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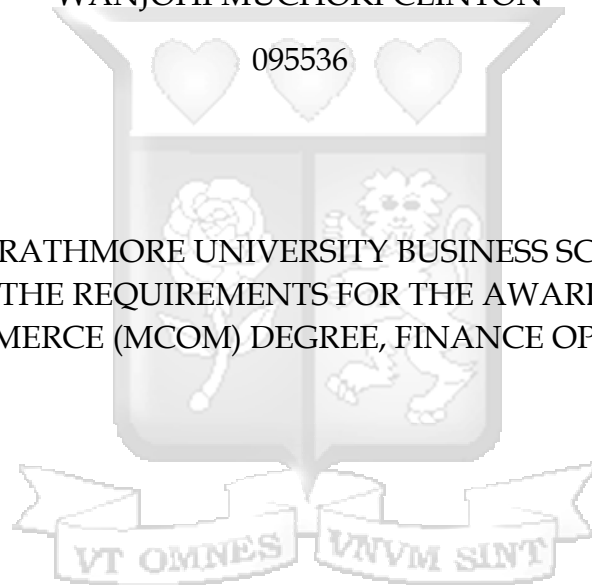
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THE IMPACT OF SUPPLY CHAIN FINANCE MECHANISMS ON THE
SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS IN
NAIROBI, KENYA.

WANJOHI MUCHOKI CLINTON



SUBMITTED TO STRATHMORE UNIVERSITY BUSINESS SCHOOL IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF
COMMERCE (MCOM) DEGREE, FINANCE OPTION.

STRATHMORE UNIVERSITY BUSINESS SCHOOL
STRATHMORE UNIVERSITY
NAIROBI, KENYA.

APRIL 2023.

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 thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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ABSTRACT

Supply chain financing (SCF) has gained increasing popularity and attention among practitioners and academicians, particularly after the global economic crisis during 2007–2008. This study aimed to assess the adoption and impact of SCF on the supply chain performance (SCP) of manufacturing firms, with a focus on external collaboration as a moderating factor. The specific objectives were to determine the impact of pre-shipment and post-shipment SCF mechanisms on SCP in manufacturing firms in Nairobi, Kenya as well as the moderating effect of external collaboration on this impact. Guided by resource-based view and social exchange theories, the study used a multistage sampling technique to select 256 firms from a population of 725 registered manufacturing firms in the Kenya Association of Manufacturers (KAM) database as of December 2021. Primary data was collected through questionnaires and analyzed using SPSS, employing descriptive and inferential statistics. The findings revealed that pre-shipment SCF had a positive and significant impact on SCP, while post-shipment SCF had a negative and significant impact. Moreover, external collaboration was found to moderate the relationship between SCF and SCP. These findings suggest that the adoption of SCF mechanisms, particularly pre-shipment financing, can enhance supply chain performance in the manufacturing sector. The study highlights the importance of considering external collaboration as a facilitator for maximizing the benefits of SCF adoption. The implications of these findings are significant for manufacturing firms in Nairobi, as they provide insights into the strategic utilization of SCF mechanisms and the importance of fostering collaborative relationships with external partners. This study contributes to the existing body of knowledge on SCF and SCP, offering valuable guidance for practitioners and policymakers in the manufacturing sector.

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LIST OF ABBREVIATIONS

SCF Supply chain finance

SCP supply chain performance

RF Reverse Factoring

KAM Kenya Association of Manufacturers

GOK Government of Kenya

SC Supply chain

RBV Resource based view

SET Social exchange theory.

PO Purchase order

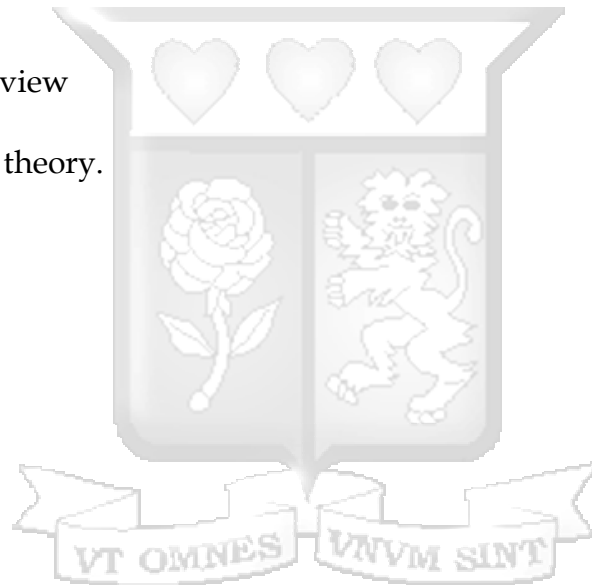


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CHAPTER ONE

INTRODUCTION

1.1 Introduction

The chapter sets a scene for the thesis and appraises the concepts of Supply chain financing mechanisms of manufacturing firms. Moreover, the chapter provides a synopsis of the research problems, theoretical gaps of the study, research aim, questions, objectives, and novelty.

1.2 Background of the study

Supply chain financing (SCF) has gained increasing popularity and attention among practitioners and academicians, particularly after the global economic crisis during 2007–2008 (Parida et al., 2021). SCF is defined by More and Basu (2013), as

“A unique kind of financing product which oversees, plans, and controls all money streams across the entire supply chain members to improve the working capital.”

The emergence of SCF has contributed to the growth of the product category of financial institutions in today’s business world. The impact of SCF on the growth and development of manufacturing firms in this modern age cannot be overlooked since traditional financing proves to be expensive for manufacturing firms who largely rely on revolving and intensive working capital (Lekkakos & Serrano, 2016). Supply Chain management has shifted focus into designing and maximizing cash flows within firms as their executive role.

The availability of SCF solutions enables firms to accomplish their targets on time by obtaining financing from financial institutions. SCF aims to optimize the cash flow at the inter-organizational level while employing the solutions given by service providers or financial institutions (Ma, Wang & Chan, 2020). SCF mechanisms demonstrate how to connect cash flow with product and information flow to get the best results possible from the current SC cycle within an SC perspective (Wuttke et al., 2013b). SCF relies on

cooperation from all concerned members of the SC which results in lower capital cost, low risk of default and new loan opportunities. Moreover, SCF enhances the level of commitment, trust, confidence, and profitability at an inter-organizational level among all members of SCs (Deepu, & Ravi, 2021).

Globally, Manufacturing firms are known to be significant contributors to the growth and strength of a country's economy with significant development in the sector observed in the last decade (Saleem et al., 2020). The success of these enterprises in the globalized and competitive environment depends on effective management of their supply chains (Lawal & Akingbade, 2018). Manufacturing firms therefore require robust supply chain management to maintain their competitive edge globally. This agrees with Nguema et al., (2021) who point out that the success of these firms largely depends on the ability to adapt and improve their supply chain effectiveness (SCE). Despite the manufacturing firms contributing greatly to the economic growth, several firms still face challenges. The 2007-2008 financial crisis generated a large deficit globally in the approval of new loans with a major increase in the cost of capital (Ivashina & Scharfstein, 2010). In this situation, manufacturing firms could hardly obtain loans from many financial institutions such as banks (Cornett et al., 2011). The unavailability of funds to manage their huge working capital demands leaves most firms in financial distress positions having forced them to get into traditional expensive loans. As a result, manufacturing firms are now looking for different sources of financing solutions, which can help them to settle and overcome their operational issues and strengthen SC performance. To realize such a goal, there are certain effective measures that firms need to adopt to aid them in achieving significant operational and financial performance, like using tech based innovative SCF mechanisms (Saleem et al., 2020; Engelseth & Wang, 2018).

Afonso and Cabrita (2015), conducted a study that aimed at developing a framework for lean supply chain performance and recommended that the financing arm of SMEs especially within the manufacturing sector to improve the adoption of strategies that

reduce on cost and time. Ali et al., (2018), reveal that supply chain finance as a risk mitigation strategy helps to improve the firm's performance. The disruptions witnessed by the emergence of a world epidemic Covid-19 calls for more research to help firms to adopt methods and mechanisms that inform their supply chain effectiveness. Some of these mechanisms are finance-based while some are operational based. This study therefore was necessary to demystify the impacts of the supply chain mechanisms that manufacturing firms adopt to improve their supply chains' performance.

1.2.1 Supply chain financing mechanisms

Literature review highlights the existence of two orientations of supply chain finance, the finance oriented and the supply chain-oriented perspectives (Gelsomino et al., 2016). The former is focused on financial aspects and considers the SCF approach as a set of financial solutions, very often provided by financial institutions (Camerinelli, 2009). The latter emphasizes the role of collaboration amongst supply chain members, with a particular focus on inventory and working capital optimization. This perspective extends the boundaries of SCF beyond simply financial solutions, taking into consideration inventories, supply chain processes, and even collaborative solutions for fixed asset financing, such as pay-on production schemes as postulated by Pfohl and Gomm (2009). The differences between the two perspectives result in conflicting frameworks and definitions, and consequently it is still very difficult to derive a clear picture of SCF from the existing literature. The integration of these two existing perspectives is critical if the benefits of the SCF approach are to be more fully realized in practice.

Traditionally, trade financing solutions aimed at enhancing supply chain performance, have viewed working capital enhancement from a single perspective, either the buyer's perspective in their attempt to defer or delay payments or even reducing the payment size or from a seller's angle in their attempt to accelerate cash collection (Hofmann & Belin, 2011). This has contributed to most firms focusing only on their individual supply chain issues taking their own best interests into account rather than understanding the

entire value and supply chain needs and coordinating with their supply chain partners. Consequentially, most firms have hence fallen into the classic prisoner's dilemma (Khadjavi & Lange, 2013).

The optimal solution to minimize capital exposure between buyers and sellers is to coordinate and cooperate simultaneously. Simply shifting the burden from one party to another adds significant risk to the supply chain, including customer loss, business continuity risk, supplier viability risk, material cost inflation, deteriorating support and a several other issues as pointed out by Marak and Pillai (2018). SCF provides an opportunity to collaborate and create benefits for each side of the transaction and improve working capital which ultimately improves the supply chain performance of the entire stakeholders.

Zhao and Huchzermeier (2015), posit that supply chain finance solutions can be categorized, from diverse perspectives in terms of the following issues: Timing of the trigger event, focal point of credit risk, availability of collateral, financed elements in the balance sheet. Under the timing of the trigger event, the SCF solutions can be classified as either pre-shipment financing, in transit financing or post-shipment financing.

This focused on the solutions based on the timing of the trigger event which is in line with what Wuttke (2013), suggested. More specifically, the study identified two SCF solutions, that is pre-shipment SCF (before invoice issuance) and post-shipment SCF (after invoice issuance). Managers can improve upstream supply chain working capital with pre-shipment SCF, whereas post-shipment SCF strengthens the buying firm's working capital position (Wuttke, 2013).

1.2.2 Supply chain performance

Fawcett and Magnan (2008) defined Supply chain performance as:

“The total system’s capability to meet end to end customer requirements through availability of product and observance of timeliness in delivery”.

Shaw, Grant and Mangan (2021), view Supply Chain Performance Measurement as the overall set of measures used to estimate both the competence and capability of the supply chain. Supply Chain management and Performance are major components of competitive strategy that enhance organizational productivity and profitability among firms (Singhry, 2015). Researchers and practitioners have paid a lot of attention lately to organizational performance measurement and metrics. It is impossible to exaggerate the importance of these indicators for an organization's success because they have an impact on strategic, tactical, and operational planning and management. Supply chain Performance measurement and metrics play a crucial role in setting objectives, evaluating performance, and determining future courses of actions (Gunasekaran, et al. 2004). Competition is a constant issue for businesses. The focus of the market today is changing to supply chain performance from individual firm performance as they are more concerned with the entire chain's ability to meet end-customer needs through product availability and responsive, on-time delivery. To achieve that goal, an organization needs performance measures, or "metrics", for global supply chain performance improvements (Gunasekaran, et al. 2004). Performance indicators for the company must demonstrate both how well it manages its business (speed, asset, inventory, and financial metrics) and how well it provides for its clients (service metrics).

This study adopted one of the supply chain performance measures as suggested by Elrod, Murray and Bande (2013) where in their review, they grouped the metrics into four major categories including costs, time, flexibility, and quality which are also supported by Gunasekaran et al., (2020). The study looked at the supply chain cycle time giving

perspective of the turnaround of the entire supply chain as impacted by the SCF mechanisms a firm adopts. Previous studies have either focused on financial or cost perspectives or non-cost perspective (Gunasekaran et al., 2004; Kumar, 2019). Gunasekaran et al., (2004) had long emphasized the role of these measures and metrics in the success of an organization stating that they affect strategic, tactical, and operational planning and control. They added that performance measurement and metrics have an important role to play in setting objectives, evaluating performance, and determining future courses of actions.

1.2.3 External Collaboration

Collaboration has been referred to as the driving force behind effective supply chain management (Ellram and Cooper, 1990; Horvath, 2001) and, as such, may be considered the ultimate core capability (Sanders and Premus, 2005). According to Powell et al., (1996), external collaboration is viewed as a relevant mechanism to increase the firm's internal value and enhance its competitive benefits because, in a knowledge-based network context, the place of innovation does not reside inside the company, but in the intersection between the company and its exterior partners. Porter and Fuller (1986) found that firms can minimize risk by building an investment portfolio through external collaborations. Additionally, firms can develop and improve their basic skills by accessing additional resources through external collaboration (Dyer and Singh, 1998; Powell et al., 1996).

In the context of supply chain management, external collaboration refers to partnership activities in which two or more companies achieve common goals and mutual benefits by integrating business processes, physical processes, capital processes and information processes (Liao et al., 2022). Studies have found that external collaboration is crucial for preserving a supply chain's competitive position (Abeysekara et al., 2019). In addition, a collaborative supply chain typically comprises some characteristics, such as information sharing, goal congruence, decision synchronization, incentive alignment, resource sharing, collaborative communication, and joint knowledge creation (Cao and Zhang, 2011; Soosay and Hyland, 2015). Prior work has investigated the outcome of supply chain

collaboration. For example, using survey data from a textile company's customers, Ramanathan and Gunasekaran (2014) reveal that the success of supply chains is influenced by the factors of collaboration; in addition, future partnerships are impacted by the collaborative execution of supply chain plans. In the context of SCF, to the best of our knowledge, only Ma et al. (2020) have explored the influence of supply chain collaborative factors on SCF adoption. However, Ma et al.'s (2020) findings are based on interpretive structural modeling, with a sample size of approximately 50 practitioners. Hence, the external validity of their findings may be relatively weak. Additionally, the findings of Ma et al. (2020) fail to explain the extent to which external collaboration affects both the adoption of SCF as well as whether this has effect on their performance. Given the above reasons, additional research on the extent to which external collaboration impacts the relationship between SCF adopted mechanisms and their SCP is deemed necessary.

1.2.4 Manufacturing Firms in Kenya

Manufacturing firms in Kenya operate within complex supply chains that involve multiple stages, including raw material sourcing, production, distribution, and customer delivery. These supply chains often involve both domestic and international partners, making them susceptible to various logistical, financial, and operational challenges. Managing the cash flow and working capital requirements across the different stages of the supply chain can be particularly demanding for manufacturing firms. Effective cash flow management is crucial for manufacturing firms to maintain stable operations. However, cash flow volatility caused by delayed payments, long inventory cycles, and seasonality can strain the financial health of these firms. Late payments from customers, especially from large buyers, can disrupt the entire supply chain, affecting the timely payment of suppliers and creating cash flow gaps. Additionally, limited access to finance especially to the SME manufacturing firms, restricts manufacturers' ability to invest in technology upgrades, expand production capacities, and meet working capital requirements, which can hinder their overall performance and growth prospects.

Globally, Manufacturing firms are known to be significant contributors to the growth and strength of a country's economy with significant development in the sector observed in the last decade (Saleem et al., 2020). In Kenya, according to KAM data, the sector accounts for close to 7.2% of the country's GDP (KAM, 2021). There has been a decline of this sector's contribution from 9.4% in 2019 to about 7.2% in 2022 according to the annual reports published by KAM. KAM in their reports cites, financing and supply chain disruptions as the major concerns affecting the growth of this sector indicating the need for innovative financing and supply chain solutions to curb the problem (KAM, 2021). The current GOK has emphasized the need for reviving this sector among others viewing the sector as a major contributor to job and wealth creation within the country.

This study therefore seeks provide solutions to this sector by demonstrating the impact that the adoption of SCF has on their SCP.

1.3 Research Problem

Modern business management has long emphasized optimizing individual firms' funding structures. Extending payment terms towards suppliers is therefore a common means of avoiding dependence on traditional external equity and debt financing (Dowling et al., 2019). During a financial crisis, firms' dependence on bank financing and the inability to raise other sources of funds on short notice can turn a liquidity shortage into a solvency problem (Gourinchas et al., 2020). Amidst the COVID-19 pandemic, various studies were conducted focusing on the health, SMEs, and manufacturing sectors as were the most affected by the pandemic disruption. These studies revealed that most firms faced logistical challenges in addition to demand disruptions that constantly threatened their survivability (Juergensen, Guimón, & Narula, 2020; Baral, Singh & Kazançoğlu, 2021; Joshi & Sharma, 2022). High production costs, limited access to formal financing and high costs of informal financing proved to be some of the major challenges that manufacturing sectors face.

Recent developments in the field of supply chain finance have led to interest in the integration of supply chain financing among the manufacturing firms as a financing tool and solution. Traditionally, most firms have found the use of informal financing as a key form of financing due to their inability to access formal credit and this has contributed to the slow growth of most of the manufacturing firms (Eniola & Entebang, 2015). These forms of financing are highly costly to them and therefore, their profitability has been greatly affected over time. Some of the businesses have had to close their operations out of being highly indebted.

Manufacturing firms play a critical role in the entire supply chain and have a significant impact on the performance of the supply chain and even at a macro level contributing about 8% of the country's GDP (KAM, 2022). Several studies have highlighted the importance and position of manufacturing firms in supply chain management. For example, a study by Gunasekaran et al. (2015) found that manufacturing firms are the primary drivers of supply chain performance, and their performance significantly influences the performance of the entire supply chain. Another study by Khanna and Arora (2016) highlighted that manufacturing firms play a crucial role in improving supply chain efficiency and reducing costs.

Furthermore, manufacturing firms are often the key link between suppliers and customers in the supply chain. As manufacturing firms remain significant contributors to Kenya's economic growth and core to this current regime's manifesto, more focus should be geared towards improving the effectiveness and sustainability of manufacturing firms in the long run. This will ensure a stable and resilient economic growth in the long run while eradicating poverty in the country. This study hence aimed to determine how SCP of these firms is impacted by the adopted SCF mechanisms as well as identifying some of the challenges that affect the adoption of these mechanisms. This research contributed to the existing body of knowledge on supply chain finance and

manufacturing firms' performance, making it significant for policymakers, managers, and investors.

1.4 General Objective

The general objective of this study was to establish the impact of supply chain financing mechanisms on the supply chain performance of manufacturing firms in Nairobi.

1.4.1 Specific Objective

- i. To determine the impact of pre-shipment SCF mechanisms on the supply chain performance of manufacturing firms in Nairobi.
- ii. To determine the impact of post-shipment SCF mechanisms on the supply chain performance of manufacturing firms in Nairobi.
- iii. To determine the extent to which external collaboration affects the relationship between SCF and SCP of manufacturing firms in Nairobi.

1.4.2 Research Questions

- i. What is the impact of Pre-shipment SCF mechanisms on SCP of manufacturing firms in Nairobi Kenya.
- ii. What is the impact of Post-shipment SCF mechanisms on SCP of manufacturing firms in Nairobi Kenya.
- iii. What is the extent to which external collaboration affects the relationship of SCF on SCP of manufacturing firms in Nairobi?

1.5 Scope of the study

This research focused on studying the impact of SCF mechanisms on the SC performance of manufacturing firms registered with KAM and whose operations are within Nairobi metropolitan area. The study more specifically focused on the pre-shipment and post-shipment financing mechanisms where primary data was collected through administered questionnaires to all participants. The participants targeted were both the supply chains

and finance supervisors among the sampled manufacturing firms. This study was conducted for a period of 6 months between November 2022 to April 2023.

1.6 Significance of the study

1.6.1 Academicians

This study adds to the body of knowledge in the field of supply chain finance, specifically dissecting the SCF mechanisms adopted or that could be adopted by manufacturing firms to improve their performance within their supply chains. Since most studies conducted in the past have focused on one timing of the shipment, this study provides more insights on both timings and determining the implication of applying both mechanisms. Academicians also find it useful to understand the effect that the factors affecting the SCF adoption and in this case looking at external collaboration. The study also points out areas for further research and given the detailed literature review conducted, there is a foundational basis for future studies suggested.

1.6.2 Government of Kenya

The government of Kenya is concerned with the welfare of manufacturing firms within the country noting that they are significant contributors to the economic growth given the different projects it has initiated. Through the findings of this study, clear recommendations have been made to the GOK that could help them develop better policies to grow the sector. Critical challenges faced by firms in relation to SCF adoption have also been highlighted and hence the GOK may find the analysis useful to help them come up with measures to mitigate those risks and challenges.

1.6.3 Manufacturing firm's managers

The study has recommended SCF mechanisms based on the analysis of the population under study to the management of manufacturing firms. The uptake and adoption levels vis a vis the benefits gained by the manufacturing firms has also been well elaborated to help the owners understand the potential benefits their firms could be losing out on.

1.7 Chapter summary

This first chapter gives an insight into the background of supply chain financing mechanisms among manufacturing and the need of adopting such mechanism. The chapter discusses the rationale of the research study as well as the objectives that the research anticipates achieving. In the subsequent chapter, a systematic literature review of the relevant literature will be done in establishing the research progress as related to issues of supply chain financing mechanisms in manufacturing firms.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews the literature on Supply chain financing mechanisms as well as the supply chain performance of manufacturing firms. In addition, the chapter provides a synopsis of the research gap, provides a conceptual framework for the study and a summary of the chapter.

2.2 Theoretical Framework

There were two theories that were instrumental in the formation and analysis of SCF mechanisms and SC performance of manufacturing firms. The theories used included Resource-based view theory and social exchange theory. A multi-theoretical approach was appropriate for a better analysis of the objectives of this study. These theories have been discussed in the subsequent sections providing further justification on how they enrich this study.

2.2.1 Resource Based View

The resource-based theory emphasizes the organizations' internal dynamic competences and external environment as major determinants of success (Barney, 1991; Lockett & Thompson, 2001). According to the resource-based theory, rent-producing resources define an organization's degree of profit, but for profits to be sustained, the resources must be scarce, hard to replace, and challenging to exchange on factor markets. Under this view, the theory states that resources are distributed unevenly within an industry and have an impact on an organization's performance due to firm-specific resources and competencies (Warnier, Weppe, & Lecocq, 2013). According to RBV, resources are defined as assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by the organization that enable it to conceive of and implement strategies that improve its efficiency and effectiveness.

In a study conducted by Lockett and Thompson (2001), on RBV theory, the findings suggest that much of the organizational performance variance come from an uneven distribution of resources and capabilities across competing firms, while industry and market attributes play a relatively small role. The firm can provide value to customers in many ways, such as via superior production systems, lower cost structures, fast and quick products delivery, and emphasis on customer service. A review of the RBV theory by Dyer and Singh (1998) posits that this theory helps one to understand productivity gains in the supply chain that are possible when trading partners undertake relation-specific investments that combine their resources uniquely. Relation specific investments include creating networks with supply chain partners who may provide the organization with access to resources, markets, information, and technologies which enables them share risks and allows them to focus on their core business.

Through the integration of SCF solutions between suppliers and buyers via a financier, firms can co-ordinate and meet their individual needs without harming other firms within the supply chain. By integrating with suppliers and customers through SCF, the organization creates unique skills, knowledge and joint capabilities that are not easily replicated. This leads to improved product quality as there is faster identification and communication of challenges, joint problem solving and better understanding of capabilities of the supply chain partners (Alshurideh et al., 2022). These capabilities position firms to have strategic resources that set the firms for long term success. In addition, the strengthening of supplier-customer relationship helps the parties greatly to reduce their costs. This theory helped the researcher to analyze the relationship between the SCF solutions available to firms and the supply chain performance. It was evident that firms which utilized their capabilities and resources to adopt SCF mechanisms effectively are therefore had better supply chain performance as compared to those that did not utilize.

2.2.2 Social Exchange Theory

The social exchange theory (SET) which is a sociology and relational marketing theory (Emerson, 1962) developed from 'social behavior as exchange' article (Homans, 1958) is used to explain why organizations need close interaction with other organizations. The theory states that the motivation for integrating systems and looking for collaborative solutions is the rewards it brings and the avoidance of punishment through being left out in competitive deals due to poor relations with supply chain partners. Shared experiences, values and goals create shared value which improve organization performance (Zheng et al., 2018).

The theory examines the markets within definite institutional and social structures and their complex exchange processes that are interdependent. The interactions within these institutions are governed by reciprocal relationships. These would only continue in the long run should there be continual observation of the principle of reciprocity where relationships are guarded in both ways. Emerson (1969) postulated that the concept of exchange often leads to the power concept based on the value imposed on the exchange that mainly implies cohesion and dependence. Many organizations develop and participate in activities based on the expectation that such activities will be mutually beneficial and that the returns would be more than costs incurred.

In events where the costs outweigh the benefits achieved, organizations start drawing back from such engagements or participations. SET is founded on key principles that should be upheld for strong supply chain relationships, among them being power, trust, and relationship commitment as stated by Bianchi and Saleh (2020). These principles are well upheld by other firms as compared to other firms. Manufacturing firms heavily rely on raw materials inflow and therefore depend on their suppliers for the raw materials. As a result, they value their supplier relationships and hence continually enhance that relationship. Studies reveal that manufacturing firms are more likely to engage in mechanisms or solutions that enhance this relationship aiming at improving their supply chain effectiveness (Ali et al., 2021). This theory was useful in understanding the

moderating role of external collaboration between SCF and SCP. An understanding of the enabling benefits or rewards that these firms seek to engage in external collaboration with other SC players will also be unpacked.

2.3 Empirical Literature Review

The empirical review entail discussions from past research in the field of SCF and the SC performance of the various firms. The researcher demystified the relationship between; pre-shipment, and post-shipment SCF mechanisms and SC performance.

2.3.1 Pre-shipment SCF mechanisms and supply chain performance

Zhao et al., (2018) stated that one of the major concerns for engaging in pre-shipment financing is that it enables a supplier to receive funding from a financier – based on a buyer’s purchase order – for working capital needs (e.g., the purchase of raw materials, inventory processing, personnel, and management costs) before product delivery. Further to this, they identified that the coherent credit risk associated with this instrument is relatively high compared to others because the collateral for pre-shipment finance is a purchase order instead of an invoice and therefore the interest rate for advancing liquidity to the supplier is usually high. Wang and Xu (2022) in agreement with Zhao (2018) on having the interest rates higher for advancing liquidity to suppliers, postulated that high costs could be reduced considering a well-established buyer’s creditworthiness backed by the willingness of the buyer to co-operate in information sharing to the financiers.

To establish a theoretical foundation for financial supply chain management (FSCM) aimed at strengthening managerial decisions concerning financial flows in supply chains, Wuttke, Blome and Henke, (2013), conducted a study and concluded based on 40 interviews that Managers can improve upstream supply chain working capital with pre-shipment FSCM. They further established that with improved upstream SC working capital, the buyer-supplier relationship was strengthened leading to ripple effects of improved product delivery and reduced supplier fetching costs (negotiation costs, contracting costs, etc.). Globally, there are two major pre-shipment financing techniques

that have been identified: Cash in advance, also known as advance payment/ deposit (Wu, 2021; Zhao et al., 2018 and Martin & Hofmann, 2019), and pricing support purchase order financing (PSPOF) or simply known as purchase order financing (Wu, 2021; Wang et al., 2022 and Tang et al., 2019). Some studies indicated that the expected benefits from using the pre-financing options do not always materialize for involved actors citing the need for guidance on when to provide these SCF practices to suppliers and why to select different types of practices (Martin & Hofmann, 2019). More emphasis has been given on the two major pre-financing mechanisms which are in relation to order placement with little efforts done on investigating the other pre-financing options which are based on inventory and production activities such as inventory/work-in-progress financing, export financing and raw material financing (Zhao et al., 2018).

The researcher notes that the past studies conducted do not reflect all situations from an emerging economy's perspective. Shifting the focus to a developing economy like Kenya, the researcher will provide insights as to whether there exists a positive relationship as postulated by Wang et al., (2022) and Zhao (2018) from a developed context or a negative relationship as postulated by Martin and Hoffman (2019). During a global crisis and disruptions in the world that see the developing economies' currencies value decrease, innovative SCF would act as a supplement to the traditional modes of financing to benefit the firms in such economies. For that reason, the researcher hypothesized that there exists a positive and significant relationship between the pre-shipment SCF and SCP of manufacturing firms.

H1: Pre-shipment SCF has a significant and positive effect on the supply chain performance of manufacturing firms.

2.3.2 Post-shipment SCF mechanisms and supply chain performance

Gelsomino et al., (2017), proposed that Post shipment financing can be referred to as rewarding SCF instruments while pre-shipment financing as enabling SCF instruments. They further pointed out that the fundamental distinction between enabling and rewarding SCF instruments is pivotal as it helps in accommodating differing maturity

degrees of suppliers in terms of sustainability and effectiveness and therefore providing guidelines on the path that SCF introduction should follow given the differences. Suppliers who are either already demonstrating sustainability performance or have the required financial muscle to achieve the desired sustainability levels are rewarded, whereas suppliers who show future potential, but lack access to funding can be enabled to make the necessary investments. In view of the sustainability of supply chains, Chen (2018) also pointed out that post shipment financing requires a significantly lower level of investment and risk from the buyer side, while the pre shipment financing implies a more demanding implementation process as well as a closer supplier relationship. Both studies found out that firms who adopted both mechanisms had their operation and financial performance improved as well as enhancing their sustainability.

Steeman et al., (2017) also indicate that suppliers that have a lower and limited level of access to finance are more likely to need SCF solutions. Given the large disparities between enabling SCF solutions and rewarding ones in implementation investments (both time and resources), the former is likely to be restricted to vendors demonstrating a significant strategic level. Rewarding solutions should be taken into consideration at the lower strategic level.

In a case study by Liebl et al. (2016) the main objectives of RF were distinguished as to extend the days payables outstanding (DPO) for buyers while exploiting the working capital improvement and simplifying the supplier's payment process. Lekakos et al., (2016) investigated the impacts of RF implementation on a firm's operations and the performance of capital-limited SMEs. They established an optimal working capital-dependent base-stock policy and identified a specific time range for trading accounts receivable to improve profits. Kouvelis and Xu (2021) theoretically identified that low credit score for supplier's was a prerequisite for the adoption of RF among SMEs. They also discovered that RF could be implemented even if the retailer's high credit rating vanished, and it could still benefit the retailer even without payment delay.

This study therefore aims to identify the impact of post shipment financing mechanisms adoption on the supply chain of participating manufacturing firms in Nairobi. The researcher hypothesizes that post shipment SCF impacts SCP positively and in a statistically significant manner.

H2: Post-shipment SCF has a significant and positive effect on the supply chain performance of manufacturing firms.

2.3.3 External collaboration and Supply chain finance

External collaboration is a relevant mechanism to increase the firm's internal value and enhance its competitive benefits because, in a knowledge-based network context, the place of innovation does not reside inside the company, but in the intersection between the company and its exterior partners (Powell, 1990; Powell et al., 1996). External collaboration can be considered as close and functionally interdependent relationships characterized by mutual influence, open and direct communication, aid for innovation and the purpose of reproducing positive outcomes for all members (Jap, 2006). Porter and Fuller (1986) found that firms can minimize risk by building an investment portfolio through external collaborations. Additionally, firms can develop and improve their basic skills by accessing additional resources through external collaboration (Dyer & Singh, 1998; Powell et al., 1996).

Nguema et al., (2021), postulates that external collaboration among other factors influencing the adoption of SCF has the greatest impact on the adoption rates. In their study of 177 manufacturing Chinese firms, they point out that strong external collaboration between supply chain members in the business strengthens them to collaborate more sustainably. They also suggest among other areas for further research as that:

“Future studies can apply the moderating and mediating effects to examine factors influencing the adoption of SCF and improve the overall SCE in manufacturing firms. Finally, future studies may

also investigate factors that influence the adoption of SCF and their effect on SCE in manufacturing firms in both developed and developing countries.”

This study therefore builds on their work checking on this moderating role and hypothesize that:

H3: External collaboration will positively and significantly moderate the relationship between SCF and SCP.

2.4 Research gap

SCF is an emerging area of study focus whose interest has increased especially due to the major supply chain disruptions in the world like the financial crisis of 2008 and the recent Covid-19. Several studies have focused on the evolution of SCF (Parida et al., 2021; Chen et al., 2018; Abbasi et al., 2017), providing suggestions for further research around SCF innovations, sustainability contributions of SCF among others. In 2018, a study by Zhan, Li, and Chen, investigated the impact of SCF mechanisms on the sustainability and effectiveness of firms in India. They based their research on only two mechanisms (AP and RF) and tried to find an equilibrium between the two innovations with an aim on establishing their impact on the firm’s sustainability and effectiveness.

So far, however, there has been little discussion about SCF’s impact on the supply chain performance of organizations. Improving on Zhan et al., (2018), who investigated the impact of SCF mechanisms on effectiveness and sustainability, this study will inform on some of the components that drive sustainability and effectiveness in a firm which is supply chain performance. In addition, the studies in the past have taken a wider view taking into consideration all sets of organizations within their studies. There is a need to narrow down the study to specific industries.

Manufacturing firms being one of the major sector contributors to the GDP of the developing economies, and yet being under-developed necessitates this study with recent contribution being around 15% of the GDP (KAM, 2021). Contextually, most studies have focused on the developed economies like China (Xu et al., 2022; Dulleck et

al., 2022; Jiang et al., 2020 and Song et al., 2021) while paying little attention to developing economies. Studies focusing on the developing markets have mainly focused on the adoption of SCF, factors affecting the adoption while some studies like Абдуллаев, 2019 & Chen et al., 2022 only focus on one SCF mechanism and the impact on corporate social responsibility and shared value and none on the supply chain performance. This study therefore is necessary to fill in these literature, theoretical, empirical, and contextual gaps through studying the manufacturing firms in Nairobi. The findings will add to the body of knowledge in the emerging SCF field and form a basis for future research and empirical review.

The table below summarizes some of the studies conducted in the past, their findings, and the gaps that this study has identified fill

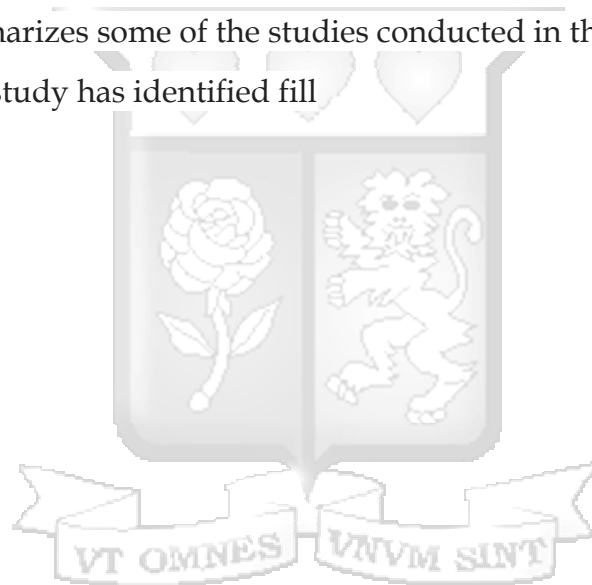


Table 2. 1 Summary of literature and the research gap bridged.

Author	Study Objective	Methodology used	Findings	Research gaps
Vu, T., Nguyen, D., Luong, T., Nguyen, T., & Doan, T. (2022)	The impact of supply chain financing on SMEs performance in Global supply chain.	PLS-SEM - Partial least squares structural equation modeling - SPSS (EFA) & Smart PLS- CFA	Supply chain financing performance has strong, positive effects on SME performance in Vietnam.	Contextual gaps - Sector selected and place of study.
More, D., & Basu, P. (2013).	Examine the different challenges that confront supply chain finance (SCF)	Extensive survey done, MIMBI analysis where: MI - measure of influencing; MBI- measure of being. Influenced.	The study reveals that lack of common vision and collaboration among the supply chain (SC) partners is the most critical challenge confronting SCF.	Need to conduct large-scale surveys in emerging countries to compare results. Need to understand the influence of these challenges on the adoption of SCF.
Zhan, J., Li, S., & Chen, X. (2018).	The Impact of Financing Mechanism on supply chain sustainability and Efficiency	Examine the equilibrium strategies between the supplier and retailer under each model and study the necessary conditions for each	Payment term affects the efforts of suppliers in promoting supply chain sustainability and efficiency	This study assumes full collaboration between supplier and the buyer and information symmetry, future research must take into consideration a

		financing mechanism to promote supply chain sustainability and efficiency.		potential information asymmetry.
Nguema, J. N. B., Bi, G., Ali, Z., Mehreen, A., Rukundo, C., & Ke, Y. (2021)	Exploring the factors influencing the adoption of supply chain finance in supply chain effectiveness: evidence from manufacturing firms	177 Chinese manufacturing firms issuing questionnaires to supply chain managers and tested the proposed conceptual model and associations using structural equation modeling.	All four factors are positively related to the adoption of SCF, which consequently improves the SCE of manufacturing firms	Need to understand the degree in which these factors affect the relationship between SCF and supply chain performance to inform policies on which factors the govt and other bodies like KAM should focus to ease them.
Zhang, C., Wang, Y., & Ma, P. (2021).	determining the optimal channel strategy of supply chains under advance payment financing	They construct the supply chain model under four corresponding cases in terms of whether there is green investment in single-channel or whether	The best financing strategy for the retailer is to choose a manufacturer who develops the online channel. When the manufacturer has less	First, this work considers only the manufacturer producing green products-Need to investigate all manufacturing firms holistically. Knowledge gap related to the SCF

		<p>there is green investment in dual-channel strategy.</p> <p>Then, the supply chain model is solved.</p>	<p>initial capital, good reputation, and a higher price discount coefficient, the retailer is more willing to finance</p>	<p>instruments and coordination mechanisms as well as the impact on both Financial and SC performance.</p>
<p>Chen, X., Wang, C., & Li, S. (2022).</p>	<p>The impact of supply chain finance on corporate social responsibility and creating shared value: a case from the emerging economy</p>	<p>Single-Case study methodology.</p>	<p>SCF could have a great impact on SCM through functional and structural innovations, structural and functional innovations could promote (CSR) and (CSV)</p>	<p>Single case Methodology-lacks generalizability and this study proposes to sample 296 manufacturing firms.</p> <p>Broadens the study to other industries and in a developing nation context.</p>
<p>Xu, X., Chen, X., Jia, F., Brown, S., Gong, Y., & Xu, Y. (2018).</p>	<p>Supply chain finance: A systematic literature review and bibliometric analysis</p>	<p>systematic literature review methodology</p>	<p>SCF has been established as an important but niche research area in supply chain management.</p>	<p>This research Studies the link between SCF and SCP given a variable that moderates that linkage.</p>

Li, X., Jiang, B., & Li, J. (2021).	Adoption of supply chain finance by small and medium enterprises in China	model and test hypotheses	positive attitude and strong AI play a crucial role for SMEs in adopting SCF.	This study identifies further adoption factors both influencing and hindering the application of SCF.
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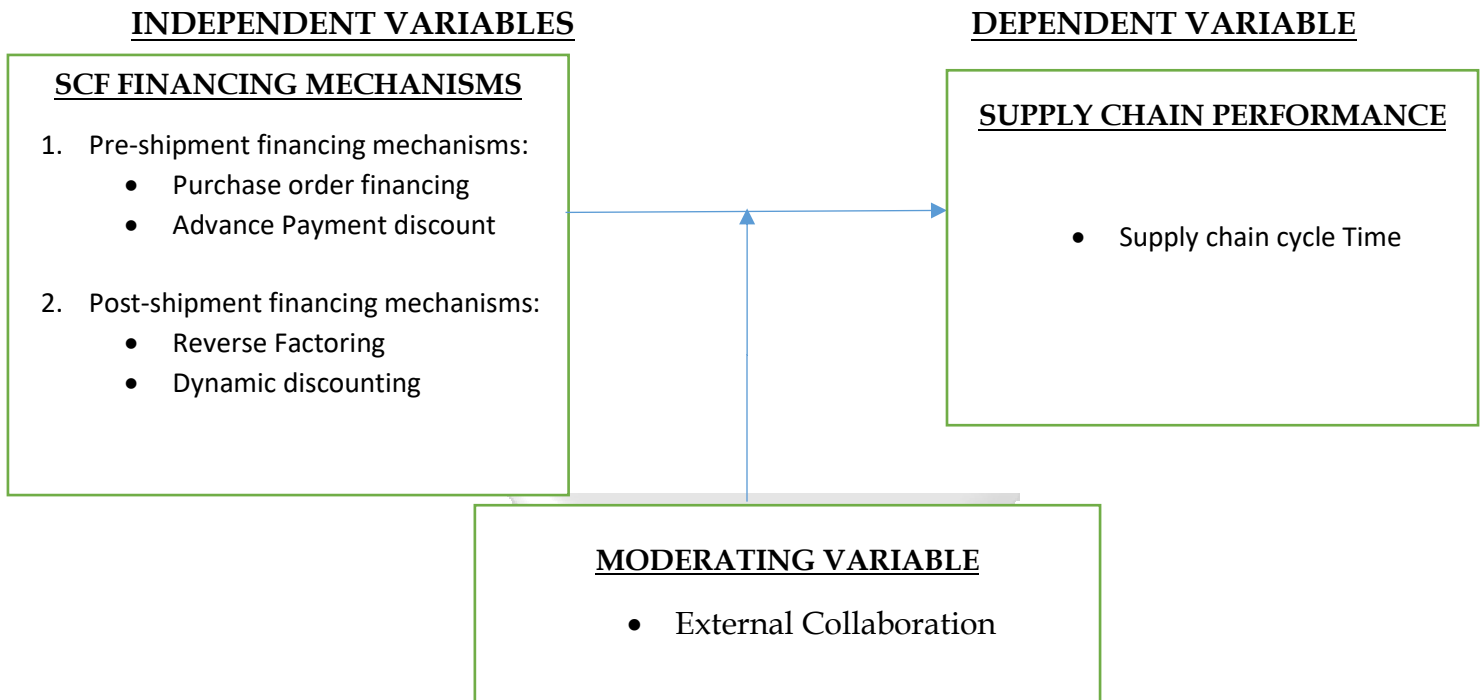
2.5 Conceptual framework

This section discusses the independent, moderating, and dependent variables, followed by the conceptual model of the variables under study. The conceptual model is shown in Figure 2.1 below and depicts the inter-relationships between the variables as envisioned.

This study focused on the relationships among pre-shipment financing mechanisms, post-shipment mechanisms, factors influencing the adoption of SCF and Supply chain performance of manufacturing firms. This dependent variable being supply chain performance. The study measured the supply chain performance of the firms using supply chain cycle time. Supply chain cycle time tests the holistic performance of the supply chain based on the lead time taken to deliver goods to a customer assuming zero inventory at the time the order is placed (Otto & Kotzab, 2003). The independent variable was the SCF Mechanisms distinguished into two dimensions as both pre and post shipment mechanisms based on the timing of the trigger event as defined by Zhen et al., (2018). Two pre-shipment mechanisms will be investigated: purchase order financing and advance payment discount while two post-shipment mechanisms will be looked at: Reverse Factoring and dynamic discounting. Various factors that influence the adoption of SCF mechanisms have been identified by different scholars. This study will focus on external collaboration supported by Chen, Li, Liu (2019) who identified supplier collaboration as the major determinant for SCF adoption among manufacturing firms.

Figure 2.1 shows the conceptual framework that will be used for this research study. The independent variable is SCF financing mechanisms. The dependent variable is firm supply chain Performance. The moderating variable is the factors influencing the adoption of SCF mechanisms.

Figure 2. 1: Conceptual Framework



Where.

Purchase order financing was adopted from (Zhao & Huchzermeier, 2019) while Advance payment discount was adopted from (Zhang, Wang & Ma, 2021). Reverse Factoring was adopted from (Lekkakos & Serrano, 2016) and dynamic discounting was adopted from (Zhao & Huchzermeier, 2019). Supply chain cycle time as a measure of supply chain performance was adopted from (Otto & Kotzab, 2003; Jin, 2006; Chae, 2009). External collaboration was adopted from (Nguema et al., 2021), being the major factor cited to influence the adoption of SCF.

2.6 Operationalization and Measurement of Variables

This sub-section identifies and operationalizes the key variables, independent, dependent, and moderating variables of the study.

Table 2. 2 Operationalization of Variables

Variable	Indicators	Source	Data Collection tool	Data Analysis
Pre-shipment SCF	<ul style="list-style-type: none"> • Adoption of Advanced payment discounting from suppliers • Adoption of Advanced payment discounting to customers • Adoption of Purchase order financing to suppliers • Adoption of Purchase order financing from customers 	Camerinelli, 2009; Caniato et al., 2016; Ali et al. 2020.	Questionnaire in form 5-likert scale questions	Descriptive and inferential analysis
Post Shipment SCF	<ul style="list-style-type: none"> • Adoption of Reverse Factoring from our customers • Adoption of Reverse Factoring to our suppliers • Adoption of dynamic discounting to suppliers • Adoption of dynamic discounting from customers 	Camerinelli, 2009; Caniato et al., 2016; Ali et al. 2020.	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis
External Collaboration	<ul style="list-style-type: none"> • Systems integration • Client service representatives • Periodic meetings 	Nguema et al., 2021	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis
Supply Chain Performance	<ul style="list-style-type: none"> • Supply chain cycle time • Goods delivery time • Payment terms 	Gunasekaran, et al. 2004	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis

2.7 Chapter summary

This chapter summarizes the theoretical and empirical literature review and provides a snapshot of the conceptual framework that this study will follow. It also introduces us to the next chapter that discusses the research methodology that was adopted. The next chapter will give a synopsis of the research philosophy, design, population, and sampling techniques to be used, data collection and analysis tools.



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This Chapter presents a detailed discussion of research methods that will be applied in the collection and analysis of the data before making the inferences that will be made in the study. Basias and Pollalis (2018) described research methodology as the specific procedures that are applied in the identification, selection, processing as well as analyzing the obtained raw data regarding the topic under study. This Chapter appraises these processes in detail and relates these processes to the underlying theory. Further, this Chapter will also justify the application of the various processes that will be applied in this research study.

In detail, this chapter presents the philosophical paradigm underpinning the study, research design, target population, sample size and sampling procedure, data collection instruments, validity and reliability of instruments and data collection procedure, data analysis techniques and ethical issues.

3.2 Research Philosophy

Research philosophy refers to the fundamental beliefs and assumptions that underpin a researcher's approach to knowledge creation and development, and shape how data is collected, analyzed, and interpreted (Creswell, 2014; Kumar, 2019). In the field of business and management research, post-positivism has emerged as a popular philosophical stance that recognizes the limitations of positivism in addressing the complex and dynamic relationships between variables (Saunders, Lewis, & Thornhill, 2016).

Post-positivism allows for a critical examination of the relationship between the observer and the observed, acknowledging that the researcher's values and beliefs influence the research process and findings (Bryman, 2015; Guba & Lincoln, 2005). As such, post-positivism emphasizes the need to use multiple sources of data, incorporate multiple

perspectives, and embrace subjectivity and contextuality in the research process (Creswell, 2014; Denzin & Lincoln, 2017).

Given the complexities of the relationships between supply chain financing solutions and the supply chain performance of manufacturing firms in Kenya, a post-positivist approach was appropriate for this study. Post-positivism allows for a more nuanced understanding of the multifaceted variables and their interactions, which cannot be adequately captured by a purely positivist approach (Smith et al., 2015). By incorporating subjective interpretations, contextual influences, and multiple sources of data, post-positivism allowed for a more comprehensive and nuanced analysis of the research problem, leading to richer and more meaningful insights (Bryman, 2015; Creswell, 2014).

In addition, post-positivism recognizes the importance of theory development and testing, which is crucial in the business and management research field (Smith et al., 2015). By drawing on established theories and frameworks, a post-positivist approach provided a more rigorous and structured analysis, ensuring that the findings were grounded in established theories and concepts.

3.3 Research Design

A research design clearly states the structure of the research problem, outlines the relationship between the study variables and the research strategy used to obtain empirical evidence on those relationships (Rahman et al; 2017). The design applied refers to the basic methods and procedures adopted during the collection of data or evidence. This study used a descriptive survey design which provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying the sample of that population (Creswell & Creswell, 2017). From the sample, the researcher generalized the results to the population under study being manufacturing firms. A descriptive survey design was appropriate as it made it easier to quantify the study variables like supply chain performance, SCF mechanisms both pre and post shipment as well as the factors influencing the adoption of SCF. Additionally, the survey design was cross

sectional since data was collected at one time for different sampled manufacturing firms across different sectors.

3.4 Population and sampling

3.4.1 Target Population

This study targeted all the manufacturing firms listed with the Kenya Association Manufacturers in Nairobi region. According to KAM membership directorate, there were 725 listed firms in Nairobi region as of 31st December 2021 (KAM, 2022). Nairobi was selected as it accommodates 62% of all the KAM members in the country providing a good representation of the manufacturing firms.

3.4.2 Sampling Frame

The sampling frame consists of all the 725 listed manufacturing firms at KAM within Nairobi region (KAM, 2022) and it is from this list that the researcher drew the sample from.

3.4.3 Sampling

Basias and Pollalis (2018) suggested that there are instances where a sampling model applied in a research study may be complemented in the study where a researcher based on their own judgement may deem fit to integrate different models of sampling to compliment the limitations of one technique over the other. This agrees with what Fletcher (2017) and Van (2009) propose as the solution to imbalanced data anticipated by the researcher during the study. This study adopted a multistage sampling method where both stratified random sampling and purposive sampling techniques were used because of the dynamic natures of the population in relation to the objectives of the study.

Stratified random sampling is defined as the sampling technique which involves choosing some group of items from population based on classification and random selection (Iliyasu & Etikan, 2021). This technique involves separating the target population element into homogenous, mutually exclusive segments and then choosing samples from each segment randomly. Purposive sampling on the other hand is based

on the judgement of the researcher as to who will provide the best information to succeed for the objectives study (Etikan & Bala, 2017).

The target population data was organized into strata based on their manufacturing sub-sectors and following the stratified random sampling technique, the number of samples to be selected from each stratum was determined. Purposive sampling was then used to select from each sector or stratum the firms that could more likely be adopting SCF financing mechanisms and provide more insightful data. These were mainly firms who demonstrated a good understanding of SCF through publicly available information about the firm's participation in industry events, conferences or training programs related to SCF. Additionally, the firms were chosen also considering the complexity of their supply chains as firms with complex SC involving various suppliers and buyers are more likely to face working capital challenges.

Based on Yamane's formula (Yamane, 1967),

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

n= Sample size

N= Population size

e= desired margin of error

$n = 725 / (1 + 725(0.05^2))$

A sample size of 256 manufacturing firms was contacted during this study where 40 firms were engaged during the pilot study while conducting both validity and reliability tests to ensure quality of the research output. The targeted respondents were either the finance managers or supply chain managers of the manufacturing firms of these 256 firms. Therefore, the study targeted 256 respondents from the sample size as the unit of analysis was the manufacturing firms targeted.

3.5 Data collection

The researcher collected primary data from the intended participants. Structured questions collecting data on the study variables were used to collect the data required for analysis. Saunders et al., (2009), posited that rating questions are often used to collect opinion data and often use Likert-style rating scale in which the respondents are asked how strongly they agree or disagree with a statement or series of statements. This study adapted questions from various authors cited following the suggestions by Saunders et al., (2009) where researchers can either adopt, adapt, or create their own questions when creating a questionnaire. Since this study sought to determine the adoption and gather opinion data on supply chain finance and performance among manufacturing firms, a 5 Likert-scale rating questionnaire was deemed appropriate for the study. Questionnaires were self-administered through drop and pick methods, use of telephone interviews as well as email sharing depending on the suitability of the intended participants. Initially the research sent emails to all the targeted participants where the emails were sent to respondents in batches of 40 firms. The response rate was very poor, and this prompted the researcher to make follow-up calls to the participants. The response rate improved however, was still below the acceptable rate. Follow-up visits were made by the researcher with limited access to certain areas due to the country demonstrations that were ongoing during this period. A mixture of these methods was used because of the financial constraints of the researcher in view as well as the limited time allocated to collecting the data. Most responses were received from clients after either a follow up email, tele-conversation or site visit was made to the respondents' premises.

3.6 Research Quality

To appraise the research instruments, a pilot study was conducted. The goal of the pilot research was to mitigate the possibility of failure by developing a tool that can fully evaluate the impact of SCF mechanisms on SCP of manufacturing firms in Kenya. The pilot test also aided in determining the questionnaire's face and content validity, as well as obtaining feedback from professionals and experts in the subject of investigation, as proposed by Mugenda & Mugenda (2003). Reliability and validity are fundamental

elements of assessing the quality of a research instrument used to enhance the accuracy of study findings. The researcher focused on both validity and reliability as discussed below:

3.6.1 Reliability

Adopting the definition by Mohajan (2017), reliability refers to the degree of consistency of the research instrument over time given a similar sample. A reliable instrument should accurately and consistently generate the same findings, given the same situation at different times. Stable and consistent outcomes are expected if the instrument is reliable. Globally, the Cronbach Alpha test has been adopted by authors as a key test for reliability and internal consistency (Gliem and Gliem 2013; Cooper and Schindler, 2016; Sabag and Krisher, 2017; Pham, 2020). This study will adopt the interpretation by Cooper and Schindler (2010) that a co-efficient of at least 0.60 and above is reliable for the study which is also in line with the suggestions by Ravinder and Saraswathi, (2020).

A total of 30 firms where in each firm one respondent was targeted, either the supply chain manager or the finance manager participated in the pilot research and were selected at random from the target population. 40 respondents were targeted where 10 did not either fully respond or consent to participating in the pilot study. The respondents who took part in the pilot study were not included in the sample for the final study. The information gathered was coded and analyzed. The findings of the pilot study aided the researcher in revising the instruments and improving the research design. Through a literature study and expert comments, the dimensions for the dependent variable SCP and external collaboration were too many and contradicted the intended measure. This was hence revised to 5 items that were in line with supply chain cycle time which was used as the measure of SCP.

The research instrument proved to be reliable given the Cronbach's alpha of .658, .604, .814 and .722 for pre, post, Ecoll and SCP variables respectively. Each variable had 5 items and additional tables provided in the Appendix.

Table 3. 1 *Reliability test results for the pilot study variables Pre, post, Ecoll and SCP respectively*

Case Processing Summary			
		N	%
Cases	Valid	21	70.0
	Excluded ^a	9	30.0
	Total	30	100.0
Study Variables		No of items	Cronbach's Alpha
Pre-shipment SCF		5	.658
Post-shipment SCF		5	.604
External collaboration		5	.814
Supply chain performance		5	.722

Source: Primary data (2023)

3.6.2 Validity

A validity test was conducted to determine if the research study measured what it was intended to measure and check on the accuracy of the results. Both Content and construct validity were tested as they have been widely recognized by literature as two forms of validity (Heale & Twycross, 2015; Bull et al., 2019). Content validity is the test of determining the adequacy of the research instrument in covering the variable contents while construct validity determines whether the study can draw significant inferences from the test scores provided (Heale & Twycross, 2015).

Expert suggestions and a careful alignment of the research instrument based on the reviewed literature facilitated the necessary revision and modification of the research to enhance the face and content validity. Factor analysis was used to establish construct validity for all the variables employed in this study (Kerlinger & Lee, 2000). All the items in the variables were subjected to factor analysis and loaded. The variables passed the factor analysis compliance test where there was significant and moderate correlation among the study variables ranging from .917 to .301. In addition, the determinant of .061 indicates that there is no multi-collinearity since the determinant is greater than 0.0001.

Table 3. 2 Results of compliance with Factor analysis

		Correlation Matrix ^a			
		Pre	Post	Ecol	SCP
Correlation	Pre	1.000	.917	.475	.484
	Post	.917	1.000	.301	.331
	Ecol	.475	.301	1.000	.588
	SCP	.484	.331	.588	1.000
Sig. (1-tailed)	Pre		.000	.000	.000
	Post	.000		.000	.000
	Ecol	.000	.000		.000
	SCP	.000	.000	.000	

a. Determinant = .061

Source: Primary data (2023)

Table 3. 3 KMO and Bartlett's Test results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.584
	Approx. Chi-Square	377.260
Bartlett's Test of Sphericity	df	6
	Sig.	.000

Source: (Research data,2023)

The KMO and Bartlett's Test results indicate the data is moderately adequate factor analysis given the factor loading is greater than 0.50 as postulated by Bucci et al., (2018). This is also supported by the Bartlett's Test of sphericity given the significance level at $p = .000$

Table 3. 4 Communalities results

Communalities		
	Initial	Extraction
Pre	1.000	.852
Post	1.000	.687
Ecol	1.000	.504
SCP	1.000	.526

Extraction Method: Principal Component Analysis.
 Source: (Research data,2023)

The results indicate loadings ranging from .504 to .852 and according to Bucci et al., (2018), the results also indicate that the data was suitable for factor analysis as they are above .50.

Table 3. 5 *Factor analysis results*

Component	Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.569	64.225	64.225	2.569	64.225	64.225
2	.959	23.967	88.192			
3	.412	10.308	98.500			
4	.060	1.500	100.000			

Extraction Method: Principal Component Analysis.
 Source: (Research data,2023)

From table 3.5 above, we find that our measurement tool explains a total of 64.23% of variance which is termed sufficient since the level is greater than 50%. These results therefore indicate that the variables are self-consistent and therefore giving us a good result regarding construct and content validity.

have a Cronbach’s alpha of above 0.60 and hence reliable for data analysis.

3.7 Data analysis

The study used both descriptive and inferential statistics to analyze the data collected. Descriptive statistics were used to summarize and describe the uptake levels of SCF mechanisms as well as provide an analysis of the barriers that influenced the uptake levels of SCF. This included measures of central tendency such as mean, median, and mode of the data collected.

Inferential statistics including multiple regression analysis were conducted to determine the effect of SCF mechanisms (post and pre) on SCP and moderation regression analysis to determine the moderating role of external collaboration on this relationship.

The regression equation used in the study is expressed as follows:

$$SCP = \beta_0 + \beta_1 * \text{Pre-shipment SCF mechanism} + \beta_2 * \text{Post-shipment SCF mechanism} + \varepsilon$$

Where SCP is the dependent variable (supply chain performance), Pre-shipment SCF mechanism and Post-shipment SCF mechanism are the independent variables, External collaboration is the moderating variable, β_0 is the constant, β_1 and β_2 are the regression coefficients, and ε is the error term. The equation based on the test results reveals that there is a positive and significant relationship on Pre shipment SCF and SCP while there exists a negative but significant relationship between post shipment SCF and SCP.

Additionally, the study also conducted a moderation regression analysis to test the moderating and iterating effect of external collaboration on the relationship between SCF mechanisms and SCP.

The equation for moderation regression analysis is expressed as follows:

$$SCP = \beta_0 + \beta_1 * \text{Pre-shipment SCF mechanism} + \beta_2 * \text{Post-shipment SCF mechanism} + \beta_3 * \text{External Collaboration} + \beta_4 * \text{Pre-shipment SCF mechanism} * \text{External Collaboration} + \beta_5 * \text{Post-shipment SCF mechanism} * \text{External Collaboration} + \varepsilon$$

Where SCP, Pre-shipment SCF mechanism, Post-shipment SCF mechanism, and external collaboration have the same meaning as described above, β_4 and β_5 are the interaction terms representing the moderating effect of External Collaboration on the relationship between SCF mechanisms and SCP. The moderation regression analysis helped to determine if External Collaboration moderates the relationship between SCF mechanisms and SCP and if so, the magnitude of this moderation effect.

3.8 Ethical considerations

The study ensured that confidentiality and anonymity was maintained by structuring the collection instrument in a way that the respondent's names did not appear. The researcher intended to make it clear to the participants that their names would not be used nor disclosed to other participants or others. All the responses that were obtained

from the respondents in the questionnaires were aggregated for statistical analysis and interpretation without specifically profiling the firms by their names. The researcher did not use any coercion but allowed the participants to take part in this study freely. Moreover, the researcher respected the right of the participants not to take part in the study.



CHAPTER FOUR:

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter highlights the data analysis and presentation. It is divided into several sections where sections 4.2 of this chapter present the study response rate; section 4.3 summarizes bio-demographic data while section 4.4 presents diagnostic tests performed. Section 4.5 highlights descriptive data analysis while section 4.6 gives an inferential analysis of the data and finally section 4.7 gives a summary of the chapter.

4.2 Response rate

The study targeted 256 Manufacturing firms registered under KAM where a total of 256 questionnaires were issued to the 256 manufacturing firms. The study response rate was captured in Table 4.1 below which indicates a positive and good response rate for data analysis.

Table 4.1 Response Rate

Response	Frequency	Percentage
Responded	180	70.31%
Not responded	76	29.69%
Total	256	100%

Source: (Research data,2023)

4.3 Demographic data

Table 4.2 below highlights demographic data of the respondents who participated in the study. The section was crafted to ensure relevant bio data of respondents is captured for sound response on subsequent sections.

Table 4. 2 Demographic data response

Variable	Frequency	Percentage
Gender		
Male	110	61.0%
Female	70	39.0%
Total	180	100%
Your duration in the organization		
0-5 years	42	23.3%
6-10	80	44.4%
11-15	34	19.0%
Over 15 years	24	13.3%
Total	180	100%
Number of employees in your organization		
0-9 (Micro Enterprises)	34	19.0%
10-99 (Small & Medium Enterprises SMEs)	86	48.0%
100 or more (Large Enterprises)	60	33.0%
Total	180	100
Your role in the organization		
Finance manager	154	85.6%
Supply chain manager	26	14.4%
Total	180	100%

Source: (Research data,2023)

From the results on table 4.2 above, findings indicate that majority of the respondents who took part in the study were Male at 61% while female-only accounted for 39%. It was important to lay a foundation of the gender composition of the supply chain or finance managers working among manufacturing firms. Results on the number of years the respondents have served in their respective organizations indicate that majority at 44.4% which translates to 80 respondents had served in their organizations between 6-10 years, followed by 0-5 years at 23% then 11-15 years at 19% and lastly over 15 years having 24 respondents translating to 13%. The responses were from reliable employees who were expected to have adequate knowledge of the firms they work for, noting that 77% had worked for more than 5 years in the organizations under study as of April 2023.

The researcher also sampled the number of employees from the respondent's respective companies and results show that most of the companies had between 10-99 employees at 48%. This is followed by 100 and above employees at 33% and lastly 0-9 employees at 60 respondents translating to 19%. This indicates that most firms are small and medium enterprises within the sector.

The research also collected data on the role of the respondents in their respective organization. From the study findings, most of the respondents indicated that their role was in the finance department, representing 85.6%. Respondents working in the supply chain department were hesitant in responding to the questionnaires and this is also evident as the majority cited the risk of disclosure of company information to competitors as a significant hinderance to their SCF adoption.

4.4 Descriptive results

This section highlights the descriptive results of study variables. Tabulation was conducted and presentation was done in the form of frequencies, mean and standard deviations.

4.4.1 Levels of SCF adoption among manufacturing firms in Nairobi.

Table 4. 3 Responses on the levels of SCF adoption among manufacturing firms in Nairobi.

Items	N	F	%
Fully adopted	180	38	21.1
Partially adopted	180	99	55.0
Not adopted	180	43	23.9
Total		180	100

Source: (Research data,2023)

While addressing the levels of SCF adoption among manufacturing firms in Nairobi, study findings indicate that majority of manufacturing firms in Nairobi have partially adopted SCF at 55% translating to 99 companies. Consequently, results indicate that 23.9% translating to 43 companies have not adopted the system while 38 companies translating to 21.1% have fully adopted the system. This translates to a 76.1% adoption either fully or partially among the sampled manufacturing firms.

4.4.2 Pre-shipment SCF mechanisms

Table 4. 4 Adoption of Pre-shipment SCF mechanisms of manufacturing firms in Nairobi.

Items	N	Mean	SD
We adopt advance payment discount when purchasing raw materials from either overseas suppliers or local suppliers or both.	138	3.64	1.066
We offer advance payment discount to our customers who buy raw materials from us.	138	3.96	.992

We approve purchase orders to help our oversea and local suppliers receive payments from financial institutions before delivery.	138	3.67	1.233
We receive financing from financial institutions based on purchase orders approved by our customers.	138	2.95	1.252
We adopt other Pre-shipment financing mechanisms in our supply chain.	138	3.65	1.085

Source: (Research data,2023)

From the response, study results indicate that on average, firms have incorporated advance payment discount to both their customers and suppliers as well as purchase order financing to both overseas and local suppliers into their financing models. However, study results indicate that firms disagree to receiving financing from financial institutions based on purchase orders approved by their customers given the mean of 2.95.

4.4.3 Post-shipment SCF mechanisms

Table 4. 5 Adoption of Post-shipment SCF mechanisms of manufacturing firms in Nairobi

Items	N	Mean	SD
We receive early payments from financial institutions based on approved invoices by our reputable customers before due dates.	138	3.96	.992
We approve invoices of our suppliers so they can get advance payment from financial institutions before the due dates.	138	3.64	1.066

We offer dynamic discounts for early payments to our customers to encourage early payments	138	2.95	1.252
Our suppliers offer us dynamic discounts when we make early payments.	138	3.54	1.033
We adopt other post-shipment financing mechanisms available to us within the supply chain.	138	3.54	1.197

Source: (Research data,2023)

From the response, most firms receive payments from financial institutions based on approved invoices by reputable customers before due dates with a mean of 3.96 while they slightly agree at a mean of 3.64 to approving invoices of suppliers so they can get advance payment from financial institutions before the due dates. This would be expected given that most of the respondents are SMEs whose financial muscles are less compared to large enterprises. Most respondents do not offer dynamic discounts to their customers to encourage early payments given the mean of 2.95 based on the results. This could be explained by the huge level of investment in technology needed for this integration that plays as a barrier to this adoption. On the other hand, results also indicate that the firms moderately take advantage of the dynamic discounts offered by their suppliers on early discounts while moderately adopting other post shipment financing mechanisms.

4.4.4 Influence of External collaboration of manufacturing firms in Nairobi.

Table 4. 6 Extent to which manufacturing firms collaborate with external players in the supply chain.

Items	N	Mean	SD
We extend our systems to our suppliers and some of our service providers for ease of monitoring.	138	3.54	1.033

We have client service representatives who collaborate with both our customers and suppliers for better sourcing arrangements.	138	3.54	1.197
Some of our clients have extended their systems to us so we can monitor their products movements and requirements.	138	3.83	1.017
We have integrated our systems with some of our suppliers.	138	3.58	1.243
We hold periodic meetings with all our major customers and suppliers to understand our service and product delivery to them.	138	4.25	.958

Source: (Research data,2023)

From the response, the study results indicate that most firms hold periodic meetings with major customers and suppliers they relate with in the SC chain. Since extending their systems to their customers or suppliers seems to be challenging to these firms as indicated by the low mean scores of 3.54, the firms still opt for collaboration but through regular meetings. Consequently, having client service representatives who collaborate with both their customers and suppliers for better sourcing arrangements, as well as firms integrating their systems with some suppliers are also some of the ways these firms use to collaborate with the other players in the SC.

4.4.5 Firm's supply chain performance measure

Table 4.7 Extent of firm's supply chain performance measure

Items	N	Mean	SD
We extend payment terms to suppliers without harming production.	138	3.71	1.012

We receive payments from sale of goods on time due to the available SCF solutions adopted.	138	3.80	1.166
We have increased our trade volumes due to the SCF arrangements we adopt.	138	4.01	1.064
We negotiate cheaper and faster deliveries with our global and local suppliers due to improved relationships enhance by SCF adoptions.	138	3.76	.932
We deliver goods on time to our clients due to the eased working capital by the mechanisms adopted.	138	4.28	1.009

Source: (Research data,2023)

From the response, study results indicate that on average, extending payment terms to suppliers without harming production, receiving payments from sale of goods on time due to the available SCF solutions adopted and negotiating cheaper and faster deliveries with global and local suppliers due to improved relationships enhance by SCF adoptions are all a measure of a firm that is moderately performing in supply chain.

Study results also indicate that increase in trade volumes due to the SCF arrangement adoptions as well as delivering goods on time due to eased working capital because of the SCF mechanisms adopted are all strongly agreed upon to be indicators of their improved SCP with a mean 4.01 and 4.28 respectively.

4.5 Diagnostic tests

The section contains prior tests that were conducted for data regression. The study performed several diagnostic tests before embarking on regression analysis as shown in table below.

Test	Significance	Test Used	Conclusion	Citations
Reliability	Tests the quality of the measurement procedure used when collecting data	Cronbach's Alpha	$\alpha \geq 0.9$ Excellent $0.9 > \alpha \geq 0.8$ Very Good $0.8 > \alpha \geq 0.7$ Adequate $0.7 > \alpha \geq 0.6$ Acceptable	Goulding & Syed-Khuzzan, (2014)
Normality	Checks whether the data is normally distributed	Shapiro-Wilk & Kolmogorov-Smirnov	Normal distribution to be uniform, then p should be greater than 0.05 ($p > 0.05$).	Razali & Wah (2011)
Multi-collinearity	checks the strength of correlations between independent variables	Variance Inflation Factor (VIF)	VIF of around or greater than 10 shows a high degree of multi-collinearity. VIF of less than 10 shows little to no multi-collinearity among the variables	Kock (2015)
Autocorrelation	checks whether the error terms in a regression model are correlated with each other	Durbin-Watson test	Values closer to 2 indicating no significant autocorrelation, values below 2 indicating positive autocorrelation, and values above 2 indicating negative autocorrelation.	Lütkepohl & Schlaak, (2019).
Homoscedasticity	checks whether the variance of the residuals is constant across different groups or levels of a categorical variable in a statistical model.	Levene's test	Levene statistic is significant at $\alpha = 0.05$, which implies that when p-value is greater than 0.05, the assumption of homogeneity is met	Levene, (1960).

4.5.1 Test for normality

Normality was tested using the Shapiro-Wilk test using the SPSS software. Shapiro-Wilk test is used to test the null hypothesis that a sample comes from a normally distributed population, where p-value should be greater than 0.05 ($p > 0.05$). This test establishes the extent of normality of the data by detecting the existence of skewness or kurtosis or both. Data is normally distributed when the test results are statistically insignificant and from the analysis, the study data revealed that the data is normally distributed given that the test results are insignificant at $p > 0.05$. The p value of our variables ranges from $p = 0.053$ to $p = 0.077$. Shapiro-Wilk statistic ranges from zero to one with figures higher than 0.05 indicating that the data is normal (Razali & Wah, 2011).

Table 4.8 Shapiro-Wilk Normality Test

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre	.203	138	.000	.929	138	.077
Post	.116	138	.000	.953	138	.068
Ecol	.124	138	.000	.969	138	.053
SCP	.155	138	.000	.938	138	.059

a Lilliefors Significance Correction

Source: (Research data,2023)

4.5.2 Test of Multi-collinearity

A multi-collinearity test was conducted to assess whether a high correlation existed between study variables. It is a situation that occurs when some independent variables are correlated with one another and when this association is high, this affects the prediction abilities of each predictor variable (Mugenda & Mugenda, 2003). The test was computed using the Variance Inflation Factors (VIF) and its reciprocal, the tolerance, to establish if one predictor had a strong linear relationship with other predictors. A

common variance inflation factor (VIF) rule of thumb is that VIFs of 10 or higher are a sign of severe or serious multi-collinearity that affects the study (O'Brien, 2007).

Table 4. 9 Test of Multi-collinearity

Model		Coefficients ^a	
		Collinearity Statistics	
		Tolerance	VIF
1	Post	.135	4.399
	Pre	.115	3.696
	Coll	.659	1.519

a. Dependent Variable: SCP

Source: (Research data,2023)

Data from the study indicated that tolerance ranged from 0.115 to 0.659 with the VIF between 1.519 to 4.399.

4.5.3 Durbin Watson test for auto correlation and independence

The Durbin-Watson test for auto correlation revealed a critical d value of 1.728 which lies between $1.5 < d < 2.5$ hence the assumption that there was no first order linear autocorrelation and variables were independent. According to Lütkepohl and Schlaak, (2019), values closer to 2 indicate no significant autocorrelation, values below 2 indicate positive autocorrelation, and values above 2 indicate negative autocorrelation.

The test results indicate there was no significant autocorrelation of the study variables used in this study.

Table 4. 10 Durbin Watson test for auto correlation and independence

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.646(a)	.417	.404	.36927	1.728

a Predictors: (Constant), Ecol, Post, Pre

b Dependent Variable: SCP

Source: (Research data,2023)

4.5.4 Test of Homoscedasticity

Homoscedasticity is tested to establish whether the variance of errors between the dependent and independent variables is the same across all levels of the independent variable which assumes homoscedasticity (variance of errors is the same). Osborne & Waters, (2002) observed that absence of homoscedasticity leads to a serious weakening of analysis and distortion of findings. Levene's test of homogeneity of variances was thus used in the current study whereby the Levene's statistic is significant at $\alpha = 0.05$, which implies a p-value greater than 0.05 there is homoscedastic. Table 4.11 results indicate that p value was $p = 0.056$ and variances equal at 221.

Table 4. 11 Levene's test of homogeneity of variances

	Levine's Statistic	df1	df2	Sig.
SCP Based on Mean	3.067	17	221	.056
Based on Median	1.814	17	221	.028
Based on Median and with adjusted df	1.814	17	147.388	.031
Based on trimmed mean	2.801	17	221	.056

Source: (Research data, 2023)

4.5.5 Test of Linearity

Regression analysis assumes linearity when data values of the dependent variable for each increment in the independent variable lie along a straight line (Zhang, Cheng & Liu, 2011). ANOVA test was used to test for linearity which computes both the linear and nonlinear components of a pair of variables. According to Zhang et al. (2011), linearity is significant if the significance value for the linear component is above 0.05 hence confirming linear relationships (constant slope) between the predictor variables and the dependent variable. This relationship should be linear for regression analysis to be carried out. Study findings met the above threshold at $p > 0.05$ where the

significance of Pre, Post and SCP was $p = 0.435, 0.479$ and 0.569 respectively thus confirming linearity and appropriateness for regression analysis.

Table 4. 12 ANOVA test of linearity

			Sum of Squares	df	Mean Square	F	Sig.
SCP * Pre	Between Groups	(Combined)	13.629	11	1.239	8.802	.003
		Linearity	7.333	1	7.333	52.090	.000
		Deviation from Linearity	6.296	10	.630	4.473	.435
	Within Groups		17.737	126	.141		
	Total		31.366	137			
			Sum of Squares	df	Mean Square	F	Sig.
SCP * Post	Between Groups	(Combined)	15.018	11	1.365	10.523	.000
		Linearity	3.437	1	3.437	26.493	.020
		Deviation from Linearity	11.580	10	1.158	8.925	.479
	Within Groups		16.348	126	.130		
	Total		31.366	137			
			Sum of Squares	df	Mean Square	F	Sig.
SCP * Ecol	Between Groups	(Combined)	17.851	13	1.373	12.598	.002
		Linearity	10.827	1	10.827	99.340	.001
		Deviation from Linearity	7.023	12	.585	5.370	.569
	Within Groups		13.515	124	.109		
	Total		31.366	137			

Source: (Research data,2023)

4.6 Inferential statistics

Inferential analysis was performed to establish the nature and magnitude of the relationships between study variables. Pearson’s Product Moment Correlation (PPMC) and Coefficient of determination (R^2), which specifies the amount of variation in the

dependent variable explained by the independent variable were used to measure the association.

4.6.1 Correlation Coefficients Matrix test

Pearson's Coefficients Matrix Test was done to first establish whether there were significant associations between the study variables. Saunders, Lewis & Thornhill (2016), The Pearson coefficient ranges between -1 and +1 with -1 indicating strong but negative correlation while +1 indicate strong and positive correlation whereas a Pearson coefficient of 0 indicates that there is no relationship.

Table 4.13 Correlation Coefficients Matrix test table

		Pre	Post	Ecol	SCP
Pre	Pearson Correlation	1	.917(**)	.475(**)	.484(**)
	Sig. (2-tailed)		.000	.000	.000
	N	138	138	138	138
Post	Pearson Correlation	.917(**)	1	.301(**)	.331(**)
	Sig. (2-tailed)	.000		.000	.000
	N	138	138	138	138
Ecol	Pearson Correlation	.475(**)	.301(**)	1	.588(**)
	Sig. (2-tailed)	.000	.000		.000
	N	138	138	138	138
SCP	Pearson Correlation	.484(**)	.331(**)	.588(**)	1
	Sig. (2-tailed)	.000	.000	.000	
	N	138	138	138	138

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

Source: (Research data,2023)

Based on the research objectives, the correlation results can be interpreted as follows:

From table 4.13, there exist moderate positive and significant correlations between Pre and SCP ($r = .484^{**}$, $p = 0.000$), Post and SCP ($r = 0.331^{**}$, $p = 0.000$) which may indicate that the use of both pre-shipment and post-shipment SCF mechanisms can positively affect supply chain performance of these firms and further analysis of the multiple regression models was carried out in the subsequent sections of this chapter to investigate this.

There also exists a strong positive and significant correlation between Ecol and SCP ($r=0.588^{**}$, $p=0.000$) which indicate that external collaboration can positively affect the relationship between SCF and SCP in manufacturing firms in Nairobi. This was further analyzed through a moderation regression analysis in subsequent sections of this chapter.

Overall, the correlation results suggest that manufacturing firms in Nairobi are utilizing SCF mechanisms and that the use of both pre-shipment and post-shipment SCF mechanisms may positively affect supply chain performance. The results also suggest that external collaboration may positively affect the relationship between SCF and SCP. These study results are in line with the study hypothesis developed by the researcher in chapter 3.

4.6.2 Multiple linear regression analysis

This section presents the results of the regression analysis that answers the study research questions. The coefficient of determination (R-square) was used to measure the change in dependent variable explained by the change in independent variable(s) while F-test was carried out to evaluate significance level of the overall model and define the relationship between the dependent and independent variables.

4.6.2.1 Goodness of fit

F-test was used to determine the validity of the model while R^2 was used as a measure of the model's goodness of fit. Goodness of fit of the model evaluates whether the model is good, reliable, and valid to be used for prediction and refers to how well the model explains the variations in the dependent variable (Gujarati, 2012). The regression coefficient summary was then used to explain the nature of the relationship between the dependent and independent variables.

Table 4. 14 Goodness of fit model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.646(a)	.417	.404	.36927

a Predictors: (Constant), Ecol, Post, Pre

Source (Research data,2023)

Study results from table 4.14, indicate that the coefficient of determination (R^2) .417 shows that 41.7% variation in firms supply chain performance can be explained by both Pre & post shipment SCF mechanisms and external collaborations between manufacturing firms, customers, and suppliers. Additionally, the adjusted R of .404 indicates that the independent variables explained the variation in manufacturing firms supply chain performance by 40.4 %, while the remaining variation can be explained by other factors not included in the model. The coefficient $R=.646$ with p-value $p<0.05$ shows that there is a strong positive and significant relation between the dependent and independent variables.

4.6.2.2 Anova

(ANOVA) analysis of variance was used to test the overall significance of the regression model. The null hypothesis for this test is that the predictor variables do not have explanatory power ($\beta_1 = \beta_2 = \beta_3 = 0$). R^2 is significant at $p<0.05$ where $p=0.00$ thereby predictor variables can account for a significant amount of variance in manufacturing firms supply chain performance. We therefore reject the null hypothesis since our regression model is significant at $p<0.05$ ($p=0.000$) and adopt the alternative hypothesis which concludes that the predictors have explanatory power ($\beta_1 \neq \beta_2 \neq \beta_3 \neq 0$).

Therefore, the regression model is significant ($p=.000$; $R^2=.417$)

Table 4. 15 Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.093	3	4.364	32.006	.000(a)
	Residual	18.273	134	.136		
	Total	31.366	137			

a Predictors: (Constant), Ecol, Post, Pre

b Dependent Variable: SCP

Source: (Research data,2023)

4.6.2.3 Multiple regression analysis

Table 4. 16 Multiple regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.831	.235		7.797	.000
	Pre	.467	.143	.633	3.254	.001
	Post	-.253	.123	-.369	-2.056	.042

a Dependent Variable: SCP, (Predictors, Pre, Post)

Source: (Research data,2023)

$$Y = 1.831 + 0.467_{pre} - 0.253_{post}$$

Where.

Y - (SCP) Supply chain performance of manufacturing firms

Pre - (Pre) Pre shipment supply chain financing mechanisms

Post - (Post) Post shipment supply chain financing mechanisms

Multiple regression analysis was used to determine whether independent variables simultaneously influence the dependent variable (Y). From the regression results in Table 4.16, the unstandardized coefficients indicate the corresponding change in the dependent variable when a change of a unit is affected by the independent variable. A unit increase in Pre shipment supply chain financing mechanisms would result to .467 increase manufacturing firms supply chain performance all other factors held constant. A unit increase in (Post) Post shipment supply chain financing mechanisms would result to -.253 change in firms supply chain performance while a unit change in external collaboration would result to a .341 change in firms supply chain performance all other factors held constant.

Table 4. 17

Moderation regression coefficients

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	2.976	.198		15.002	.000
	Post	-.731	.601	-1.067	-1.215	.026
	Pre	.631	.588	.855	1.073	.005
	Pre_Coll	-.033	.156	-.254	-.211	.833
	Post_Coll	.126	.163	.934	.772	.041

a. Dependent Variable: SCP
Source: (Research data,2023)

$$Y = 2.976 + 0.631 \text{ Pre} - 0.731 \text{ Post} - 0.033 \text{ Pre_Ecoll} + 0.126 \text{ Post_Ecoll}$$

Where,

Y - (SCP) Supply chain performance of manufacturing firms

Pre - (Pre) Pre shipment supply chain financing mechanisms

Post - (Post) Post shipment supply chain financing mechanisms

Pre_Coll- Iterating effect of external collaboration on pre-shipment SCF mechanisms

Post_Coll- Iterating effect of external collaboration on post-shipment SCF mechanisms

A further analysis of the moderation regression analysis was conducted to check on the moderating effect if any of external collaboration on SCF mechanisms. The test results indicate a negative and insignificant moderating effect of external collaboration on pre shipment SCF mechanisms where a unit increase in external collaboration leads to a - 0.033 decrease on pre-shipments' effect on SCP *ceteris paribus*. Whereas a positive but significant moderating effect exist on post SCF mechanisms where a unit increase in external collaboration leads to a 0.126 increase of post shipment's effect on SCP *ceteris paribus*.

4.7 Chapter summary

The chapter presented data and study results from the filled and returned questionnaires. Descriptive statistics, diagnostic tests, correlation, and regression analysis were all performed, and results presented in this chapter. The next chapter provides details on the discussions, conclusions and recommendations based on the study results presented in this chapter.



CHAPTER FIVE:

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines discussions of the findings, conclusions, and recommendations from the study. Discussions of the findings based on the objectives is given in section 5.2, conclusions in section 5.3, Recommendations in section 5.4, and limitations of the study and areas for further studies in section 5.5.

5.2 Discussions

This section highlights discussions of study findings as captured in chapter four in relation to the study title, supply chain finance and supply chain performance of manufacturing firms in Nairobi-Kenya. The discussions will be based on the study objectives that were aimed to be achieved.

5.2.1 To determine the impact of pre-shipment SCF mechanisms on the supply chain performance of manufacturing firms in Nairobi.

The first hypothesis H_1 of this study objective as discussed in chapter 2 was that Pre-shipment SCF has a significant and positive effect on the supply chain performance of manufacturing firms. The study findings reveal that there exists a positive and significant effect of pre shipment financing on SCP and therefore we fail to reject the null hypothesis.

H₁: Pre-shipment SCF has a significant and positive effect on the supply chain performance of manufacturing firms in Nairobi.

RBV theory postulates that firms that utilize their internal resources and capabilities well stand to experience long term success and the study results agree with this theory in that firms who adopted pre-shipment financing mechanisms and capabilities had a positive impact on their supply chain performance.

In the context of this study, the adoption of pre-shipment SCF mechanisms is considered a resource or capability that manufacturing firms can leverage to enhance their supply

chain performance. The positive and significant effect of pre-shipment financing on SCP aligns with the RBV perspective. By utilizing pre-shipment financing mechanisms such as purchase order financing, manufacturing firms can improve supplier performance, reduce lead times, and enhance working capital management. This indicates that firms that effectively utilize the resource of pre-shipment SCF mechanisms experience improved supply chain performance. The findings are supported by Chen et al. (2021), who found a positive impact of SCF adoption on the performance of Chinese manufacturing firms. The RBV perspective emphasizes the importance of effectively leveraging internal resources, in this case, pre-shipment SCF mechanisms, to drive performance outcomes. The positive impact of pre-shipment SCF mechanisms on SCP supports the notion of social exchange, as the adoption of these mechanisms enhances collaboration, trust, and cooperation between supply chain partners. This aligns with the findings of Kavita and Goswami (2019), who emphasized the positive impact of pre-shipment SCF mechanisms on supplier performance and working capital management.

5.2.2 To determine the impact of post-shipment SCF mechanisms on the supply chain performance of manufacturing firms in Nairobi.

The second hypothesis postulated in chapter 2 presumed that consequently, post shipment SCF mechanisms would also have significant and positive impact on the supply chain performance. However, the study results revealed that based on the 138 manufacturing firms who responded to this part of the questionnaire, post shipment SCF has a negative and almost insignificant impact on SCP. We therefore reject the null hypothesis below and adopt the alternate hypothesis that post shipment does not have a significant and positive effect on the supply chain performance of manufacturing firms.

H2: Post-shipment SCF mechanisms have a significant and positive effect on the supply chain performance of manufacturing firms in Nairobi.

Ha: Post-shipment SCF mechanisms do not have a significant and positive effect on the supply chain performance of manufacturing firms in Nairobi.

The study findings are inconsistent with the predictions of Social Exchange Theory. Despite the expectations of a positive impact, the results indicate a negative and insignificant relationship between post-shipment SCF mechanisms and SCP. This discrepancy could be due to various factors, such as contextual differences, the specific nature of the post-shipment SCF mechanisms being examined, or variations in the way supply chain partners engage in social exchange. The inconsistency with Social Exchange Theory is supported by the study by Wang et al. (2021), which found a positive effect of post-shipment SCF components, specifically reverse factoring, on buyer firms' operating performance. This study focused on both the buyers and suppliers' perspectives, suggesting that the different focus and dynamics of the relationships between buyers and suppliers might explain the differing findings. While Wang et al. (2021) primarily examined the buyer's perspective, the current study focused on the impact of post-shipment SCF mechanisms from both perspectives. In summary, the findings that post-shipment SCF mechanisms have a negative and insignificant impact on the SCP of manufacturing firms in Nairobi are inconsistent with both SET and RBV theories. The lack of a positive relationship contradicts the expectations of social exchange and the effective utilization of internal resources as predicted by RBV.

Despite the inconsistent findings with RBV and SET theories, the study highlights the importance of pre-shipment SCF mechanisms in enhancing SCP for manufacturing firms in Nairobi. These mechanisms contribute to improved supplier performance, reduced lead times, and enhanced working capital management. The pre shipment SCF mechanisms adoption has a greater positive impact on SCF as compared to the negative impact of post shipment adoption given their Beta values.

5.2.3 To Determine the extent to which external collaboration affects the relationship between SCF and SCP of manufacturing firms in Nairobi.

The study aimed to determine the extent to which external collaboration affects the relationship between SCF and SCP manufacturing firms in Nairobi. The results showed that external collaboration has a negative impact on the relationship between pre-

shipment SCF mechanisms and SCP. This negative impact is however insignificant for analysis purposes in this study. However, external collaboration has a Positive impact on the relationship between post-shipment SCF mechanisms and SCP. These findings are consistent with previous studies that have reported the importance of external collaboration in the adoption and implementation of SCF systems (Xu and Wang, 2019; Yu et al., 2020). External collaboration can help to reduce information asymmetry, increase trust, and enhance the effectiveness of SCF systems.

This study's findings can be understood through the lens of Social Exchange Theory. External collaboration involves interactions and cooperation between different supply chain partners, such as buyers, suppliers, and financial institutions. In these collaborations, each party contributes resources, knowledge, and expertise to achieve mutually beneficial outcomes. In the context of SCF, external collaboration can be seen as a form of social exchange, where partners engage in reciprocal relationships aimed at optimizing supply chain performance. Manufacturers who collaborate with external partners, such as suppliers or financial institutions, can access valuable resources, information, and expertise that contribute to the effectiveness of SCF systems.

One of the key mechanisms through which external collaboration influences the relationship between SCF and SCP is by reducing information asymmetry (Ali et al., 2021). In supply chain relationships, there is often a disparity in information available to different partners. By collaborating externally, manufacturers can bridge this gap and gain access to relevant information about suppliers' financial health, creditworthiness, and performance. This information exchange helps to reduce uncertainties and risks associated with SCF practices, ultimately leading to improved supply chain performance. Moreover, external collaboration fosters trust and strengthens relationships among supply chain partners. Trust is a fundamental component of social exchange, as individuals are more likely to engage in cooperative behaviors when they perceive the other party as trustworthy. In the context of SCF, trust between manufacturers and external partners, such as financial institutions or buyers, is crucial for the successful

implementation of SCF mechanisms. Trust enables manufacturers to rely on external partners for timely payments, favorable financing terms, and other forms of support. This trust-based collaboration enhances the effectiveness of SCF practices and positively impacts supply chain performance.

The findings align with previous studies that have emphasized the importance of external collaboration in the adoption and implementation of SCF systems. Xu and Wang (2019) and Yu et al. (2020) have also highlighted the positive role of collaboration in enhancing SCF outcomes. These studies provide further support for the Social Exchange Theory perspective, as they recognize the value of social interactions, trust, and information exchange in achieving favorable outcomes within supply chains.

In summary, the positive impact of external collaboration on the relationship between SCF and SCP in the context of manufacturing firms in Nairobi can be explained through Social Exchange Theory. External collaboration facilitates information sharing, reduces information asymmetry, fosters trust, and strengthens relationships among supply chain partners. These social exchange dynamics contribute to the effectiveness of SCF practices and ultimately lead to improved supply chain performance.

5.3 Conclusions

In conclusion, this study aimed to assess the levels of SCF adoption among manufacturing firms in Nairobi, examine the barriers hindering adoption of SCF, determine the impact of pre-shipment and post-shipment SCF mechanisms on the supply chain performance of manufacturing firms, and determine the extent to which external collaboration affects the relationship between SCF and SCP. The study employed a quantitative approach and data was collected from 180 manufacturing firms in Nairobi. The data was analyzed using multiple regression analysis and moderation regression analysis.

The findings of the study indicate that manufacturing firms in Nairobi have moderate levels of SCF adoption. The barriers to the adoption of SCF identified in the study include

poor relationships with downstream and upstream players in the SC, high implementation costs, and lack of trust between partners. The study found that pre-shipment SCF mechanisms have a positive impact on the supply chain performance of manufacturing firms, while post-shipment SCF mechanisms have a negative impact. Furthermore, the study found that the effect of pre-shipment and post-shipment SCF mechanisms on supply chain performance is influenced by the level of external collaboration.

The study contributes to the literature on SCF adoption by manufacturing firms in emerging economies, particularly in the African context. The findings of this study provide insights into the factors that hinder the adoption of SCF, which can inform policymakers and practitioners in developing strategies to promote the adoption of SCF among manufacturing firms. The study also highlights the importance of pre-shipment SCF mechanisms in enhancing supply chain performance, which can inform managers in developing strategies to improve their supply chain performance.

In summary, the findings of this study contribute to the literature on SCF adoption in emerging economies and provide practical implications for policymakers, practitioners, and managers in enhancing supply chain performance. Overall, SCF adoption is a complex process that requires collaboration between partners, trust, and awareness. Policymakers and practitioners should focus on developing strategies to address the barriers hindering the adoption of SCF and promote its adoption among manufacturing firms in emerging economies.

5.4 Recommendations

Manufacturing firms in Nairobi should increase their adoption of supply chain finance mechanisms to improve their supply chain performance. This can be achieved through awareness creation campaigns by SCF service providers, industry associations and the government.

To overcome the barriers to SCF adoption identified in this study, manufacturing firms in Nairobi should collaborate with other stakeholders such as financial institutions and technology providers to leverage their expertise and resources. Since external collaboration was found to positively affect the relationship between SCF and SCP, manufacturing firms should actively seek opportunities for collaboration with their supply chain partners, such as sharing information, joint planning, and joint risk management.

To ensure successful implementation of SCF mechanisms, manufacturing firms in Nairobi should undertake a thorough assessment of their supply chain processes and capabilities to identify areas for improvement, and ensure they have the necessary technology and personnel in place to support the implementation of SCF mechanisms.

Overall, the findings of this study suggest that SCF can be a valuable tool for improving the supply chain performance of manufacturing firms in Nairobi, and that increased adoption and external collaboration can enhance its impact.

5.5 Limitations and Suggestions for further research

Despite the contributions of this study, there are several limitations that should be addressed in future research. First, the study was limited to manufacturing firms in Nairobi, and therefore the findings may not be generalizable to other regions or industries. Second, the study employed a cross-sectional design, which limits the ability to establish causality. Future research should employ longitudinal designs to establish causal relationships between SCF adoption, external collaboration, and supply chain performance. There is also the need for further research to explore the complexities and contextual factors that influence this relationship. Finally, the study did not investigate the role of cultural factors in the adoption of SCF, which may be an important factor to consider in future research. Such cultural factors include and are not limited to attitude towards innovation, trust, time orientation as well as risk aversion or profiling.

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Appendix I: Participant information and consent form

Topic: THE IMPACT OF SUPPLY CHAIN FINANCE MECHANISMS ON THE SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI, KENYA.

SECTION 1: INFORMATION SHEET

Investigator: CLINTON WANJOHI MUCHOKI

Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION SHEET-THE STUDY

2.1: Why is this study being carried out?

In partial fulfillment of my master's degree in commerce- Finance option at Strathmore Business School.

2.2 Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on **THE IMPACT OF SUPPLY CHAIN FINANCE MECHANISMS ON THE SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI, KENYA**. If you are not able to answer all the questions successfully the first time, you may be asked to sit through another informational session after which you may be asked to answer the questions a second time. You are free to decline to take part in the study from this study at any time without giving any reasons.

2.3: Who is eligible to take part in this study?

Employees of the selected manufacturing firms working either in the supply chain and procurement, or finance department.

2.4: Who is not eligible to take part in this study?

Participants not working in the selected manufacturing firms.

2.5: What will taking part in this study involve for me?

You will be approached by the researcher and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

2.6: Are there any risks or dangers in taking part in this study?

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission. All responses will be randomized to enhance confidentiality.

2.7: Are there any benefits of taking part in this study?

The information will be used to improve the manufacturing sector as well as the governing body set up by the government, KAM.

2.8 What will happen to me if I refuse to take part in this study?

Participation in this study is entirely voluntary. Even if you decide to take part at first but later change your mind, you are free to withdraw at any time without explanation.

2.9 Who will have access to my information during this research?

All research records will be stored in securely locked cabinets. That information may be transcribed into our database, but this will be sufficiently encrypted, and password protected. Only the people who are closely concerned with this study will have access to your information. All your information will be kept confidential.

2.10 Who can I contact in case I have further questions?

You can contact me, Clinton Wanjohi at SBS, or by e-mail (cwanjohi@strathmore.edu), or by phone (0702732570). You can also contact my supervisor, Dr. Diana Ominde, at the Strathmore Business School, Nairobi, or by e-mail dominde@strathmore.edu.

If you want to ask someone independent anything about this research, please contact:

The Secretary-Strathmore University Institutional Ethics Review Board, P. O. BOX 59857, 00200, Nairobi, email ethicsreview@strathmore.edu Tel number: +254 703 034 375

I, _____, have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you.

Participation in the research study

I AGREE to take part in this research.

DON'T AGREE to take part in this research.

Storage of information on the completed questionnaire

I AGREE to have my completed questionnaire stored for future data analysis.

DON'T AGREE to have my completed questionnaire stored for future data analysis.

Participant's Signature:

Date: ____/____/____

DD / MM / YEAR

Participant's Name:


Time: ____/____

(Please print name)

HR / MN

I, **Clinton Wanjohi**, certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that s/he has understood the nature and the purpose of the study and consents to the participation in the study. S/he has been given opportunity to ask questions which have been answered satisfactorily.

Investigator's Signature:



Date: 06/03/2023

DD / MM / YEAR

Investigator's Name: Clinton Wanjohi

Time: ____/____

(Please print name)

HR / MN

Appendix II: Questionnaire

INTRODUCTION

My name is Clinton Wanjohi, and I am conducting this research to fulfill the requirements of my Master of Commerce - Finance option at Strathmore University Business School. My study is titled : **THE IMPACT OF SUPPLY CHAIN FINANCE MECHANISMS ON THE SUPPLY CHAIN PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI, KENYA.**

I am kindly requesting your participation in this research by filling out this questionnaire. This should take 5-10 minutes of your noble time.

No information given will be personalized or shared with anyone other than the researcher and the supervisor. Your data will be anonymized to ensure data privacy protection.

SECTION A: DEMOGRAPHIC INFORMATION

This section seeks to get some basic demographic information of the respondents to give the analysis of the data collected more meaningful insights.

Please tick , circle or answer where necessary in the spaces provided below.

1. Gender: Male [] Female []
2. How long has your organization been in operation since incorporation?
 - A. 0-5 years
 - B. 6-10 years
 - C. 11-15 years
 - D. Over 15 years
3. On average how many employees does your organization have?
 - A. 0-9 Employees
 - B. 10-99 Employees
 - C. 100 or more employees
4. What's your role in the organization you work for?
 - A. Finance Manager
 - B. Supply Chain Manager

SECTION B: ADOPTION OF SUPPLY CHAIN FINANCE MECHANISMS

SCF instruments include:

Advance payment discounting - a buyer finances the supplier by advancing payment at a discount prior to product shipment and invoicing.

Purchase order financing - suppliers receive funding from a financial institution based on a reputable buyer's purchase order before product shipment and invoicing.

Reverse factoring- Early payments offered based on approved invoices by a financial institution.

Dynamic discounting - Discount offered decreases gradually over time.

5. To what extent has your organization adopted SCF mechanisms?
- A. Fully Adopted
 - B. Partially Adopted
 - C. Not Adopted

SECTION C: PRE & POST SHIPMENT SCF MECHANISMS

Pre-shipment SCF are mechanisms that aid in easing the cashflow constraints of the supplier before delivery of goods or issuance of invoice.

Post-shipment SCF are the mechanisms available after the issuance of invoice and delivery of goods.

Adapted from Camerinelli, 2009; Caniato et al., 2016; Ali et al. 2020.

6. Please indicate your level of agreement with the below statements in relation to the adoption of both Pre-shipment and post-shipment SCF mechanisms within your firm on a scale of 1-5 where:

1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree, 5 = Strongly agree

1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly Agree				
				1	2	3	4	5
1. We adopt advance payment discount when purchasing raw materials from either overseas suppliers or local suppliers or both.								
2. We offer advance payment discount to our customers who buy raw materials from us.								
3. We approve purchase orders to help our overseas and local suppliers receive payments from financial institutions before delivery.								
4. We receive financing from financial institutions based on purchase orders approved by our customers.								
5. We adopt other Pre-shipment financing mechanisms in our supply chain.								
6. We receive early payments from financial institutions based on approved invoices by our reputable customers before due dates.								

7. We approve invoices of our suppliers so they can get advance payment from financial institutions before the due dates.					
8. We offer dynamic discounts for early payments to our customers to encourage early payments					
9. Our suppliers offer us dynamic discounts when we make early payments.					
10. We adopt other post-shipment financing mechanisms available to us within the supply chain.					

Tick one response per row

SECTION D: EXTERNAL COLLABORATION - Adapted from Nguema et al., (2021)

7. Please rate the extent to which you agree or disagree with the below statements on a scale of 1-5. Where:

1= Strongly disagree; 2= Disagree; 3= Neither agree nor disagree; 4= Agree; 5= Strongly Agree

1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly Agree					
					1		5	6	7
1. We have integrated our systems with some of our suppliers.									
2. We extend our systems to some of our service providers for ease of monitoring.									
3. We have client service representatives who collaborate with both our customers and suppliers for better sourcing arrangements.									
4. Some of our clients have extended their systems to us so we can monitor their products movements and requirements.									
5. We hold periodic meetings with all our major customers and suppliers to understand our service and product delivery to them.									

SECTION E: SUPPLY CHAIN PERFORMANCE MEASURES - Adapted from Gunasekaran, et al. 2004

8. Below statements relate to your firm's supply chain performance. Please rate your level of agreement with the below statements on a scale of 1-5. Where:

1= Strongly disagree; 2= Disagree; 3= Neither agree nor disagree; 4= Agree; 5= Strongly Agree

1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly Agree					
					1	2	3	4	5
1. We extend payment terms to suppliers without harming production.									
2. We receive payments from sale of goods on time due to the available SCF solutions adopted.									
3. We have reduced our supply chain cycle time.									
4. We negotiate cheaper and faster deliveries with our global and local suppliers due to improved relationships enhanced by SCF adoptions.									
5. We deliver goods on time to our clients due to the eased working capital by the mechanisms adopted.									



Appendix III: Research Budget

Item	Unit	Cost (Kshs)
Printing and photocopying of proposal	Item	2,000
Research assistants	2	80,000
Binding of proposal	300	1,000
Data analysis	Item	20,000
Traveling expenses	Item	20,000
Hard cover binding	3 Copies	3,000
Miscellaneous	Item	19,000
Total		104,000

Appendix IV: Sample list

1. 64Door Factory Ltd
2. A plus PVC Technology company ltd
3. AAM Resources
4. AARO E.Ltd
5. Access Alliance Ltd
6. Accurate Steel Mills Ltd
7. Ace Plastics Company Ltd
8. Acee Ltd
9. Adarsh Polymer Ltd
10. Addison Industries Ltd
11. Adix Shoes Ltd
12. Adpak International Ltd
13. Advanced Molecular Imaging Ltd
14. Advanced Plastics Ltd
15. Aesthetics Ltd
16. AFAL Manufacturing Ltd
17. Afri Piping Systems Kenya Ltd
18. Afribon (K) Ltd
19. Africa Apparels EPZ LTD
20. Afriken International Ltd
21. Afrikstones Ltd
22. Afrimac Nut Company
23. Agriscope (Africa) Ltd
24. Airos Investment Ltd
25. Akinyi Odongo Kenya Ltd
26. Al-Noor Feisal \$ Co Ltd
27. Aldo wood makers
28. Alfatech Contractors Ltd
29. Alicia Bakers & Confectioners Ltd
30. All Times Ltd
31. Allan International Co Ltd
32. AL-mahra Industries LTD
33. Almasi Beverages Ltd
34. Alpha Medical Manufacturers Ltd
35. Alpine Coolers Ltd
36. Aluglass Africa Ltd
37. Amki Kenya Ltd
38. Analabs Ltd
39. Anke Home Appliance Services Ltd
40. Ankole Grill Ltd
41. Apex Piping Systems Ltd
42. Arax Mills Ltd
43. Arc Packaging Ltd
44. ARC Ride Kenya Ltd
45. Aristocrats Concrete Ltd

46. Ariya Energy Holding Ltd
47. Armor East Africa Imaging Services Ltd
48. Aromakare Ltd
49. Ashut Engineers
50. Ashut Plastics Ltd
51. ASL Ltd
52. ASL Packaging Ltd
53. ASP Company Ltd
54. Associated Battery Manufacturers (E.A.) Ltd
55. Athi River Steel Plant Ltd
56. Auto Ancillaries Ltd
57. Auto Industries Ltd
58. Autopak International Ltd
59. Auto Sterile East Africa Ltd
60. Avery Dennison Kenya Ltd
61. Azaavi Collections
62. Azuri Technologies Kenya Ltd
63. Bags & Ballers Manufacturers Ltd
64. Bakemark Ltd
65. Bakers Corner Ltd
66. Balaji Group of Industries Ltd
67. Bamburi Cement Ltd
68. Bamburi Special Products Ltd
69. Barakat Bakers Ltd
70. Basco East Africa Ltd
71. Basf Company Ltd
72. Bayer East Africa Ltd
73. BCS Kenya Ltd
74. Bdelo Ltd
75. Belersdof East Africa Ltd
76. Belfast Millers Ltd
77. Beta Healthcare International Ltd
78. Betatrad (K) Ltd
79. Better Globe Forestry Ltd
80. Beyond Borders Ltd
81. Bhachu Industries Ltd
82. Bhuraj Metal Industries Ltd
83. BIC East Africa Limited
84. Bidco Land O' Lakes Ltd
85. Bio Food Products Ltd
86. Biocorn Products (EPZ) Ltd
87. Biodeal Laboratories Ltd
88. Biogas International Ltd
89. Biomerieux Kenya Ltd
90. Bitutech Ltd
91. Blends of Nature Ltd
92. Bloc Enterprises Ltd
93. Blue Nile Rolling Mills Ltd.
94. Blue Ring Products Ltd
95. Blue Stone Ltd
96. BlueKey Seidor (K) Ltd
97. Blueplastics and Water Co. Ltd
98. BMG Holdings Ltd
99. Bobmil Industries Ltd
100. BOC Kenya Ltd
101. Bosch Rexroth Kenya Ltd
102. Botosoft Technologies Ltd
103. Bowmans Coulson Harney LLP
104. Boyama Building Materials Ltd
105. Brand ID Technologies (EA) Ltd
106. Brandnest Advertising & Design Ltd
107. Brandworld Communications Ltd
108. Britannia Food Ltd
109. British American Tobacco Kenya Plc
- Formaly (British American Tobacco Ltd
110. Broadband Communications Networks Ltd
111. Brothers Shirts Factory Ltd
112. Brush Manufacturers Ltd
113. Budget Shoes Ltd
114. Burton and Bamber Ltd
115. Buruk General Trading
116. Bushtown Kitchen & Interiors
117. Buyline Industries Ltd
118. C & P Shoes Industries Ltd
119. C Dormans SEZ Ltd
120. C.Czarnikow Sugar (EA) Ltd
121. Cable Connect Ltd
122. Candy Kenya Ltd
123. Canon Aluminium Fabricators Ltd
124. Canton Alloys Ltd
125. Capel Food Ingredients
126. Capital Blocks & Pavers
127. Capitol Printers Ltd
128. Captain Motorcycle Manufacturing Co Ltd
129. Car and General Trading Ltd
130. Carton Experts Ltd
131. Chandaria Industries Ltd
132. Chemraw EA Ltd
133. Chiromo Fertilizer Ltd
134. Chrome Partners Ltd
135. Chrysal Africa Ltd
136. Chryso Eastern Africa Ltd
137. Chui Auto Spring Industries Ltd
138. Chui Wires Products Ltd
139. City Engineering Works Ltd
140. Cloud Hop (K)Ltd
141. CMC Motors Group Ltd
142. Coca-Cola East Central and West Africa Ltd

143. Colgate Palmolive (EA) Ltd
144. Colour Labels Ltd
145. Columbus Footwear Ltd
146. Comet Plastics Ltd
147. Complast Industries Ltd
148. Compulynx Ltd
149. Coninx Industries Ltd
150. Consol Glass Kenya Ltd
151. Convex Commodity Merchants Ltd
152. Cooper K-Brands Ltd
153. Cosmos Ltd
154. Cotecna Kenya Ltd
155. Crafts With Meaning Ltd
156. Create A Tree Ltd
157. Crop Nutrition Laboratory Services Ltd
158. Crown Paints Kenya PLC
159. Crown Solution Ltd
160. Crystal Industries Ltd
161. Crystal River Products
162. Crystal World Agencies Ltd
163. Dala Textile (K) EPZ Ltd
164. Danone Baby Nutrition Africa and Overseas
165. Davis & Shirliff Ltd
166. Dawa Ltd
167. Delegation German Industry and Commerce
168. Delta Blade Consultants
169. Dentex Industries Ltd
170. Devkan Enterprises Ltd
171. Devyani Foods Industries (Kenya) Ltd
172. Dharamshi & Co. Ltd
173. Di Lorenzo Ltd
174. Diversey Eastern & Central Africa
175. Dodhia Packaging Kenya Ltd
176. Dow Chemical's East Africa Ltd
177. DPL Festive Ltd
178. Drychem Kenya Solutions Ltd
179. DST East Africa
180. Duma Sagacity Ltd
181. Dupont de Nemours Kenya Ltd
182. Dynamic Chemicals Ltd
183. East Africa Cans & Closures Ltd
184. East Africa Ventures Company Ltd
185. East African Breweries Ltd
186. East African Cables Ltd
187. East African Sea Food Ltd
188. Eastern Produce Kenya Ltd (Kakuzi)
189. Eco Bags Industries Ltd
190. Eco Living International Ltd
191. Ecoeri Green Co Ltd
192. Eco-LAB CO LTD
193. Economic Industries Ltd
194. Edible Oil Products Ltd
195. Elex Products Ltd
196. Elgon Kenya Ltd
197. Elida Industries Ltd
198. Elite Innovations K Ltd
199. Elite Offset Ltd
200. Elite Tools Ltd
201. Eliams Products
202. Elpha Kenya Ltd
203. Elvants Ltd
204. Elys Chemicals Industries Ltd
205. Embellisher Ltd
206. Empire Glass Industries Ltd
207. Enclave Packaging Ltd
208. Engineering Development Ltd
209. English Press Ltd
210. Enova Industries Ltd
211. EPCO Quarries
212. Eriken Manufacturing Industries Ltd
213. Eslon Plastics of Kenya Ltd
214. Espace Malter Limited
215. Euro Packaging Ltd
216. Eurocon Tiles Products Ltd
217. Europack Industries Ltd
218. Excel Chemicals Ltd
219. Excel Packaging Ltd
220. Extra Dimensions Co. Ltd
221. Fame Electrical Ltd
222. Farm Engineering Industries Ltd
223. Farm Refrigeration and Electrical Systems
224. Farmers Choice Ltd
225. Farmyard International Investment Ltd
226. Five-star Manufacturers
227. Flexoworld Limited
228. General Industries
229. Giloil company Ltd
230. Glacier Products
231. Guaca Stationers ltd
232. Hayat Kimya Kenya Hygienic Products
233. Healthy U Two thousand ltd
234. Henkel Kenya limited.
235. Hitech Granite Industries limited.
236. Hotpoint appliances limited.
237. Isuzu East Africa

238. Kartasi Industries ltd
 239. Kenpoly Manufacturers ltd
 240. Kentainers limited.
 241. Kenya Wine Agencies Ltd
 242. Kim-Fay East Africa Ltd
 243. King Plastics industries ltd
 244. L'Oreal East Africa Ltd
 245. Lean Energy solutions limited.
 246. Koko Networks limited.
 247. Manji Food Industries ltd
 248. Manufacturers & Supplies Ltd
 249. Maaai Rollings Mills Limited
 250. Mayleen (K) Ltd
 251. Midco Textiles (EA) Ltd
 252. Metal Cans and closures Kenya Ltd
 253. Mobius Motors Kenya Ltd
 254. Nairobi Bottlers ltd
 255. Nasib Industrial products ltd
 256. Neuce Kenya Paint Industry ltd
 257. Nestle Kenya ltd
 258. Nirmal Fabrictors ltd
 259. Osho Chemicals Industries ltd
 260. Paper converters (K) ltd
 261. Patco Industries ltd
 262. Philips Esst Africa
 263. Plastico Industries ltd
 264. Pipe manufacturers Ltd
 265. Polychem East Africa
 266. Polyflex Industries ltd
 267. Polytanks and containers
 268. Printing services Ltd
 269. Premier foods industries ltd
 270. Quickpack Limited
 271. R & R plastic ltd
 272. Ramco printing works ltd
 273. Royal Mabati factory Ltd
 274. Ritz Enterprises
 275. Saj ceramics ltd
 276. Sanergy Ltd
 277. Simba Caetano Formula Limited
 278. Simba Foam limited.
 279. Specialized fiberglass ltd
 280. Space and style ltd
 281. Steel makers ltd
 282. Super manufacturers ltd
 283. Tin Can Manufacturers ltd
 284. Tononoka Rolling Mills ltd
 285. Tononoka Steel Ltd
 286. Twiga chemical Industries ltd
 287. Twiga stationers and Printers Ltd
 288. United Bags Manufacturers ltd
 289. Unga Group ltd
 290. Unilever Kenya Limited
 291. Veja's Manufacturers ltd
 292. Vitafoam products ltd
 293. Weetabix east Africa
 294. Welding Alloys ltd
 295. Zeelandia East Africa
 296. Zenith steel Fabricato

Table 6. 1 Sample Size

Manufacturing sector - Based on the Raw materials imported or products they manufacture.	Number of Firms in Nairobi County	Sample size - Inclusive of the pilot study
--	-----------------------------------	--

Agriculture / Agro-processing	65	27
Automotive	58	24
Building Mining and Construction	46	19
Chemical and Allied	84	34
Energy, Electrical and Electronics	46	19
Food and Beverages	108	44
Leather and Footwear	24	10
Metal and Allied	41	17
Paper	34	14
Pharmaceutical and Medical Equipment	39	16
Plastics and Rubber	31	13
Textile and Apparels Sector	130	51
Timber	19	8
TOTAL SIZE	725	296
PILOT STUDY		40
MAIN STUDY		256

Source: Researcher 2023



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RESEARCH LICENSE



This is to Certify that Mr.. Clinton Muchoki Wanjohi 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: Supply chain finance mechanisms and supply chain performance of Manufacturing firms in Nairobi Kenya. for the period ending : 05/April/2024.

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Strathmore
UNIVERSITY

BUSINESS SCHOOL

24th March 2023

To Whom It May Concern,

RE: FACILITATION OF RESEARCH – CLINTON MUCHOKI

This is to introduce Clinton Muchoki who is a Master of Commerce (MCOM) Student at Strathmore University Business School, admission number MCOM/95536. As part of our MCOM Programme, Clinton is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MCOM course. To this effect, Clinton would like to request appropriate data from your organization.

Clinton is undertaking a research paper on “**Supply chain finance mechanisms and supply chain performance of Manufacturing firms in Nairobi Kenya.**” The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MCOM Programme seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Njoki Kiagiri'.

Njoki Kiagiri
Manager – Graduate Programmes
Strathmore University Business School.

Strathmore Business School is a Proud member of;










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