to a specialized firm (Makmor et al., 2019). 3PL manages and works together with a selected group of subcontractors, transporters, and warehouse managers to coordinate all operations. 3PL companies are engaged to provide services that are more valuable to organizations than what the organizations could accomplish independently (Marchet et al., 2017).

Marchet et al. (2017) argues that economies of scale and learning economies are crucial for 3PL providers to deliver value to manufacturers' businesses. The 3PL handles the manufacturers' customer relationship and serves as an actual link in the

supply chain (Gegeleso et al., 2021). Overall, they handle inbound and outbound logistics together with warehousing functions and are increasingly becoming a popular approach to distribution around the world (Benrqya, 2019).

3PL providers play a critical role in lowering costs, increasing productivity, and improving customer service quality, making them an integral aspect of supply chain management (Sahay & Mohan, 2006). Both industries and third-party logistics providers can benefit significantly from successful logistics outsourcing. Manufacturing businesses can reduce expenditure on capital investments and mitigate financial risks by entrusting their logistics operations to external service providers.

The traditional logistics approach in the FMCG sector typically involves a sequential and linear process, starting from raw material procurement to production, warehousing, and finally, distribution to retailers (Shi et al., 2020). This approach often relies on maintaining high levels of inventory to meet fluctuating demand, which can lead to significant carrying costs and a tied-up capital (Dujak, 2019). For FMCG manufacturers in Kenya, this can be particularly problematic due to the rapid changes in consumer preferences and the need to respond quickly to market demands.

The reliance on traditional logistics practices in the FMCG sector can result in inefficiencies and lower operational performance (Esther & Katuse, 2013). These inefficiencies may manifest as excessive lead times, inventory stockouts, increased transportation costs, and overall supply chain disruptions (Jayant, 2013). For instance, long lead times can lead to delays in fulfilling customer orders, which in turn can negatively impact customer satisfaction and retention. Moreover, the stockouts caused by poor inventory management can lead to missed sales chances and potential harm to the brand's image.

Additionally, the traditional logistics approach may struggle to adapt to the growing complexities of the FMCG supply chain in Kenya. With the increasing number of SKU (Stock Keeping Units) variations, varying order sizes, and diverse distribution channels, the traditional logistics model may prove to be rigid and inflexible (Esther & Katuse, 2013). This may hinder effective resource allocation and disrupt the seamless coordination of activities across the supply chain network.

To address the deficiencies of the traditional approach and improve operational performance, FMCG manufacturers in Kenya could consider adopting modern supply chain practices and technology-driven solutions. Strategies like lean manufacturing, just-in-time inventory control, and cross-docking are effective in decreasing inventory holding expenses, shortening lead times, and enhancing the efficiency of the entire supply chain (Bolumole et al., 2016).

To facilitate this transition, the role of 3PL providers in supply chain management cannot be neglected (Wambua, 2017). Third-party logistics (3PL) providers deliver tailored supply chain solutions, including transportation, storage, distribution, and order processing, enabling FMCG producers to concentrate on their primary business functions. Bolumole et al. (2016) argue that this outsourcing of logistics functions can potentially moderate the relationship between the traditional logistics approach and operational performance in Kenya.

Several studies have shown that engaging with 3PL providers can lead to improved operational performance for FMCG manufacturers. A study by Gegeleso et al. (2021) revealed that partnering with 3PL providers can lead to reduced lead times and enhance delivery efficiency. FMCG manufacturers can leverage the knowledge and resources of 3PL companies to optimize transportation routes, efficient inventory management, and an enhanced synchronization throughout the supply chain network (Fayezi et al., 2012). Consequently, this can result in reduced expenses, improved customer satisfaction, and greater competitiveness.

Moreover, the flexibility offered by 3PL providers can be particularly advantageous for FMCG manufacturers in Kenya. During peak demand seasons or periods of market fluctuations, 3PL companies can quickly scale up or down their services to align with the manufacturer's needs (Shi et al., 2020). This agility allows FMCG manufacturers to adapt to changing market dynamics efficiently, reducing the risk of stockouts or excess inventory.

The business landscape is evolving, with a growing emphasis on the overall supply chain's capacity to seamlessly fulfill end-customer expectations. Key considerations include ensuring product availability, enhancing responsiveness, and maintaining punctual delivery (Esther & Katuse, 2013; Wambua, 2017). Due to their importance

in the survival of a business, logistics, and supply chain management have gained widespread recognition.

Logistics activities span the whole supply chain, making them essential to a firm's overall performance (Heiyantuduwa et al., 2015). The capacity of a corporation to meet its customer promises is directly impacted by outsourcing logistics activities. When it comes to logistics outsourcing, cost and service are the most crucial factors (Gegeleso et al., 2021).

The subsequent sub-sections offer a review of empirical studies pertinent to the research, organized according to the study's objectives. This approach highlights and integrates existing research on cross-docking, aiming to pinpoint gaps in the current literature. Although research in this area is novel and that it has received scant attention with regard to this study's variables in the context of joint crossdocking 3PL adoption, the study draws insights from related studies on adoption of related practices or technologies that resonate with this current study to contribute to the current discussion.

2.4.1 Relationship between Organizational Motivations and Adoption Intention – Empirical Review

There has been limited research on how organizational motivations influence the adoption or use of practices or technologies, and to the authors' knowledge, no studies specifically address organizational motivations related to the adoption of joint cross-docking in third-party logistics (3PL). Only a single study (see Liu et al., 2016) have been identified in relation to the study's context.

In the study by Liu et al. (2016) on various organizational motivations for adoption and utilization of supply chain technology (SCT), the study argued that while extant research has been dedicated to the adoption of SCT, we know little about why with the same adoption, levels of utilization and effectiveness differ. Accordingly, the study employed three theories: the TCE, institutional theory, and the contingency theory to argue that the extent to which organizational motivations for adoption of SCT drive performance through SCT utilization varies depending upon levels of information sharing and levels of logistics integration. The research utilized a survey to gather information from 202 manufacturing firms in Australia and analyzed using Mplus 7.0. The study found that efficiency motivations for the adoption of SCT drive

performance through SCT utilization, but not legitimacy motivations. The extent to which efficiency-driven motivations for adopting SCT impact performance through its application is influenced by the degree of information sharing. This effect is more pronounced when information sharing is high than when it is limited. This study rather considers organizational motivations that can drive the adoption of joint cross-docking 3PL and how organizational factors – organizational readiness and inter-organizational trust can condition the relationship, which remain less explored in literature.

2.4.2 Moderating Role of Organizational Readiness – Empirical Review

Marei et al. (2023) investigated how organizational readiness moderates the impact of technological, organizational, and environmental factors on Fintech adoption and financial performance within Jordanian commercial banks, based on data from 215 departmental heads and managers. Under the technological influences, the study examines two sub-constructs, which are relative advantage and technological compatibility. The study revealed that while relative advantage has a positive correlation with Fintech adoption, it does not significantly impact technological compatibility. The support from top management, as a measure of organizational influences, is positively associated with the adoption of Fintech. Furthermore, competitive pressure, as an indicator of environmental factors, exhibits a positive correlation with Fintech adoption. Regarding moderation, organizational readiness positively influences the relationship between both technological compatibility and Fintech adoption, as well as competitive pressure and Fintech adoption. This demonstrates that in terms of adoption of technologies, readiness of organizations to adoption is paramount. This current study, however, focuses on the adoption of joint crossdocking and how the adoption is driven by organizational motivational factors (efficiency and legitimacy) under the conditions of organizational readiness.

Alsmairat (2022) conducted a study to investigate the role of organizational readiness as a mediator between organizational capabilities and the adoption of reverse supply chains among 350 managers in Jordan's industrial sector. The study underscored that, while there is an expanding body of research addressing supply chain challenges related to environmental concerns and reverse logistics—encompassing areas like sustainability, green supply chains, lean production, and outsourcing—there remains a gap in examining the adoption of reverse supply chains, organizational

competencies, and preparedness. By employing Structural Equation Modeling (SEM) to analyze data from managerial respondents, the findings indicated a strong positive link between internal organizational capabilities and the adoption of reverse supply chains. Furthermore, organizational readiness was identified as a significant mediator in this relationship. However, this research positions organizational readiness as a moderating variable in the connection between organizational motivations and the intent to implement joint cross-docking third-party logistics (3PL).

Salim et al. (2022) examined how organizational readiness influences the intention to embrace blockchain technology. They observed that although blockchain provides benefits like lower expenses, faster transactions, minimized friction, fraud prevention, and enhanced trust, identity verification, and reputation oversight, numerous organizations are still assessing their transition to this technology. The study also pointed out that the costs associated with implementing blockchain and its impact on organizational readiness are not well-studied. To address this gap, they analyzed data from 101 blockchain experts in the United Arab Emirates (UAE). Utilizing partial least squares structural equation modeling (PLS-SEM), the study revealed that factors enabling the Technology Readiness Index (TRI) have a positive influence on the willingness to adopt blockchain technology. Both TRI enablers and inhibitors were found to have a positive relationship with the perceived cost of blockchain technology, and perceived cost was shown to positively moderate the link between TRI factors and adoption intention. This study extends the concept of organizational readiness to examine how organizational motivations influence the intention to adopt joint cross-docking third-party logistics (3PL), distinguishing it from previous research.

Jun et al. (2022) explored how organizational readiness acts as an intermediary in the relationship between organizational capabilities and innovation performance. Their study drew upon data collected from 647 managers representing small and medium enterprises (SMEs) in Pakistan. The findings reveal that both digital platform capability and improvisational ability contribute positively to organizational preparedness and innovation outcomes. Moreover, organizational readiness emerged as a complete mediator in the connections between digital platform capability and innovation performance, as well as between improvisational capability and innovation performance. In this current study, organizational readiness is treated as a moderator

to strengthen the extent to which organizational motivations drive the adoption of joint crossdocking 3PL, making this study unique.

Furthermore, in a study by Hussain & Papastathopoulos (2022), the authors collected data from 440 IT experts working in service organizations in UAE to examine how organizational readiness drives resilience through digital financial innovation under the boundary condition of digital business strategy alignment. The study explored three sub-variables within organizational readiness: change valence, change efficacy, and contextual factors. The authors employed PLS-SEM to evaluate the measures and the proposed relationships. Their findings reveal that the organization's change efficacy – which includes resource readiness, IT readiness, and cognitive readiness and contextual factors encompassing culture readiness, strategic readiness, and partnership readiness – have a positive impact on digital financial innovation. Furthermore, digital financial innovation is positively associated with financial performance and resilience, encompassing both robustness and adaptability. This underscores the crucial role of organizational readiness in IT, strategy, collaborations, and organizational culture in improving financial resilience.

2.4.3 Moderating role of Inter-Organizational Trust – Empirical Review

The primary problems for 3PL service providers are to preserve client relationships while simultaneously earning profits under pricing pressure from customers and delivering services in various geographical zones. As a result, to maintain a healthier relationship among supply chain actors, it is important to build inter-organizational trust with them. Trust plays a role in deterring opportunistic behavior and the pursuit of self-interest, traits that are frequently observed in supply networks (Ali & Larimo, 2016; Hawkins et al., 2008; Liu et al., 2010; Lumineau et al., 2022; Tran et al., 2021; Wang et al., 2021; Yen & Hung, 2017). Building trust between organizations is crucial for enhancing collaboration among partners, particularly by exchanging information to boost the transparency of physical product movements between them (Wei et al., 2012).

Lu et al. (2019) studied how trust and contract governance influence the relationship between quality management practices and performance in inter-organizational performance. The study collected data from 14 companies who have completed construction projects in China and 265 valid responses were used to conduct the

analysis using Mplus 7.4. The results indicate that effective quality management practices have a beneficial impact on inter-organizational project performance. Moreover, contract governance strengthens this beneficial effect. In contrast, trust does not seem to amplify the positive influence of quality management practices on inter-organizational project performance. The minimal moderating impact of trust is unexpected, highlighting the need for more in-depth research to explore its role across different academic perspectives.

Squire et al. (2009) examined how inter-firm trust, relationship duration, and supplier performance impact the link between cooperation and knowledge exchange in buyer-supplier partnerships. Their research involved data collection from 104 manufacturing firms in the UK. The researchers employed the ordinary least squares (OLS) approach through SPSS to analyze the data. Findings from the study suggest that buyer-supplier cooperation is positively related with knowledge transfer and this relationship become more profound at high levels of inter-firm trust and at high levels of supplier performance. This highlights the crucial impact of trust between organizations in enhancing supply chain management strategies.

Table 2.1: Empirical Studies

Author, year, Journal	*Purpose*	*Findings*	*Gaps*	*How the study addresses these gaps*
Benrqya (2019); International Journal of Retail and Distribution Management	This research aimed to examine the pros/cons of implementing the cross-docking strategy in a retail supply chain setting using a cost model.	Cross-docking performed at the supplier level results in a 5.3% increase in the overall cost of the supply chain when compared to conventional warehousing methods. Furthermore, performing cross-docking at the retailer level proves to be a more cost-effective approach compared to traditional warehousing, resulting in a reduction of 1% in expenses and combining cross-docking and conventional	A quantitative case study may not have a high level of generalizability. Therefore, it would be necessary to conduct further research by incorporating additional business cases from the retail sector into the analysis.	This study is conducted among the FMCG manufacturing firms

		warehousing results in a 6.4% reduction in supply chain expenses.		
Benrqya (2020); International Journal of Retail and Distribution Management	To investigate the influence of cross-docking on the occurrence of retail Out of Stock (OOS).	The research discovered that cross-docking could have either positive or negative effects on retailers' out-of-stock (OOS) drivers. Cross-docking adversely affects the process of ordering, arranging, transporting, managing, and receiving goods at a facility. It also has a beneficial impact on the process of suppliers placing orders.	The findings may not apply to a larger population due to the small size of the sample.	This study employed a relatively large sample

Benrqya & Jabbouri (2023); Journal of Modelling in Management	The research aimed to investigate how the bullwhip effect is influenced using a cross-docking strategy as opposed to traditional warehousing.	The research discovered that using cross-docking helps to minimize the bullwhip effect further up the supply chain. The decrease is contingent on the duration it takes for an order to be completed, the intervals at which evaluations are conducted, and the efficiency of the process.	An exhibition of mathematics cannot be widely applicable. It is strongly recommended to conduct a practical study using actual data.	Survey data is been used to collect data from the FMCG manufacturing firms.
Yu et al. (2023); Transportation Research Part E: Logistics and Transportation Review	This study focuses on the issue of the Vehicle Routing Problem with Cross-docking under Demand Uncertainty (VRPCD-DU).	The findings indicate that the ALNS algorithm effectively generates improved solutions for the VRPCD benchmark instances. Demand uncertainty is thoroughly examined by	While robust optimization is an effective method for addressing uncertainty in optimization, its solutions may be overly cautious. Alternative methods such as stochastic optimization and adjustable robust	This study utilizes an alternative analytical approach, such as Structural equation modelling (SEM)

		investigating insights from managers.	optimization can be utilized as well.	
Gallo et al. (2022); EURO Journal on Transportation and Logistics	The research aimed to minimize the penalties incurred due to late deliveries by using an innovative stochastic genetic algorithm (GA) that incorporates a scenario tree (SGA-ST).	The research discovered that utilizing the SGA-ST solution enhances the deterministic schedule, resulting in a 60% reduction in penalty expenses.	Future research should address strategic decision-making by determining the most efficient number of dock-doors to prevent queues and enhance the quality of service provided. Furthermore, the optimization of the amount of time spent by forklifts in transportation between door-to-door handling tasks can be included as a dual-objective problem formulation.	This study address strategic decision by determining what can actually drives firms to adopt joint cross-docking
Pan et al. (2021); International Journal of Production Economics	The research examines the impact of the risk	The findings indicate substantial advantages of integrating risk analysis	The suggested model has the potential to be expanded to incorporate several	This study includes organizational readiness and inter-organizational trust as

	of varying deterioration rates that are linked to unstable conditions.	for varying deterioration rates on a platform that serves multiple suppliers, buyers, and products for cross docking services.	receiving and shipping docks.	enabling factors of adopting cross-docking
Benrqya et al. (2020); International Journal of Physical Distribution and Logistics Management	The research aimed to examine how the characteristics of products affect the effectiveness of three distribution strategies: traditional warehousing (TW), cross-docking pick by line (XDPL), and cross-docking	The research discovered that XDPL results in a rise in the overall cost of the supply chain, while XDPS diminishes the cost. Furthermore, when aiming for a specific service-level objective, it is recommended to utilize cross-docking approaches for items that exhibit limited variation, require ample shelf space, possess low value, and have a short lead time. To achieve the objective of	The analysis did not take into account the financial impact of transportation costs when deciding on the most suitable distribution plan.	This study uses the TCE to account for economic or financial motivations for adopting cross-docking

	pick by store (XDPS).	reducing inventory, it is advised to employ these tactics specifically for products that have a high level of demand.		
Wei et al. (2012); International Journal of Production Economics	The research examines how inter-organizational trust is connected to integrating logistics information and cooperative partnerships in the face of environmental uncertainty.	Logistics information integration and trust between organizations enhance partner collaboration, and this bond is more robust when faced with high environmental uncertainty. Collaboration between partners improves the performance of both buyers and suppliers.	Use of cross-sectional data; Using longitudinal data is recommended.	The study will used a survey approach.

Ashnai et al. (2016); Industrial Marketing Management	The research aimed to explore the significance of trust in each context. The text discusses the importance of business-to-business (B2B) relationships at both the individual and organizational level.	Both trust between individuals and trust between organizations contribute to the development of positive behaviors such as commitment, investment in specific relationships, and information sharing. These behaviors, in turn, lead to beneficial outcomes in relationships, including improved financial performance and non-economic achievements.	Data was obtained exclusively from the United Kingdom. Data is gathered from one aspect of the supply chain. A dyadic point of view is more suitable.	Data will be gathered from a different context, Kenya
Hussain & Papastathopoulos (2022); International	The study sought to examine the impact of organizational	The research discovered that the effectiveness of an organization's ability to change, which includes	Data collected from developing economy. Evaluating the model in	Data will be collected from FMCG manufacturing firms in Kenya, a developing economy.

Journal of Production Economics	readiness on digital financial innovation (DFI), as well as the impact of DFI on financial resilience.	being prepared with resources, IT systems, and cognitive readiness, as well as the surrounding factors such as cultural readiness, strategic readiness, and partnership readiness, has a positive impact on DFIs. However, there is no evidence to support the idea that digital technology has a moderating effect on business strategy. Additionally, we discover that development finance institutions (DFIs) have a positive effect on the financial performance and ability of companies	various economies and sectors.	

		to withstand and adapt to challenges.		
Salim et al. (2022); Technology in Society	This research investigates how the perceived cost affects the relationship between organizational readiness and the intent to adopt blockchain, looking at both the mediation and moderation roles.	The results indicate that perceived cost does not act as a mediator, but instead, it influences the relationship between the enablers and inhibitors of the Technology Readiness Index (TRI) in terms of individuals' willingness to adopt blockchain technology. The intention to adopt blockchain is most influenced by the perceived cost.	Data obtained from emerging economies. Assessing the effectiveness of the model across different economies and industries. Blockchain cannot function independently. Our previous research did not incorporate the use of other technologies, but future studies have the potential to integrate it with emerging technologies such as IoT and AI. Additionally, future studies can also explore the influence of other factors, such as firm characteristics	This study considers the influence of other factors, such as inter-organizational trust.

			at the organizational level and GDP at the country level.	

2.5 Summary of Literature and Research Gaps

As earlier, an increasing number of companies are choosing to prioritize their main areas of expertise and delegate their secondary functions to external parties. Logistics has arguably been seen as one of the main non-core functions that cut across many sectors (Akbari, 2018). Because cost is a fundamental incentive and 3PL logistics service providers have evolved into strategic partners in a firm's performance, 3PL providers have a substantial impact on business performance. 3PL providers play a crucial role in gaining a competitive edge by improving service quality and flexibility, while also streamlining and optimizing supply chain operations (Marchet et al., 2017). As a result, a study into the outsourcing of 3PL providers in Kenya is highly essential.

Despite the documented benefits of joint cross-docking by 3PL, adoption and utilization of cross-docking among firms have been studied to address the low adoption of cross-docking and the lack of literature (Liu & Li, 2023). Although several studies (*see Table 2.1)* have been conducted on cross-docking, most of these studies employed optimization and simulation models to address vehicle routing problems associated with cross-docking (Cen et al., 2023; Liu & Li, 2023; Serrano et al., 2021), with limited empirical investigation, using real data (Benrqya & Jabbouri, 2023). Additionally, while these investigations were extensively carried out in the advanced economies (*see Table 2.1*), not much has been done in the developing economies, largely because of the low adoption of cross-docking. It is not obvious that the findings established in the advanced economies are applicable in the developing economies due to the different economic dynamics.

Considering the low adoption of the cross-docking (Liu & Li, 2023) and the limited empirical and theoretical understanding of what could potentially drive firms to adopt the cross-docking (Dudukalov et al., 2020), this study fills this gap by examining organizational motivations that can drive adoption of joint cross-docking and how this function is contingent at various organizational factors (inter-organizational trust and organizational readiness). Accordingly, this study asserts that the knowledge of various organizational motivations for the adoption could serve as a foundation for promoting the adoption.

Based on the transaction cost economics (TCE) (Williamson, 1981) and institutional theory (DiMaggio & Powell, 1983), the study identifies two firm motivations for adoption: the economic goal of improving efficiency and the normative goal of gaining legitimacy (Liu et al., 2016) and argues further that the extent to which these organizational motivations for adoption (efficiency and legitimacy motivations) drive the cross-docking adoption intention is contingent upon organizational factors, such as organizational readiness and inter-organizational trust among FMCG manufacturers in Kenya and their trading partners.

2.6 Conceptual Framework

Considering the insufficient understanding of organizational motivations that can drive organizations' intention to adopt joint cross-docking as well as the enabling conditions that can facilitate this relationship, this study presents a pictorial view of how the study variables in the study are related in the framework below.

Initially, the research outlines the organizational drivers for adopting cross-docking, identifying efficiency and legitimacy motivations as independent variables that influence the dependent variable, which is defined as the actual intention to adopt cross-docking. The belief is that organizations will be willing to adopt joint cross-docking when they believe that cross-docking has efficiency and legitimacy benefits.

Second, the study configures two boundary conditions, which are organizational readiness and inter-organizational trust as enabling conditions under which the extent to which the various organizational motivations (efficiency and legitimacy) drive firms' intention to adopt cross-docking depend on. The study predicts that companies will be more inclined to implement joint cross-docking practices when there is a strong level of inter-organizational trust and when the organization is well-prepared, in terms of technology, competencies, resources, etc. compared to situations with low levels of inter-organizational trust or technological incompatibility, etc.

The study is grounded in real-world logistics practices but tailored to the unique challenges and opportunities in Kenya. The insights offered herein aim to empower logistics practitioners and researchers with a wealth of knowledge that transcends theoretical bounds, providing practical guidance to optimize supply chain performance and drive transformational change in the FMCG industry. With the rapid expansion of Kenya's fast-moving consumer goods (FMCG) sector, which has

significantly propelled industrial growth, primarily fueled by robust consumer demand for food and beverage (F&B) items and personal care products (Oxford Business Group, 2016), understanding the potentials of joint cross-docking adoption can further improve their operational efficiencies.

According to KPMG (2014), Kenya is one of ten countries on the continent with significant growth prospects, driven by increasing demand for food, beverages, and personal care items. In Kenya, businesses take different approaches to logistics. Some manage their supply chains internally, while others rely on multiple third-party providers. However, outsourcing to various logistics firms can be both costly and complex to oversee (Esther & Katuse, 2013). With joint cross-docking 3PL, FMCG manufacturers in Kenya can minimize these complexities by eliminating the necessity of storing inventory at the retailer's direct centers by facilitating immediate transfer upon reception. This approach is facilitated using specialized warehouses designed for cross-dock abilities and dock-levelers to accommodate trucks of different heights. Joint cross-docking is instrumental in lowering the levels of inventory, working capital, and associated inventory costs (Benrqya et al., 2020). The adoption of joint cross-docking 3PL holds the promise of shaping the future of FMCG logistics in Kenya and beyond.

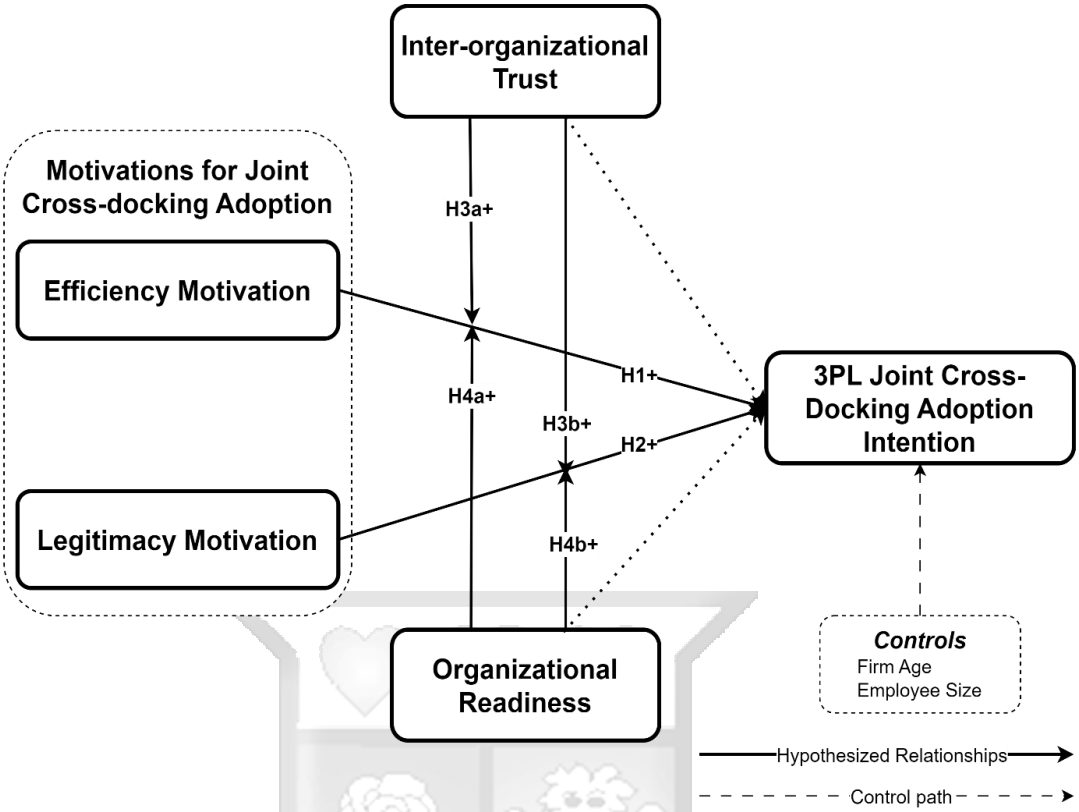

Figure 2.1 Research model

Source: Author's own construct

Note:

The unbroken arrows represent the hypothesized relationships. These relationships indicate the propositions, which the study intends to tests. In contrast, the broken arrows represent the non-hypothesized relationships or the control relationships. These relationships are included to account for the influence of any confounding variables, that are not of interest in the study.

2.6.1 Efficiency Organizational Motivations to Cross-docking Adoption

Efficiency refers to the ability of a process to make effective use of resources, thus minimizing waste. Organizational efficiency motivation seeks to understand whether firms' attempt to implement strategies and policies are mainly driven by the cost minimization goals that the strategy can enable the organization to attain. On the premise of the TCE, the study defines efficiency motivation for adopting joint cross-docking as the company's aim to lower operational expenses in its distribution process by improving inventory management, optimizing transportation routes, consolidating loads, and improving response time to achieve a competitive advantage (Gegeleso et

al., 2021). The organizational efficiency motivation for joint cross-docking 3PL is explained that when firms are made known of the cost-saving benefits associated with cross-docking, then it would increase their intention to adopt cross-docking.

As it has been demonstrated in literature that cross-docking decreases inventory management costs, including decreases handling costs, holding costs (Benrqya, 2020; Benrqya et al., 2020; Liu & Li, 2023; Shahram fard & Vahdani, 2019), firms become more willing to align their strategic resources and capabilities to adopt cross-docking to attain such efficiency. The TCE theory supports the economic efficiency rationale for why firms may adopt a strategy to reduce costs. Therefore, the TCE serves as a theoretical foundation for understanding the necessity of efficiency in implementing joint cross-docking for economic benefits.

2.6.2 Legitimacy Organizational Motivations to Cross-docking Adoption

Another fundamental reason firms may implement a strategy is to get recognition from various stakeholders (Liu et al., 2016). While the TCE accounts for the economic justification of organizational actions and strategies, the institutional theory provides a social perspective of organizational actions and strategies that are deemed as suitable (Chu et al., 2017; Lin & Ho, 2015).

Institutional theory emphasizes that the behavior of organizations is shaped by their desire for social validation. Actions tend to receive more support when they are backed by rational and substantial justifications (DiMaggio & Powell, 1983; Scott, 2004). In terms of society, a company's drive for legitimacy is referred to as a widespread understanding or belief that the actions of the company align with the accepted norms, values and beliefs (Suchman, 1995). Firms can validate their legitimacy through multiple approaches, including aligning their operations with expectations set by institutional stakeholders, such as supply chain collaborators, or by adopting strategies and methodologies demonstrated by established organizations recognized as industry benchmarks (DiMaggio & Powell, 1983; Liu et al., 2016; Scott, 2004).

From the perspective of institutional theory, a firm's decision to implement joint cross-docking is driven by the degree to which it conforms to institutional influences, including the actions of competitors, suppliers, and customers throughout the adoption process. The institutional theory argues that firms are not standalone entities; rather,

they function within institutional frameworks that shaping strategic decisions and actions (DiMaggio & Powell, 1983). Hence, adherence to cultural conventions (e.g., the need to minimize transport intensity to minimize vehicle emissions) related to strategy adoption (e.g., joint cross-docking), and imitating best practices of proven benchmarked firms can increase a firm's legitimacy (Liu et al., 2016).

2.6.3 Joint Cross-Docking Adoption Intention

Intention refers an individual's desire, resolute aim, or firm commitment to carry out a particular action. Adoption often follows a careful assessment of the pros and cons of the predetermined action. At the organizational level, firms may have to perform SWOT analysis before making the final decision. Adoption of joint cross-docking is a strategic decision, which requires a holistic assessment (Benrqya & Jabbouri, 2023). This study argues from both the TCE and institutional theories that a company's intention to adopt cross-docking is driven by the efficiency and legitimate motivations of joint cross-docking, in that, firms become determined to adopt joint cross-docking for economic efficiency goals and to attain legitimacy through social obligations.

2.6.4 Inter-organizational Trust

Inter-organizational trust refers to the assessment of how dependable the other party (Ashnai et al., 2016; Zaheer et al., 1998). In supply chain collaborations, it is essential for fostering trust and strengthening partnerships (Bettis-Outland et al., 2021; Jain et al., 2014; Johnston et al., 2004). Trust plays a role in deterring opportunistic behavior and the pursuit of self-interest, traits that are frequently observed in supply networks (Ali & Larimo, 2016; Lumineau et al., 2022; Tran et al., 2021; Wang et al., 2021; Yen & Hung, 2017).

It is imperative for an organization which intends to adopt joint cross-docking to build trust with trading partners. This is because, in cross-docking 3PL, the many trivial activities in the traditional system of warehousing and distribution are eliminated, keeping only the few vital activities. Hence, it becomes very essential for firms who intend to adopt cross-docking 3PL to build and maintain a considerable level of inter-organizational trust among their business partners to keep the vital few activities functioning effectively to minimize delivery delays and failures.

2.6.5 Organizational Readiness

Organizational readiness pertains to the degree to which a person or a group is ready and willing to embrace and execute change (Vaishnavi et al., 2019; Weiner et al., 2008). In organizational change management literature, organizational readiness indicates both the psychological and behavioural preparedness to take action, thus, taking into consideration, their willingness and abilities (Lokuge et al., 2019; Weiner, 2009). The readiness in this case includes all resources that enable goal achievement (Su et al., 2023).

These resources can be technological, skilled labour, etc. Literature posits that when organizational readiness increases, people become better equipped better equipped to exert more effort and stay committed, resulting in the successful completion of tasks (Sanders et al., 2017). Organizational readiness is suggested to be a crucial factor in successfully implementing a change, without that implementation is likely to be jeopardized (Vaishnavi et al., 2019). In this study, organizational readiness describes a firm's willingness and capacity to adopt joint cross-docking 3PL strategy for products delivery management. This study conceptualizes readiness to measure the degree at which indicators including firm culture, staff competence and behaviours, resources, strategic goals, etc. (Hussain & Papastathopoulos, 2022) support joint cross-docking adoption.

2.7 Hypotheses Development

This section delves into the various relationships investigated within the study, offering a detailed examination of how they interact and influence each other.

2.7.1 Efficiency motivations and Joint Cross-Docking Adoption Intention

From the TCE perspective (Williamson, 1981), companies might choose to implement joint cross-docking third-party logistics (3PL) to diminish transactional expenses linked with internal logistical tasks, which could be more efficiently managed by a third-party logistics provider at a lower cost. Also, due to the high transactional costs associated with the traditional warehousing, distribution and transportation systems (Appiah et al., 2018), firms would want to adopt the joint cross-docking 3PL as a strategic cost minimization approach to achieve competitive advantage.

As a result, companies are increasingly inclined to implement cross-docking third-party logistics (3PL) to enhance their operational efficiency. The growing competitiveness in the business landscape has compelled numerous organizations to look for more effective supply chain strategies that can enhance delivery, responsiveness, minimize expenses, and improve inventory management (Liu et al., 2016). Hence, companies are more inclined to adopt a practice if it can contribute significantly to their transactional cost minimization. Accordingly, the study proposes that:

H1: An organizational efficiency motivation toward cross-docking 3PL adoption is positively related to its cross-docking 3PL adoption intention.

2.7.2 Legitimate motivations and Joint Cross-Docking Adoption Intention

Apart from the efficiency motivation as a drive for firms to adopt a practice, firms would want to adopt a practice to attain social legitimacy from their business partners (including suppliers, customers, etc.) (Liu et al., 2016). Institutional theory suggests that the framework of institutions establishes social norms and expectations that influence how organizations are structured, operate, and behave. Complying with these norms and expectations is essential for an organization to maintain its legitimacy and secure important resources (DiMaggio & Powell, 1983; Liu et al., 2010). From the perspective of institutional theory's normative principles, organizations considering the adoption of a practice such as cross-docking 3PL analyze institutional expectations, weigh potential costs and benefits, and strategically align their approach to mitigate risks (Liu et al., 2010).

Furthermore, according to the mimetic principle within institutional theory, firms may be prompted to emulate the actions of their competitors due to the perceived success of those actions (DiMaggio & Powell, 1983). Although it is posited that imitation may not always confer any efficiency benefits (Heugens & Lander, 2009), an organization may still feel compelled to imitate others in order to reduce perceived risks and gain social approval (Liu et al., 2010). Extending this logic to the adoption cross-docking 3PL, when firms observe the advantages that their competitors gain from adopting cross-docking third-party logistics (3PL), they will feel compelled to imitate these successful competitors in order to establish themselves as reputable and respected

(Mitra and Singhal, 2008) to pursue status-conferring legitimacy (Heugens & Lander, 2009; Liu et al., 2010). Against this background, the study proposes that:

H2: An organizational legitimacy motivation toward cross-docking 3PL adoption is positively related to its cross-docking 3PL adoption intention.

2.7.3 Moderating Role of Inter-organizational Trust

Inter-organizational trust plays a crucial role in establishing a sense of mutual confidence in supply chain partner relationships (Bettis-Outland et al., 2021; Jain et al., 2014; Johnston et al., 2004). Trust can deter opportunistic behavior and the pursuit of self-interest, traits that are commonly observed in supply networks (Ali & Larimo, 2016; Hawkins et al., 2008; Liu et al., 2010; Lumineau et al., 2022; Tran et al., 2021; Wang et al., 2021; Yen & Hung, 2017) and lower transaction costs (Delbufalo, 2012; Kim et al., 2010). Developing trust among different organizations is important for improving collaboration between partners, including the sharing of information to enhance the visibility of physical product flows among these firms (Wei et al., 2012).

It is imperative for an organization that intends to adopt cross-docking to build trust with trading partners. This is because, in cross-docking 3PL, the trivial many activities in the traditional system of warehousing and distribution are eliminated, keeping only the vital few activities. Therefore, it is crucial for companies considering the adoption of cross-docking 3PL services to establish and uphold a strong level of inter-organizational trust with supply chain partners. This trust is essential for ensuring the smooth operation of key activities, thereby reducing delivery delays and failures.

From the contingency theory perspective (Lawrence & Lorsch, 1967; Luthans et al., 1976), the study employs inter-organizational trust as an internal-external resource built through social exchanges with trading partners to minimize risks of uncertainties, information asymmetry, and opportunistic behaviors, that could be associated with the adoption of cross-docking 3PL. Consequently, this study argues from the contingency theory that, inter-organizational trust conditions the degree to which (a) efficiency and (b) legitimacy organizational motivations for cross-docking adoption drive its adoption intention, such that ***at high levels*** of inter-organizational trust, (a) efficiency and (b) legitimacy organizational motivations for cross-docking adoption drive its adoption intention more than at low levels of inter-organizational trust. Considering the preceding discussion, the study puts forward the following proposals:

H3a: Inter-organizational trust positively moderates the relationship between efficiency organizational motivations for cross-docking adoption drive and its adoption intention, such that ***at high levels*** *of inter-organizational trust, efficiency organizational motivations for cross-docking adoption drive its adoption intention* ***more than at low levels*** *of inter-organizational trust.*

H3b: Inter-organizational trust positively moderates the relationship between legitimacy organizational motivations for cross-docking adoption drive and its adoption intention, such that ***at high levels*** *of inter-organizational trust, legitimacy organizational motivations for cross-docking adoption drive its adoption intention* ***more than at low levels*** *of inter-organizational trust.*

2.7.4 Moderating Role of Organizational Readiness

Organizational readiness includes all resources that facilitate goal achievement (Su et al., 2023). The resources come in various forms, both tangible and intangible, including culture, technology (Lokuge et al., 2019), support from management, resource availability, employees' skills, and willingness to embrace change (Carbonara et al., 2023; Weiner et al., 2008). These play a key role in facilitating a change process. In a competitive setting, the preparedness of an organization is crucial for effectively responding to normative or mimetic demands from stakeholders as a means of gaining social legitimacy or minimizing transactional costs as a way of gaining competitive urge (Su et al., 2023).

For instance, Salim et al. (2022) demonstrated that the preparedness of technology impacts a company's decision to implement blockchain technology. From the contingency theory perspective (Lawrence & Lorsch, 1967; Luthans et al., 1976), the study posits that organizational readiness is an internal resource that conditions the extent to which efficiency and legitimacy of organizational motivations for cross-docking adoption drive its adoption intention, such that ***at high levels*** of organizational readiness, the efficiency and legitimacy organizational motivations for cross-docking adoption drive its adoption intention more than at low levels of organizational readiness. Based on the foregoing conversation, the study proposes that:

H4a: Organizational readiness positively moderates the relationship between efficiency organizational motivations for cross-docking adoption drive and its adoption intention, such that ***at high levels*** *of organizational readiness, efficiency organizational motivations for cross-docking adoption drive its adoption intention* ***more than at low levels*** *of organizational readiness.*

H4b: Organizational readiness positively moderates the relationship between legitimacy organizational motivations for cross-docking adoption drive and its adoption intention, such that ***at high levels*** *of organizational readiness, legitimacy organizational motivations for cross-docking adoption drive its adoption intention* ***more than at low levels*** *of organizational readiness.*

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section will provide a thorough examination of the methodology that would be utilized in carrying out this investigation with precision. This chapter covers various aspects including research philosophy, research design, size of the target population and sampling methods employed, data collection techniques, and the strategies for data analysis. Additionally, this section will delve into the research's quality, examining elements such as its credibility, consistency, and impartiality. Ethical concerns related to data confidentiality and respondent anonymity will be given attention.

3.2 Research Philosophy

The way a researcher views the essence of knowledge (epistemology) and the nature of existence/reality (ontology) has a profound impact on the research design, affecting how data is gathered and analyzed (Gray, 2004). This study adheres to an ontological position of objectivism, where the world is perceived as independent, allowing for the objective acquisition and analysis of information related to the study's variables. The aim is to present an accurate profile of respondent firms without undue researcher influence. As Yeong (2011) highlighted, the researcher's epistemological stance is a consequence of their ontological position. This study's epistemological position is aligned with positivism, a theoretical perspective closely tied to objectivism (Gray, 2004).

3.2.1 Positivist Paradigm

The positivist research philosophy contends that reality can be objectively understood and described through the research process. According to Hair et al. (2019), positivism, rooted in the works of Francis Bacon, Auguste Comte, and the Vienna Circle philosophers and scientists from the early twentieth century, strives to offer clear and accurate knowledge. This empiricist approach posits that the world is composed of observable elements accessible through sensory experience. It aims to uncover universal causal laws by identifying statistical regularities while emphasizing value neutrality (Given, 2008; Saunders et al., 2019).

The central tenet of positivism is the external existence of the social world, measurable directly through observation (Gray, 2004). Positivism asserts three main tenets: first, reality consists of elements that can be sensed—things that can be seen, smelled, or touched; second, research should depend on scientific observation rather than philosophical reasoning, with a focus on empirical methods; and third, both the natural and social sciences adhere to similar logical and methodological standards, emphasizing factual information over values. Positivism conceptualizes phenomena as simple, homogeneous, and distinct variables (Given, 2008). Positivism's epistemology aligns with the scientific principle of verification, dictating rules for what qualifies as knowledge. According to variables Given (2008), this involves confirming sensory experiences through replication. Positivism seeks to provide a methodical and objective means of exploring and understanding the world, emphasizing empirical evidence and adherence to scientific principles.

The research follows the scientific method, employing a rigorous, fact-based approach to explore relationships among the study's variables. The positivist approach, consistent with the ontological stance of objectivism, emphasizes a scientific, fact-based methodology for data gathering, analysis, and reporting. The choice of this epistemological position serves to clarify aspects of the research design and aids in selecting tools appropriate for the study (Gray, 2004). Given the benefits of joint cross-docking, the increasing attention to joint cross-docking studies in the developed countries but less emphasis in the developing economies, there is a growing call for more empirical examinations what can drive firms to adopt joint crossdocking 3PL so that firms in the developing economies can enjoy the benefits thereof. Consequently, this study adopts a rigorous hypothesis testing procedure aligned with the stances of objectivism and positivism. The goal is to impartially determine the connections between the research variables, aligning with the study's intent and supporting a methodologically sound investigation.

3.3 Research Design

Research design generally denotes a detailed strategy for systematically arranging various components of a study in a coherent manner. Its aim is to effectively tackle the research issue by offering a structured approach to address the research questions.

This research will employ a cross-sectional survey design, utilizing a quantitative approach. This is to help collect data on organizational motivations and joint cross-docking adoption intention among FMCG in Kenya. Specifically, the data covers information on legitimacy motivation, efficiency motivation, joint cross-docking adoption intention, interorganizational trust and organizational readiness. The study will be structured within a cross-sectional framework, integrating both descriptive and explanatory methods. The descriptive methods help to describe the variables in the study using the mean and standard deviation statistics. In contrast, the explanatory method helps to explain the association between the variables in the study. The quantitative methodology emphasizes numerical data collection and analysis to ensure precise representation. Additionally, it relies on structured procedures, statistical tools, and systematic methodologies to evaluate hypotheses and generate predictive insights.

The study distributed the questionnaires prepared from relevant literature sources to various FMCG firms in Kenya. After the data collection, the data was cleaned to eliminate incomplete responses and cases with significant missing information. The study then conducted a range of reliability and validity assessments through exploratory factor analysis and confirmatory factor analysis for all the constructs in the study, which are legitimacy motivation, efficiency motivation, joint cross-docking adoption intention, interorganizational trust and organizational readiness. This process involved comparing the data against the theoretical model and further refining the dataset by excluding items that fall below established thresholds, as specified in the literature, to ensure the model's adequacy. The study subsequently conducted a structural model analysis to evaluate the hypothesized relationships.

3.4 Population and Sampling

3.4.1 Population

This research targets the large FMCG manufacturing companies located within Kenya. To obtain a legitimate listing of manufacturers operating in Kenya, the directory of the Kenya Manufacturers & Exporters (2022-2023) was used as the primary source of data regarding the manufacturers established in Kenya. The Kenya Association of Manufacturers (KAM) is a key industry organization in Kenya.

Established in 1959, KAM represents the interests of the manufacturing sector in the country.

According to the Kenya Manufacturers and Exporters Directory (2022-2023), there are 1,128 registered manufacturing companies in Kenya. From the directory, it is established that there are 237 companies in the food and beverage manufacturing sector which constitute 21% of the total members registered with the KAM. Of the total listing of the FMCG manufacturers, the report records that 54% of these members are based in Nairobi, with the rest spread across the country. This study's population comprises all 237 FMCG manufacturing firms that are officially registered with KAM and actively operating within Kenya.

3.4.2 Sampling Frame and Size

For this research, the sample frame constitutes the 237 manufacturing firms in Kenya as listed in the Kenya Manufacturers and Exporters directory (KAM, 2022). This study focuses on all 237 FMCG manufacturing companies located within Kenya. In research, samples refer to the units or observations chosen from the population, while sample size refers to the total number of the samples, which is considered representative of the population by the researcher. The technique for choosing the sample and sample size is highlighted below.

3.4.4 Sampling Technique

The convenience sampling technique has been employed. As corroborated further by the Kenya Manufacturers and Exporters directory (2022-2023), 54% of the registered companies (127 companies) are located in Nairobi and have subsidiaries in other regions within the country. Other factors that have been considered in support of the convenience sampling approach include the willingness of the manufacturing companies to participate in this study as well as the accessibility of the companies. Due to the challenges associated with data collection which often leads to low response rate, convenience and willingness of firms became essential considerations. The use of convenience sampling techniques is to also help get a sample that is representative of the population. Considering the constraints that other sampling techniques place in sampling, it sometimes becomes difficult to get a sample that is truly a representative of the population, in terms of sample size. Therefore, the study employed convenience sampling techniques.

3.5 Data Collection Methods

This study primarily utilized questionnaires as the main instrument for data collection. This method provides a structured approach to gathering uniform data from a sizable sample. The questionnaire was crafted to capture information on both dependent and independent variables. It featured closed-ended questions to ensure precise data collection and minimize variability. Questionnaires were distributed to participants via email and in physical form. The table below details the operationalization of the variables.

A 7-point Likert scale was preferred over a 5-point scale because it offers greater sensitivity, precision, and reliability, allowing respondents to express more nuanced opinions while reducing response bias and central tendency effects. Research indicates that 7-point scales improve data validity and discriminatory power, making them more effective for statistical analysis and predictive modeling (Finstad, 2010).

Table 3.1 Operationalization of the study's variables

Variables	**Measures**	**Sources**
Efficiency motivation	*Ordinal scale from 1 = Strongly Disagree = 7 Strongly Agree* *We would adopt cross-docking Third-Party Logistics (3PL) to:*	Liu et al. (2016)
	To accelerate the order response time	
	To cut down on operation costs	
	To enhance inventory management	
	To help gain a competitive advantage.	
	Cross-docking in Third-party Logistics can boost customer benefits without increasing costs or achieve similar benefits with reduced expenses.	Nevo & Wade (2011)
Legitimacy motivation	*Ordinal scale from 1 = Strongly Disagree = 7 Strongly Agree* ***We would adopt cross-docking 3PL because:***	Liu et al. (2016)
	Our competitors have reaped substantial advantages through the adoption.	

	Customers in the same industry perceive our competitors favorably for embracing it.	
	Suppliers within the industry regard positively those competitors who have embraced it.	
	Our key suppliers mandate its implementation.	
	The majority of our suppliers have adopted them	
Inter-organizational trust	*Ordinal scale from 1 = Strongly Disagree = 7 Strongly Agree*	
	Our supply chain partners consistently uphold their commitments.	Alazab et al. (2021) and Lippert (2007)
	Our supply chain partners frequently demonstrate honesty in their dealings with us	
	We believe in the accuracy of the information provided by our supply chain partners	
	Our supply chain partners genuinely care that our business succeeds.	
	Our supply chain partners actively consider our well-being as equivalent to their own when making significant decisions.	
	We have confidence that our supply chain partners prioritize our best interests.	
	Our supply chain partners uphold trustworthiness.	
	Cautiousness towards our supply chain partners is unnecessary.	
	Our supply chain partners refrain from exploiting opportunities for personal gain at our expense	Cai et al. (2010)
	This supplier consistently demonstrates fairness in negotiations with us.	
	We can rely on the sincerity of the supplier in their interactions with our firm.	Wei et al. (2012)
	The supplier is known for its commitment to honoring agreements.	

Organizational readiness	*Ordinal scale from 1 = Strongly Disagree = 7 Strongly Agree*	Hussain & Papastathopoulos (2022)
	Overall, our organization possesses the requisite resources, technologies, and staff competencies to drive change effectively.	
	Overall, our organization fosters a robust culture that motivates professionals to champion change	
	Overall, our organization boasts a strong foundation of culture, strategy, and partnerships conducive to facilitating change.	
	Our organization diligently conducts risk assessments to support change initiatives.	
	Overall, our strategic goals are well-defined, relevant, and communicated effectively to facilitate change initiatives.	
	Our staff members exhibit the requisite mindset to drive change.	
	Our staff members are entrusted with the authority to make decisions that advance change initiatives.	
	Our organization demonstrates flexibility in allocating sufficient IT infrastructure resources to support change.	
	The enterprise system(s) within our organization are reliable, current, and stable	
Intention to adopt Cross-docking 3PL	*Ordinal scale from 1 = Strongly Disagree = 7 Strongly Agree*	Salim et al. (2022)
	We intent incorporate cross-docking third-party logistics in our business services.	
	In the coming months, we intent to implement cross-docking third-party logistics approach.	

	Cross-docking third-party logistics is likely to become part of our business operations in the near future.	
	If the opportunity arises, we anticipate adopting cross-docking third-party logistics	

3.6 Control Variables

Th study employs firm size, measured by the number of employees and firm age as the control variables in the study. Prior research demonstrates that firm size and firm age produce confounding effect on organizational outcomes, which when not accounted for, may lead to wrong conclusions in regression results (Das, 2018).

Firm size

The size of a firm reflects the extent of its operational scale. As a control variable, firm size is considered because larger firms are generally better positioned financially to implement capital-intensive strategies. In this research, firm size is represented by the number of full-time employees.

Firm Age

The length of the period for which the firm has been in existence will likely reflect the firm's experience in the market. More experienced firms are likely to have better knowledge of the business environment, in comparison to new firms. Specifically, older firms often have more experience and a longer history of dealing handling organizational changes. Controlling for firm age helps in understanding whether intention to adopt joint crossdocking 3PL is a result of this accumulated experience and whether younger firms exhibit different levels of joint crossdocking 3PL adoption intention.

3.7 Data analysis

This section details the statistical methods and tools that were utilized to analyze the data gathered from the field study. The data was entered first using SPSS version 27.0. The primary analytical method utilized is Structural Equations Modeling (SEM), encompassing both measurement and structural models. In the analysis of the measurement model, the tools that were employed include reliability tests,

Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and tests for Common Method Bias (CMB). The examination of structural relations involved path analysis within Structural Equations Modeling (SEM), which encompasses a set of statistical procedures for investigating relationships among multiple constructs (Hair et al., 2014). Reliability tests, specifically Cronbach's Alpha, and Exploratory Factor Analysis were carried out using SPSS version 27. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were executed with LISREL version 8.8. The following section provides detailed insights into the procedures employed for these analyses.

3.7.1 Validity and Reliability Tests

Validity pertains to the degree to which a test effectively measures the particular variables it is designed to evaluate (Cooper and Dan Schindler, 2014). Data validation was carried out using both qualitative and quantitative methods. The validity of research findings or outcomes reflects their level of genuineness or credibility. Results from validity analysis provide real facts and statistics for the researcher to validate and generate theories. Both SPSS and LISREL were used to test the validity. Specifically, in SPSS, EFA was conducted to explore the various components in the data, for which these components were further confirmed in LISREL through the CFA approach. In the CFA, some of the validity measures to test include the convergent validity, which describes the extent to which different measurement methods yield consistent results for a variable construct validity test. The Discriminant validity test, which assesses the extent of uniqueness in the measures of different variables, was also tested.

Reliability, conversely, pertains to the extent of internal consistency demonstrated by research tools. Reliability pertains to the exactness and accuracy of a method used for measuring (Cooper and Dan Schindler, 2014). Reliability refers to the consistency of results obtained when a researcher uses a measurement tool multiple times under the same conditions (Taherdoost, 2016). Differently, it is the level of consistency with which a research approach delivers steady outcomes. In the SPSS, reliability was tested by the Cronbach Alpha coefficient generated from the scale reliability analysis. Whereas in LISREL, reliability was assessed through the compositive reliability values.

In Structural Equation Modeling (SEM), ensuring that both reliability and validity criteria are met is crucial for the trustworthiness of the results (Hair et al., 2019; Henseler *et al*., 2015). The study also performed some bias tests, including response bias analysis and common method bias analysis to verify whether these biases exist in the data or not and their influence on the results generated.

3.7.2 Analytical Models for the study

The study followed a hierarchical order of testing the proposed model and computed the following proposed relationships.

Analysis on the influence of the control variables on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA$ ----------

-Model 1

Analysis on the influence of the independent variables and moderating variables on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA + \beta_3 EM + \beta_4 LM + \beta_5 IOT + \beta_6 OR$ ----------

-Model 2

Analysis on the influence of the interaction effect (EM × IOT) on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA + \beta_3 EM + \beta_4 IOT + \beta_5 EM \times IOT$ ----------

-Model 3

Analysis on the influence of the interaction effect (EM × OR) on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA + \beta_3 EM + \beta_4 OR + \beta_5 EM \times OR$ ----------

Model 4

Analysis on the influence of the interaction effect (LM × IOT) on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA + \beta_3 LM + \beta_4 IOT + \beta_5 LM \times IOT$ ----------

-Model 5

Analysis on the influence of the interaction effect (LM × OR) on the dependent variable

$JCXDAI = \beta_0 + \beta_1 FZ + \beta_2 FA + \beta_3 LM + \beta_4 OR + \beta_5 LM \times OR$ ----------

Model 6

Note: *Controls are: Employee size, Firm age*
JCXDAI = 3PL Joint Cross-Docking Adoption Intention; FZ = Firm Size; FA = Firm Age, EM = Efficiency Motivation; LM = Legitimacy Motivation; ORD = Organizational Readiness; IOT = Inter-organizational Trust

3.8 Research Quality

High-quality research produces reliable evidence that is ethical and can withstand scrutiny, making it suitable for informing policymaking (Groot & García-Valderrama, 2006). Professionalism, transparency, accountability, and suitability are all standards that should be followed. It is most commonly used to describe to the scientific process that includes judgments regarding the fit between methodologies and questions, subject selection, outcome assessment, and protection against systematic, non-systematic, and inferential error.

3.9 Ethical Considerations

Under ethical considerations, how the collected data is handled raises ethical issues that ought to be addressed not only during the period of collecting data but also after the research has been conducted.

The researcher is obligated to the respondents to respect their privacy and rights. Some of the critical concerns and issues involved which ought to be addressed include among others are (1) disclosing and providing the respondents or informants full knowledge of what the research is all about, (2) Reviewing whether the research can potentially hurt the participants in any way, especially given its competition, (3) Assuring respondents about privacy, confidentiality, and anonymity; (4) The interventions and advocacy; (5) Participating voluntarily. The provisions of the Data Protection Act (2019) will also be put into consideration when handling data collected from respondents of this study.

Before commencing data collection, ethical approval was obtained from the Strathmore University Institutional Scientific and Ethics Research Committee, which granted clearance on September 16, 2024 (Appendix III), and the National Commission for Science, Technology, and Innovation (NACOSTI), which issued approval on September 24, 2024 (Appendix IV).

CHAPTER 4

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This section of the research outlines the analysis of data gathered from FMCG companies operating in Kenya. It includes demographic insights, descriptive statistics, assessments of validity and reliability, correlation and regression analyses, as well as a discussion of the findings in relation to existing literature. The analytical process utilizes the Statistical Package for the Social Sciences (SPSS, version 27) and LISREL version 8.8. The results are illustrated through tables and figures.

4.2 Response Rate

The research aimed to gather data from 237 FMCG companies in Kenya. Nevertheless, responses were obtained from 176 firms, yielding a participation rate of 74.26%. According to Fincham (2008), response rates above 60% are generally deemed acceptable for survey-based research, ensuring sufficient representativeness and reliability of the findings. A 74.26% response rate, which is more than 60%, suggests that the response is adequate for conducting the analysis.

4.3 Demographic Characteristics of the FMCG Manufacturing Firms and Respondents

This part outlines the foundational attributes of both the firms and the respondents, with the corresponding results displayed in Table 4.1. The results in Table 4.1 show the industrial composition of the FMCG manufacturing firms. As well as the respondent's background characteristics. Respondents were made to choose the products type they produce; hence, it is possible for some firms to produce more than one product type. The results show that firms that produce beverages occupy the largest portion of the sample with a total of 165, followed by firms that produce food items with a total of 149 firms. Firms that produce detergents are up to 52 firms. A total of 45 firms indicated that they produce other products in addition to the three listed above.

Results on the ownership structure revealed that 101 (57.4%) of them are owned by local firms, 4 (2.3%) of them are owned by foreign firms while 70 (39.8%) of them are owned by both local and foreign nationals. One company did not indicate.

Moreover, 67 (38.1%) of the firms serve local markets while 109 (61.9%) serve both local and foreign markets. In terms of logistics handling, 36 (20.5%) handle their logistics internally only, while 140 (79.5%) outsource some or all aspects of their logistics activities to third party logistics.

Table 4.1: Firm information

Firm Information	Frequency (176)	Percentage (100%)
Product Type		
Food	149	36.25
Beverage	165	40.15
Detergent	52	12.65
Others	45	10.95
Ownership Structure		
Local	101	57.4
Foreign	4	2.3
Both Local and Foreign	70	39.8
Missing	1	.6
Distribution Market		
Local	67	38.1
Local and Foreign	109	61.9
Logistics Handling		
Internal handling Only	36	20.5
Outsource	140	79.5
Outsourcing Services		
Warehousing	6	3.4
Transport	123	69.9
Both warehouse and transport	11	6.3
Missing	36	20.5
Providers		
Single	68	38.6
Several	72	40.9
Missing	36	20.5
Position		

Supervisor	54	30.7
Middle Manager	102	58.0
Top Manager	17	9.7
Missing	3	1.7
Education		
Diploma/HND	42	23.9
First Degree	113	64.2
Second Degree or more	19	10.8
Missing	2	1.1

Descriptive	**Employee Size**	**Firm Age**
Mean	413.23	34.98
Standard Deviation	535.328	15.372

Note: *Some firms produce more than one product type so the total of the product type exceeds 176*

Of those that outsource, 6 (3.4%) outsource their warehousing activities while 123 (69.9%) of their transportation activities. Moreover, 68 (38.6%) of them indicated that they engage single service providers for their outsourcing activities, while 72 (40.9%) use multiple service providers for their logistics handling activities.

In addition to the firm characteristics, the study also presented the demographic characteristics of the respondents. Results from the study suggest that 54 (30.7%) of them are in the supervisory position, 102 (58.0%) of them are middle managers whilst 17 (9.7%) of them are top managers. With their level of education, 42 (23.9%) are Diploma/HND holders, 113 (64.2%) are first degree holders while 19 (10.8%) are second degree holders.

The study also performed a descriptive statistic of the size of some firm characteristics. These are the employee size and firm age. The study found that the average employee size is 413.23 with a standard deviation of 535.328. Also, firm age had a mean score of 34.98 and a standard deviation of 15.372.

4.4 Descriptive Statistics

This part provides an overview of the descriptive statistics for the variables examined in the research. The primary statistical measures recorded include the mean, standard

deviation, skewness, and kurtosis. These figures are displayed across different subsections within the subsequent tables.

4.4.1 Descriptive Statistics of Efficiency Motivation

Efficiency motivation was conceptualized as a uni-construct. The descriptive statistics for the indicators capturing this construct are presented on the table below. Table 4.2 demonstrates that the mean of the items measuring efficiency motivation fall between 4.52 and 5.00 and a standard deviation of 1.493 and 1.621. Also, the skewness and the kurtosis of all the items measuring efficiency motivation construct fall within the acceptable range of -3+3 and -10+10 respectively (Brown, 2006; Griffin & Steinbrecher, 2013). Thus, the distribution of the data measuring the construct mimics a normal distribution.

Table 4.2: Descriptive statistics of efficiency motivation

Codes	Description	N	Mean	Std.	Skew.	Kurt.
EM1	To speed up order response time	176	4.52	1.621	-.259	-.868
EM2	To cut costs in operations	176	4.73	1.605	-.460	-.371
EM3	To facilitate better inventory control	176	4.84	1.520	-.419	-.450
EM4	To help generate competitive advantage.	176	4.77	1.612	-.378	-.667
EM5	The adoption of the cross-docking 3PL would enable the organization to deliver greater benefits to customers for a given cost (or can deliver the same benefit levels for a lower cost)	176	5.00	1.493	-.521	-.159

4.4.2 Descriptive Statistics of Legitimacy Motivation

Legitimacy motivation was conceptualized as a uni-construct. The descriptive statistics for the indicators capturing this construct are presented in the table below. Table 4.3 demonstrates that the mean of the items measuring legitimacy motivation fall between 4.21 and 4.47 and a standard deviation of 1.644 and 1.906. Also, the skewness and the kurtosis of all the items measuring the legitimacy motivation construct fall within the acceptable range of -3 +3 and -10 +10 respectively (Brown, 2006; Griffin & Steinbrecher, 2013). Thus, the distribution of the data measuring the construct mimics a normal distribution.

Table 4.3: Descriptive statistics of legitimacy motivation

Codes	Description	N	Mean	Std.	Skew.	Kurt.
LM1	Our competitors have benefited greatly with its adoption	176	4.47	1.906	-.132	-1.149
LM2	Our competitors who have adopted it are perceived favorably by customers in the same industry	176	4.21	1.739	.068	-.905
LM3	Our competitors who have adopted it are perceived favorably by suppliers in the same industry	176	4.42	1.787	-.099	-1.006
LM4	It is required by our key suppliers	176	4.34	1.655	.034	-.956
LM5	Most of our suppliers have adopted them	176	4.43	1.644	.095	-.945

4.4.3 Descriptive Statistics of Inter-organizational Trust

The descriptive statistics for the indicators capturing inter-organizational trust construct are presented in the table below. Table 4.4 demonstrates that the mean weight of the items measuring inter-organizational trust fell between 4.69 and 5.03 and a standard deviation of 1.175 and 1.408. Also, the skewness and the kurtosis of all the items measuring inter-organizational trust construct fall within the acceptable range of -3 +3 and -10 +10 respectively (Brown, 2006; Griffin & Steinbrecher, 2013). Thus, the distribution of the data measuring the construct mimics a normal distribution.

Table 4.4: Descriptive statistics of inter-organizational trust

Codes	Description	N	Mean	Std.	Skew.	Kurt.
IOT1	Our supply chain partners keep promises they make to our firm	176	5.03	1.322	-.318	-.315
IOT2	Our supply chain partners are often honest to us	176	4.96	1.341	-.315	-.084
IOT3	We believe the information our supply chain partners provide us	176	4.92	1.307	-.084	-.420
IOT4	Our supply chain partners are genuinely concerned that our business succeeds.	176	4.93	1.294	-.096	-.397

IOT5	When making important decisions, our supply chain partners consider our welfare as their own.	176	4.98	1.408	-.491	-.136
IOT6	We trust our supply chain partners keep our best interest in mind	176	4.97	1.326	-.279	-.180
IOT7	Our supply chain partners are trustworthy	176	4.95	1.275	-.322	-.035
IOT8	It is not necessary to be cautious with our supply chain partners.	176	4.97	1.343	-.381	-.059
IOT9	Our supply chain partners never use opportunities that arise to profit at our expense.	176	4.93	1.351	-.410	-.067
IOT10	This supplier has always been evenhanded in its negotiations with us.	176	4.69	1.175	-.366	-.162
IOT11	We could count on the supplier to be sincere in their dealings with our firm.	176	4.70	1.188	-.038	-.400
IOT12	The supplier was a company that stood by its word.	176	4.78	1.182	-.402	.026

4.4.4 Descriptive Statistics of Organizational Readiness

The descriptive statistics for the indicators capturing organizational readiness construct are presented in the table below. Table 4.5 demonstrates that the mean weight of the items measuring organizational readiness falls between 5.10 and 5.38 and a standard deviation of 1.277 and 1.482. Also, the skewness and the kurtosis of all the items measuring organizational readiness construct fall within the acceptable range of -3 +3 and -10 +10 respectively (Brown, 2006; Griffin & Steinbrecher, 2013). Thus, the distribution of the data measuring the construct mimics a normal distribution.

Table 4.5: Descriptive statistics of organizational readiness

Codes	Description	N	Mean	Std.	Skew.	Kurt.
OR1	Overall, our organization has the necessary resources, technologies, and staff capabilities to facilitate a change.	176	5.13	1.438	-.850	.354
OR2	Overall, our organization has a well-developed culture to engage professionals to facilitate a change	176	5.10	1.482	-.860	.492
OR3	Overall, our organization has a well-established culture, strategy, and partnerships to facilitate a change.	176	5.11	1.465	-.772	.196
OR4	Our organization takes reasonable risk assessment to facilitate a change.	176	5.19	1.420	-.869	.695
OR5	Overall, our organizational strategic goals are clear, relevant, and well-communicated to facilitate a change.	176	5.28	1.405	-.832	.437
OR6	Our staff members have the right attitudes that facilitate a change.	176	5.14	1.421	-.592	-.371
OR7	Our staff members are empowered to make decisions that facilitate a change	176	5.28	1.245	-.866	1.139
OR8	Our organization is flexible in allocating adequate IT infrastructure resources necessary to facilitate a change.	176	5.25	1.311	-.842	.784
OR9	Enterprise system/s in my organization is stable, up-to-date, and reliable.	176	5.38	1.277	-.734	.220

4.4.5 Descriptive Statistics of Joint Cross-docking Adoption Intention

The descriptive statistics for the indicators capturing joint cross-docking adoption intention construct are presented in the table below. Table 4.6 demonstrates that the mean weight of the items measuring joint cross-docking adoption intention fall between 3.61 and 4.61 and a standard deviation of 1.682 and 1.756. Also, the skewness and the kurtosis of all the items measuring organizational readiness construct fall within the acceptable range of -3 +3 and -10 +10 respectively (Brown,

2006; Griffin & Steinbrecher, 2013). Thus, the distribution of the data measuring the construct mimics a normal distribution.

Table 4.6: Descriptive statistics of 3PL Joint Cross-docking Adoption Intention

Codes	Description	N	Mean	Std.	Skew.	Kurt.
IACD1	We intend to use cross-docking third party logistics in our business services	176	4.10	1.756	-.085	-.862
IACD2	We plan to use cross-docking third party logistics in the next few months.	176	3.61	1.814	.247	-.870
IACD3	We think we will use cross-docking third party logistics in our business in the near future.	176	4.33	1.682	-.262	-.776
IACD4	Given a chance, we predict we will use cross-docking third party logistics.	176	4.61	1.700	-.484	-.612

4.5 Bias Analysis

The study performed two key bias analysis tests. These are the non-response bias and common method bias tests.

4.5.1 Non-response Bias Analysis

An assessment of non-response bias was carried out to determine if there were significant differences between firms that participated in the survey and those that chose not to respond. To assess those that did not respond, the study assumes that the firms that responded late mimic the characteristics of those that did not respond. In a period of 4 weeks, the researcher obtained 92 responses within the first two weeks (i.e., early responses), while the remaining 84 were obtained in the next two weeks (late responses). Accordingly, the mean of each variable was compared based on the time of the responses (early and late responses) through an independent sample t-test and the results are shown in Table 4.7 below.

Table 4.7: Non-response bias assessment

Variables	Early vs Late responses	N	Mean	Std. Deviation	t	p	*95% CI Interval of the Difference* Lower CI	Upper CI
Employee Size	Early	92	404.17	311.41	-.23	.82	-184.51	146.55
	Late	84	423.15	705.49				
Firm Age	Early	92	36.00	17.18	.94	.35	-2.38	6.67
	Late	84	33.86	13.12				
Efficiency	Early	92	4.62	1.32	-1.61	.11	-.70	.07
Motivation	Late	84	4.93	1.28				
Legitimacy	Early	92	4.38	1.74	.05	.96	-.47	.49
Motivation	Late	84	4.37	1.44				
Inter-	Early	92	5.01	1.20	.66	.51	-.23	.45
organizational	Late	84	4.90	1.09				
trust								
Organizational	Early	92	5.07	1.19	-1.73	.08	-.63	.04
readiness	Late	84	5.37	1.05				
3PL Joint CXD	Early	92	4.42	1.61	.68	.50	-.30	.62
Adoption	Late	84	4.26	1.48				
Intention								

The results from Table 4.7 show that there was no significant difference between early responses and late responses for all the variables in the study. Thus, employee size (| t | = .23, t < 1.96; p = .82, p>.05); Firm age (| t | = .94, t < 1.96; p = .35, p>.05); efficiency motivation (| t | = 1.61, t < 1.96; p = .11, p>.05); legitimacy motivation (| t | = .05, t < 1.96; p = .96, p>.05); inter-organizational trust (| t | = .66, t < 1.96; p = .51, p>.05); organizational readiness (| t | = 1.73, t < 1.96; p = .08, p>.05); 3PL Joint cross-docking adoption intention (| t | = .68, t < 1.96; p = .50, p>.05). These results suggest the absence of non-response bias.

4.5.2 Common Method Bias

The research implemented several strategies to mitigate potential bias associated with the common method approach. These included randomizing the sequence of questions, isolating the predictor (independent variable) from the criterion (dependent variable) assessments, and incorporating intervals within the questionnaire structure. (Podsakoff *et al.*, 2003). Herman's single-factor approach was employed to assess whether common method bias (CMB) threatened the measurement model. In SPSS, an exploratory factor analysis (EFA) was conducted, restricting the extraction to a single factor. The EFA output showed that the single factor extracted a total of 7.359 eigenvalues, corresponding to 28.305% of the total variance extracted. These results can be found in the EFA results in Table 4.8. The single-factor model explains less than 50% of the total variance, implying the absence of CMB in the current study (Malhotra *et al.*, 2006; Podsakoff & Organ, 1986).

4.6 Reliability and Validity Analysis

An assessment of reliability and validity was conducted using both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Reliability pertains to the extent of internal consistency demonstrated by research tools (Cooper and Dan Schindler, 2014). In SPSS, reliability was tested using Cronbach's alpha coefficient generated from the scale reliability analysis, while in LISREL, reliability was evaluated through composite reliability values.

Conversely, validity, which pertains to the degree to which a test effectively measures the particular variables it is designed to evaluate (Cooper and Dan Schindler, 2014) was assessed in SPSS through EFA to explore the various components in the data. These components were further confirmed in LISREL through the CFA approach. In the CFA, some of the validity measures to test for include convergent validity, which describes the extent to which different measurement methods yield consistent results for a variable construct validity test. Also, the discriminant validity test, which assesses the extent of uniqueness in the measures of different variables was also tested.

4.6.1 Exploratory Factor Analysis

As most of the study's indicators were taken from previous research works, it became essential to use exploratory factor analysis (EFA) to understand the underlying structure and unidimensionality of the data (Hair et al., 2019). Exploratory factor analyses (EFA) on every multi-item indicator were performed using the principal component and varimax processes for factor extraction and rotation (Hair et al., 2019). The Kaiser Meyer-Olkin (KMO) of 0.885 and Bartlett's test of Sphericity show a statistically significant level of ($\chi 2$ = 3505.637; df = 325, p = 0.00), demonstrating that sample size was not a problem for the study. Therefore, in total five (5) components explained 75.361% variance in the data set. The percentage of variance explained ranged between 28.305% and 6.323%, whilst the Eigenvalues were between 7.359 to 1.644. Regarding the Cronbach alpha values, each is above the threshold of 0.70, which further indicates that each collection of indications has strong internal consistency according to Cronbach's alpha (α), a measure of dependability. These are shown in Table 4.8.

Table 4.8: Exploratory Factor Analysis

	Component loadings					**Eigen value**	**%variance explained**	**Cronbach alpha (α)**
	1	2	3	4	5			
Efficiency Motivation						2.416	9.292	.858
EM1	.078	.072	.040	**.804**	.085			
EM2	-.056	.008	.144	**.845**	.071			
EM3	.102	-.087	.076	**.831**	.143			
EM5	.166	.056	.121	**.800**	.179			
Legitimacy Motivation						3.614	13.899	.951
LM1	.070	-.097	**.900**	.032	.151			
LM2	.140	-.061	**.919**	.092	.106			
LM3	.132	-.074	**.904**	.102	.118			
LM4	.172	-.095	**.881**	.101	.138			
LM5	.238	-.230	**.803**	.146	.108			

Inter-organizational Trust						7.359	28.305	.942
IOT1	**.836**	.041	.163	.077	.076			
IOT2	**.858**	-.105	.106	.041	.060			
IOT3	**.876**	-.083	.149	.004	.032			
IOT4	**.817**	-.032	.070	.132	.019			
IOT5	**.868**	.008	.103	.019	.062			
IOT7	**.835**	-.030	.076	.052	.044			
IOT9	**.861**	-.033	.096	.036	.025			
Organizational Readiness						4.561	17.543	.918
OR1	-.032	**.803**	-.119	-.012	-.089			
OR3	.069	**.853**	-.106	.032	-.022			
OR4	.033	**.833**	-.099	.007	-.129			
OR5	-.070	**.856**	-.036	.012	-.041			
OR6	-.133	**.821**	-.169	.010	.024			
OR7	-.036	**.795**	-.067	-.076	.105			
OR9	-.051	**.735**	.045	.074	.037			
3PL Joint Cross-Docking Adoption Intention						1.644	6.323	.887
IACD1	.151	-.068	.315	.162	**.795**			
IACD3	.083	-.017	.176	.145	**.886**			
IACD4	.025	-.003	.092	.190	**.897**			
Total							***75.361***	

Common method bias (CMB): Single factor extracted 7.359 eigenvalues, corresponding to 28.305% total variance extracted.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) = .885; Bartlett's Test of Sphericity: Chi-square = 3505.637; d.f. = 325; p-value = .000

4.6.2 Confirmatory Factor Analysis

This study employed covariance-based confirmatory factor analysis (CFA) with a maximum likelihood estimator to evaluate the validity and reliability of the measures in LISREL 8.8 (Bagozzi & Yi, 2012). As presented in Table 4.9, the model has a good fit for the data given: ($\chi2$ = 499.344; df = 289; $\chi2$/df = 1.728; p = .00; SRMR = .0591; RMSEA = .0645; NFI = .923; NNFI = .957; IFI = .962; CFI = .962; RFI = .913) (Bagozzi & Yi, 2012; Hair *et al*., 2014). Table 4.9 presents the factor loadings (and their associated t-values), composite reliability (CR), average variance extracted (AVE), and Cronbach alpha (CA). All factor loadings are greater than 0.60 and they are statistically significant.

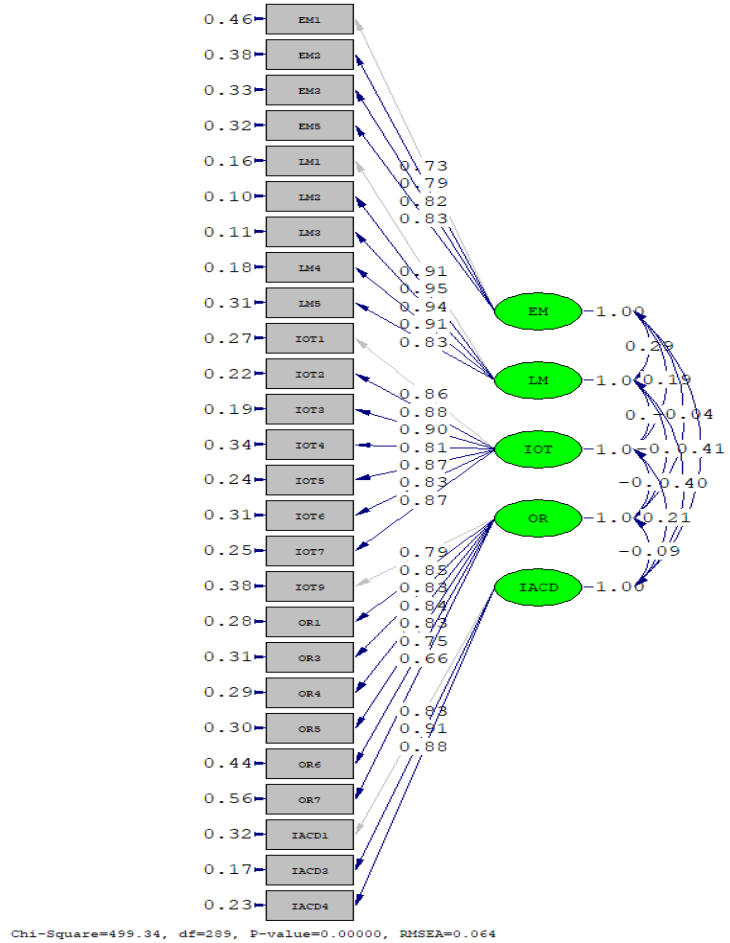

Figure 4.1: Confirmatory Factor Analysis

The values for composite reliability, average variance extracted, and Cronbach's alpha for each measurement set exceed the recommended benchmarks of 0.60, 0.50, and 0.70, respectively. This indicates that the measures successfully establish uni-

dimensionality, convergent validity, and reliability (Bagozzi & Yi, 2012; Hair *et al*., 2014).

Table 4.9: Confirmatory Factor Analysis

Codes	Constructs and Measures	Estimate	T-value
Efficiency Motivation: *We would adopt cross-docking Third-Party Logistics (3PL) because we want:* ***(CR = .876; AVE = .641; CA = .858)***			
EM1	To speed up order response time	0.734	***Fixed***
EM2	To cut costs in operations	0.788	9.879
EM3	To facilitate better inventory control	0.82	10.248
EM5	The adoption of the cross-docking Third-party Logistics would enable the organization to deliver greater benefits to customers for a given cost (or can deliver the same benefit levels for a lower cost)	0.826	10.313
Legitimacy Motivation: *We would adopt cross-docking Third-Party Logistics (3PL) because we want:* ***(CR = .857; AVE = .670; CA = .951)***			
LM1	Our competitors have benefited greatly with its adoption	0.914	***Fixed***
LM2	Our competitors who have adopted it are perceived favorably by customers in the same industry	0.951	23.254
LM3	Our competitors who have adopted it are perceived favorably by suppliers in the same industry	0.944	22.742
LM4	It is required by our key suppliers	0.906	20.014
LM5	Most of our suppliers have adopted them	0.831	16.115
Inter-organizational Trust (CR = .907; AVE = .710; CA = .942)			
IOT1	Our supply chain partners keep promises they make to our firm	0.857	***Fixed***
IOT2	Our supply chain partners are often honest to us	0.882	15.921
IOT3	We believe the information our supply chain partners provide us	0.902	16.616
IOT4	Our supply chain partners are genuinely concerned that our business succeeds.	0.813	13.736

IOT5	When making important decisions, our supply chain partners consider our welfare as their own.	0.871	15.542
IOT7	Our supply chain partners are trustworthy	0.829	14.185
IOT9	Our supply chain partners never use opportunities that arise to profit at our expense.	0.868	15.440
Organizational Readiness (CR = .910; AVE = .771; CA = .918)			
OR1	Overall, our organization has the necessary resources, technologies, and staff capabilities to facilitate a change.	0.789	***Fixed***
OR3	Overall, our organization has a well-established culture, strategy, and partnerships to facilitate a change.	0.851	12.640
OR4	Our organization takes reasonable risk assessment to facilitate a change.	0.833	12.301
OR5	Overall, our organizational strategic goals are clear, relevant, and well-communicated to facilitate a change.	0.844	12.505
OR6	Our staff members have the right attitudes that facilitate a change.	0.834	12.309
OR7	Our staff members are empowered to make decisions that facilitate a change	0.751	10.762
OR9	Enterprise system/s in my organization is stable, up-to-date, and reliable.	0.66	9.193
3PL Joint Cross-Docking Adoption Intention (CR = .929; AVE = .725; CA = .887)			
IACD1	The company should not be expected to give each customer individualized attention	0.826	***Fixed***
IACD3	We think we will use cross-docking third party logistics in our business in the near future.	0.914	14.445
IACD4	Given a chance, we predict we will use cross-docking third party logistics.	0.879	16.699

$\chi 2$ = 499.344; df = 289; $\chi 2$/df = 1.728; p = .00; SRMR = .0591; RMSEA = .0645; NFI = .923; NNFI = .957; IFI = .962; CFI = .962; RFI = .913

Additionally, discriminant validity was assessed using the Fornell-Larcker Criterion which states that the square root of the AVEs should be larger than the correlation coefficient of a construct with other constructs. From Table 4.10, the square root of the AVEs, showing at the diagonals, are always larger than any pair of inter-construct correlation between the constructs. This demonstrates that discriminant validity is achieved.

Table 4.10: Discriminant validity - Fornell-Lacker criteria

Constructs	1	2	3	4	5
1. Efficiency Motivation	**.801**				
2. Legitimacy Motivation	.239	**.819**			
3. Inter-organizational Trust	.162	.298	**.843**		
4. Organizational Readiness	.006	-.223	-.088	**.878**	
5. JCXD Adoption Intention	.345	.376	.185	-.078	**.851**

4.7 Correlation Results

Correlation explains the degree of linear relationship between two variables. The correlation between the variables was assessed using the Pearson correlation coefficient. The correlation coefficient lies within the interval of -1 and +1. The degree of association between variables is determined by the coefficient value, where higher values signify a strong relationship, while lower values suggest a weaker connection. Additionally, the correlation coefficient's sign reflects the direction of the relationship. The findings are displayed in Table 4.11.

The results demonstrate that both employee size [r = -063, p> 0.05] and firm age [r = -111, p> 0.05] have insignificant association with joint cross-docking adoption intention. This suggests that a change in employee size and firm age do not significantly affect joint cross-docking adoption intentions. Moreover, efficiency motivation has a significant moderate positive association with joint cross-docking adoption intention [r = .345, p< 0.05]; legitimacy motivation has a significant moderate positive association with joint cross-docking adoption intention [r = .376, p< 0.05] and inter-organizational trust has a significant weak positive association with joint cross-docking adoption intention [r = .185, p< 0.05]. These results suggest that an increase in efficiency motivation, legitimacy motivation and inter-organizational

trust significantly correspond to increment in intention to adopt joint cross-docking adoption. However, organizational readiness has an insignificant negative association with joint cross-docking adoption intention [r = -.078, p> 0.05], suggesting that a change in organizational organizational readiness does not correspond to a change in joint cross-docking adoption intention.

Table 4.11: Correlation results

Constructs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Efficiency Motivation	1.000						
2. Legitimacy Motivation	.239**	1.000					
3. Inter-organizational Trust	.162*	.298**	1.000				
4. Organizational Readiness	.006	-.223**	-.088	1.000			
5. JCXD Adoption Intention	.345**	.376**	.185*	-.078	1.000		
6. Log (Employee Size)	.041	-.156*	.098	.177*	-.063	1.000	
7. Log (Firm Age)	-.011	-.166*	.022	-.010	-.111	.351**	1.000
Descriptives	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Min	1.00	1.00	1.00	1.00	1.00	2.00	.95
Max	7.00	7.00	7.00	6.86	7.00	3.82	2.07
Mean	4.770	4.373	4.959	5.215	4.345	2.521	1.505
Standard Deviation	1.307	1.599	1.144	1.134	1.546	.243	.187
Skewness	-.588	.078	-.271	-1.008	-.341	1.341	-.218
Kurtosis	-.117	-.935	-.014	1.260	-.476	4.565	.191

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

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

4.8 Regression results

Regression analysis thrives on various assumptions. One of the key assumptions is the absence of multicollinearity. Therefore, prior to the regression analysis, the study performed a multicollinearity test. This test is to find out whether the predictor variables are highly correlated with each other or not. To test this, the study used the variance inflation factor (VIF). It has been largely documented that VIF ≥ 10 suggests

the presence of multicollinearity. Results in Table 4.12 reveal that the VIF of all the predictors fall below 10. This demonstrates that there is no multicollinearity.

Table 4.12: Collinearity Statistics

Predictors	Tolerance	Variance Inflation Factor (VIF)
Firm Size	.821	1.217
Firm Age	.854	1.171
Efficiency Motivation	.925	1.081
Legitimacy Motivation	.786	1.271
Inter-organizational Trust	.882	1.134
Organizational Readiness	.914	1.094

Table 4.13 presents the output from the regression analysis. As explained in the previous chapter, six different models were performed to estimate the regression coefficients. The control variables are firm size and firm age. The independent variables are efficiency motivation and legitimacy motivation. The moderators are inter-organizational trust and organizational readiness while the dependent variable is joint cross-docking adoption intention. All the relationships were tested at 5% significance level and at one tail, thus, the minimum t-value for significance is 1.645.

Under model 1, the control variables were regressed on the dependent variable. The results from Table 4.13 revealed that the control variables explained just 1.3% variation in the dependent variable, with an insignificant F-value of 1.132. The regression coefficients suggest that firm size (β = -.175; t = -.34) and firm age (β = -.83; t = -1.25) have an insignificant relationship with joint cross-docking adoption intention.

Under model 2, the control variables, independent variables and the moderators were regressed on the dependent variable. The results from Table 4.13 revealed that the predictors explained 20.7% variation in the dependent variable, with a significant F-value of 7.327. The regression coefficients suggest that efficiency motivation (β = .29; t = 3.39; t > 1.645) and legitimacy motivation (β = .28; t = 3.83; t > 1.645) have significant positive relationship with joint cross-docking adoption intentions. These suggest that a unit increase in efficiency motivation and legitimacy motivation would

lead to a respective .29 units and .28 units increase in firms' willingness to adopt joint cross docking.

Table 4.13: Regression Results

	Dependent Variable: JCXD Adoption Intention					
Predictors	**Model 1 β (t)**	**Model 2 β (t)**	**Model 3 β (t)**	**Model 4 β (t)**	**Model 5 β (t)**	**Model 6 β (t)**
Control Variables						
Firm Size	-.175 (-.34)	-.07 (-.14)	-.39 (-.81)	-.16 (-.33)	.15 (.30)	.07 (.13)
Firm Age	-.83 (-1.25)	-.46 (-.76)	-.63 (-1.01)	-.73 (-1.17)	-.44 (-.72)	-.46 (-.73)
Independent Variables						
Efficiency Motivation (EM)		.29 (3.39) **	.38 (4.43) **	.36 (4.22) **		
Legitimacy Motivation (LM)		.28 (3.83) **			.31 (4.16) **	.36 (5.04) **
Moderators						
Inter-organizational Trust (IOT)		.07 (.66)	.18 (1.91) *		.06 (.63)	
Organizational Readiness (OR)		-.01 (-.09)		-.11 (-1.12)		.02 (.18)
Interaction effect						
EM*IOT			.12 (1.92) *			
EM*OR				-.13 (-1.85) *		
LM*IOT					.11 (1.67) *	
LM*OR						-.03 (-.44)
Fit index						
R	.114	.455	.391	.374	.408	.388
R^2	.013	.207	.153	.140	.167	.150
ΔR^2		.194				

F	1.132	7.327	6.113	5.501	6.766	5.983
ΔF		10.302				
p-value	.325	.000	.000	.000	.000	.000

*** p < .01, t-value > 1.96 at 1-tailed test; * p < .05 at 1-tailed test, t-value > 1.645*

Source: Field survey (2024)

These results support the first two hypotheses that efficiency motivation and legitimacy motivation have a significant positive relationship with 3PL JCXD adoption intention. However, both inter-organizational trust (β = .07; t = .66; t < 1.645) and organizational readiness (β = -.01; t = -.09; | t | < 1.645) have insignificant relationship with joint cross-docking adoption intention.

Model 3 sought to estimate the interaction effect of efficiency motivation and inter-organizational trust on firms JCXD adoption intention. Therefore, the study regressed the control variables, efficiency motivation, inter-organizational trust and the interaction effect (EM*IOT) on the dependent variable. The results from Table 4.13 revealed that the predictors explained 15.3% variation in the dependent variable, with a significant F-value of 6.113. The regression coefficients suggest that the interaction between efficiency motivation and inter-organizational trust has a significant positive effect on joint cross-docking adoption intention at one-tailed test (β = .12; t = 1.92; t >1.645). This result suggests that inter-organizational trust positively moderates the relationship between efficiency motivation and JCXD adoption intention.

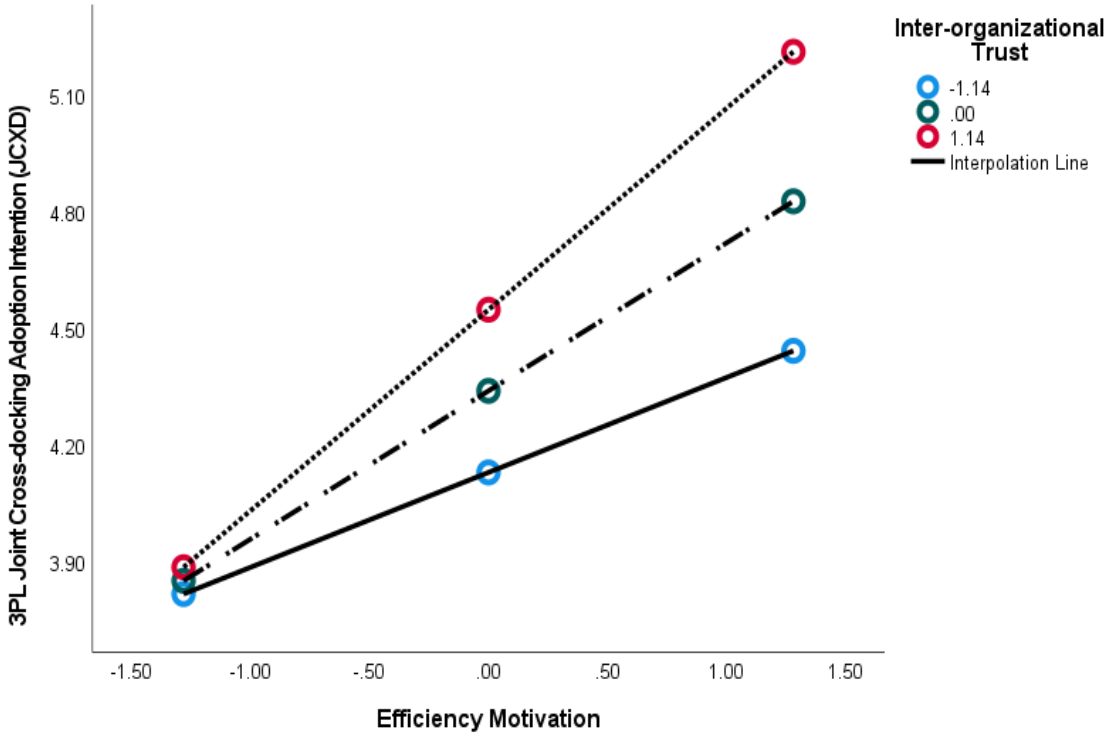

Figure 4.1: Interaction effect (EM*IOT) on JCXD adoption intention

Source: Field survey (2024)

This implies that inter-organizational trust strengthens the positive relationship between efficiency motivation and JCXD adoption intention, such that at high levels of inter-organizational trust, firms' efficiency motivations for 3PL joint cross-docking adoption drive its adoption intention more than at low levels of inter-organizational trust. This result supports hypothesis 3a, confirming the positive moderating role of inter-organizational trust in the relationship between efficiency motivation and 3PL JCXD adoption intention. Interaction graph and Johnson-Neyman output from the Hayes Process macro are displayed in Figure 4.1 and Table 4.14. The graph demonstrates that the slope of the relationship, which signifies the rate of change increases when inter-organizational trust level is higher (as indicated with red circle) than at low levels (as indicated with blue circle). This shows the positive moderating effect of inter-organizational trust.

Table 4.15: Johnson-Neyman Output on the conditional effect of EM on JCXD adoption intention at values of the moderator (IOT)

IOT	Effect	Se	T	P	LLCI	ULCI
-3.967	-0.094	0.253	-0.371	0.711	-0.592	0.405
-3.667	-0.058	0.235	-0.246	0.806	-0.522	0.406
-3.367	-0.022	0.218	-0.101	0.919	-0.452	0.408
-3.067	0.014	0.201	0.069	0.945	-0.382	0.41
-2.767	0.05	0.184	0.27	0.788	-0.314	0.413
-2.467	0.086	0.168	0.51	0.611	-0.245	0.417
-2.167	0.121	0.152	0.799	0.425	-0.178	0.421
-1.867	0.157	0.137	1.149	0.252	-0.113	0.427
-1.567	0.193	0.123	1.573	0.118	-0.049	0.436
-1.326	0.222	0.112	1.974	0.05	0	0.444
-1.267	0.229	0.11	2.079	0.039	0.012	0.446
-0.967	0.265	0.099	2.665	0.008	0.069	0.461
-0.667	0.301	0.091	3.296	0.001	0.121	0.481
-0.367	0.337	0.086	3.894	0	0.166	0.507
-0.067	0.372	0.086	4.355	0	0.204	0.541
0.233	0.408	0.089	4.607	0	0.233	0.583
0.533	0.444	0.095	4.658	0	0.256	0.632
0.833	0.48	0.105	4.571	0	0.273	0.687
1.133	0.516	0.117	4.413	0	0.285	0.747
1.433	0.552	0.13	4.232	0	0.294	0.809
1.733	0.588	0.145	4.052	0	0.301	0.874
2.033	0.624	0.161	3.885	0	0.307	0.94

Source: Field survey (2024)

The Johnson-Neyman output produces the conditional effect of the predictor at varied levels of the moderator. From Table 4.15, the relationship between efficiency motivation and JCXD adoption intention increases significantly from .222 to 0.624, when inter-organizational trust increases significantly from -1.326 to 2.033.

Model 4 sought to estimate the interaction effect of efficiency motivation and organizational readiness on firms JCXD adoption intention. Therefore, the study regressed the control variables, efficiency motivation, organizational readiness and

the interaction effect (EM*OR) on the dependent variable. The results from the Table 4.13 revealed that the predictors explained 14.0% variation in the dependent variable, with a significant F-value of 5.501. The regression coefficients suggest that the interaction between efficiency motivation and organizational readiness has a significant negative effect on joint cross-docking adoption intention at one-tailed test (β = -.13; t = -1.85; | t | >1.645). This result suggests that organizational readiness negatively moderates the relationship between efficiency motivation and JCXD adoption intention. This implies that organizational readiness rather weakens the positive relationship between efficiency motivation and JCXD adoption intention, such that at high levels of organizational readiness, firms' efficiency motivations for 3PL joint cross-docking adoption drive its adoption intention less than at low levels of organizational readiness.

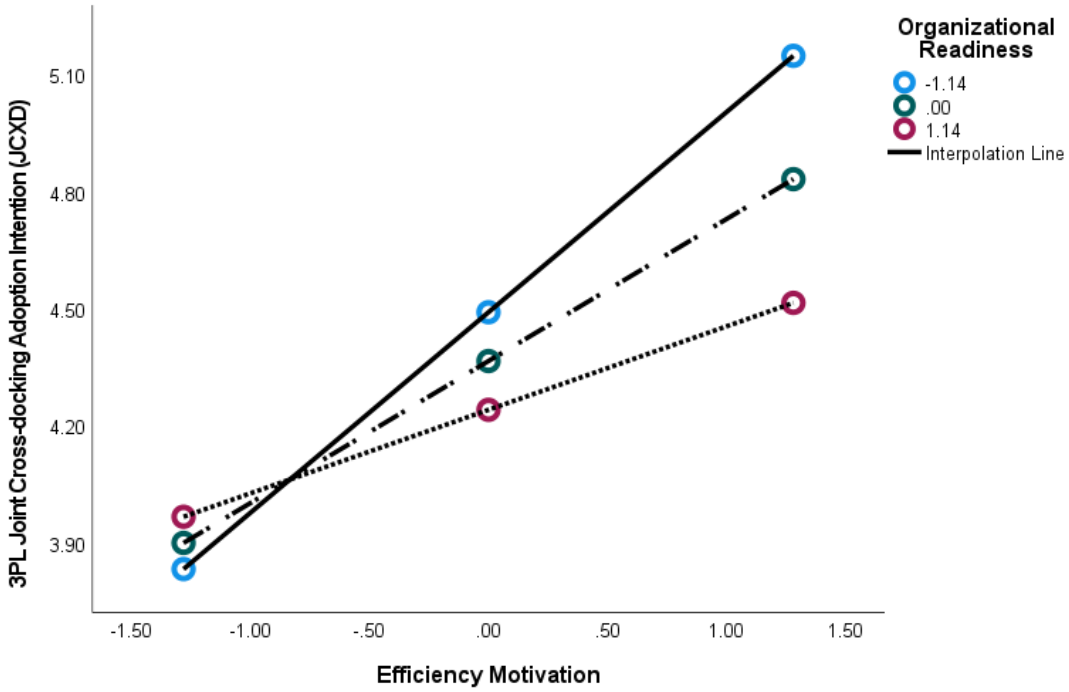

Figure 4.2: Interaction effect (EM*OR) on JCXD adoption intention

Source: Field survey (2024)

This result does not support hypothesis 4a, rejecting the positive moderating role of organizational readiness in the relationship between efficiency motivation and 3PL JCXD adoption intention. Interaction graph and Johnson-Neyman output from the Hayes Process macro are displayed in Figure 4.2 and Table 4.16. The graph demonstrates that the slope of the relationship, which signifies the rate of change,

decreases when organizational readiness level is high (as indicated with red circle) than at low levels (as indicated with blue circle). This shows the negative moderating effect of organizational readiness.

Table 4.16: Johnson-Neyman Output on the conditional effect of EM on JCXD adoption intention at values of the moderator (OR)

OR	Effect	se	T	p	LLCI	ULCI
-4.213	0.917	0.299	3.064	0.003	0.326	1.508
-3.92	0.879	0.28	3.144	0.002	0.327	1.431
-3.627	0.84	0.26	3.235	0.001	0.327	1.353
-3.334	0.802	0.24	3.337	0.001	0.328	1.276
-3.042	0.763	0.221	3.455	0.001	0.327	1.199
-2.749	0.725	0.202	3.589	0	0.326	1.123
-2.456	0.686	0.183	3.744	0	0.324	1.048
-2.163	0.648	0.165	3.922	0	0.322	0.974
-1.87	0.609	0.148	4.123	0	0.317	0.901
-1.577	0.571	0.131	4.346	0	0.311	0.83
-1.284	0.532	0.116	4.577	0	0.303	0.761
-0.992	0.493	0.103	4.78	0	0.29	0.697
-0.699	0.455	0.093	4.888	0	0.271	0.639
-0.406	0.416	0.087	4.797	0	0.245	0.588
-0.113	0.378	0.085	4.431	0	0.21	0.546
0.18	0.339	0.089	3.825	0	0.164	0.514
0.473	0.301	0.097	3.113	0.002	0.11	0.492
0.766	0.262	0.108	2.428	0.016	0.049	0.475
0.985	0.233	0.118	1.974	0.05	0	0.467
1.058	0.224	0.122	1.835	0.068	-0.017	0.464
1.351	0.185	0.138	1.346	0.18	-0.086	0.457
1.644	0.147	0.154	0.95	0.344	-0.158	0.451

Source: Field survey (2024)

The Johnson-Neyman output produces the conditional effect of the predictor at varied levels of the moderator. From Table 4.16, the relationship between efficiency

motivation and JCXD adoption intention decreases significantly from .917 to .233, when organizational readiness increases significantly from -4.213 to 0.985.

Model 5 sought to estimate the interaction effect of legitimacy motivation and inter-organizational trust on firms JCXD adoption intention. Therefore, the study regressed the control variables, legitimacy motivation, inter-organizational trust and the interaction effect (LM*IOT) on the dependent variable. The results from Table 4.13 revealed that the predictors explained 16.7% variation in the dependent variable, with a significant F-value of 6.766. The regression coefficients suggest that the interaction between legitimacy motivation and inter-organizational trust has a significant positive effect on joint cross-docking adoption intention at one-tailed test ($\beta = .11$; $t = 1.67$; $t > 1.645$). This result suggests that inter-organizational trust positively moderates the relationship between legitimacy motivation and JCXD adoption intention. This implies that inter-organizational trust strengthens the positive relationship between legitimacy motivation and JCXD adoption intention, such that at high levels of inter-organizational trust, firms' legitimacy motivations for 3PL joint cross-docking adoption drive its adoption intention **more than at low levels** of inter-organizational trust.

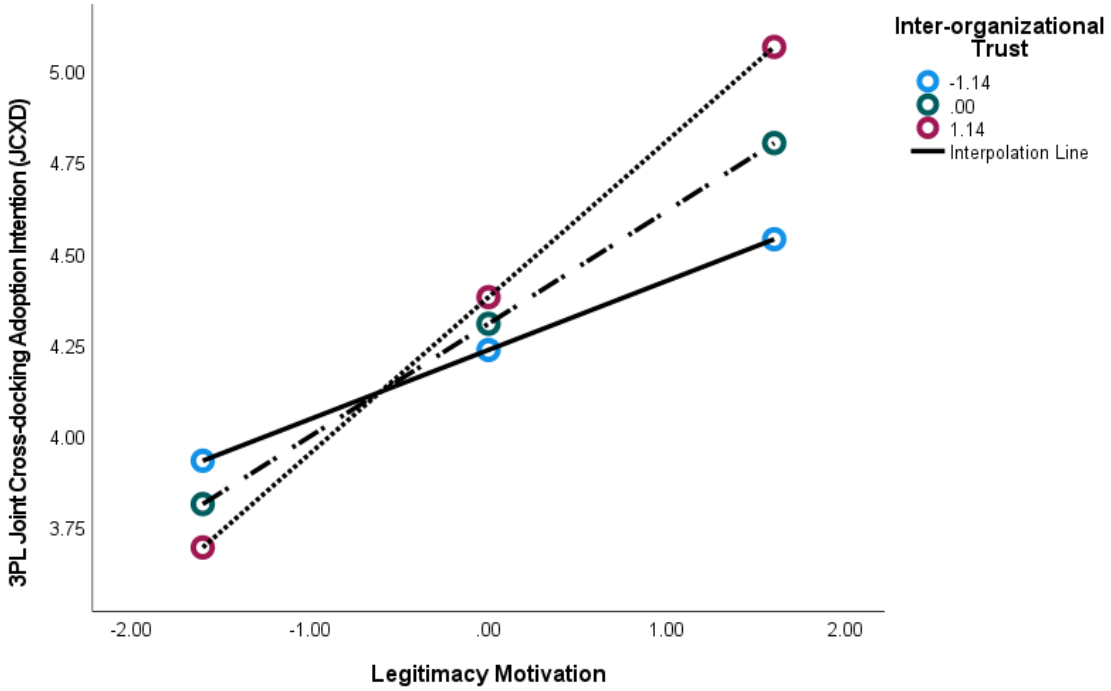

Figure 4.3: Interaction effect (LM*IOT) on JCXD adoption intention

Source: Field survey (2024)

This result supports hypothesis 3b, confirming the positive moderating role of inter-organizational trust in the relationship between legitimacy motivation and 3PL JCXD adoption intention. Interaction graph and Johnson-Neyman output from the Hayes Process macro are displayed in Figure 4.3 and Table 4.17. The graph demonstrates that the slope of the relationship, which signifies the rate of change increases when inter-organizational trust level is high (as indicated with red circle) than at low levels (as indicated with blue circle). This shows the positive moderating effect of inter-organizational trust.

The Johnson-Neyman output produces the conditional effect of the predictor at varied levels of the moderator. From Table 4.15, the relationship between efficiency motivation and JCXD adoption intention from increases significantly from 0.209 to 0.522, when organizational readiness increases significantly from -0.952 to 2.033.

Table 4.17: Johnson-Neyman Output on the conditional effect of LM on JCXD adoption intention at values of the moderator (IOT)

IOT	Effect	se	T	P	LLCI	ULCI
-3.967	-0.106	0.277	-0.384	0.702	-0.653	0.44
-3.667	-0.075	0.259	-0.289	0.773	-0.585	0.436
-3.367	-0.043	0.241	-0.18	0.857	-0.518	0.432
-3.067	-0.012	0.223	-0.054	0.957	-0.452	0.428
-2.767	0.019	0.205	0.095	0.925	-0.385	0.424
-2.467	0.051	0.187	0.271	0.787	-0.319	0.421
-2.167	0.082	0.17	0.483	0.63	-0.254	0.418
-1.867	0.114	0.153	0.741	0.46	-0.189	0.416
-1.567	0.145	0.137	1.059	0.291	-0.125	0.416
-1.267	0.176	0.121	1.454	0.148	-0.063	0.416
-0.967	0.208	0.107	1.946	0.053	-0.003	0.419
-0.952	0.209	0.106	1.974	0.05	0	0.419
-0.667	0.239	0.094	2.551	0.012	0.054	0.424
-0.367	0.271	0.083	3.259	0.001	0.107	0.435
-0.067	0.302	0.076	4	0	0.153	0.451
0.233	0.333	0.072	4.615	0	0.191	0.476
0.533	0.365	0.074	4.943	0	0.219	0.511

0.833	0.396	0.08	4.958	0	0.239	0.554
1.133	0.428	0.09	4.771	0	0.251	0.605
1.433	0.459	0.102	4.502	0	0.258	0.66
1.733	0.491	0.116	4.227	0	0.261	0.72
2.033	0.522	0.131	3.974	0	0.263	0.781

Source: Field survey (2024)

Finally, Model 6 estimated the interaction effect of legitimacy motivation and organizational readiness on firms JCXD adoption intention. The study regressed the control variables, legitimacy motivation, organizational readiness and the interaction effect (LM*OR) on the dependent variable. The results from the Table 4.13 revealed that the predictors explained 15.0% variation in the dependent variable, with a significant F-value of 5.983. The regression coefficients suggest that the interaction between legitimacy motivation and organizational readiness has an insignificant negative effect on joint cross-docking adoption intention at one-tailed test (β = -.03; t = -.44; | t | < 1.645). This result suggests that organizational readiness does not significantly moderate the relationship between legitimacy motivation and JCXD adoption intention. Therefore, hypothesis 4b is not supported.

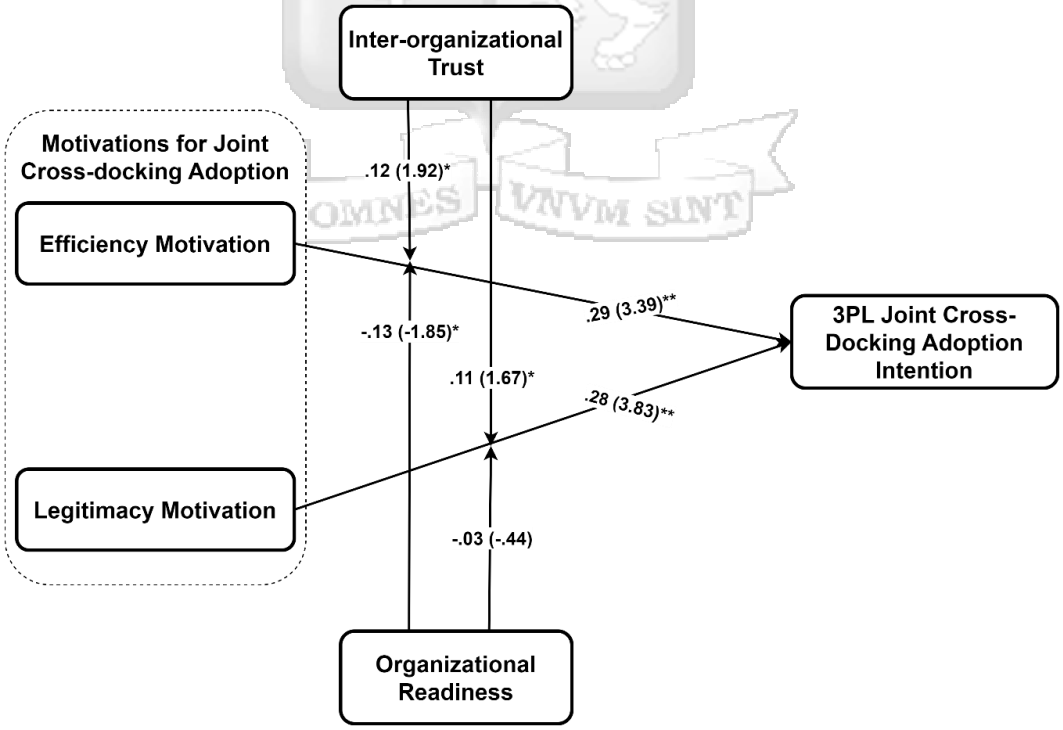

Figure 4.4: Regression results

Source: Field survey (2024)

4.9 Summary of Hypotheses

This section presents a summary of the hypotheses. All the hypotheses were tested at 5% significance level and at one tail, thus, the minimum t-value for significance is 1.645.

Table 4.18: Summary of Hypotheses

H	Hypotheses	β	t	Remarks
H1+	Efficiency Motivation (EM) → 3PL JCXD Adoption Intention (JCXDAI)	.29	3.39**	Supported
H2+	Legitimacy Motivation (LM) → 3PL Joint CXD Adoption Intention (JCXDAI)	.28	3.83**	Supported
H3a+	EM*IOT → JCXDAI	.12	1.92*	Supported
H3b+	LM*IOT → JCXDAI	.11	1.67*	Supported
H4a+	EM*OR → JCXDAI	-.13	-1.85*	Not Supported
H4b+	LM*OR → JCXDAI	-.03	-.44	Not Supported

** |t-value| > 1.96 at one tail; *| t-value| > 1.645 at one tail

Source: Field survey (2024)

Out of the six (6) hypotheses tested in the study, the study supported four (4) of them. These are presented in Table 4.18.

4.10 Discussion of Results

This section presents a discussion of the results based on the objectives of the study. The discussions are presented in line with literature.

4.10.1 Organizational Motivations and Joint Cross-docking Adoption Intention Relationship

The first objective of the study was to examine the relationship between organizational motivations and joint cross-docking adoption intention among FMCG manufacturing firms in Kenya. The study found that both efficiency motivation and legitimacy motivation have significant positive effect on joint cross-docking adoption intention. This implies that FMCG manufacturing firms are willing to adopt 3PL joint

cross-docking when they perceive that its adoption can offer both economic and legitimate benefits. Thus, organizations intending to make effective use of resources and minimize waste are more driven to implement joint cross-docking. This result is supported by the TCE, that relates cost minimization goals, including improving inventory management, optimizing transportation routes, consolidating loads, and improving response time (Gegeleso et al., 2021) as motivations for outsourcing decisions. Prior research demonstrates that cross-docking decreases inventory management costs, including handling costs, holding costs (Benrqya, 2020; Benrqya et al., 2020; Liu & Li, 2023; Shahram fard & Vahdani, 2019). The TCE theory supports the economic efficiency rationale for why firms may adopt a strategy to reduce costs. Thus, the TCE provides the theoretical basis for explaining the need for efficiency in adopting joint cross-docking for economic reasons.

Similarly, the study demonstrates that organizations intending to acquire social legitimacy from their business partners (including suppliers, customers, etc.) may be driven to engage in policies that improves their logistics and supply chain practices. From the institutional theory perspective, compliance to norms and expectations is essential for an organization to maintain its legitimacy and secure important resources (DiMaggio & Powell, 1983; Liu et al., 2010). From the normative and mimetic tenets of the institutional theory (DiMaggio & Powell, 1983), decisions on joint cross-docking adoption are also respectively based on institutional expectations and actions competitors take in their risk minimization agenda (Liu et al., 2010). Therefore, firms that perceive that their competitors are benefiting from joint cross-docking may learn to adopt the practices to stay competitive. Similarly, when firms perceive a high level of social legitimacy among their stakeholders for joint cross-docking adoption, they become more eager to adopt to gain the legitimacy and recognition from their stakeholders (Heugens & Lander, 2009; Liu et al., 2010). In technology adoption literature, this study aligns with the study of Liu et al. (2010), who also found that efficiency motivations and legitimacy motivations drive the adoption of supply chain technologies.

4.10.2 Moderating Role of Inter-organizational Trust

The second objective of the study was to examine the moderating role of inter-organizational trust in the relationship between organizational motivations and joint

cross-docking adoption intention. The study found that inter-organizational trust significantly and positively moderates the relationship between both organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intention. This implies that the efficiency motivation and legitimacy motivation drive firms more to adopt joint cross-docking adoption when there is high inter-organizational trust among their supply chain actors than when there is mistrust among the actors. This demonstrates the essential role or trust in facilitating joint cross-docking adoption.

Inter-organizational trust plays a crucial role in establishing a sense of mutual confidence in supply chain partner relationships (Bettis-Outland et al., 2021; Jain et al., 2014; Johnston et al., 2004). Trust can deter opportunistic behavior and the pursuit of self-interest, traits that are commonly observed in supply networks (Ali & Larimo, 2016; Hawkins et al., 2008; Liu et al., 2010; Lumineau et al., 2022; Tran et al., 2021; Wang et al., 2021; Yen & Hung, 2017) and minimise transaction costs (Delbufalo, 2012; Kim et al., 2010). Developing trust among different organizations is important for improving collaboration between partners, including the sharing of information to enhance the visibility of physical product flows among these firms (Wei et al., 2012).

The study demonstrates that it is imperative for an organization that intends to adopt cross-docking to build trust with trading partners. This trust is essential for ensuring the smooth operation of key activities, thereby reducing delivery delays and failures. From the contingency theory perspective (Lawrence & Lorsch, 1967; Luthans et al., 1976), inter-organizational trust as an internal-external resource built through social exchanges with trading partners minimize risks of uncertainties, information asymmetry, and opportunistic behaviors, that could be associated with the adoption of cross-docking 3PL.

4.10.3 Moderating role of Organizational Readiness

The third objective of the study was to examine the moderating role of organizational readiness in the relationship between both organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intentions. Interestingly, the study found that organizational readiness significantly and negatively moderates the relationship between efficiency motivation and joint cross-docking adoption intention. This is contrary to the positive effect proposed. However,

it failed to moderate the relationship between legitimacy motivation and adoption intention. There are a number of plausible reasons why organizational readiness might still negatively moderate this relationship, even at a high mean score of organizational readiness.

First, organizational readiness might lead to overconfidence in their ability to adopt joint cross-docking, causing them to overlook potential risks. Excessive reliance on their readiness, in terms of resources, technology availability and staff capabilities can lead to complacency in planning and preparation, insufficient risk assessment and underestimate the complexities of joint cross-docking. The consequence is their inability to implement joint cross-docking adoption as expected.

Second, organizations might fear that adopting joint cross-docking could disrupt their existing operations. This can attract resistance from employees and stakeholders even when its adoption offers potential benefits. Third, prior negative experiences with similar initiatives might deter the firms from carrying out the initiatives. Past mistakes and failures from similar initiatives make them overly risk-averse and become skepticism about potential benefits, affecting their willingness to adopt joint cross-docking.

Despite the explanations, the study however, attributes the insignificant results for organizational readiness to the weaknesses in the contingency theory. Contingency theory relies on a few assumptions that have been explicitly stated, and these guide contingency research. The first explicit assumption is that there is no one best way to organize; the second is that any way of organizing is not equally effective under all conditions (Galbraith, 1973). The theory then asserts that, in order to be most effective, organizational structures should be appropriate to the work performed and/or to the environmental conditions facing the organization.

As the theory thrives on only a few assumptions, few factors are taken into account, which may not be sufficient to explain specific boundary conditions. Although the overall strategy is reasonably clear, the substance of the theory is not clear (Schoonhoven, 1981).

CHAPTER FIVE

DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings from the study. The summary of the findings is presented based on the objectives of the study. The chapter also presents the conclusion emerging from the study as well as practical implications for management and recommendation for future studies.

5.2 Summary of Findings

This section presents a summary of the findings emerging from the study. These are presented based on the objectives of the study and the various hypotheses.

5.2.1 Organizational Motivations and 3PL Joint Cross-docking Adoption Intention Relationship

The first objective of the study was to examine the relationship between organizational motivations and joint cross-docking adoption intention among FMCG manufacturing firms in Kenya. The study found that both efficiency motivation and legitimacy motivation have significant positive effect on joint cross-docking adoption intention. This implies that FMCG manufacturing firms are willing to adopt 3PL joint cross-docking when they perceive that its adoption can offer both economic and legitimate benefits. Thus, organizations intending to make effective use of resources and minimize waste are more driven to implement joint cross-docking. Similarly, the study demonstrates that organizations intending to acquire social legitimacy from their business partners (including suppliers, customers, etc.) may be driven to engage in policies that improve their logistics and supply chain practices.

This result is supported by the TCE, that relates cost minimization goals, including improving inventory management, optimizing transportation routes, consolidating loads, and improving response time (Gegeleso et al., 2021) as motivations for outsourcing decisions. The TCE theory supports the economic efficiency rationale for why firms may adopt a strategy to reduce costs. Thus, the TCE provides the theoretical basis for explaining the need for efficiency in adopting joint cross-docking for economic reasons.

From the institutional theory perspective, compliance to norms and expectations is essential for an organization to maintain its legitimacy and secure important resources (DiMaggio & Powell, 1983; Liu et al., 2010). From the normative and mimetic tenets of the institutional theory (DiMaggio & Powell, 1983), decisions on joint cross-docking adoption are also respectively based on institutional expectations and actions competitors take in their risk minimization agenda (Liu et al., 2010). Therefore, firms that perceive that their competitors are benefiting from joint cross-docking may learn to adopt the practices to stay competitive. Similarly, when firms perceive a high level of social legitimacy among their stakeholders for joint cross-docking adoption, they become more eager to adopt to gain the legitimacy and recognition from their stakeholders (Heugens & Lander, 2009; Liu et al., 2010).

5.2.2 Moderating Role of Inter-organizational Trust

The second objective of the study was to examine the moderating role of inter-organizational trust in the relationship between organizational motivations and joint cross-docking adoption intention. The study found that inter-organizational trust significantly and positively moderates the relationship between both organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intention. This implies that the efficiency motivation and legitimacy motivation drive firms more to adopt joint cross-docking adoption when there is high inter-organizational trust among their supply chain actors than when there is mistrust among the actors. This demonstrates the essential role of trust in facilitating joint cross-docking adoption. Inter-organizational trust plays a crucial role in establishing a sense of mutual confidence in supply chain partner relationships.

Trust can deter opportunistic behavior and the pursuit of self-interest, traits that are commonly observed in supply networks and minimise transaction costs. Developing trust among different organizations is important for improving collaboration between partners, including the sharing of information to enhance the visibility of physical product flows among these firms. The study demonstrates that it is imperative for an organization that intends to adopt cross-docking to build trust with trading partners. This trust is essential for ensuring the smooth operation of key activities, thereby reducing delivery delays and failures.

The study demonstrates that it is imperative for an organization that intends to adopt cross-docking to build trust with trading partners. This trust is essential for ensuring the smooth operation of key activities, thereby reducing delivery delays and failures. From the contingency theory perspective (Lawrence & Lorsch, 1967; Luthans et al., 1976), inter-organizational trust as an internal-external resource built through social exchanges with trading partners minimize risks of uncertainties, information asymmetry, and opportunistic behaviors, that could be associated with the adoption of cross-docking 3PL.

5.2.3 Moderating Role of Organizational Readiness

The third objective of the study was to examine the moderating role of organizational readiness in the relationship between both organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intentions. Interestingly, the study found that organizational readiness significantly and negatively moderates the relationship between efficiency motivation and joint cross-docking adoption intention. This is contrary to the positive effect proposed. However, it failed to moderate the relationship between legitimacy motivation and adoption intention.

Despite the explanations, the study however, attributes the insignificant results for organizational readiness to the weaknesses in the contingency theory. Contingency theory relies on a few assumptions that have been explicitly stated, and these guide contingency research. As the theory thrives on only a few assumptions, few factors are taken into account, which may not be sufficient to explain specific boundary conditions. Although the overall strategy is reasonably clear, the substance of the theory is not clear (Schoonhoven, 1981).

5.4 Conclusion

Despite the popularity of joint cross-docking across the globe, its adoption among developing countries remains extremely low, largely due to the low awareness of the potential benefits and knowledge of underlying conditions that support its adoption. This study therefore sought to examine the organizational motivations that drive the adoption of joint cross-docking and boundary conditions that support the adoption among FMCG manufacturing firms in Kenya. The study identified two organizational motivations for joint cross-docking adoption intention. These were efficiency

motivation and legitimacy motivation. Also, the study identified inter-organizational trust and organizational readiness as two boundary conditions that supports how the organizational motivations drive the adoption intention. Data from 176 FMCG manufacturing firms suggests that both organizational motivations (efficiency motivation and legitimacy motivation) have significant positive relationship with joint cross-docking adoption intention, supporting both hypothesis 1 and hypothesis 2. The study also found that inter-organizational trust positively moderates the relationship between organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intention, supporting hypothesis 3a and hypothesis 3b. These suggest that efficiency motivation and legitimacy motivation drive firms more to adopt joint cross-docking adoption when there is high inter-organizational trust among their supply chain actors than when there is mistrust among the actors. This confirms the essential role of trust in establishing a sense of mutual confidence in supply chain partner relationships, by minimizing opportunistic behavior and the pursuit of self-interest, traits that are commonly observed in supply networks. This facilitates collaboration between partners, including the sharing of information to enhance the visibility of physical product flows among these firms. The study demonstrates that it is imperative for an organization that intends to adopt joint cross-docking to build trust with trading partners. This trust is essential for ensuring the smooth operation of key activities, thereby reducing delivery delays and failures.

However, organizational readiness negatively moderates the relationship between efficiency motivation and joint cross-docking adoption intention, whereas it failed to significantly moderates the relationship between legitimacy motivation and joint cross-docking adoption intention, rejecting both hypothesis 4a and hypothesis 4b. This contrasting finding may be attributed to complacency and overconfidence in their readiness, in terms of resources, technology availability and staff capabilities to adopt joint cross-docking, causing them to overlook potential risks. It could also be attributed to some fear that adopting joint cross-docking could disrupt their existing operations, thereby attracting resistance from employees and some stakeholders even when its adoption offers potential benefits.

5.5 Recommendations/Implications

This section presents recommendations based on the findings from the study. The recommendations are in three-folds: for management, policy and future research.

5.5.1 Managerial Implications

The study found that both organizational motivations (efficiency motivation and legitimacy motivation) have significant positive relationship with joint cross-docking adoption intention.

By implication, it is essential for managers to prioritize efficiency improvements by emphasizing the potential benefits of joint cross-docking, including lower transportation expenses and enhanced delivery timelines. Organizations need to perform cost-benefit analyses to equip managers with data-driven insights into the possible cost reductions and efficiency improvements associated with joint cross-docking. They should also establish key performance indicators to assess the efficiency enhancements of joint cross-docking, such as decreased transit times or increased cargo capacity.

Additionally, managers ought to underscore industry best practices by presenting examples of successful joint cross-docking implementations in the sector to validate their efforts. They can pursue certifications and compliance to ensure that joint cross-docking operations adhere to pertinent regulations and secure necessary certifications to bolster credibility. Ultimately, they should cultivate strategic partnerships and collaborate with other organizations to affirm their dedication to joint cross-docking and enhance their legitimacy.

The study also found that inter-organizational trust positively moderates the relationship between organizational motivations (efficiency motivation and legitimacy motivation) and joint cross-docking adoption intention. Firms need to promote open communication by encouraging transparent and consistent dialogue among partners to foster trust. They must outline shared goals and expectations to guarantee that all partners are unified and striving towards the same aims. Furthermore, managers should establish trust-building mechanisms. They ought to implement strategies such as regular progress updates, collaborative problem-solving, and conflict resolution procedures to nurture trust.

Contrary to expectations, the study found that organizational readiness negatively moderates the relationship between efficiency motivation and joint cross-docking adoption intention, whereas it failed to significantly moderates the relationship between legitimacy motivation and joint cross-docking adoption intention. Managers need to carry out readiness assessments to gauge organizational preparedness for adopting joint cross-docking, pinpointing areas that require enhancement. They should also devise customized implementation plans to tackle specific organizational readiness obstacles effectively. Organizations must offer training and development programs to improve organizational capabilities and readiness.

5.5.2 Policy Implications

Policymakers ought to establish industry-wide standards by formulating guidelines and benchmarks for joint cross-docking, thereby enhancing both legitimacy and efficiency.

Policymakers should also consider offering incentives for adoption. They might provide inducements, such as tax reductions or subsidies, to motivate organizations to embrace joint cross-docking. Moreover, they should finance research and development initiatives aimed at enhancing the efficiency and effectiveness of joint cross-docking operations. By executing these recommendations, managers and policymakers can facilitate the adoption of joint cross-docking, thereby enhancing efficiency and legitimacy, and fostering a more collaborative and sustainable logistics among FMCG manufacturing sector.

5.5.3 Limitations of the Study

Despite the contributions of the study, it has two major limitations, which need to be highlighted to guide interpretations. First, this study employed a cross-sectional design, which is insufficient to discuss causal effect. Second, this study considered firms operating in Kenya. As a result, findings may not reflect in economies that have different cultural and structural background, like Asia, Europea and America.

5.5.4 Recommendations for Future Research

Contrary to expectations, organizational readiness negatively moderates the relationship between efficiency motivation and adoption intention. Organizational readiness has several dimensions, such as resource readiness, IT readiness, cultural readiness, cognitive readiness, strategic readiness, partnership readiness (Hussain &

Papastathopoulos, 2022). It is possible that analyzing readiness at the first-order level can produce different insights peculiar to specific readiness dimension. Future research is therefore encouraged to investigate the readiness dimension separately.

Second, the study recommends to future study to extend the current study from intention to adopt to actual adoption. Third, this study is a quantitative study, therefore, in-depth insights could not be drawn from the study. Future study is encouraged to conduct a qualitative or a mixed method to provide a more comprehensive understanding of joint cross-docking adoption. Moreover, future research is recommended to perform an in-depth case study of organizations that have successfully adopted joint cross-docking to identify best practices and challenges. Finally, the study is a cross-sectional survey, hence causality could not be drawn from the findings. Future studies are required to perform a longitudinal study to examine the trend of joint cross-docking adoption over time.

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Appendix I: Authorization Letter

Date: .....

The Managing Director ….....

Dear Sir/Madam,

RE: ACADEMIC RESEARCH: DRIVERS OF JOINT CROSS-DOCKING THIRD-PARTY LOGISTICS ADOPTION INTENTION AMONG FMCG MANUFACTURERS IN KENYA: THE MODERATING ROLES OF ORGANIZATIONAL READINESS AND INTER-ORGANIZATIONAL TRUST

I am a student at Strathmore University's School of Business Studies pursuing a Master's degree, MSc. Development studies. As part of the program, I am required to undertake research as partial fulfillment for the award of a master's degree.

Your organization has been identified as one of the companies to form part of this novel study on the utility of joint cross-docking third-party logistics by FMCG manufacturers on their business performance in Kenya.

This is to request your indulgence and to allow the collection of relevant information through the use of questionnaires and interviews with your staff, particularly in the supply chain and procurement management.

It is my assurance that the data collected will be treated with the utmost confidentially, will not be shared with any third party but strictly applied for this academic research.

I look forward to your kind consideration.

Yours sincerely,

Stephen M Kivuva

[Admin. No. 147174]

Appendix II: Sample Questionnaire

***STUDY TOPIC*: DRIVERS OF JOINT CROSS-DOCKING THIRD-PARTY LOGISTICS ADOPTION INTENTION AMONG FMCG MANUFACTURERS IN KENYA: THE MODERATING ROLES OF ORGANIZATIONAL READINESS AND INTER-ORGANIZATIONAL TRUST**

The information requested is strictly confidential and will only be used for academic purposes. Respondents are encouraged to provide any additional information which in their view consider to be both important and relevant to this study.

PART 1:

ORGANISATIONAL DATA:
This section seeks to provide the general information of your organization.

1. Company name [optional]…….
2. Kindly indicate the type of products your company manufactures
   A] Beverages [ ]
   B] Food [ ]
   C] Detergents [ ]
   D] Others [ ]

3. What is the company's ownership structure?
   A] Local [ ]
   B] Foreign [ ]
   C] Both [ ]

4. What is your distribution network?
   A] Kenyan Market only [ ]
   B] International market only [ ]
   C] Both markets [ ]

5. Do you handle your logistics internally or outsource

   A] Internal handling [ ]

   B] Outsourcing [ ]

6. If logistics are outsourced, which aspects of the distribution logistics are you outsourcing

   A] Warehousing [ ]

   B] Transport services [ ]

   C] Please specify any other service……..

7. If logistics are outsourced, are you engaging a single service provider or several providers

   A] Single [ ]

   B] Several [ ]

8. Have you engaged utility of a cross-docking warehousing facility either owned or through a third-party logistics service provider

   A] Yes [ ]

   B] No [ ]

INSTRUCTIONS: Please kindly write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (✓) all that apply.	
Title or Job Position in the Company [ ] supervisor [ ] middle manager [ ] top manager	Level of education: ☐ diploma/HND ☐ 1st Degree ☐ 2nd Degree or more
Number of Employees _____	What is the age of your firm? _____
Please indicate the yearly average revenue of the Company in KES	_____
Instructions: Indicate your opinion for the following statement by placing a checkmark (✓) in the right column under the 7-point Likert Scale.	
Ordinal scale: ***1 = Strongly Disagree; 2 = Disagree; 3 = Somewhat Disagree; 4 = Neither Agree nor Disagree; 5 = Somewhat Agree; 6 = Agree; 7 = Strongly Agree***	

Efficiency motivation *We would adopt cross-docking Third-Party Logistics (3PL) because we want:*	**7-point Likert Scale** ***Strongly Disagree*** 1 2 3 4 5 6 7 ***Strongly Agree***
To speed up order response time	1 2 3 4 5 6 7
To cut costs in operations	1 2 3 4 5 6 7
To facilitate better inventory control	1 2 3 4 5 6 7
To help generate competitive advantage.	1 2 3 4 5 6 7
The adoption of the cross-docking Third-party Logistics would enable the organization to deliver greater benefits to customers for a given cost (or can deliver the same benefit levels for a lower cost)	1 2 3 4 5 6 7
Legitimacy motivation *We would adopt cross-docking Third-Party Logistics (3PL) because we want:*	***Strongly Disagree*** 1 2 3 4 5 6 7 ***Strongly Agree***
Our competitors have benefited greatly with its adoption	1 2 3 4 5 6 7
Our competitors who have adopted it are perceived favorably by customers in the same industry	1 2 3 4 5 6 7

Our competitors who have adopted it are perceived favorably by suppliers in the same industry	1	2	3	4	5	6	7
It is required by our key suppliers	1	2	3	4	5	6	7
Most of our suppliers have adopted them	1	2	3	4	5	6	7
Inter-organizational trust	***Strongly Disagree***						***Strongly Agree***
Our supply chain partners keep promises they make to our firm	1	2	3	4	5	6	7
Our supply chain partners are often honest to us	1	2	3	4	5	6	7
We believe the information our supply chain partners provide us	1	2	3	4	5	6	7
Our supply chain partners are genuinely concerned that our business succeeds.	1	2	3	4	5	6	7
When making important decisions, our supply chain partners consider our welfare as their own.	1	2	3	4	5	6	7
We trust our supply chain partners keep our best interest in mind	1	2	3	4	5	6	7
Our supply chain partners are trustworthy	1	2	3	4	5	6	7
It is not necessary to be cautious with our supply chain partners.	1	2	3	4	5	6	7
Our supply chain partners never use opportunities that arise to profit at our expense.	1	2	3	4	5	6	7
This supplier has always been evenhanded in its negotiations with us.	1	2	3	4	5	6	7
We could count on the supplier to be sincere in their dealings with our firm.	1	2	3	4	5	6	7
The supplier was a company that stood by its word.	1	2	3	4	5	6	7
Organizational readiness	***Strongly Disagree***						***Strongly Agree***
Overall, our organization has the necessary resources, technologies, and staff capabilities to facilitate a change.	1	2	3	4	5	6	7

Overall, our organization has a well-developed culture to engage professionals to facilitate a change	1	2	3	4	5	6	7
Overall, our organization has a well-established culture, strategy, and partnerships to facilitate a change.	1	2	3	4	5	6	7
Our organization takes reasonable risk assessment to facilitate a change.	1	2	3	4	5	6	7
Overall, our organizational strategic goals are clear, relevant, and well-communicated to facilitate a change.	1	2	3	4	5	6	7
Our staff members have the right attitudes that facilitate a change.	1	2	3	4	5	6	7
Our staff members are empowered to make decisions that facilitate a change	1	2	3	4	5	6	7
Our organization is flexible in allocating adequate IT infrastructure resources necessary to facilitate a change.	1	2	3	4	5	6	7
Enterprise system/s in my organization is stable, up-to-date, and reliable.	1	2	3	4	5	6	7
Joint Cross-docking 3PL Adoption Intention	***Strongly Disagree***						***Strongly Agree***
We intend to use cross-docking third party logistics in our business services	1	2	3	4	5	6	7
We plan to use cross-docking third party logistics in the next few months.	1	2	3	4	5	6	7
We think we will use cross-docking third party logistics in our business in the near future.	1	2	3	4	5	6	7
Given a chance, we predict we will use cross-docking third party logistics.	1	2	3	4	5	6	7

Thank you. Your participation is greatly appreciated. If you are interested in a personalized copy of the analysed results, please attach a business card or provide your contact information.

Appendix III: Ethical Committee Approval

16th September 2024

Mr Kivuva Stephen,
stephen.kivuva@strathmore.edu

Dear Mr Kivuva,

RE: Drivers of Joint Cross-Docking Third-Party Logistics Adoption Intention among FMCG Manufacturers in Kenya: The Moderating Roles of Organizational Readiness and Inter-Organizational Trust

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** proposal. Your application reference number is **SU-ISERC2375/24.** The approval period is from **16th September 2024 to 15th September 2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

Mr Ambrose Rachier,
Chairperson; SU-ISERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix IV: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **287818**

Date of Issue: **24/September/2024**

RESEARCH LICENSE

This is to Certify that Mr.. STEPHEN MUTHAMI KIVUVA of Strathmore 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: DRIVERS OF JOINT CROSS-DOCKING THIRD-PARTY LOGISTICS ADOPTION INTENTION AMONG FMCG MANUFACTURERS IN KENYA: THE MODERATING ROLES OF ORGANIZATIONAL READINESS AND INTER-ORGANIZATIONAL TRUST for the period ending : 24/September/2025.

License No: **NACOSTI/P/24/40459**

287818

Applicant Identification Number

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

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
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