

**DIGITAL FINANCE AND THE GROWTH OF THE JUA KALI
ENTERPRISES IN MAKUENI COUNTY**

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DECLARATION

This research project is my original work and has not been presented for any academic award in any other university.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATMs	Automated Teller Machines
CBK	Central Bank of Kenya
COVID	Coronavirus Disease
FI	Financial Inclusion
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
GSMA	Global System for Mobile Communications Association
IB	Internet Banking
ICT	Information and Communication Technology
IFC	International Finance Corporation
IFI	Index of Financial Inclusion
KCB	Kenya Commercial Bank
KNBS	Kenya National Bureau of Statistics
M-Pesa	Mobile Payment Service by Safaricom
MSMEs	Micro, Small, and Medium-Sized Enterprises
NACOSTI	National Commission for Science, Technology and Innovation
NGOs	Non-Governmental Organizations

OLS	Ordinary Least Squares
PEOU	Perceived ease of use
POS	Point-Of-Sale
PU	perceived usefulness
QASOs	Quality Assurance and Standards Offices
Q-Q plot	Quantile-Quantile plot
SDGs	Sustainable Development Goals
SMEs	Small and Medium-Sized Enterprises
SMS	Short Message Service
SPSS	Statistical Packages for Social Sciences
STOF	Service, Technology, Organization, and Finance
TAM	Technology Acceptance Model
TCT	Transaction Cost Theory
TRA	Theory of Reasoned Action
TSC	Teachers Service Commission
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

DEFINITION OF TERMS

Digital Loans	Refers to lending platforms that provide access to quick and often collateral-free loans through digital means, such as mobile apps or internet banking portals (Mwaura, 2020).
Digital Finance	Digital finance encompasses a wide range of financial services delivered through digital platforms, including mobile money, internet banking, and fintech applications (Gomber et al., 2021).
Growth	Refers to the measurable improvement in the size, profitability, and operational efficiency of businesses over time (Kamau, 2023).
Internet Banking	It is also known as internet banking, refers to conducting banking transactions through internet-enabled devices, enabling services such as fund transfers, loan applications, and account management without visiting a bank branch (Muli & Karanja, 2023).
Jua Kali Enterprise	Refers to informal micro and small enterprises which typically employ less than 10 employees, possess assets not exceeding KSh 500,000, and have annual turnover not exceeding KSh 1 million. They encompass artisans,

traders, and service providers engaged in small-scale manufacturing, repair works, and various informal economic activities that play a vital role in job creation and local economic growth (Nyaga & Onyango, 2021).

Mobile Banking

Involves accessing and managing bank accounts using mobile devices, enabling functions such as balance checks, bill payments, and funds transfers (Gikonyo et al., 2021).

Mobile Money Transfer

Refers to financial transactions conducted via mobile phones, allowing users to send and receive money without requiring a bank account (World Bank, 2020).

ABSTRACT

The aim of the study was to investigate the effect of digital finance on the growth of Jua Kali enterprises in Makueni County, Kenya, focusing on four key tools: mobile money, mobile banking, internet banking, and digital loans. The study was guided by the four specific objectives: to examine the effect of mobile money transfers on the growth of the Jua Kali enterprises in Makueni County; to assess the effect of mobile banking on the growth of the Jua Kali enterprises in Makueni County; to determine the effect of internet banking on the growth of the Jua Kali enterprises in Makueni County; and to investigate the effect of digital loans on the growth of Jua Kali enterprises in Makueni County. Anchored on the Technology Acceptance Model (TAM), Schumpeter's Innovation Theory, Transaction Cost Theory, and Financial Inclusion Theory, the research adopted a descriptive design and employed stratified random sampling to select 266 respondents. Data were collected through structured questionnaires and analyzed using descriptive statistics, Spearman correlation, and ordinal regression analysis. The ordinal regression results revealed that mobile money had the strongest and statistically significant positive association with enterprise revenue growth ($\beta = 1.628$, $\text{Exp}(\beta) = 5.10$, $p < 0.001$). This indicates that enterprises utilizing mobile money were over five times more likely to achieve higher growth levels than those that did not, emphasizing its pivotal role in enhancing transaction efficiency, liquidity management, and market access within the informal sector. Digital loans also exhibited a significant positive effect ($\beta = 0.833$, $\text{Exp}(\beta) = 2.30$, $p < 0.001$), suggesting that access to digital credit facilities substantially improves short-term liquidity and operational performance. Similarly, internet banking had a positive and statistically significant influence ($\beta = 0.501$, $\text{Exp}(\beta) = 1.65$, $p = 0.008$), reflecting its growing importance in promoting financial management and supporting enterprise modernization. Conversely, mobile banking showed a positive but statistically insignificant relationship ($\beta = 0.050$, $\text{Exp}(\beta) = 1.05$, $p = 0.736$), implying its limited impact on growth among informal businesses, possibly due to minimal integration with enterprise financing tools. The model's goodness-of-fit tests confirmed that the data met the proportional odds assumption, while the Nagelkerke R^2 value of 0.288 indicated that the digital finance variables collectively explained approximately 29% of the variation in enterprise growth levels. Overall, the findings affirm that digital financial inclusion, particularly through mobile money, internet banking, and digital lending, plays a critical role in enhancing the performance and sustainability of informal enterprises. The study concludes that strengthening Kenya's digital finance ecosystem through innovative financial products, flexible credit systems, enhanced digital literacy, and infrastructure development is vital for promoting inclusive growth and enterprise resilience.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter lays the foundation for the study by introducing the context and rationale for investigating the influence of digital finance on the growth of Jua Kali enterprises in Makueni County. It begins with the background of the study, highlighting key developments in digital finance and the role of informal enterprises in Kenya's economy. The chapter then outlines the problem statement, research objectives, and research questions. It also presents the significance and scope of the study. Through this structure, the chapter establishes the basis for the research and guides the reader on what to expect in the subsequent sections.

1.1 Background of the Study

Digital finance has emerged as a key driver of economic transformation globally, reshaping financial ecosystems and influencing how individuals and enterprises access and manage financial services. It encompasses the use of digital technologies, such as mobile banking, internet banking, and fintech applications, to deliver financial solutions efficiently and inclusively (Gomber et al., 2021). According to the World Bank (2021), about 1.7 billion people worldwide lacked access to traditional financial systems as of 2020, and digital finance has been instrumental in bridging this gap, particularly in developing economies. Globally, it has enhanced access to financial services, reduced transaction costs, and stimulated economic productivity (Demirgüç-Kunt et al., 2020).

In Sub-Saharan Africa, the expansion of mobile technology has driven the rapid growth of digital finance, enabling millions of people to engage in financial transactions using their mobile devices. Jack and Suri (2016) note that innovations such as M-Pesa in Kenya have transformed how individuals save, borrow, and transfer money, significantly reducing the barriers to financial access. The GSMA (2022) reported that Sub-Saharan Africa accounted for 70% of global mobile money transactions in 2021, with over 160 million active accounts. These developments have facilitated safer, faster, and more affordable transactions, strengthening financial inclusion and enabling small businesses to access microloans and expand operations (Klapper et al., 2021).

In Kenya, digital finance has become integral to the operations of micro, small, and medium enterprises (MSMEs), particularly those within the informal sector. The Central Bank of Kenya (2022) indicated that mobile money transactions reached KSh 6.91 trillion in 2022, reflecting the dominance of digital financial services in the country's economy. Platforms such as M-Pesa, KCB M-Pesa, and M-Shwari have transformed business operations by facilitating payments, savings, and access to credit (Safaricom, 2022). According to Mbiti and Weil (2020), the adoption of mobile money has enhanced business resilience, household welfare, and overall enterprise growth by simplifying transactions and improving liquidity.

The Jua Kali sector, comprising artisans, small-scale traders, and service providers operating largely informally, forms the backbone of Kenya's informal economy. According to the Kenya National Bureau of Statistics (KNBS, 2021), the informal sector employs over 80% of the country's workforce. More recent statistics show that the sector created about 720,900 out of 848,200 new jobs in 2023, accounting for nearly

85% of all new employment opportunities (KNBS, 2025). Despite its contribution to employment and income generation, the growth of Jua Kali enterprises has been constrained by limited access to finance, inadequate infrastructure, and lack of formal business management skills. Digital finance solutions such as mobile money, mobile banking, internet banking, and digital loans were expected to address these challenges by improving access to financial resources and streamlining business operations.

In Makueni County, located in eastern Kenya, the Jua Kali sector remains a key driver of local economic development. The sector comprises small-scale artisans, mechanics, welders, and traders whose survival depends on daily transactions and informal networks (Makueni County Government, 2022). The adoption of mobile money and mobile banking services has enabled many of these entrepreneurs to manage their businesses more efficiently. However, barriers such as low digital literacy, unreliable network connectivity, and high internet costs continue to limit the full utilization of digital financial platforms (Tiony, 2023; Communications Authority of Kenya [CA], 2024). The CA (2024) reported that mobile phone ownership in rural areas stands at 48.6%, compared to 64.6% in urban areas, while only 17% of rural residents use the internet weekly compared to 44% of urban users (World Bank, 2023). These figures illustrate a persistent digital divide that undermines the potential of digital finance in rural-based enterprises.

Although several studies have explored digital finance in relation to financial inclusion and business performance, notable conceptual and contextual gaps remain. Prior research has concentrated on general aspects such as education levels and adoption of digital platforms among artisans (Momanyi, Rasugu, & Khatete, 2024), digital

infrastructure disparities (CA, 2024), and the affordability of internet services (World Bank, 2023). However, limited empirical evidence exists on how specific components of digital finance, namely mobile money transfers, mobile banking, internet banking, and digital loans, affect the growth of Jua Kali enterprises, especially within rural contexts such as Makueni County.

Therefore, this study seeks to examine the influence of mobile money transfers, mobile banking, internet banking, and digital loans on the growth of Jua Kali enterprises in Makueni County, Kenya. By addressing these conceptual and contextual gaps, the study aims to generate empirical evidence on how different facets of digital finance contribute to enterprise growth in the informal sector. The findings will help policymakers, financial institutions, and development partners design targeted digital finance interventions that enhance the productivity, sustainability, and competitiveness of Jua Kali enterprises in rural Kenya.

1.1.1 Digital Finance & Financial inclusion

Digital finance encompasses a wide range of financial services delivered through digital platforms, including mobile money, internet banking, and fintech applications. It has revolutionized the way individuals and businesses access and manage financial services, particularly in regions where traditional banking infrastructure is limited. According to Gomber et al. (2021), digital finance has enhanced financial inclusion by offering services that are more accessible, affordable, and convenient than traditional banking systems. This shift has been particularly evident in developing countries, where mobile money platforms have bridged the financial inclusion gap.

In Kenya, digital finance has largely been driven by mobile money services, with M-Pesa leading the way since its inception in 2007 (Suri & Jack, 2016). M-Pesa allows users to send and receive money, pay bills, and access savings and credit services, all through a mobile phone. As of 2022, M-Pesa had over 30 million active users in Kenya, processing transactions worth over Ksh. 15 billion daily (Safaricom, 2022). Studies by FSD Kenya (2020) and the World Bank (2021) have shown that mobile money has significantly boosted financial inclusion, enabling millions of Kenyans, particularly those in the informal sector, to access formal financial services.

According to Durai and Stella (2021), financial inclusion refers to the process of ensuring that individuals and businesses, particularly those in underserved and low-income communities, have access to useful and affordable financial products and services. These services include savings, credit, insurance, payments, and pensions, which are provided in a responsible and sustainable manner. Financial inclusion (FI) is vital in reducing income inequality, fostering economic empowerment, and enabling individuals to manage risks and uncertainties. For marginalized groups, such as women and rural communities, financial inclusion can act as a powerful tool for social and economic transformation. Ozili (2020) states that access to financial services not only promotes personal financial security but also drives entrepreneurship and job creation, contributing to the overall economic growth of a country. Governments, private institutions, and non-governmental organizations (NGOs) play an essential role in creating an enabling environment for financial inclusion by addressing barriers like high transaction costs, lack of financial literacy, and limited physical access to banking infrastructure.

Participation by individuals in the financial system increases their ability to start businesses, control risk, and survive financial crises (Al-Smadi, 2023). Hence, international bodies such as the World Bank have encouraged policy makers worldwide to develop strategies and plans for enhancing FI as an enabler of sustainable economic growth and poverty reduction. However, Ozili (2020) argues that, according to the public good theory of FI, financial services should be delivered to everyone in the population. To achieve FI, various stakeholders should jointly try to bring the financially excluded population into the formal financial system.

1.1.2 Growth of Jua Kali Enterprises

The growth of an enterprises refers to the expansion and improvement of the business in terms of productivity, revenue, market reach, employment opportunities, and sustainability (Lekovic & Marić, 2021). Jua Kali enterprises, often operating within the informal sector, are characterized by small-scale operations, minimal capital investment, and limited access to formal financial services. Growth in this context entails transitioning from subsistence-level operations to more structured and competitive businesses capable of generating consistent income and contributing to the local economy. This transformation can be achieved through better access to resources such as capital, technology, and market information, which enable these enterprises to scale their operations, improve efficiency, and compete effectively in the marketplace.

The Jua Kali sector, comprising small and medium enterprises (SMEs) in Kenya's informal economy, is essential for job creation and economic growth. These enterprises are labor-intensive and cover a wide range of activities, including metalwork, carpentry, food vending, and vehicle repairs (KNBS, 2021). Research by Nyaga and Onyango

(2021) shows that the Jua Kali sector absorbs a large portion of the country's labor force, particularly among low-income households, making it a crucial player in poverty alleviation.

However, despite their importance, Jua Kali enterprises face significant challenges in accessing finance due to their informal nature (IFC, 2020). Traditional financial institutions often regard them as high-risk borrowers because they lack collateral and formal credit histories. This has impeded their growth and ability to scale up operations. Studies by Kinyanjui (2021) and FSD Kenya (2020) highlight the need for tailored financial products that cater to the unique needs of the informal sector, particularly as Jua Kali enterprises contribute to over 33% of Kenya's GDP (KNBS, 2021).

1.1.3 Jua Kali Enterprises in Makueni County

Makueni County's Jua Kali sector is diverse, encompassing artisans, traders, and service providers who operate informally but play a vital role in the local economy. The county is predominantly rural, with limited access to formal financial services, making digital finance an important tool for economic inclusion. According to a report by the Makueni County Government (2022), over 60% of the county's population engages in informal sector activities, with Jua Kali enterprises providing critical employment opportunities.

Despite the growing adoption of digital finance, challenges persist in Makueni County. A study by Omwenga *et al.* (2021) indicates that digital illiteracy and poor internet infrastructure are key barriers to the full utilization of digital financial services in rural areas. Mwangi and Njuguna, (2020) noted that only 28% of Jua Kali entrepreneurs in

rural areas have access to formal credit facilities, while over 60% rely solely on informal savings groups or personal funds to finance their businesses. This lack of access to affordable credit and structured savings products has stifled their ability to expand operations, invest in new tools, or diversify their offerings. Although mobile money platforms have improved business transactions and enhanced convenience, they have not fully addressed the critical need for accessible credit and savings products. For instance, while 85% of Jua Kali entrepreneurs in the region use mobile money for daily transactions, only 15% report successfully accessing mobile-based credit services (Mwangi & Njuguna, 2020). This disparity highlights a gap in the financial ecosystem, where digital finance has yet to reach its full potential in driving enterprise growth.

1.2 Statement of the Problem

The Jua Kali sector remains the backbone of Kenya's economy, accounting for approximately 90% of all new jobs created annually (Kenya National Bureau of Statistics [KNBS], 2025). However, recent trends point to a slowdown in this sector's growth. KNBS (2025) reported that only 703,700 new informal jobs were created in 2024, a decline from 720,900 in 2023, indicating stagnation among informal enterprises, particularly in rural counties such as Makueni. County-level reports further reveal that despite the increased availability of digital financial platforms, many Jua Kali enterprises continue to experience limited sales growth, weak capital accumulation, and poor business sustainability (Makueni County Government, 2023).

While digital finance, comprising mobile money transfers, mobile banking, internet banking, and digital loans, has been celebrated as a catalyst for enterprise growth,

empirical findings remain mixed. Jack and Suri (2016) found that mobile money improved household welfare and business resilience in Kenya, while Obunga et al. (2021) reported that digital loans enhanced short-term liquidity among small enterprises. However, Tiony (2023) noted that rural micro-enterprises still struggle to convert access to digital finance into tangible business growth due to low digital literacy and limited network coverage. Similarly, Makworo *et al.* (2020) and Kirui (2020) identified barriers such as high interest rates, data insecurity, and poor financial management as major obstacles to the productive use of digital finance in informal sectors.

Most of these studies were conducted in urban or peri-urban contexts such as Nairobi and Nakuru, leaving limited empirical evidence from rural areas like Makueni, where infrastructural and socio-economic realities are markedly different. Moreover, past research has treated digital finance as a single construct rather than disaggregating its specific components to determine their distinct effects on enterprise growth. This study therefore addresses these conceptual and contextual gaps by examining how mobile money transfers, mobile banking, internet banking, and digital loans influence the growth of Jua Kali enterprises in Makueni County, Kenya.

1.3 Objectives of the Study

In line with the research problem and guided by the identified knowledge gaps, this section sets out clear objectives to provide a structured approach to the investigation.

1.3.1 General Objective

To examine the effect of digital finance on the growth of Jua Kali enterprises in Makueni County.

1.3.2 Specific Objectives

- i. To examine the effect of mobile money transfers on the growth of the Jua Kali enterprises in Makueni County.
- ii. To assess the effect of mobile banking on the growth of the Jua Kali enterprises in Makueni County.
- iii. To determine the effect of internet banking on the growth of the Jua Kali enterprises in Makueni County.
- iv. To investigate the effect of digital loans on the growth of Jua Kali enterprises in Makueni County.

1.4 Research Questions

- i. What is the influence of mobile money transfer on the growth of Jua Kali enterprises in Makueni County?
- ii. How does mobile banking influence the growth of Jua Kali enterprises in Makueni County?
- iii. What is the influence of internet banking on the growth of Jua Kali enterprises in Makueni County?
- iv. What is the influence of digital loans on the growth of Jua Kali enterprises in Makueni County?

1.5 Significance of the Study

This study has significant implications for development at the county, national, regional, and global levels, as it explores the influence of digital finance tools on the growth of Jua Kali enterprises. The research supports policy formulation and practical interventions aligned with key strategic development frameworks.

1.5.1. Contribution to Makueni County Development Agenda

Makueni County prioritizes youth and women empowerment, enterprise development, and the promotion of ICT-based innovations to drive inclusive economic growth. The Jua Kali sector forms a major part of the county's informal economy, providing livelihoods to thousands of residents. This study will provide empirical evidence on the effectiveness of digital finance in enhancing productivity, financial resilience, and sustainability of these enterprises. The findings will inform county-level policies and capacity-building initiatives that support financial inclusion, local entrepreneurship, and digital transformation in informal markets.

1.5.2 Contribution to Kenya Vision 2030

Kenya Vision 2030 seeks to create a globally competitive and prosperous nation by focusing on economic, social, and political development. Under the economic pillar, the Vision emphasizes financial inclusion, SME growth, and ICT integration. This research contributes to that pillar by highlighting how digital financial services such as mobile money, mobile banking, internet banking, and digital loans can empower Jua Kali enterprises to expand, improve operations, and access credit. It supports national efforts in job creation, poverty reduction, and enhancing the contribution of SMEs to GDP.

1.5.3 Contribution to Africa Agenda 2063

The study also contributes to Agenda 2063 (The Africa We Want) by promoting inclusive economic growth, financial integration, and entrepreneurship across the continent. The African Union emphasizes the need for increased financial accessibility to empower small businesses and boost intra-African trade. By assessing how digital finance facilitates business growth in the informal sector, this research provides a framework for policymakers and financial institutions to enhance financial solutions that support micro and small enterprises. Strengthening the Jua Kali sector through digital financial services contributes to economic transformation and self-reliance, which are key pillars of Agenda 2063.

1.5.4 Contribution to the Sustainable Development Goals (SDGs)

At the global level, this research advances the achievement of several Sustainable Development Goals (SDGs). It directly supports SDG 1 (No Poverty) by demonstrating how access to digital finance can help small businesses grow, generate income, and lift people out of poverty. It also aligns with SDG 8 (Decent Work and Economic Growth) by promoting financial inclusion for small enterprises, which in turn creates employment and stimulates economic activity. Furthermore, the study supports SDG 9 (Industry, Innovation, and Infrastructure) by emphasizing the role of digital financial solutions in enhancing financial infrastructure and fostering innovation in the informal sector. This study provides valuable insights into how digital finance can be leveraged to drive sustainable development at national, regional, and global levels.

1.5.5 Contribution to Management of Jua Kali Enterprises

For Jua Kali enterprise managers and owners, this study offers practical insights into how different digital financial tools can be strategically adopted to improve operational efficiency, enhance liquidity, and facilitate business expansion. By understanding the specific contributions of mobile money, mobile banking, internet banking, and digital loans, enterprise managers can make informed financial decisions that promote sustainability, competitiveness, and innovation. The study will also guide training institutions and business support organizations in designing programs that enhance digital and financial literacy among informal sector entrepreneurs.

1.5.6 Contribution to Scholars and Future Research

For scholars and researchers, this study enriches the body of knowledge on digital finance and informal enterprise growth, particularly within rural contexts such as Makueni County. It addresses a contextual and conceptual gap in existing literature, which often focuses on urban settings and treats digital finance as a single construct. The study's disaggregated approach provides a theoretical and empirical foundation for future research on digital financial innovation, rural enterprise development, and informal economy resilience in developing countries.

1.6 Scope of the Study

This study was geographically limited to Makueni County, one of Kenya's devolved units located in the eastern region. The focus was on Jua Kali enterprises operating within this county. The choice of Makueni was deliberate and guided by several key factors. First, the county has a rapidly growing informal sector that provides substantial employment and contributes significantly to the local economy, yet it remains under-

researched compared to urban centers such as Nairobi and Mombasa. Second, despite relatively high mobile phone penetration and expanding mobile financial services, many Jua Kali enterprises in Makueni still experience challenges in accessing and fully utilizing digital financial tools. Third, Makueni provides a unique rural–peri-urban mix, making it an ideal context for examining how digital finance affects informal enterprises outside major urban economies. Furthermore, the county has been at the forefront of devolution-driven enterprise development programs, particularly in supporting micro and small-scale businesses, making it a relevant and timely setting for this study.

Conceptually, the study was confined to the relationship between digital finance tools and the growth of Jua Kali enterprises. The independent variables were mobile money transfers, mobile banking, internet banking, and digital loans, while the dependent variable was enterprise growth, measured through indicators such as business expansion, sales turnover, profitability, and capital accumulation. The time scope of the study covered the period 2020 to 2025, during which there was a notable acceleration in the adoption of digital financial services across Kenya, coupled with the governments and private sector's increased investment in digital infrastructure. This period also reflects the most recent developments in digital finance and their possible influence on informal enterprise growth.

The population scope comprised 2,350 registered Jua Kali entrepreneurs in Makueni County where a stratified random sampling technique was employed to select a sample of 342 to ensure proportional representation of each sector. These entrepreneurs operate in diverse sectors, including carpentry, construction, welding, car washing, food

vending, and shoe-making. Thus, the study's scope was clearly delineated to ensure that findings accurately capture how digital financial tools influence the growth of Jua Kali enterprises within the unique socio-economic environment of Makueni County.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter details the various aspects of digital finance and examines their influence and importance in enhancing the growth of Jua Kali enterprises within this study's scope. The concepts selected in chapter are directly related to the focus area of the study. Thus, this chapter documents the empirical literature relating to the study topic, supporting theories and develops a conceptual framework which forms the basis of the study.

2.2 Theoretical Framework

This study is grounded on a multiple-theory approach, combining perspectives from technology adoption, innovation, financial inclusion, and transaction cost economics. The rationale for using multiple theories lies in the complex, multidimensional nature of digital finance and enterprise growth. No single theory adequately explains how entrepreneurs adopt digital technologies, access financial services, innovate business processes, and ultimately enhance enterprise performance. Integrating these theoretical lenses provides a holistic understanding of how digital finance tools, such as mobile money transfers, mobile banking, internet banking, and digital loans, affect the growth of Jua Kali enterprises in Makueni County.

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), originated from the Theory of Reasoned Action (TRA) and aims to explain users' acceptance of technology by analyzing the effects of Perceived Usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). TAM suggests that PU, defined as the extent to which a user believes a technology will improve their performance, and PEOU, the belief that the technology is effortless to use, significantly affect the user's attitude toward technology adoption. The model posits that these beliefs directly influence a user's behavioral intention to use the technology, which subsequently leads to actual usage behavior (Venkatesh & Davis, 2000). TAM's parsimonious structure has made it one of the most widely utilized models for understanding technology adoption across varied fields.

TAM's is valued for its simplicity and applicability, offering a robust framework for studying technology acceptance across diverse contexts (Venkatesh, Thong, & Xu, 2012). Its flexibility allows for adaptation, with extensions such as TAM2 and the Unified Theory of Acceptance and Use of Technology (UTAUT), enhancing the model's scope (Venkatesh & Davis, 2000). However, critics argue that TAM oversimplifies technology adoption, overlooking critical external factors like social influence and facilitating conditions, which are crucial in complex real-world environments (Bagozzi, 2007). Moreover, the model's focus on rational decision-making limits its ability to account for emotional and affective aspects of user behavior, potentially affecting its predictive power in certain contexts (Bagozzi, 2007).

TAM has been applied extensively in research to predict and explain the acceptance of technologies ranging from healthcare information systems to e-commerce platforms and educational tools (Holden & Karsh, 2010). For example, Park, Nam, and Cha (2012) used TAM to investigate e-learning adoption, while Szajna (1996) employed it to understand spreadsheet software adoption in business environments. In financial technology (fintech) research, TAM has been utilized to study mobile banking adoption, providing insights into factors that drive user engagement in digital finance services (Afshan & Sharif, 2016). These studies demonstrate TAM's versatility in evaluating user acceptance across different technological innovations.

In the current study, TAM is applied to examine the adoption of Mobile Money Transfer by Jua Kali enterprises in Makueni County. By focusing on PU and PEOU, TAM provides a structured approach to understanding how these enterprises perceive mobile money as a beneficial, easy-to-use financial service that can enhance their business operations. Given the informal nature of Jua Kali enterprises, factors such as the perceived value of mobile money for streamlining payments and enabling efficient transactions become critical in assessing technology acceptance. Therefore, the model's application here allows for a focused examination of the attitudes and intentions underlying mobile money adoption, contributing insights into the potential for increased digital finance integration within Kenya's informal economy.

2.2.2 Schumpeter's Innovation Theory

Schumpeter's Innovation Theory, proposed by Joseph Schumpeter in the early 20th century, highlights the central role of innovation in economic development and business cycles. Schumpeter argued that innovation, defined as the creation of new products,

processes, or business models, is a key driver of economic growth and market transformation (Schumpeter, 1934). He introduced the concept of "creative destruction," where old industries and practices are replaced by innovative alternatives, allowing economies to evolve and grow. According to Schumpeter, entrepreneurs, through their pursuit of novel ideas, play a critical role in instigating innovation and enabling advancements that ultimately lead to economic progress (Schumpeter, 1942). This theory emphasizes that innovation is not only a source of competitive advantage for firms but also a fundamental factor in the long-term growth of economies.

Schumpeter's Innovation Theory has been influential in shaping economic thought, offering strengths that include its recognition of entrepreneurship's role and the long-term economic benefits of innovation (Freeman, 2002). It provides a robust framework to understand how technological progress and innovation drive structural change within industries. However, the theory has limitations, as it may oversimplify the innovation process by attributing it solely to entrepreneurs, overlooking external factors like government policy, organizational dynamics, and market demand (Fagerberg, 2003). Additionally, critics argue that Schumpeter's focus on "creative destruction" can fail to account for the social and economic disruptions caused by the replacement of older industries, such as unemployment and market monopolization, which can have adverse effects on the economy.

Schumpeter's Innovation Theory has been widely applied in various fields, particularly in studies exploring the impact of innovation on economic growth, entrepreneurship, and industry dynamics. For example, Audretsch and Keilbach (2004) applied Schumpeterian principles to analyze the relationship between innovation and regional

economic growth, concluding that regions with high entrepreneurial activity exhibit greater innovation and economic expansion. Similarly, Baumol (2002) explored the link between innovation and competitive advantage, emphasizing that Schumpeter's theory provides a foundation for understanding how firms can leverage innovation to outcompete rivals. The theory has also been instrumental in digital economy studies, with researchers using it to examine how technological advancements such as the internet and mobile devices disrupt traditional business models (Evans & Schmalensee, 2016).

In the context of Makueni County's Jua Kali sector, Schumpeter's Innovation Theory can help explain how mobile banking adoption serves as a catalyst for economic growth and business efficiency. Mobile banking, as an innovative financial solution, aligns with Schumpeter's concept of "creative destruction" by providing an alternative to traditional banking methods, allowing Jua Kali enterprises to access banking services conveniently, enhance cash flow management, and increase financial inclusion (Mbogo, 2010). This study applies Schumpeter's framework by analyzing how mobile banking innovation influences the operational capabilities of Jua Kali enterprises, facilitating easier transactions and supporting business scalability in a rural setting. Moreover, the theory's emphasis on entrepreneurs as innovation drivers aligns with the resilience and adaptability of Jua Kali entrepreneurs in adopting new technologies to stay competitive in their informal economy (Wanyonyi & Bwisa, 2013).

2.2.3 Transaction Cost Theory

Transaction Cost Theory (TCT) was initially developed by economist Ronald Coase in his seminal work, *The Nature of the Firm* (1937). Coase argued that firms exist because

they can conduct certain transactions more efficiently internally than in the open market, thereby reducing transaction costs. This foundational idea was expanded by Oliver Williamson, who argued that transaction costs could arise from factors such as asset specificity, uncertainty, and frequency of transactions (Williamson, 1981). TCT suggests that when transaction costs are high due to such factors, firms will prefer internalization (hierarchical governance) over market transactions, whereas low transaction costs favor market exchanges. The theory has since evolved to become a key framework in organizational economics and strategic management, offering insights into why firms choose different governance structures to minimize costs (Williamson, 1985).

TCT offers robust explanatory power in organizational decisions, particularly concerning the structure and boundaries of firms (Grover & Malhotra, 2003). Its strengths include providing a clear framework for analyzing costs associated with various governance modes and helping explain decisions around outsourcing, vertical integration, and joint ventures. However, critics argue that TCT can be overly reductionist, focusing too heavily on cost minimization while underestimating the importance of other strategic considerations, such as learning, flexibility, and innovation (Ghoshal & Moran, 1996). Additionally, the theory often assumes that human behavior is largely opportunistic, which can limit its applicability in contexts where trust and cooperative behavior play a significant role (Powell, 1990).

TCT has been widely applied in research examining organizational boundaries, vertical integration, and the choice between in-house and outsourced services. For instance, in the technology sector, researchers have used TCT to analyze whether firms should

develop software internally or outsource it to reduce transaction costs (Aubert *et al.*, 2004). Similarly, studies in the supply chain industry have applied TCT to investigate why firms might prefer long-term partnerships over market-based contracts when asset specificity is high (Walker & Weber, 1987). Research in e-commerce has also leveraged TCT to explain firms' decisions to adopt digital systems to reduce transaction and operational costs, thus improving competitiveness and efficiency (Teo *et al.*, 2003).

In the context of this study, TCT will be applied to explain the adoption of internet banking by Jua Kali enterprises in Makueni County. Small enterprises in the Jua Kali sector face significant transaction costs, especially in managing cash flow, handling payments, and accessing credit (Ngugi *et al.*, 2010). By adopting internet banking, these enterprises can potentially reduce the costs associated with traditional banking methods, including transportation, time, and transactional inefficiencies. Given that Jua Kali enterprises operate with limited resources, TCT suggests that they may adopt internet banking as a cost-efficient solution to enhance financial management and operational efficiency (Kimani, 2022). In this way, TCT provides a framework to understand how transaction cost considerations drive digital financial adoption among these small enterprises in rural Kenya.

2.2.4 Financial Inclusion Theory

The Financial Inclusion Theory emerged from developmental economics, primarily driven by the need to address financial disparities and include underserved populations in formal financial systems. Its roots are traced back to post-colonial economic structures, where significant portions of the population in developing countries were excluded from traditional banking services (Sarma & Pais, 2011). The theory argues

that access to affordable and effective financial services is essential for economic development, poverty alleviation, and social equity (Demirguc-Kunt *et al.*, 2018). It underscores that providing marginalized groups—especially in rural and informal sectors like the Jua Kali sector in Kenya—with banking services, savings accounts, and credit options can significantly improve their economic stability, resilience, and entrepreneurial growth (World Bank, 2014).

One of the strengths of the Financial Inclusion Theory is its emphasis on economic empowerment and poverty alleviation through equitable access to financial services. By expanding credit, savings, and insurance to underserved populations, it promotes economic resilience and fosters sustainable development (Beck *et al.*, 2009). Moreover, it enhances financial literacy and reduces dependency on informal lending sources, which often charge high-interest rates. However, the theory has limitations, particularly in underestimating the risks associated with increased financial access, such as over-indebtedness among low-income borrowers (Bhanot & Bapat, 2015). Additionally, the success of financial inclusion initiatives depends on adequate infrastructure and regulatory frameworks, which are often lacking in developing countries, limiting the effectiveness of financial inclusion efforts.

Financial Inclusion Theory has been applied in various studies assessing access to financial services in low-income and underserved communities. For instance, Cull, Demirguc-Kunt, and Morduch (2013) examined the impact of microfinance on poverty reduction and noted that inclusive financial services facilitate the reduction of economic inequality. In Kenya, Johnson and Arnold (2012) analyzed how mobile money platforms contributed to financial inclusion among rural and low-income populations,

showing that technology-driven solutions could effectively reach populations previously excluded from traditional financial systems. These applications underscore the relevance of financial inclusion as a vehicle for economic and social development, particularly through innovations like digital finance.

In this study, Financial Inclusion Theory is applied to examine the adoption of digital loans by Jua Kali Enterprises in Makueni County. This informal sector often faces credit access challenges due to a lack of collateral and credit history, making it difficult to qualify for traditional loans (Muthiora, 2015). By applying Financial Inclusion Theory, this study aims to understand how digital loans, as an accessible financial service, enables Jua Kali enterprises to overcome these barriers, fostering growth and financial resilience. Digital loans provide an alternative financing option that aligns with the financial needs and preferences of this sector, potentially driving economic inclusivity and supporting informal businesses in scaling their operations (Demirguc-Kunt & Klapper, 2012).

2.3 Empirical Literature

Several empirical studies have explored the role of digital finance in promoting the growth of micro, small, and informal enterprises. This section reviews selected studies relevant to the present research and provides insight into their data collection methods, analytical techniques, and key findings.

2.3.1 Mobile Money Transfer

Parashar et al. (2023) in their study sought to explore the factors influencing users' behavioral intentions, attitudes, and perceptions toward mobile payment services

during the COVID-19 pandemic. A survey method was employed to gather primary data, capturing user attitudes and behaviors regarding mobile payment services both during and after the pandemic. As a quantitative study, multiple regression analysis was used to assess the data. The findings reveal that education played a key role in mobile payment adoption, while security was the primary factor driving user satisfaction. Additionally, ease of use was crucial for continued app usage. The statistical analysis highlights that ease of use is a significant determinant of mobile payment service adoption, followed by familiarity, safety, and security. Based on these results, the study recommended that mobile payment providers focus on enhancing the performance and usability of their applications. Furthermore, addressing users' specific needs can contribute to long-term customer retention.

Ariffin and Lim (2020) explored the factors that shape the intention to use mobile payment services among young professionals in Malaysia. A descriptive survey design was used for this study. To analyze this, the Technology Acceptance Model and Theory of Planned Behavior were combined. Five key factors, perceived ease of use, perceived usefulness, attitude, subjective norms, and perceived behavioral control, were examined for their influence on mobile payment intentions. Additionally, trust was introduced into the model as a moderating factor. A total of 250 young professionals were invited to participate through an online survey. The findings reveal that both attitude and perceived behavioral control positively and significantly impact the intention to use mobile payment among young professionals, while subjective norms, perceived ease of use, and perceived usefulness did not show significant effects. Furthermore, trust was found to moderate the relationship between attitude and

subjective norms regarding mobile payment intentions. These insights could assist marketers and mobile payment providers in tailoring their strategies to better meet the preferences of young professionals in Malaysia.

Talom and Tengeh's (2020) study provided a detailed analysis of the financial impact of mobile money payment and receipt services on small and medium-sized enterprises (SMEs) in Cameroon, particularly in Douala. Using a comprehensive mixed-methods approach, data were collected through structured survey interviews and in-depth one-on-one interviews with business owners and operators, which allowed for a nuanced understanding of mobile money's role. The researchers then triangulated the findings to enhance credibility and reliability. The results were notable: mobile money payment and receipt services accounted for approximately 73% of the observed variance in SMEs' turnover after integrating the technology, highlighting mobile money as a transformative factor in improving business revenues and operational efficiency for SMEs in the region.

Onyango et al. (2021) investigated the impact of mobile transfer services on the financial growth of SMEs in Busia Town, Kenya, utilizing the Entrepreneurship and Innovation Theory alongside the Technology Acceptance Model as guiding frameworks. The study employed a descriptive survey research design, targeting a population of 2,700 registered SMEs in Busia Town, with purposive sampling used to select the SMEs. Data were analyzed using descriptive and inferential statistics. Findings indicated that enhancing money transfer services such as M-Pesa, M-Shwari, and mobile banking could significantly improve the financial performance of SMEs by enabling faster customer response, facilitating savings from business revenue, and

providing safe, convenient transaction methods. Adhering to government regulations was also identified as crucial for smooth business operations. The study recommended that SMEs incorporate mobile money savings and transfer services, as these have a considerable effect on financial performance. To maximize financial gains from mobile money services, SMEs should adopt modern technology, utilize efficient mobile money transfer and credit services, and adhere to regulatory requirements.

Khorow (2023) examined the impact of mobile money services on the financial health of SMEs in Garissa County, Kenya. Specifically, it aimed to assess the effects of mobile banking, mobile payments, and mobile financing on the financial performance of SMEs in the region. The research was grounded in the theories of agency, technological advancement, dynamic capability, and innovation. A descriptive survey research design was employed, targeting all SMEs in Garissa County. A sample of 334 SME owners was selected using a simple random sampling method. Data collection was conducted through questionnaires, and the analysis was performed using SPSS version 24. The results indicated that most respondents agreed that mobile money payments, mobile financing, and mobile banking had a significant effect on the financial performance of SMEs in Garissa County. The study further demonstrated a strong positive correlation between mobile money services and SME financial performance. Based on these findings, the study concluded that mobile money services play a crucial role in enhancing SME financial performance. It recommended that SMEs integrate mobile money services into their business operations to remain competitive.

Mutiso and Reuben (2021) explored the connection between mobile money services and the performance of micro, small, and medium-sized enterprises (MSMEs) in

Kitengela, Kajiado County, Kenya, using the Diffusion of Innovation Theory as a theoretical framework. A descriptive research design was employed, targeting a population of 817 formally registered MSMEs in Kitengela engaged in trade, services, and manufacturing. Primary data were collected through questionnaires. The relationship between the independent and dependent variables was analyzed using multiple regression. The findings indicated that mobile money payments and transfers accounted for approximately 60% of the performance of MSMEs in Kitengela. There was a significant positive linear relationship between mobile money payments, mobile money transfers, and MSME performance in the region. Additionally, the overall influence of mobile money services on MSME performance was significant. The study also found that loan disbursement and repayment significantly impacted mobile money transfer performance. The study concluded that mobile commerce has a statistically significant relationship with the performance of MSMEs in Kenya. Consequently, it recommended that mobile service providers enhance their promotional efforts to encourage more business owners to utilize mobile money services.

2.3.2 Mobile Banking

Akter *et al.* (2021) investigated the impact of mobile banking on financial inclusion across 17 developing countries. Using data from 2011 to 2021, the study analyzed three aspects of financial inclusion namely, penetration, access and usage. The researchers employed the Sarma Index of Financial Inclusion (IFI) model, integrating mobile money accounts as a penetration variable and mobile banking outlets as an access variable to measure mobile banking's effects. The study findings indicate that mobile banking positively contributes to financial inclusion in the selected countries, though the level of impact varies. African countries, in particular, have seen significant

improvements in financial inclusion following the introduction of mobile banking compared to other regions.

Qamruzzaman and Wei (2021) conducted an extensive study on the growth of mobile banking across Asia, focusing on its influence in promoting financial inclusion. The researchers analyzed mobile and internet banking as well as other financial innovations, examining how these technologies contribute to the "inclusion matrix," which represents the access and usage of financial services among underserved populations. Through quantitative analysis, the study found that mobile banking initiatives were particularly effective in bridging gaps for rural and low-income individuals, significantly expanding their access to essential financial services like savings accounts, loans, and payment systems. The study concluded that mobile banking not only improves financial accessibility but also supports economic growth by empowering individuals with tools for better financial management, fostering a more inclusive financial ecosystem across Asian economies.

Asongu and Odhiambo (2021) investigated the relationship between mobile banking and inclusive development, specifically examining growth quality, inequality, and poverty across 93 developing countries in 2011. A comparative analysis approach was followed in the study. Mobile banking was defined as the use of mobile phones to pay bills and send or receive money. The study's results indicated that enhancing mobile banking to specific levels could improve growth quality and reduce inequality, especially in higher quantiles of inclusive development distributions. This study is unique in its approach, employing three inclusive development measures: growth quality, inequality, and poverty. The primary policy recommendation suggests that

promoting mobile banking applications could significantly address issues related to immiserizing growth, inequality, and poverty in developing nations.

Israel (2022) examined the impact of mobile banking on the performance of small and medium-sized enterprises (SMEs) in Anambra State. The study's objectives centered on evaluating how mobile banking influences SME performance in the region. It was based on the Task Technology Fit theory. Using a survey research design, the researcher developed a structured questionnaire to gather information from the target group, which included all operational SMEs in Anambra State with at least 10 employees, totaling a population of 1,328 employees. The Borg and Gall formula (1973) was applied to determine a sample size of 256, with 93% of the questionnaires completed and returned. ANOVA was used to test the research hypotheses. Results indicated that instant payment significantly influences SME performance in Anambra State, as do fund transfer machines and point-of-sale systems. The study recommended expanding instant payment facilities in strategic locations for better access. It also suggested increased marketing and education on internet banking services to attract more customers and boost profitability, alongside educating customers on the use of POS systems and the consequences of card mishandling.

Banda (2022) assessed the impact of mobile money banking on selected Micro and small enterprises (MSEs) in Lusaka District, Zambia, using an embedded mixed research design to enhance the reliability and validity of findings. Qualitative data were gathered through structured interviews, while quantitative data were collected via questionnaires. Quantitative analysis was conducted using regression and correlation, and qualitative data were analyzed through thematic methods. Results indicated that

mobile money banking had an insignificant effect on the financial performance of MSEs in Lusaka. The study also identified challenges faced by MSEs, including limited marketing opportunities, restricted access to loans, inadequate management skills, and low education levels among business owners. Although there was a weak link between mobile money and financial performance, MSEs were found to play a critical role in job creation, though sustainability remains an issue. Based on these findings, key recommendations included: financial institutions should consider removing loan caps for MSEs to support business startups and expansion, and mobile money banking providers should increase loan amounts to more effectively support the growth of MSEs in Lusaka.

Mutio (2021) explored how mobile banking services impact the performance of micro-enterprises in Kenya's informal sector. Using a cross-sectional research design, it focused on 1,850 micro-business traders at Gikomba Market in Nairobi's Kamukunji sub-county, selecting 100 participants based on the Slovin formula. Findings indicated that over half of respondents used mobile banking for sending, saving, and withdrawing money, checking account balances, and paying bills. Additionally, micro-businesses could access short-term loans via mobile banking, which supports their continued growth. Correlation analysis showed a positive and significant relationship between mobile banking services and micro-business performance. The study concluded that embracing mobile banking can help these businesses thrive and emphasized the importance of low-interest credit for performance enhancement. Recommendations included expanding mobile banking features, such as real-time account alerts and offering more unsecured mobile loans to support emerging businesses.

Muathe (2021) examined how mobile banking services impact the growth of micro and small enterprises (MSEs) in Makueni Sub-County. Using a descriptive research design, the study targeted 2,000 licensed MSEs in the area, with a purposive sampling technique applied to select 200 MSEs (10% of the population) that use mobile banking. Primary data was gathered through survey questionnaires. The findings showed that access to mobile banking has a notable positive effect on MSE growth. Additionally, the cost-effectiveness of mobile banking services, transaction security, and service efficiency were all found to positively and significantly influence MSE growth. Based on these findings, the study suggested launching awareness campaigns to encourage MSEs to adopt mobile money transfer services, which offer more flexibility and security than carrying cash—an advantage particularly relevant in today's technologically advancing world. For policymakers, the study underscored the need for robust digital policies that support cashless transactions to further enhance financial inclusivity and promote sustainable growth among MSEs in Kenya.

Mue (2021) assessed how mobile banking influences the financial performance of SMEs in Nairobi County, Kenya. A descriptive research design was adopted for this purpose. The study targeted SMEs within Nairobi County, estimating a sample size of 400 SMEs using a specific sampling formula. Both primary and secondary data sources were utilized. The researcher applied multiple regression and correlation analyses to evaluate the effects of mobile banking on SME financial performance. Findings showed that most participants reported m-banking facilitated bill payments, money transfers, payment receipts, mobile loan access, savings, and supplier payments. As a result, m-banking services enhanced SME operational efficiency and reduced costs compared to

traditional banking methods. Additionally, mobile loans were found to contribute to improved SME financial performance. The study further identified a strong, positive, and significant correlation between m-banking deposits and SME financial performance, while an increase in m-banking payment services positively impacted SME outcomes. Overall, the study concluded that mobile banking has a positive and significant effect on the financial performance of SMEs in Nairobi County.

2.3.3 Internet banking

Madan *et al.* (2021) conducted a comparative analysis of public and private sector banks in the Dehradun region, focusing on their provision of products and services through e-banking. The study emphasizes the distinctions in deposits, customer base, and satisfaction levels between banks that offer e-banking services and those that do not. Technological advancements have led to a major shift within the banking sector, with all institutions working to optimize their supply chain management for improved customer acquisition and retention. E-banking has globally transformed the banking industry and remains a central topic in numerous studies. By leveraging technology, banks now offer the convenience of "anytime, anywhere" banking to meet rising customer expectations. This shift has prompted banks to redesign their service distribution strategies to allow flexible access through various channels. Internet and mobile banking have enabled banks to deliver services directly to customers' homes and workplaces, accessible 24/7.

Monge-González (2021) conducted a randomized controlled trial in Costa Rica to examine the effects of internet banking (IB) use by clients of Banco Nacional de Desarrollo on the performance of micro and small enterprises (MSEs). The study

followed a descriptive research design in which survey data was collected and analyzed. Performance was assessed based on productivity, sales growth, and cost savings. Survey results from the intervention group revealed that MSEs' daily operations had minimal internet use due to limited computer access and low internet service integration in employee activities. Additionally, many firms lacked awareness of the internet's potential as a business development tool. However, a small subset of firms reported benefits, such as cost reductions, increased sales, and improved customer interactions.

Mbah and Obiezekwem (2021) conducted a study examining the relationship between electronic banking and the performance of small and medium-sized enterprises (SMEs) in Anambra State, Nigeria. This research aimed to explore how electronic banking services—such as automated teller machines (ATMs), point-of-sale (POS) services, SMS transaction alerts, and mobile banking—relate to SME performance in a state known for its high concentration of SMEs, entrepreneurial culture, and favorable business environment. Data analysis was conducted using SPSS and Excel for descriptive statistics, while regression analysis tested the study's hypotheses. The results indicated a positive association between electronic banking components (ATMs, POS services, SMS alerts, and mobile banking) and SME performance in Anambra State. The study found that SMEs continually use electronic banking services due to benefits such as cost-effectiveness, convenience, security, accessibility, and service variety. It recommends enhancing electronic banking security through SME-bank partnerships, establishing adequate government regulations to protect consumers and transaction security, and encourages policymakers to use these insights to develop

policies supporting SME growth, particularly by formalizing many informal enterprises.

Iyke-Ofoedu (2022) investigated the impact of internet banking on the performance of small and medium-sized enterprises (SMEs) in Enugu Metropolis. Specifically, it aimed to assess the effect of internet efficiency on SME business growth in Enugu Metropolis, and the impact of internet convenience on the quality of job delivery among SMEs in the same area. Using a descriptive survey design, the study collected data through a structured questionnaire. Out of a population of 650, a sample of 264 was surveyed. The findings showed that internet efficiency significantly influences SME business growth in Enugu Metropolis (t-statistic = 38.887, p-value = 0.000). Additionally, internet convenience was found to have a substantial impact on job quality in SMEs (t-statistic = 33.446, p-value = 0.000). Furthermore, internet accessibility was linked to a notable increase in SME income base expansion, as it facilitates cost-effective banking operations online (t-statistic = 51.826, p-value = 0.000). The study suggests that SMEs should regularly conduct training on internet banking to enhance the value both they and their customers derive from these services.

Ngungi (2023) examined how internet banking affects the financial performance of commercial banks in Kenya. Using a descriptive research design, the study included all 43 commercial banks in Kenya, making it a census survey. Primary data was gathered through questionnaires, while secondary data was sourced from the annual reports published by the Central Bank of Kenya (CBK). Data analysis was conducted using multiple regression. The findings indicate that internet banking has a generally weak but positive and significant effect on the financial performance of Kenyan commercial

banks. This positive impact is attributed to cost reductions, increased commission income, reduced staffing, and improved convenience for customers. The study suggests that banks should encourage greater customer adoption of internet banking, as it effectively lowers operational costs, enhances security, and improves accessibility. Additionally, addressing security concerns to curb the rise in internet banking fraud and updating fraud legislation could mitigate fraud-related risks. The study emphasizes the need for banks in Kenya to boost investments in ICT to enhance service speed, convenience, and accuracy, warning that failing to do so may result in competitive disadvantages.

Obunga *et al.* (2021) sought to determine the impact of internet banking on the performance of small and medium enterprises (SMEs) in Kisumu City, with a particular focus on the effect of communicative internet banking. The study posed the research question: How does communicative internet banking influence SME performance in Kisumu County? Using a descriptive research design, the study selected a sample of 57 respondents from a population of 332 SMEs in Kisumu, utilizing stratified random sampling and the Yamane model for sample size determination. Data was gathered through questionnaires and analyzed using descriptive and inferential statistics. The findings indicated that communicative internet banking had a positive effect (0.361) on SME performance in Kisumu County, with a statistically significant impact. The study recommends that SMEs in Kisumu adopt ICT and communicative internet banking, as these enhance SME performance by enabling access to timely information, leading to faster and more effective decision-making.

Makworo *et al.* (2021) investigated the impact of e-banking strategies on the sustainable growth of small and medium-sized enterprises (SMEs) in Nairobi County's hospitality sector, specifically focusing on mobile banking strategies. Employing an explanatory research design, the study targeted 183 licensed hotels in Nairobi County, with respondents consisting of either hotel owners or general managers. Primary data was collected through questionnaires using a drop-and-collect method over three weeks. The data was coded and analyzed with SPSS version 22, utilizing descriptive statistics, including mean, and percentages. Additionally, correlation and univariate regression analyses were applied. The study's results showed that mobile banking has a positive and significant impact on the sustainable growth of SMEs in Nairobi's hospitality industry.

Kirui (2020) aimed to determine the impact of internet banking on economic development and assess its adoption in Kenyan commercial banks. Specifically, the study explored factors such as ICT investment, the number of internet banking clients, return on assets, and ATM adoption from 2009 to 2013. Economic development was measured by the gross domestic product. Utilizing a causal and descriptive research design, the study analyzed data with inferential statistics. Primary data was gathered through questionnaires from 15 banks, while secondary data was sourced from CBK and KNBS records, analyzed via a linear regression model. Findings revealed that all fifteen banks had implemented internet banking, allowing customers online access to certain services for improved efficiency. Results indicated a positive relationship between economic development and the number of internet banking customers, ATM

availability, and return on assets. Conversely, a negative relationship was observed between economic development and banks' ICT investments.

2.3.4 Digital Loans

Yang and Zhang (2020) explored how digital financial inclusion influences the sustainable growth of small and micro enterprises in China, using data from companies listed on China's New Third Board Market (2011–2018) and Peking University's digital financial inclusion index. The study used a qualitative research design. Findings indicated that digital financial inclusion fosters the sustainable growth of small and micro enterprises, particularly in private, high-tech sectors, and competitive markets. This influence occurs by alleviating financing constraints, which prevents financial crises related to capital structure imbalances and liquidity issues, thus supporting sustainable growth. The study concludes that promoting digital financial inclusion within China's economy provides consistent financial support for these enterprises, advancing both microenterprise health and macroeconomic stability.

Shofawati (2021) explored the role of digital finance in enhancing financial inclusion and promoting the growth of small and medium-sized enterprises (SMEs) in Indonesia. Utilizing a qualitative research approach, the study presented a model illustrating how digital finance can strengthen financial inclusion and facilitate SME development in the country. The findings highlight that technological innovation is a critical factor for businesses, particularly within the financial sector, as it enhances the product life cycle. In today's fast-paced environment, the quick delivery of products and services, especially in the realm of Islamic financial services, is increasingly important. Given Indonesia's unique geography, which comprises many islands, efficient delivery of

financial services is vital for providing essential financing to SMEs, which are fundamental to the country's economy.

Natumoi and Oluoch (2020) conducted a study to examine the impact of credit services on investment growth within the informal sector in Narok Town. Utilizing a survey research design, the study targeted licensed informal sector proprietors and credit officers in the area. A sample of 171 respondents was derived from a population of 300 licensed Jua Kali proprietors. The findings indicated that business growth in the Jua Kali sector is influenced by existing financial policies, with factors such as loan interest rates, repayment periods, and inflation significantly affecting growth rates. Additionally, access to finance, economic growth, and timely loan repayment were identified as critical factors impacted by credit availability. Legal frameworks regarding loan acquisition also affect growth and performance in the Jua Kali sector, which contributes to employment, even among highly educated individuals. The study concluded that accessible credit facilities positively impact growth in this sector. Recommendations included that lending institutions set minimum loan requirements and clear policies to improve loan access for the Jua Kali sector. The government was urged to establish policies addressing inflation and high-interest rates from banks to improve credit accessibility. It was also recommended that the informal sector enhance record-keeping and account monitoring to increase loan accessibility. Furthermore, the government, through the Youth & Women Fund, should provide Jua Kali proprietors with basic financial training to boost productivity and growth.

Wathome (2020) examined the impact of digital credit on youth financial inclusion in Kangemi, Nairobi, focusing on its direct effects, positive and negative spillovers. Using

a descriptive research design with a sample of 384 youth, the study revealed that digital credit, accessed mainly via mobile providers like KCB-M-Pesa and Mshwari, enabled increased financing, job creation, poverty reduction, and financial independence. Despite these benefits, 39% of respondents were over-indebted, often listed on the Credit Reference Bureau due to defaults, and some used loans for non-essential expenses. The study concluded that while digital credit enhances financial inclusion, it also brings risks such as high-interest rates and financial mismanagement. Recommendations included enhancing financial literacy, leveraging social media to reach unbanked youth, and mitigating risks associated with platform reliance.

Okiro (2021) investigated the impact of digital financial credit access on the growth of small and medium-sized enterprises (SMEs) in Nairobi County, Kenya, employing a descriptive and causal research approach with data from 231 respondents across 17 constituencies. The study found that 45% of SMEs used digital platforms for credit access, though high costs led to predominantly negative perceptions. A weak but statistically significant relationship emerged between digital credit usage frequency and business turnover, whereas a strong positive correlation was observed between digital credit access and cash flow, which contributed to business growth. Major challenges included adapting to new technologies, high interest rates, brief repayment terms, and limited-service provider engagement. Okiro concluded that digital credit has high growth potential for SMEs and improves data for credit assessments, but uptake is hindered by negative perceptions. This highlights a market need for competitive, well-structured digital credit solutions tailored specifically to SME requirements.

Kimbio (2020) investigated how credit access affects the growth of micro, small, and medium enterprises (MSMEs) in Kenya. The study utilized data from the 2016 KNBS MSMEs survey, a cross-sectional dataset from 50,043 businesses, analyzed using an Ordinary Least Squares (OLS) estimation technique. The results demonstrated that credit access positively impacts MSME growth in Kenya. Additional factors that favorably influence growth include initial capital, enterprise age, male management, secondary education, location in Nairobi, and electricity access. The study further found that growth tends to slow when micro-enterprises transition into small and medium enterprises. Key policy recommendations suggest that the Kenyan government should prioritize meeting MSMEs' credit and startup capital needs to promote faster growth. Furthermore, the government should support higher education levels and, through the Micro and Small Enterprises Authority (MSEA), provide training for MSME owners to enhance business efficiency during growth transitions.

Auma (2023) conducted a study examining the impact of digital loans on small business performance in Obunga, Railways Ward, Kisumu, Kenya, focusing on operating cash flow, sales volume, and net profit margin as performance indicators. The research was guided by the Asymmetric Information Theory and Default Risk Theory of Credit and employed a descriptive research design. The study targeted 454 small and micro enterprises, selecting a sample of 212 through stratified and simple random sampling. Data was gathered using structured questionnaires, interviews, and existing records on digital credit and small business performance, with content validity measures applied. Statistical analysis was performed using SPSS version 24.0. Findings revealed that SME performance, as indicated by profit margins and sales, improved with access to

digital credit. However, rapid growth in fintech had led to higher borrowing costs for SMEs and repayment challenges, despite offering flexible loan contracts that allow SMEs to customize repayment schedules. Recommendations include encouraging SME managers and owners in Obunga to adopt entrepreneurial mindsets for enhanced financial access. Additionally, it was suggested that government mobile lending institutions consider lowering credit costs, and that SME managers leverage flexible repayment options to match business needs accurately.

Zeituna (2020) examined the impact of digital lending platform designs on loan performance among small business owners in Nairobi's Gikomba Open-Air Market, focusing on instantaneous processing, service automation, and remote processing. Additionally, the study investigated how demographic factors like age, gender, education, and income moderated this relationship. Grounded in financial inclusion and intermediation theories, the research employed a positivist philosophy and a descriptive research design. Data were collected from registered small-scale business owners using structured questionnaires and analyzed through descriptive and inferential statistics, with partial correlation applied to assess demographic moderating effects. The findings revealed that key digital lending features—instant processing, automation, and remote accessibility—positively influenced loan performance. These digital designs helped borrowers access multiple lenders, improve repayment rates, and decrease defaults compared to traditional loan options. The study further noted that demographic factors significantly moderated the relationship between digital lending platforms and loan performance. Recommendations included regulatory measures to ensure consumer protection, increased investment in technology to support instant processing, and

expanded automation in customer service. Lenders were also advised to incorporate demographic considerations in their loan assessments to tailor lending limits for different borrower profiles, which could potentially improve repayment outcomes and reduce defaults.

Nandwa (2021) investigated the impact of workload on teacher burnout in Tharaka Nithi County, Kenya, using a descriptive survey design grounded in the Multidimensional Theory of Burnout and the Golembiewski and Munzenrider burnout model. The study population included 104 principals, 6,862 teachers from 104 schools, as well as 10 officials each from the Teachers Service Commission (TSC) and Quality Assurance and Standards Offices (QASOs). A sample of 378 teachers and 31 principals from 31 schools, alongside all TSC and QASO officials, was selected through a two-stage cluster random sampling and purposive sampling methods. Data collection employed questionnaires for teachers, interview guides for TSC and QASO officials, and structured data collection forms. Quantitative data were analyzed through descriptive statistics, including frequencies, percentages, means, and standard deviations, and Pearson Correlation for inferential analysis, while qualitative data underwent content analysis. The results indicated a positive and significant correlation between workload and teacher burnout ($r=0.275$, $P<0.05$), suggesting that workload significantly contributes to teacher burnout in Tharaka Nithi County. The study recommends hiring additional teachers to help alleviate workload-related burnout.

2.4 Critique of Literature Review

The reviewed empirical studies provide valuable insights into the role of digital finance in enhancing financial inclusion and supporting small and informal enterprises.

However, while the findings are broadly relevant, several limitations and gaps are evident.

Firstly, the literature is largely descriptive and segmented, focusing on specific components of digital finance such as mobile banking, digital credit, or fintech platforms. Although this approach offers detailed insights into individual financial innovations, there is limited synthesis of how these digital finance tools collectively influence the growth trajectory of informal enterprises. For instance, while Khorow (2023) and Mutiso and Reuben (2021) highlight the positive impact of mobile-based platforms on financial inclusion, they do not directly assess how such inclusion translates into business growth, particularly in the informal sector. This study adopts a more integrated approach by examining mobile money, mobile banking, internet banking, and digital credit platforms both individually and jointly. This enables a broader understanding of how digital finance tools collectively relate to the growth of informal enterprises

Secondly, the reviewed studies also exhibit methodological variability, which presents challenges for comparing findings. While some studies employ mixed-methods approaches (e.g., Talom & Tengeh, 2020) that bolster data reliability through triangulation, others rely solely on quantitative surveys, potentially limiting depth in understanding complex user behaviors. Furthermore, the inclusion of studies like that by Banda (2022) reveals inconsistencies, as it found a weak relationship between mobile money services and MSE performance in Zambia, suggesting regional discrepancies that could benefit from more nuanced analysis of context-specific barriers to technology adoption. This study addresses the methodological variability identified

in previous research by adopting a systematic and context-specific quantitative approach, grounded in a well-defined theoretical framework. While acknowledging the value of mixed methods, the study focuses on using structured questionnaires and multiple linear regression analysis to ensure consistency in data collection and allow for statistical testing of associations between digital finance variables and enterprise growth indicators.

Thirdly, the literature review on internet banking effectively highlights the transformative role of electronic and internet banking across diverse geographical contexts and sectors. Studies by Madan et al. (2021) and Monge-González (2021) illustrate the widespread adoption of e-banking as banks adapt to technological advancements to offer "anytime, anywhere" services, reflecting shifts in consumer preferences and competitive dynamics. While these studies provide a broad overview, they lack a cohesive analysis of customer behavior variations across regions and sectors, limiting insights into why uptake rates might differ (Mbah & Obiezekwem, 2021). Furthermore, while the review acknowledges the operational and financial performance improvements e-banking offers to businesses, it overlooks how these benefits may vary based on digital literacy levels or infrastructural access disparities, especially in less urbanized areas (Iyke-Ofoedu, 2022; Ngungi, 2023). The current study addresses these limitations by specifically focusing on Jua Kali enterprises in Makueni County- a predominantly rural and semi-urban region where digital literacy levels, infrastructure availability, and user behavior differ significantly from urban settings.

2.5 Research Gaps

Although previous studies have explored various aspects of digital finance and financial inclusion, several key research gaps remain unaddressed. These gaps justify the need for the current study, which seeks to investigate the influence of digital finance on the growth of informal enterprises, specifically Jua Kali businesses in Makueni County.

2.5.1. Limited Focus on Rural Informal Enterprises

Most of the reviewed studies, such as Barasa (2022), Wathome (2020), and Iki and Otoghile (2023) were conducted in urban settings like Nairobi, Kangemi, and Kibera. There is limited empirical evidence on how digital finance affects informal sector enterprises operating in rural counties, such as Makueni. This represents a significant gap, given the unique infrastructural and economic constraints faced by rural entrepreneurs. This study directly addresses the underrepresentation of rural informal enterprises by focusing on Jua Kali businesses in Makueni County, a predominantly rural region with distinct infrastructural, socio-economic, and technological challenges compared to urban centers. By selecting this context, the study captures the realities of digital finance adoption and usage in underserved areas, offering valuable insights that urban-focused studies may overlook.

2.5.2. Focus on Financial Inclusion rather than Business Growth

Much of the literature emphasizes digital finance's role in promoting financial inclusion but fails to explore how it translates into actual enterprise growth metrics, especially in the informal sector. The study shifts the focus from access to impact, examining how digital finance tools relate to measurable growth indicators such as revenue increase in Jua Kali enterprises.

2.5.3. Methodological Inconsistency and Limited Quantitative Rigor

Prior research shows variability in methodology- some use descriptive or qualitative approaches, limiting the statistical validity and comparability of results across contexts. This study adopts a robust quantitative approach using structured questionnaires and multiple linear regression analysis, enabling statistical testing of associations between digital finance components and enterprise growth.

2.6 Conceptual Framework

The conceptual framework for this study was guided by the assumption that digital finance enhances access to financial services, which in turn contributes to the growth of Jua Kali enterprises. The framework identifies four key instruments of digital finance as independent variables and business growth as the dependent variable. The conceptual framework is demonstrated in Figure 2.1

Independent Variables

Dependent Variables

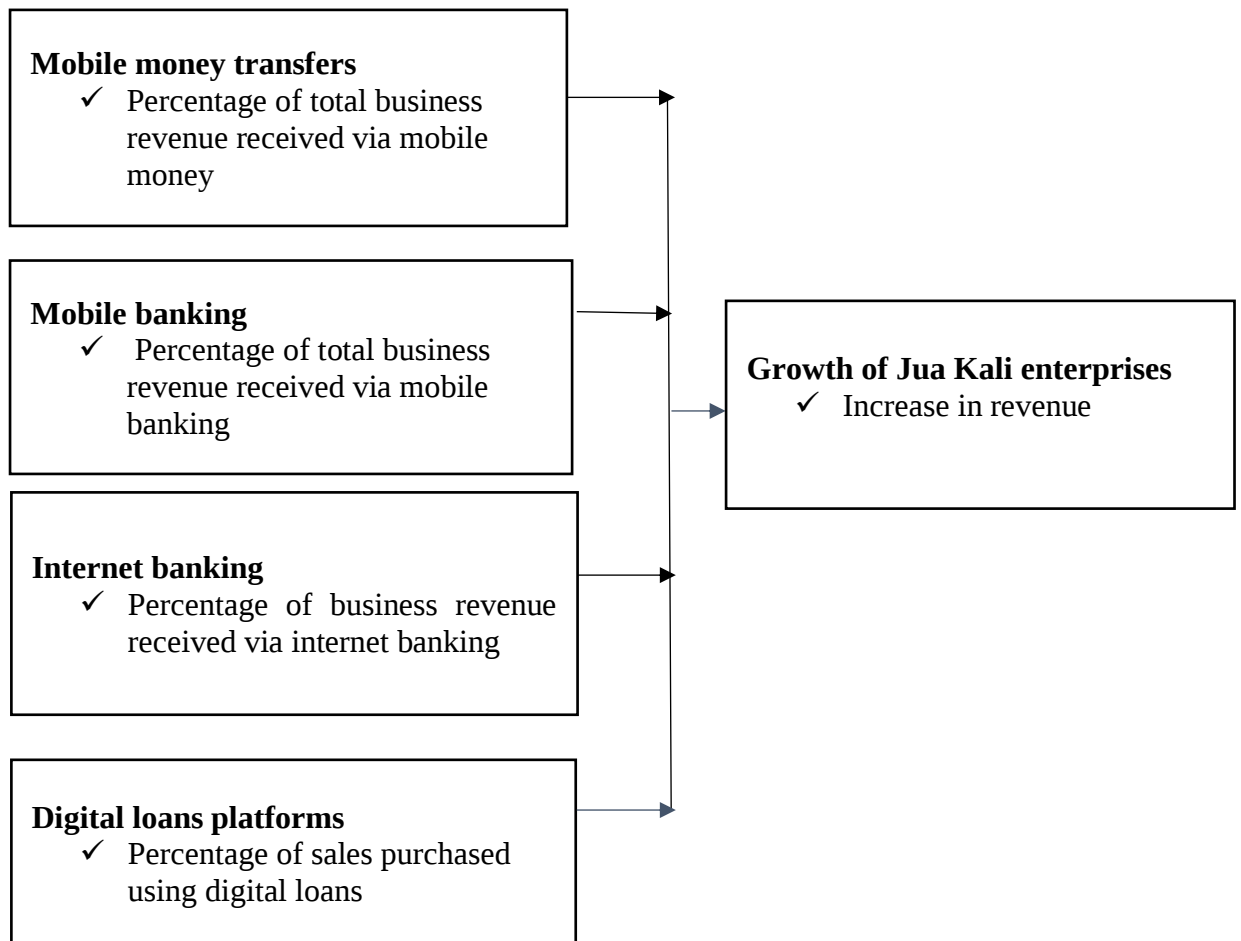


Figure 2.1 Conceptual Framework

2.7 Operationalization of Variables

2.7.1 Mobile Money Transfer

Mobile money transfer refers to financial transactions conducted via mobile phones, enabling users to send, receive, and store money without the need for a traditional bank account (World Bank, 2020). In the context of this study, mobile money transfer is operationalized as the proportion of total monthly business revenue (in Kenya shillings) received via mobile money, not the number of individual transactions. This operational definition reflects how deeply mobile money is integrated into business operations, particularly as a channel for receiving payments from customers. The variable will be measured as a percentage (%) of monthly business revenue received via mobile money, as reported by the enterprise owner.

This approach enables a quantifiable, continuous measure suitable for regression analysis. Mobile money has become especially relevant in Kenya's informal economy due to its widespread accessibility, ease of use, and capacity to facilitate secure and immediate financial transactions (Kimani & Mugambi, 2021). The study posits that a higher proportion of revenue received through mobile money is associated with increased operational efficiency and revenue growth for Jua Kali enterprises, by reducing cash-handling risks, improving payment speed, and expanding customer reach.

2.7.2 Mobile Banking

Mobile banking refers to the use of mobile-enabled applications provided by formal financial institutions to conduct banking activities such as checking balances, paying bills, transferring funds, and accessing credit services (Gikonyo, Muthoni, & Ochieng,

2021). In the context of this study, mobile banking is operationalized as the percentage of total business revenue received via mobile banking platforms, including mobile apps from banks such as KCB, Equity Bank, and Co-operative Bank.

This operationalization provides a quantifiable and continuous measure, allowing the study to assess how integrated mobile banking is within a Jua Kali enterprise's revenue stream. Respondents will report the proportion of monthly revenue paid in through mobile banking, rather than through cash or mobile wallet services like M-Pesa. This allows for appropriate application of multiple linear regression in assessing the variable's association with business revenue growth.

Mobile banking is particularly relevant to informal enterprises in Kenya as it allows users to manage formal banking services remotely, reducing time and operational inefficiencies (Wambua, 2022). Additionally, mobile banking enhances business operations by improving security, facilitating access to banking history, and promoting structured financial planning (Okello, 2023). The study therefore hypothesizes that a higher proportion of revenue received through mobile banking is positively associated with improved revenue growth among Jua Kali enterprises.

2.7.3 Internet Banking

Internet banking refers to conducting banking transactions through internet-enabled platforms, allowing users to access services such as fund transfers, loan applications, bill payments, and account management without physically visiting a bank branch (Muli & Karanja, 2023). In this study, internet banking is operationalized as the percentage of total monthly business revenue received through internet banking

platforms, including browser-based bank transfers and web portals provided by formal financial institutions.

This operationalization provides a continuous, quantifiable measure suitable for regression analysis. Respondents are asked to estimate what proportion of their business revenue is received via internet banking. This allows for a more precise understanding of the extent to which internet banking has been integrated into the financial operations of Jua Kali enterprises. Internet banking is increasingly relevant in rural settings like Makueni County, where formal banking infrastructure may be limited. According to Muli and Karanja (2023), internet banking enhances operational efficiency by offering businesses real-time access to formal banking services, reducing costs, and improving cash flow management. The study hypothesizes that a higher percentage of revenue received through internet banking is positively associated with business revenue growth among Jua Kali enterprises.

2.7.4 Digital Loans

Digital loans refer to financial services that provide users with quick, often collateral-free loans through digital channels such as mobile applications, USSD platforms, or internet banking portals (Mwaura, 2020). These platforms, including services like M-Shwari, KCB M-Pesa, Fuliza, and Tala, have expanded access to credit, particularly among informal and underserved business sectors.

In this study, digital loans were operationalized as the percentage of total sales financing or working capital obtained through digital loans. This is measured by asking respondents to estimate what proportion of their enterprise's funding in a typical month

is sourced from digital credit platforms. This percentage-based metric is continuous and allows for its inclusion as an independent variable in the regression model assessing revenue growth.

Digital loans have gained popularity in Kenya's informal sector due to its speed, convenience, and flexibility, particularly for small business owners who lack access to formal collateral-based loans. According to Wafula and Muchai (2021), such platforms help micro-entrepreneurs address short-term liquidity gaps and expand their operations. Similarly, Mwenda (2022) notes that digital credit adoption enhances financial resilience and business scalability in informal enterprises. The study therefore hypothesizes that a higher percentage of business capital sourced through digital credit platforms is positively associated with revenue growth among Jua Kali enterprises.

2.7.5 Growth of Jua Kali Enterprises

Growth of enterprises refers to the measurable improvement in the size, profitability, and operational efficiency of businesses over time (Kamau, 2023). For this study, enterprise growth is operationalized by indicators of revenue changes due to adoption of digital finance tools. Growth is critical for Jua Kali enterprises as it reflects resilience, sustainability, and the capacity to contribute to economic development (Kinyua & Kariuki, 2022). By assessing changes in revenue, productivity, and market reach, the study measures how digital finance tools—such as mobile money transfer, mobile banking, internet banking, and digital credit—support the growth and competitive edge of Jua Kali enterprises in Makueni County.

The identified constructs in the conceptual framework were selected because they represent critical aspects of digital finance and its impact on business growth, particularly in the context of small and medium-sized enterprises (SMEs). Mobile money transfers offer unparalleled convenience and flexibility for transactions, especially in regions with limited banking infrastructure. Their frequency of usage and the security of transactions are key determinants of user adoption and trust. Similarly, internet banking is crucial for operational efficiency and reducing risks associated with financial transactions, which can significantly influence the volume and speed of business operations.

Digital credit platforms are vital for providing accessible financing solutions to businesses, especially in underserved markets. The constructs of loan approval time, frequency of borrowing, and credit scores/history capture the accessibility and reliability of these platforms in supporting business growth. Finally, the constructs related to business growth i.e revenue was chosen as it encapsulates measurable outcomes that directly reflect the effectiveness of digital finance interventions.

Table 2.1 Operationalization of Variables

Variable	Variable Definition	Variable Measurement	Scale of Measurement	Supporting Literature	Supporting Theory
Mobile Money Transfer (Independent variable)	The use of mobile phone-based applications (e.g., M-Pesa, M-Shwari) to send, receive, or store money, enabling quick and secure financial transactions.	Frequency of use; transaction volume; ease of transfer; security; speed of transactions; business revenue generated through mobile money.	Ordinal / Likert scale	Talom & Tengeh (2020); Onyango et al. (2021); Khorow (2023); Mutiso & Reuben (2021)	Technology Acceptance Model (Davis, 1989)
Mobile Banking (Independent variable)	The use of mobile phone applications provided by financial institutions to access banking services, such as balance inquiry, funds transfer, bill payment, and loan requests.	Frequency of mobile banking use; perceived convenience; transaction cost; access to credit; impact on sales and profit.	Ordinal / Likert scale	Akter et al. (2021); Israel (2022); Mutio (2021); Muathe (2021); Mue (2021)	Schumpeter's Innovation Theory (1934)
Internet Banking (Independent variable)	A system that allows customers to conduct financial transactions through a bank's website or online platform using the internet.	Access to online banking services; convenience; transaction speed; cost reduction; customer satisfaction; sales and profit improvement.	Ordinal / Likert scale	Mbah & Obiezekwe (2021); Iyke-Ofoedu (2022); Obunga et al. (2021); Ngungi (2023)	Transaction Cost Theory (Williamson, 1981)

Digital Loans (Independent variable)	The process of accessing, disbursing, and repaying loans through digital platforms without face-to-face interaction, often facilitated via mobile apps or online systems.	Loan accessibility ; interest rate; repayment period; credit amount; effect on cash flow, sales, and profitability.	Ordinal / Likert scale	Okiro (2021); Auma (2023); Wathome (2020); Zeituna (2020); Kimbio (2020)	Financial Inclusion Theory (Sarma & Pais, 2011)
Growth of Jua Kali Enterprises (Dependent Variable)	The increase in the productivity, profitability, and operational capacity of informal sector businesses, often measured through sales, profits, and employment levels.	Annual sales growth; profit margins; number of employees; market expansion; customer base growth.	Ratio / Interval scale	Talom & Tengeh (2020); Mutio (2021); Muathe (2021); Auma (2023)	Schumpeter's Innovation Theory (1934); Transaction Cost Theory (Williamson, 1981)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the approach used in this study. It includes the research design, the determination of the target population, the sampling technique, data collection instruments, the pilot study, reliability and validity of the research instruments, and methods of data analysis and presentation.

3.2 Research Design

The study adopted a correlational research design within a quantitative research approach (Cresswell, 2014). This design was appropriate for assessing the nature and strength of the relationships between the independent variables, mobile money transfer, mobile banking, internet banking, and digital credit, and the dependent variable, which is the growth of Jua Kali enterprises.

A correlational design allowed the researcher to explore the extent to which digital finance tools are associated with measurable indicators of enterprise growth, such as changes revenue (Babbie, 2010). The design supported the use of inferential statistical techniques, particularly multiple regression analysis, to test whether variations in digital finance usage predict variations in enterprise growth.

Similar research designs have been used effectively in related studies. For example, Ngugi, Gakure, and Waititu (2021) employed a correlational approach to examine the relationship between mobile banking and SME performance, while Munyua and Mutua

(2022) used regression analysis to assess how digital credit affected the sustainability of informal retailers. These studies provide a precedent for using correlational designs to explore causal tendencies in financial behavior within informal economic sectors.

3.3 Target Population

The target population consists of 2,350 registered Jua Kali entrepreneurs in Makueni County as per the records of Makueni Jua Kali Association (Makueni Jua Kali Association, 2024). These entrepreneurs are involved in various sectors, including carpentry, construction, shoe-making, car wash services, food vending, and welding. According to Mugenda and Mugenda (2015), selecting a target population with a clear connection to the research focus ensures that the data collected is relevant and accurately reflects the phenomena under investigation.

3.4 Sampling Design and Sample Size

A stratified random sampling technique was used to ensure representation of various sectors in the population (Saunders *et al.*, 2016). To ensure fair representation, the number of respondents sampled from each sector was taken proportionate to its actual size in the target population. Since the study focused on users of digital finance, the respondents were purposively selected by asking them whether they use digital financial services. If some respondents do not use digital finance, replacements were randomly selected from the same stratum to maintain the sectoral balance. Thus, the sample size (n) of the study is 342 respondents determined using Yamane's (1967) formula as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where:

N = 2,350 (population)

e = 0.05 (margin of error)

$$n = \frac{2350}{1+2350*0.05^2} = 342$$

The table 3.1 demonstrates how the sample size was drawn from each stratum in the target population

Table 3.1 Sample size

Category	Population	Sample size
Carpentry	502	72
Construction and materials production	622	89
Shoe and leather goods making	146	21
Car wash and repair services	202	31
Street food vendors	548	82
Traditional art (wood carvings, beadwork, paintings)	168	24
Painting and decorating services	162	24
Total	2350	342

3.5 Data Collection

Cresswell (2014) defines data collection as means of getting information from the selected subjects of research. This research employed primary quantitative data. Primary data was collected using a structured questionnaire. This tool is efficient for

gathering firsthand information from the entrepreneurs, as it allows for both closed and open-ended questions. A questionnaire was suitable for this kind of study because it allowed for standardization of questions, ensuring consistency and comparability of responses (Saunders *et al.*, 2016).

3.5.1 Research Instruments

Primary data was collected using a structured questionnaire. A questionnaire is suitable for this kind of study because it allows for standardization of questions, ensuring consistency and comparability of responses (Saunders *et al.*, 2016). The questionnaire included structured, closed-ended items aligned with the study variables. To account for the varying levels of digital finance adoption among Jua Kali operators, the instrument incorporated binary filter questions (Yes/No) at the start of each section relating to a digital tool (e.g., mobile banking, internet banking, digital loans). Respondents who indicate they do not use a particular tool were automatically excluded from answering follow-up questions related to that tool. This design reduces response bias and ensures data relevance.

3.5.2 Piloting of the Research Instruments

The questionnaire data collection instrument underwent pilot testing to assess its reliability and validity with 18 Jua Kali enterprises, which were excluded from the final data collection and analysis. A pilot test is a small-scale trial designed to test all strategies planned for the main study (Oso & Onen, 2008). As recommended by Cooper and Schilder (2006), 5% to 10% of the target sample should be involved in the pilot test. The pretest aimed at identifying any strengths and weaknesses of the survey in terms of question format, wording, and order.

The instrument was piloted in Wote Town, with 5% of the Jua Kali sample respondents participating. Eighteen questionnaires were administered, following Cooper and Schilder's (2006) recommendations. The Jua Kali enterprises involved in the pilot study were included in the main research.

3.5.3 Reliability

Reliability refers to the extent to which a research instrument consistently produces the same results after repeated trials (Kothari, 2003). To enhance reliability, the researcher pre-tested the questionnaires to ensure their effectiveness. Additionally, Cronbach's Alpha was used to assess the reliability of the instruments. According to Sekaran (2006), a Cronbach's Alpha value of 0.8 or higher is considered good, 0.7 is acceptable, while values of 0.6 or lower indicate poor reliability. The problematic items were reviewed, reworded, or removed to enhance consistency.

3.5.4 Validity

Validity refers to the extent to which the results obtained from data evaluation accurately reflect the phenomenon under study (Mugenda & Mugenda, 2003). The validity of the study's questionnaire was assessed after the pilot study using both content and construct validity. Content validity was ensured by consulting the supervisors. The supervisors reviewed the questionnaire to verify that the questions adequately cover all aspects of the study objectives, ensuring the instrument was comprehensive and relevant (Kumar, 2021). Construct validity was tested by analyzing the pilot study data to determine if the questionnaire items effectively measure the intended constructs. Any identified deficiencies were addressed by refining the questionnaire to enhance its validity before the main data collection.

3.6 Data Collection Procedures

To facilitate the data collection process, the researcher first visited the study location for familiarization and secure the required approvals from Machakos University and the National Commission for Science, Technology, and Innovation (NACOSTI). Further, the researcher organized and trained data collection assistants to ensure they understood the questionnaire and adhere to ethical considerations such as confidentiality and informed consent during data collection. The questionnaires were self-administered to ensure full response rates. In cases where respondents were absent, follow-up appointments were scheduled.

3.7 Data Analysis and Presentation

The data collected through the structured questionnaire were analyzed using both descriptive and inferential statistical methods to ensure a comprehensive understanding of the influence of digital finance on the growth of Jua Kali enterprises in Makueni County. The analysis was carried out assisted by Statistical Package for Social Sciences (SPSS) version 30.

3.7.1 Descriptive Statistics

Descriptive statistics were used to summarize and describe the characteristics of the data collected from respondents. These included frequencies, percentages, and means. Descriptive analysis was particularly used for demographic variables and to present usage patterns of mobile money transfer, mobile banking, internet banking, and digital loans.

Prior to analysis, responses were screened using the Yes/No filter responses. Only respondents who confirmed usage of a given digital finance tool were included in the analysis of that specific variable. This ensured that regression analysis and correlations were only conducted using valid, applicable data. This approach acknowledges the heterogeneous digital finance adoption landscape in rural settings like Makueni County and ensures data integrity and model accuracy.

3.7.2 Inferential Statistics

This study utilized Ordinal regression analysis to determine the influence of digital finance tools on the growth of Jua Kali enterprises. Ordinal regression was appropriate for estimating the relationship between one dependent variable and multiple independent variables while accounting for their combined and individual effects.

The dependent variable in the model was enterprise growth, measured by the increase in business revenue. The independent variables included: the percentage of revenue received through mobile money transfers (X_1), the percentage of revenue received through mobile banking applications (X_2), the percentage of revenue received through internet banking (X_3), and the percentage of sales finances through digital loans (X_4). Ordinal regression was used to determine the relationships between the independent variables and the ordinal outcome variable (enterprise growth).

This analytical approach was suitable for identifying significant predictors of enterprise growth and estimating the magnitude of their effects. It helped establish whether, and to what extent, digital finance adoption correlates with measurable improvements in informal business performance.

3.7.3 Diagnostics Tests

Diagnostic tests were conducted to assess the suitability and robustness of the ordinal regression model. The test of parallel lines was performed to verify the proportional odds assumption, ensuring that the relationship between each predictor and the dependent variable remained consistent across all outcome categories. Goodness-of-fit tests, including the Pearson and Deviance statistics, were applied to evaluate how well the model fitted the observed data. In addition, multicollinearity diagnostics was carried out using Variance Inflation Factor (VIF) values to confirm that the independent variables were not highly correlated. These tests collectively ensured that the ordinal regression model met the necessary statistical assumptions for reliable interpretation of results.

3.7.4 Variable Analysis per Objective

This section outlines how each research objective was analyzed in relation to the study variables. It links the specific independent variables- representing different dimensions of digital finance- to the dependent variable, which is the growth in revenue of the Jua Kali enterprises. For each objective, appropriate statistical techniques were employed to test the relationship between variables and determine the strength and direction of their influence. The summary was presented in the table 3.2:

Table 3.2: Variable Analysis Per Objective

Objective	Independent Variable	Measurement	Dependent Variable	Statistical Technique
To examine the influence of mobile money transfer on the growth of Jua Kali enterprises	Mobile Money Transfers	% of revenue via mobile money	Growth in revenue	Correlation & Ordinal Regression
To assess the influence of mobile banking on the growth of Jua Kali enterprises	Mobile Banking	% of revenue via mobile banking	Growth in revenue	Correlation & Ordinal Regression
To determine the influence of internet banking on the growth of Jua Kali enterprises	Internet Banking	% revenue via banking	Growth in revenue	Correlation & Ordinal Regression
To investigate the influence of digital loans on the growth of Jua Kali enterprises	Digital loans	% of sales purchased via digital loans	Growth in revenue	Correlation & Ordinal Regression

3.8 Presentation of Results

The analyzed data was presented using tables, charts, and graphs to facilitate clear interpretation and comparison. The findings were interpreted in relation to the study objectives and research questions, and conclusions were drawn based on the evidence generated.

3.9 Ethical Considerations

Before the study commenced, participants provided their informed consent. Participation was entirely voluntary, with no coercion or pressure applied to those who choose not to take part. The researcher obtained an introduction letter from Machakos University and a data collection permit from NACOSTI.

Respondents were only required to answer questions relevant to their digital finance experience. Those who do not use a specific digital finance service were not obligated to provide answers about it, thereby respecting the respondent's experience and avoiding confusion or fatigue.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the gathered data, analysis, and the results of the research on the impact of digital finance tools on Jua Kali enterprises growth. The researcher starts with the presentation on the response rate before moving to the data analysis and the research findings. During the research, the scholar employed excels in compilation of the data collected then utilized SPSS to assist in data analysis. The scholar also used the regression model and correlation analysis to establish the relationship between digital finance and the growth of the Jua Kali enterprises in Makueni County.

4.2 Response Rate

Out of 342 issued questionnaires, 266 were completed and returned, yielding a response rate of 77.7%, which is robust and sufficient for statistical inference. The response rate was adequate for use in the study (Mugenda & Mugenda, 2003).

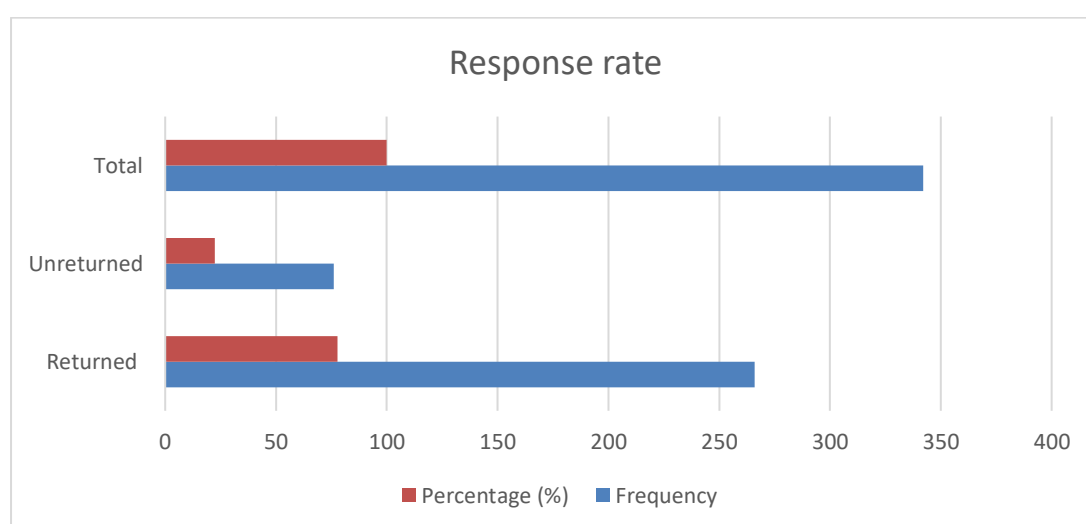


Figure 4.1: Response rate

4.3 Demographic Characteristics of Respondents

This section introduces key demographic variables relevant to digital finance adoption among Jua Kali enterprises.

4.3.1 Gender

The demographic profile of the respondents reveals that the Jua Kali sector in Makueni County is predominantly male-driven, with male respondents constituting 74.1%, compared to 25.9% female respondents. This male predominance aligns with broader patterns observed in Kenya's informal sector, where men are more likely to run or operate informal enterprises than women. For instance, an analysis by the International Labour Organization (2022) notes that male-owned enterprises are more prevalent in the informal economy than female-owned ones, highlighting systemic gender disparities in participation and opportunity.

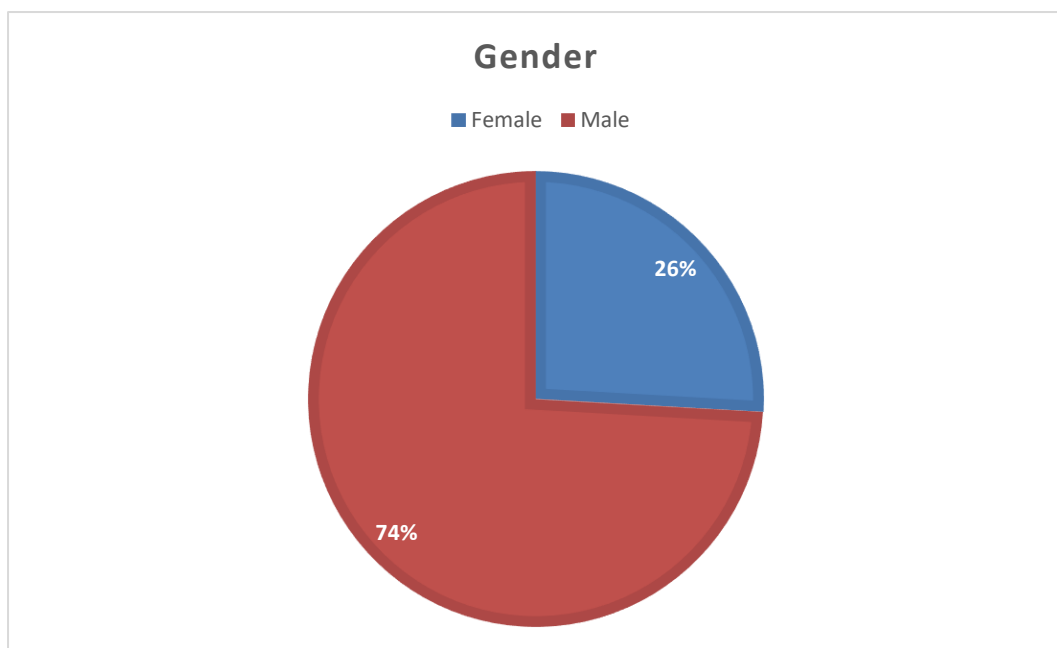


Figure 4.2: Gender

4.3.2 Age

In terms of age distribution, the largest proportion of respondents (48.5%) fell within the 26–35 age bracket, indicating a predominantly youthful entrepreneurial population. This finding aligns with recent studies on Kenya’s informal sector, which highlight that the majority of micro and small enterprise operators are young adults, often driven by limited formal employment opportunities and the need for income-generating activities (Kenya National Bureau of Statistics [KNBS], 2023).

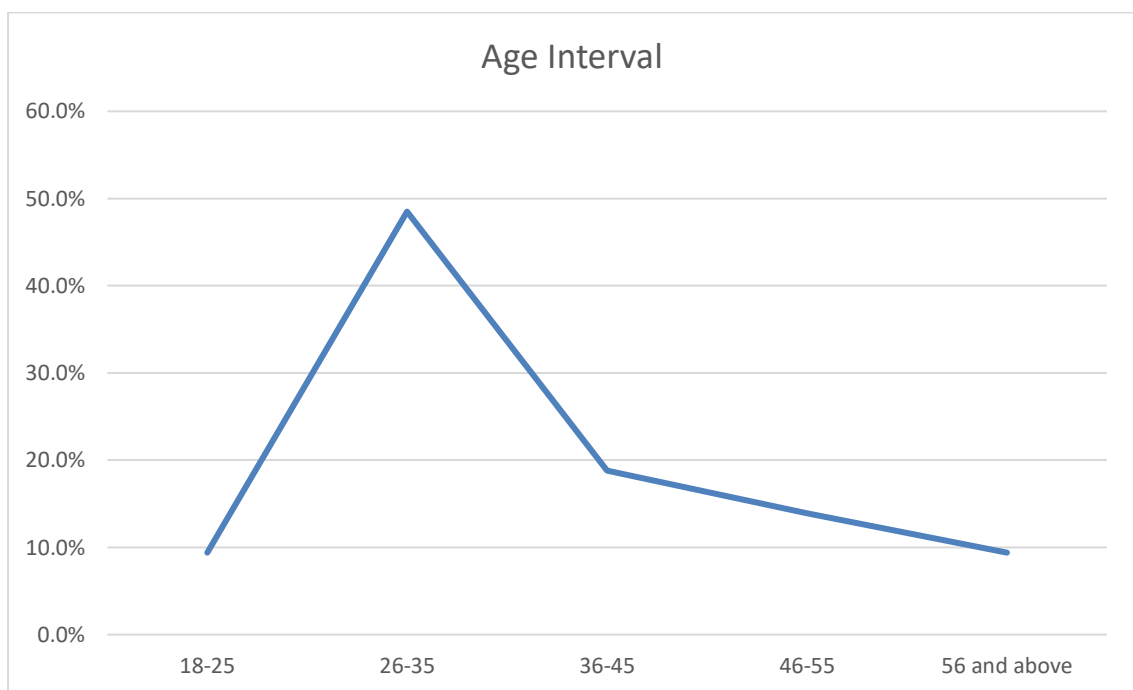


Figure: 4.3 Age interval

4.3.3 Education level

Regarding educational attainment, 41.0% of respondents had completed secondary education, whereas only 6.0% possessed a university degree. This pattern reflects the broader educational profile of Kenya’s informal sector, where many participants have attained at least basic secondary education but relatively few have pursued higher

education. Similar trends were reported in the MSME Survey by the Kenya National Bureau of Statistics (2023), which found that the majority of small-scale enterprise operators have secondary-level qualifications, highlighting the sector's accessibility to individuals without advanced academic credentials.

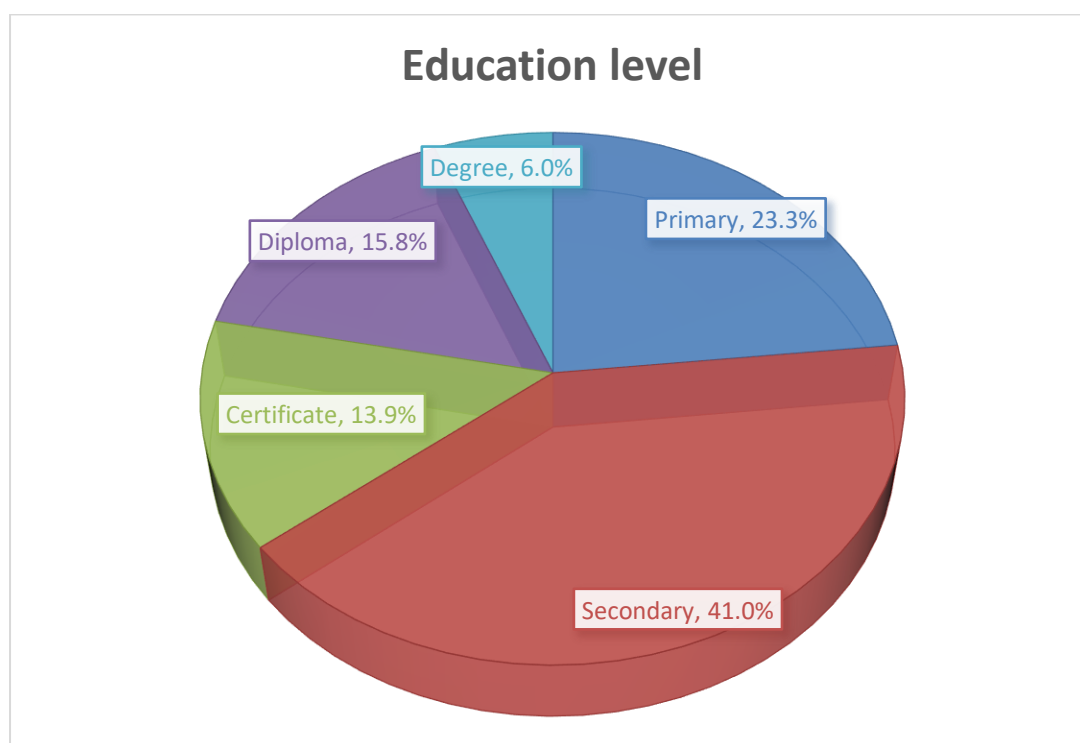


Figure 4.4: Level of education

4.3.4 Business experience

With respect to business experience, 57.5% of the entrepreneurs had operated their enterprises for a period of one to three years. This suggests that a majority of participants were in the early stages of business development, a trend consistent with findings from the Kenya National Bureau of Statistics (2023), which reported that a significant proportion of micro and small enterprises in Kenya are relatively young, often reflecting high start-up rates coupled with high turnover in the informal sector.

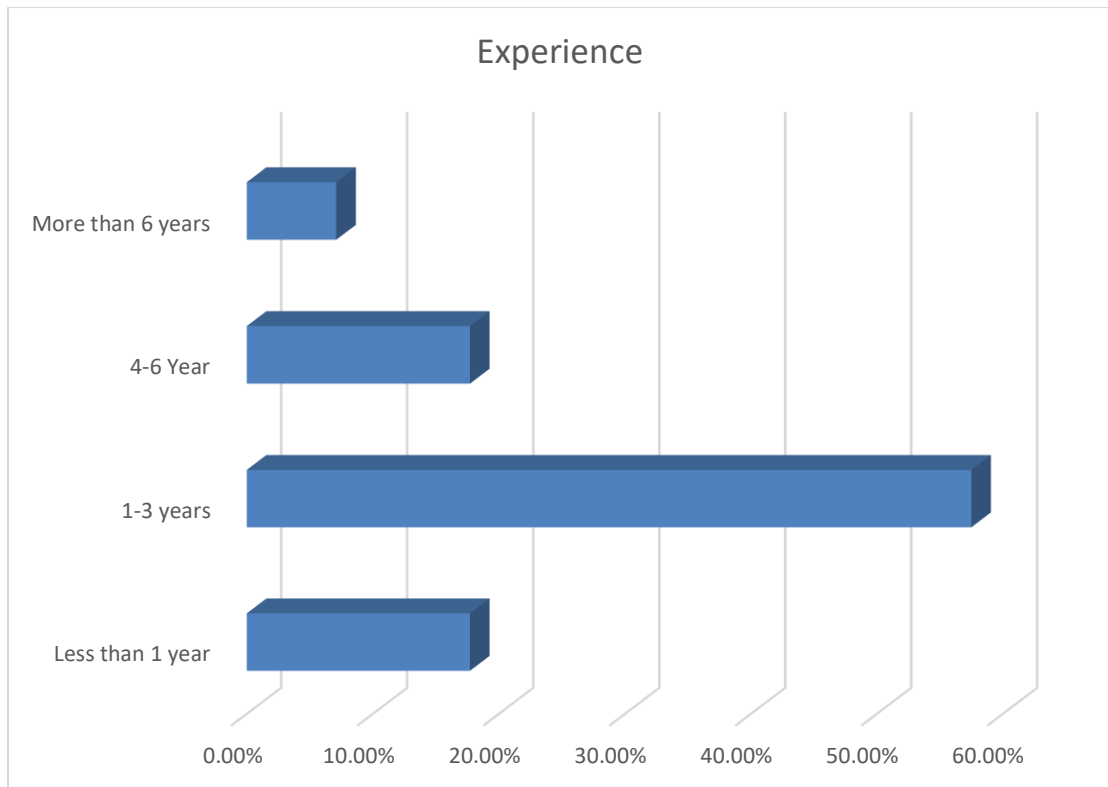


Figure 4.5: Business experience

4.3.5 Type of Enterprise

Table 4.1 indicates that the most common types of enterprises are building and materials production (26.3%), street food vending (24.4%), and carpentry (22.2%). Smaller segments include car wash and repair services (9.4%), traditional art (6.0%), and shoe/leather goods (4.9%). This diversity in enterprise types highlights the need for digital finance tools that are flexible and tailored to support a wide range of business activities.

Table 4.1 Type of Jua Kali Enterprise

Type of Enterprise	Frequency	Percent
Car wash and repair services	25	9.4
Carpentry	59	22.2
Construction and materials production	70	26.3
Painting and decorating services	18	6.8
Shoe and leather goods making	13	4.9
Street food vendors	65	24.4
Traditional art (wood carvings, beadwork, paintings)	16	6.0
Total	266	100.0

4.4 Validity and Reliability Results

Table 4.2 provides the results of the reliability testing of different variables of the digital financial services used to measure the internal consistency using Cronbach's Alpha. The Cronbach Alpha in each of the five variables, Mobile Money Transfer, Mobile Banking, Internet Banking, Digital loans, and Growth is more than 0.7, which is an acceptable to high range of reliability. Mobile Banking (0.897) and Mobile Money Transfer (0.877) demonstrate the highest level of internal reliability, and the lowest one shows the internal reliability of Internet Banking (0.779), Growth (0.719), and Digital loans (0.707). These findings indicate that the measuring instruments in gauging each of the variables are credible and dependable, which confirms their applicability in the further analysis.

Table 4.2 Reliability Analysis

Variables		Number Items	Cronbach's Alpha	Comment
Mobile Money transfer	18	0.877	Accepted	
Mobile Banking	18	0.897	Accepted	
Internet Banking	18	0.779	Accepted	
Digital loans	18	0.707	Accepted	
Growth	18	0.719	Accepted	

4.5 Descriptive Statistical Analysis

Descriptive statistical analysis was employed to summarise and present the characteristics of the study variables in a manner that is clear, concise, and easy to interpret. This approach provided an overview of the central tendencies, variability, and distribution patterns of the responses obtained from the surveyed Jua Kali enterprises. Measures such as means were used to capture the average ratings and the degree of consensus among respondents.

4.5.1 Influence of mobile money transfer on the growth of Jua Kali enterprises

The first objective sought to determine the effect of mobile money transfer on the growth of Jua Kali enterprises in Makueni County. This was motivated by the rapid rise of mobile money services in Kenya, which have transformed the way informal businesses receive payments and manage their finances. In an economy where cashless transactions are increasingly common, mobile money has become a key driver of market accessibility and financial inclusion. Evaluating its contribution to business

growth is therefore essential for both policymakers and entrepreneurs in the informal sector.

To achieve this, the study used descriptive statistical analysis focusing on two dimensions: perceived business impact and integration depth. Perceived impact was measured using a five-point Likert scale, where 1 represented a very small extent and 5 represented a very great extent, to assess the degree to which mobile money had increased sales. Integration depth was measured by asking respondents to indicate the proportion of their total business revenue received through mobile money platforms, using predefined percentage categories (0%, 1–25%, 26–50%, 51–75%, and 76–100%). The Likert scale provided insight into subjective perceptions of mobile money’s usefulness, while the revenue proportion categories offered an objective measure of its integration into business operations.

The results, presented in Table 4.3 show that the mean score for perceived impact was 3.93, indicating that respondents generally agreed that mobile money significantly improved their sales.

Table 4.3 Mobile money transfer perceived impact on revenue

Survey item	N	Mean
Extent send money has helped to improve sales	266	3.93

This finding aligns with recent studies that have documented the transformative role of mobile money in facilitating business transactions, improving cash flow, and expanding customer reach among small-scale enterprises in Kenya.

For instance, Mwangi, Muthoni, and Otieno (2022) found that mobile money was the most widely adopted digital finance tool among SMEs in Nairobi, with over 70% of revenues in some firms being processed through mobile platforms such as M-Pesa. Their study highlighted that mobile money services reduce transaction time, lower handling risks associated with cash, and allow businesses to serve customers beyond their immediate geographic location.

Further analysis of revenue distribution as shown in Table 4.4 revealed that 49.6% of respondents reported receiving between 51% and 75% of their total income via mobile money, while 27.1% received between 76% and 100%. Only 3.8% reported not using mobile money at all as presented in Table 4.4

Table 4.4 Percentage of sales received through mobile money transfer

Response	Frequency	Percentage
0	10	3.8%
1–25%	15	5.6%
26–50%	37	13.9%
51–75%	132	49.6%
76–100%	72	27.1%
Total	266	3.8%

These findings reveal that mobile money is not only widely adopted but also deeply embedded in the financial operations of Jua Kali enterprises in Makueni County. The combination of a high mean score and a large proportion of revenue being transacted

via mobile money highlights its role as both a payment mechanism and a driver of growth.

The results align with Talom and Tengeh (2020) in Cameroon and Mutiso and Reuben (2021) in Kenya, who found that mobile money accounted for over 60% of SME turnover in their respective study contexts. They also support the propositions of the Technology Acceptance Model (TAM) and Financial Inclusion Theory, both of which emphasise perceived usefulness and accessibility as key adoption drivers. Overall, the evidence confirms that mobile money transfer is a crucial enabler of sales growth and operational efficiency among Jua Kali enterprises.

In conclusion, mobile money transfer services play a vital role in driving the growth of Jua Kali enterprises in Makueni County. The findings indicate both high adoption and deep integration into business operations, with most enterprises earning the majority of their revenue through these platforms. This strong reliance confirms mobile money's importance as a driver of sales growth, financial inclusion, and operational efficiency in the informal sector.

4.5.2 Influence of mobile banking on the growth of Jua Kali enterprises

The second objective examined the influence of mobile banking on the growth of Jua Kali enterprises. Mobile banking services provided by commercial banks have the potential to enhance revenue management, facilitate payments, and provide access to broader financial products. However, their actual contribution to informal enterprises, particularly in rural areas, remains less understood compared to mobile money platforms.

This objective was addressed using descriptive statistics to analyse perceived impact and integration depth. Perceived impact was measured on a five-point Likert scale (1 = very low extent, 5 = very high extent), assessing the extent to which mobile banking had improved business sales. Integration depth was measured by the proportion of revenue received via mobile banking platforms, classified into categories from 0% to 100%.

As presented in Table 4.5, the mean score for perceived impact was 2.12, suggesting that respondents generally rated the contribution of mobile banking to sales growth as low

Table 4.5 Mobile banking perceived impact on revenue

Survey item	N	Mean
Extent mobile banking has helped improve sales	266	2.12

This suggests that respondents generally rated the contribution of mobile banking to sales growth as low. The relatively modest rating may reflect limited adoption of mobile banking services among Jua Kali enterprises, possibly due to low awareness of available banking products, perceived complexity of usage, or transaction charges associated with such services.

This finding contrasts with evidence from urban SME settings. Mwangi, Muthoni, and Otieno (2022) reported a statistically significant positive effect of mobile banking on SME growth in Nairobi ($\beta = .249$, $p = .001$), attributing this to the integration of banking

services with digital platforms that support savings, transfers, and loan facilities. The divergence between the present study and urban-focused research may be perhaps explained by contextual differences, such as lower digital literacy, weaker banking infrastructure, and the prevalence of cash-based or mobile money-based transactions in rural informal enterprises.

Further analysis of integration depth as presented in Table 4.6 shows that 47.7% of respondents did not use mobile banking at all, while 33.1% used it to process between 51% and 75% of their revenue. Only 7.5% reported a high level of integration, receiving between 76% and 100% of their revenue through mobile banking

Table 4.6 Percentage of sales received through mobile banking

Response	Frequency	Percentage
0	127	47.7
1–25%	17	6.4
26–50%	14	5.3
51–75%	88	33.1
76–100%	20	7.5
Total	266	100.0

These results indicate that, despite being accessible, mobile banking is not widely integrated into the daily financial operations of most Jua Kali enterprises in Makueni County. The low perceived impact score implies limited recognition of its benefits, while the usage data reveals that adoption is concentrated among a small subset of enterprises. These findings mirror Banda’s (2022) results from Zambia, which showed

that mobile banking had no significant impact on micro and small enterprise performance in low-adoption environments.

In conclusion, while mobile banking offers potential benefits, its current influence on the growth of Jua Kali enterprises in Makueni County is minimal. This may be due to a preference for simpler, more widely accepted platforms like mobile money, or a lack of awareness about mobile banking's features.

4.5.3 Influence of internet banking on the growth of Jua Kali enterprises

The third objective investigated the effect of internet banking on the growth of Jua Kali enterprises. Internet banking theoretically enables enterprises to conduct a wide range of financial transactions remotely, potentially improving operational efficiency and reducing costs. However, its uptake in the informal sector may be limited by technological barriers, internet access issues, and low digital literacy.

The analysis measured perceived impact and integration depth using descriptive statistics. Perceived impact was assessed on a five-point Likert scale (1 = very low extent, 5 = very high extent), while integration depth was determined from the proportion of sales revenue received via internet banking, categorised from 0% to 100%.

The analysis measured perceived impact and integration depth using descriptive statistics. Perceived impact was assessed on a five-point Likert scale (1 = very low extent, 5 = very high extent), while integration depth was determined from the proportion of sales revenue received via internet banking, categorised from 0% to

100%. The results in Table 4.7 show that the mean score for the perceived impact of internet banking on sales growth was 2.32 on a five-point Likert scale. This indicates that respondents generally perceived internet banking as having a low contribution to sales growth.

Table 4.7 Internet banking perceived impact on revenue

Survey item	N	Mean
Extent internet banking has helped improve sales	266	2.32

The relatively low rating may be attributed to limited adoption of internet banking in the Jua Kali sector, potentially due to infrastructural constraints such as unreliable internet connectivity, limited access to computing devices, and lower levels of digital literacy among informal enterprise operators.

These findings align with observations by Kikulwe, Fischer, and Qaim (2021), who reported that while digital banking services are expanding in Kenya, rural and informal enterprises remain slower adopters compared to urban and formal businesses. Similarly, Wambugu and Kiragu (2022) noted that SMEs in rural counties often face barriers to internet banking adoption, including lack of awareness, perceived complexity, and a preference for more familiar mobile money platforms.

Further analysis on revenue distribution revealed that, 24.8% of respondents did not use internet banking at all, while the largest group (35.3%) received between 26% and 50% of their total sales through it. Only 1.1% of respondents reported conducting the majority of their sales (76–100%) via internet banking as shown in Table 4.8

Table 4.8 Percentage of sales received through internet banking

Response	Frequency	Percent
0	66	24.8
1–25%	39	14.7
26–50%	94	35.3
51–75%	64	24.1
76–100%	3	1.1
Total	266	100.0

These findings suggest that internet banking adoption among Jua Kali enterprises in Makueni County is limited, with most businesses perceiving little direct benefit in terms of sales growth. This trend is consistent with global patterns in informal economies, where barriers such as unreliable connectivity, lack of trust in online transactions, and limited awareness of banking services constrain uptake (Demirgüç-Kunt et al., 2022).

Similar results were reported by Banda (2022) in Zambia, who found that low adoption rates of internet banking in the informal sector limited its potential to enhance enterprise performance. Compared to the widespread success of mobile money, internet banking in Makueni County appears less accessible and less relevant to the operational needs of informal traders, underscoring the need for targeted interventions to increase digital literacy and improve infrastructure.

In summary, internet banking is not currently a significant contributor to the growth of Jua Kali enterprises in Makueni County. Greater investment in awareness campaigns, digital literacy, and infrastructure could be necessary to unlock its potential benefits.

4.5.4. Influence of digital loans on the growth of Jua Kali enterprises

The fourth objective evaluated the impact of digital loans on the growth of Jua Kali enterprises. Digital lending platforms, often accessed via mobile phones, have emerged as an important source of quick, collateral-free credit for small businesses. Such loans can help enterprises manage cash flow, purchase stock, and respond to market opportunities, potentially boosting sales.

The study measured perceived impact using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) in relation to the statement that digital loans had increased sales. Integration depth was captured by the proportion of sales financed using digital loans, classified into percentage categories from 0% to 100%.

The analysis revealed that digital loans have a substantial positive effect on the growth of Jua Kali enterprises in Makueni County. The perceived impact on sales achieved a high mean score of 4.51 on a five-point Likert scale, indicating a strong consensus among respondents that digital loans contribute significantly to increased sales. In terms of integration depth, as presented in Table 4.9

Table 4.9 Digital loans perceived impact on revenue

Survey item	N	Mean
Digital loans have helped increase sales	266	4.51

This high mean value indicates both a strong perceived benefit and a high level of consensus among respondents that digital loans contribute significantly to revenue generation. The findings suggest that access to quick, flexible credit enables enterprises

to finance stock replenishment, meet working capital needs, and take advantage of short-term market opportunities, thereby boosting sales performance.

These results are aligned with the findings of Tala Kenya (2023), which reported that digital loans have improved small business performance by increasing operational liquidity, enabling timely procurement of inputs, and supporting business continuity. Similarly, Chege (2023) noted that digital credit is playing an increasingly critical role in Kenya's SME sector, contributing not only to sales growth but also to broader economic activity, with projections that expanded access could add up to 2% to Kenya's GDP by 2025.

Further analysis into the revenue integration depth, 49.6% of respondents reported financing 76–100% of their sales with digital loans, while 40.2% financed between 51% and 75%. Only 0.4% used digital loans for 26–50% of their sales as shown in Table 4.10

Table 4.10 Percentage of sales financed using digital loans

Response	Frequency	Percent
1–25%	26	9.8
26–50%	1	0.4
51–75%	107	40.2
76–100%	132	49.6
Total	266	100.0

These results suggest that digital loans are not only widely adopted but also deeply integrated into the financial operations of most Jua Kali enterprises in the study area. The high mean score reflects strong perceived usefulness, while the integration data

indicates that digital loans form a primary source of financing for many enterprises. Such heavy reliance implies that digital credit is crucial in enabling traders to purchase stock, meet customer demand, and maintain steady cash flow. The combination of high adoption and high perceived impact underscores the strategic importance of digital lending in sustaining and expanding business activities in the informal sector

The findings align with Mutiso and Reuben (2021), who reported that mobile-based credit significantly improved liquidity and operational capacity among SMEs in Kenya, leading to higher sales turnover. Similarly, Demirgüç-Kunt et al. (2022) observed that digital lending has enhanced financial resilience in developing countries, especially among small-scale entrepreneurs who face barriers to accessing traditional bank credit. These results also echo the conclusions of Talom and Tengeh (2020), who found that the accessibility and flexibility of mobile financial services, including digital loans enable SMEs in Cameroon to address working capital shortages and respond more effectively to market opportunities.

In conclusion, digital loans have emerged as a powerful enabler of growth for Jua Kali enterprises in Makueni County. Their accessibility, speed, and flexibility make them a preferred financing option, allowing traders to replenish stock quickly, maintain liquidity, and respond to market fluctuations. By directly enhancing sales and operational stability, digital lending platforms are not only supporting day-to-day business survival but also contributing to long-term growth and competitiveness in the informal sector.

4.5.5. Business Revenue Growth among Jua Kali Enterprises

This section presents an analysis of how digital finance tools have influenced the financial growth of Jua Kali enterprises in Makueni County. The analysis of business revenue growth focused on two indicators: changes in average monthly revenue before and after the adoption of digital finance tools, and the perceived extent of revenue growth over the past three months

The results in Table 4.11 reveal a notable increase in average monthly revenue following the adoption of digital finance tools. The mean average monthly revenue before adoption was Ksh 16,969.85, while the mean current monthly revenue after adoption rose to Ksh 22,558.88. This represents an absolute increase of Ksh 5,589.03, equivalent to a 32.93% rise from the pre-adoption average. payment efficiency, enabling better cash flow management, and expanding customer reach.

Table 4.11 Average monthly revenue before and after using digital finance

Survey item	N	Mean
Business's average monthly revenue before using digital finance (Kshs)	266	16,969.85
Business's current average monthly revenue after using digital tools (Kshs)	266	22,558.88

While this study does not establish a causal relationship, the upward shift in revenue is consistent with literature indicating that digital financial services can enhance business performance by improving. These findings align with evidence from Mwangi, Muthoni, and Otieno (2022), who reported that SMEs in Nairobi experienced significant revenue

growth following the adoption of mobile money, mobile banking, and internet banking platforms. Similarly, Kouadio, Tchouassi, and Tadjuidje (2023) observed that digital finance adoption among SMEs in Sub-Saharan Africa contributed to resilience and revenue recovery during and after the COVID-19 pandemic by facilitating contactless transactions and broadening market access.

Additionally, the respondents were asked to indicate the extent to which their average monthly revenue has grown due to using digital finance in their business in the past 3 months. Their responses ranged between 1=Very Small Extent, 2=Small Extent, 3=Moderate Extent, 4= Great Extent, 5=Very Great Extent. The responses were analyzed and summarized in table 4.12.

Table 4.12 Extent average monthly revenue has grown

Survey item	N	Mean
Extent business average monthly revenue has grown in the past 3 months	266	3.03

The analysis indicated that average monthly revenues among the Jua Kali operators had grown to a moderate extent. This was supported by a mean response of 3.03. Thus, the uptake of digital finance has contributed to increase in business revenues.

The increase in mean monthly revenue suggests that digital finance tools have positively influenced the earning capacity of Jua Kali enterprises. The ability to process transactions more efficiently, access wider markets, and secure quick financing likely

contributed to this growth. However, the moderate mean score for perceived growth (3.03) indicates that while gains are present, they may not be evenly distributed across all enterprises. Factors such as varying levels of digital finance adoption, differences in business size, and sector-specific market demand could explain the variability in impact.

These findings align with the World Bank's Global Findex Database 2021 (Demirgüç-Kunt et al., 2022), which highlighted that adoption of digital financial services often leads to improved sales and revenue among small businesses, particularly in low- and middle-income economies. Similarly, Mutiso and Reuben (2021) reported that Kenyan SMEs using mobile-based financial tools experienced higher average monthly revenues compared to non-users. The moderate growth perception observed in this study mirrors results from Banda (2022) in Zambia, where digital finance adoption led to revenue increases but was tempered by limited digital literacy and infrastructural barriers.

4.6 Inferential Statistics

Inferential statistics were applied to examine the relationship between the use of digital finance tools and various indicators of business growth among Jua Kali enterprises. Ordinal regression was used in this analysis. Diagnostic tests were used ahead of time to guarantee that the best-unbiased estimate was obtained and also to figure out how well the data matched the regression model:

4.6.1 Diagnostic Tests

According to Chapter Three, the study conducted several diagnostic tests. This was carried out so that there were no inconsistencies and inefficiency in regression

parameters. This was achieved by testing for multicollinearity, Likelihood Ratio Test and Goodness-of-Fit Tests (Pearson and Deviance).

4.6.1.1 Multicollinearity

The multicollinearity test was conducted to ensure that the independent variables used in the ordinal regression model were not highly correlated with one another, as excessive intercorrelation can inflate standard errors and undermine the reliability of regression estimates. As presented in Table 4.13, all Variance Inflation Factor (VIF) values ranged from 1.253 to 1.773, well below the commonly accepted threshold of 5, which indicates the point beyond which multicollinearity becomes problematic. Similarly, all tolerance values were above 0.2, further confirming the absence of significant collinearity among the predictors. These results suggest that the independent variables, mobile money transfer, mobile banking, internet banking, and digital loans, each contributed distinct and non-redundant information to the model. Therefore, the ordinal regression results can be interpreted with confidence, as multicollinearity was not a concern in this analysis.

Table 4.13 Multicollinearity

Variables	Collinearity Statistics	
	Tolerance	VIF
Mobile Money Transfer	.564	1.773
Mobile Banking	.798	1.253
Internet Banking	.602	1.662
Digital loans	.649	1.540

4.6.1.2 Correlation Analysis

Spearman's rank correlation coefficient was employed in this study to examine the association between digital finance tools and the growth of Jua Kali enterprises. This choice was informed by the measurement level of the study variables, which were primarily derived from Likert-scale items.

Understanding these relationships helps determine whether increases or decreases in the use of certain digital finance tools are linked to changes in business growth. Each variable was measured using mean scores from Likert-scale responses and proportion-based revenue categories derived from the survey. The Spearman's rank correlation analysis results in Table 4.14 reveals several notable relationships among the digital financial services variables and growth.

Table 4.14 Correlation Analysis

Variable	Mobile Money	Mobile Banking	Internet Banking	Digital Credit	Growth
Mobile Money	1.000				
Mobile Banking	.136*	1.000			
Internet Banking	-.665**	.061	1.000		
Digital Credit	-.700**	-.545**	.493**	1.000	
Growth	.334**	-.081	-.161**	-.109	1.000

Note. $N = 266$. Spearman's correlation coefficients are shown. $p < .05$ (*), $p < .01$ (**), two-tailed tests.

The correlation analysis examined the relationships between various digital finance variables and enterprise growth among Jua Kali enterprises. The results revealed a weak positive but non-significant correlation between mobile money usage and enterprise growth ($r_s = .334$, $p < .01$). Although this indicates some association, the effect is minimal, suggesting that while mobile money enhances convenience in transactions, it may not directly translate to measurable enterprise growth. Notably, mobile money exhibited strong negative correlations with both internet banking ($r_s = -.665$, $p < .01$) and digital credit ($r_s = -.700$, $p < .01$), implying that mobile money may act as a substitute rather than a complement to these digital financial tools. Enterprises relying heavily on mobile money might, therefore, engage less in digital borrowing or online banking.

Mobile banking showed a very weak and statistically insignificant relationship with enterprise growth ($r_s = -.081$, $p > .05$). This finding implies that mobile banking use does not significantly influence growth outcomes within the sampled enterprises. However, mobile banking was negatively associated with digital credit ($r_s = -.545$, $p < .01$).

.01), suggesting that firms that utilize mobile banking services may rely less on borrowing through digital credit platforms. This could be because mobile banking systems enable enterprises to manage liquidity and internal funds more efficiently, thereby reducing the need for external financing.

Internet banking demonstrated a weak and non-significant negative relationship with enterprise growth ($r_s = -.161$, $p < .01$). The low correlation indicates that internet banking has not yet translated into tangible growth benefits for informal enterprises. However, a moderate positive and significant correlation was observed between internet banking and digital credit ($r_s = .493$, $p < .01$), suggesting that enterprises that adopt internet banking are also more likely to access or utilize digital loans. This relationship might reflect the integrated nature of digital lending within online banking portals, which facilitates credit access for technologically inclined enterprises.

Lastly, digital credit showed a weak and non-significant negative correlation with enterprise growth ($r_s = -.109$, $p > .05$). This suggests that while digital credit services are increasingly available, they do not necessarily promote growth among Jua Kali enterprises. The negative relationship may result from the short repayment periods and high interest rates associated with many digital loan products, which limit their capacity to support business expansion. Overall, the correlation results imply that while digital financial services are interrelated, their direct influence on enterprise growth remains limited, highlighting the need for improved digital finance literacy, affordable credit options, and tailored financial products to enhance the growth of informal enterprises.

4.6.1.3 Goodness-of-Fit

The Goodness-of-Fit results assessed how well the ordinal regression model fits the observed data. As shown in table 4.15 the Pearson Chi-Square statistic ($\chi^2 = 216.175$, $df = 212$, $p = .408$) and the Deviance statistic ($\chi^2 = 198.843$, $df = 212$, $p = .732$) both have p-values greater than 0.05. This indicates that there is no significant difference between the observed and model-predicted values. In other words, the model's predictions are not significantly different from the actual data, suggesting that the model fits the data well. The non-significant p-values for both the Pearson and Deviance tests mean that the residuals are small and randomly distributed, which supports the conclusion that the model adequately represents the data structure. Therefore, the ordinal regression model was considered to have an acceptable overall fit, making it appropriate for interpreting further parameter estimates.

Table 4.15 Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	216.175	212	.408
Deviance	198.843	212	.732
Link function: Logit.			

4.6.2 Ordinal Regression Statistics

4.6.2.1 Model Fitting and Pseudo R-Square

The results of the ordinal regression model are summarized in Table 4.16. The model fitting information shows that the inclusion of the predictors (mobile money, mobile banking, internet banking, and digital loans) significantly improves the model compared to a null model without predictors ($\chi^2 = 79.711$, $p < .001$). This indicates that,

collectively, the digital finance tools have a statistically significant effect on the likelihood of being in a higher revenue growth category.

The Nagelkerke Pseudo R^2 value of 0.288 indicates that the four digital finance predictors, mobile money, mobile banking, internet banking, and digital loans, collectively explain approximately 28.8% of the variation in enterprise growth. This suggests that while digital finance tools play a meaningful role in influencing the growth of Jua Kali enterprises, their explanatory power remains moderate rather than strong. Consequently, about 71.2% of the variation in enterprise growth is attributable to other factors not captured in the model.

Table 4.16 Model Fit and Pseudo R-Square

Model Fit Summary	Chi-square	df	Sig.	Pseudo R^2 (Nagelkerke)
Final Model	79.711	4	.000	0.288

4.6.2.2 Parameter Estimates

Table 4.17 presents the parameter estimates (β), standard errors, Wald statistics, significance levels, and odds ratios [$\text{Exp}(\beta)$]. The results show that mobile money ($\beta = 1.628$, $p < 0.001$), internet banking ($\beta = 0.501$, $p = 0.008$), and digital loans ($\beta = 0.833$, $p < 0.001$) were statistically significant positive predictors of enterprise growth. This indicates that increased use of these digital finance tools significantly raises the likelihood of an enterprise belonging to a higher growth category. However, mobile banking ($\beta = 0.050$, $p = 0.736$) was not statistically significant, implying that it had no meaningful effect on enterprise growth among Jua Kali operators.

Table 4.17 Parameter Estimates (Coefficients)

Predictor	Estimate (β)	Std. Error	Wald χ^2	Sig.	Exp(β)
Mobile Money	1.628	0.221	54.383	.000	5.10
Mobile Banking	0.050	0.149	0.113	.736	1.05
Internet Banking	0.501	0.188	7.114	.008	1.65
Digital Loans	0.833	0.206	16.341	.000	2.30

The coefficient for mobile money ($\beta = 1.628$, $p < 0.001$) indicates a strong and statistically significant positive relationship between mobile money usage and enterprise growth. The corresponding odds ratio ($\text{Exp}(\beta) = 5.10$) suggests that for every one-unit increase in the use of mobile money services, the odds of a Jua Kali enterprise moving to a higher growth category increase by a factor of 5.10. In other words, enterprises that frequently utilize mobile money platforms for transactions, savings, bill payments, and customer payments are 410% more likely to experience higher growth than those that do not. This finding underscores the transformative impact of mobile money on financial inclusion and operational efficiency, as it enhances liquidity management, facilitates instant payments, and reduces transaction costs. The result is consistent with prior studies such as Mwangi et al. (2022) and Kouadio et al. (2023), which found that mobile money use significantly improves financial accessibility and accelerates business growth in small and informal enterprises.

For internet banking ($\beta = 0.501$, $p = 0.008$), the positive and statistically significant coefficient indicates that enterprises that adopt internet banking services are more likely to experience growth. The odds ratio ($\text{Exp}(\beta) = 1.65$) shows that a one-unit increase in internet banking usage increases the odds of an enterprise moving to a higher growth

category by 65%. This suggests that online banking—through functions such as digital account access, electronic fund transfers, and real-time transaction monitoring, enhances financial control, transparency, and strategic decision-making. These capabilities contribute to improved cash flow management and operational efficiency, ultimately supporting business expansion.

Similarly, digital loans ($\beta = 0.833$, $p < 0.001$) exhibit a significant and positive relationship with enterprise growth, with an odds ratio ($\text{Exp}(\beta) = 2.30$). This implies that enterprises using digital credit facilities are 130% more likely to advance to higher growth categories compared to those not utilizing them. Access to digital loans allows small enterprises to address liquidity shortages, restock inventory, and finance short-term operations without the lengthy procedures associated with traditional bank loans. These findings corroborate prior research by Ngugi and Karugu (2021), which highlighted that mobile-based credit services empower micro and small enterprises by providing flexible and immediate financing solutions that drive profitability and expansion.

In contrast, mobile banking ($\beta = 0.050$, $p = 0.736$) shows a positive but statistically insignificant relationship with enterprise growth. This suggests that although mobile banking provides convenient account access and basic transactional services, its effect on enterprise performance remains minimal. This could be attributed to the limited integration of mobile banking services with business financial management tools and the preference among small-scale traders for mobile money platforms due to their ease of use and lower transaction barriers.

Overall, the ordinal regression results indicate that mobile money, internet banking, and digital loans are critical determinants of enterprise growth among Jua Kali enterprises. The magnitude of the coefficients and odds ratios confirms that mobile money exerts the strongest influence, reflecting its widespread adoption and practical utility in daily business transactions. These findings emphasize the central role of digital financial inclusion in enhancing business resilience, operational flexibility, and competitiveness within Kenya's informal sector.

These findings align with Mwangi et al. (2022), who reported that mobile money and digital credit significantly improved SME growth in Nairobi, though the effect of mobile banking was stronger in urban settings than in rural areas. Similarly, Kouadio et al. (2023) observed that mobile money enhanced SME resilience during COVID-19, consistent with the strong effect observed here. Conversely, Banda (2022) found that mobile banking had no significant effect on SMEs in Zambia, which parallels the current study's finding of minimal impact in Makueni. The positive role of digital loans in this study mirrors findings by Okoth and Mungai (2023), who noted that digital credit supports liquidity but may not always translate into long-term investment. The modest effect of internet banking here contrasts with Mutio (2021) and Muathe (2021), who found stronger positive impacts in more digitally integrated enterprises, suggesting that context, infrastructure, and literacy levels mediate its effectiveness.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a synthesis of the study's findings, draws conclusions based on empirical evidence, and offers recommendations for policy, practice, and future research. The study investigated the influence of digital finance tools on the growth of Jua Kali enterprises in Makueni County, Kenya. The analysis was guided by the Technology Acceptance Model (TAM), Schumpeter's Innovation Theory, Transaction Cost Theory, and Financial Inclusion Theory, providing a multidimensional framework for interpreting the results.

5.2 Summary of the Findings

The study adopted a descriptive research design targeting Jua Kali enterprise across Makueni County. Stratified random sampling yielded a representative sample of 266 respondents. Primary data were collected through structured questionnaires and analyzed using both descriptive and inferential statistics, including Spearman's rank correlation and ordinal regression analysis. The main objective was to assess how various digital finance tools, mobile money, mobile banking, internet banking, and digital loans, influence enterprise growth.

The findings revealed that mobile money had the strongest positive and statistically significant influence on enterprise growth. The ordinal regression coefficient ($\beta = 1.628, p < 0.001$) and odds ratio ($\text{Exp}(\beta) = 5.10$) indicated that increased use of mobile

money increased the likelihood of enterprises moving to higher growth categories by more than five times. Descriptive data supported this pattern, with 76.7% of respondents reporting that over half of their business revenues were received through mobile money. This underscores mobile money's central role as a convenient, reliable, and low-cost financial platform that enhances liquidity, transaction efficiency, and financial inclusion among informal enterprises.

Mobile banking, in contrast, showed a positive but statistically insignificant relationship with enterprise growth ($\beta = 0.050$, $p = 0.736$). Almost half of the respondents indicated minimal use of mobile banking services for business operations, suggesting that despite widespread availability, the tool remains underutilized within the Jua Kali sector. This limited uptake may stem from usability barriers, low awareness, or a preference for simpler mobile money services that are more adaptable to informal business needs.

The study also found that internet banking had a statistically significant positive influence on enterprise growth ($\beta = 0.501$, $p = 0.008$; $\text{Exp}(\beta) = 1.65$). Although 65.8% of respondents reported some level of internet banking usage, integration into daily business operations remained modest. The findings suggest that enterprises adopting online banking platforms for payments, transfers, and financial management are 65% more likely to experience higher revenue growth. This reflects how internet banking enhances financial control, reduces transaction friction, and supports more informed decision-making.

Furthermore, digital loans emerged as another significant predictor of enterprise growth ($\beta = 0.833$, $p < 0.001$; $\text{Exp}(\beta) = 2.30$). Enterprises utilizing digital credit were found to be 2.3 times more likely to advance to higher growth categories. Approximately 89.8% of respondents had accessed digital loans for working capital, restocking, or operational financing. However, challenges such as high interest rates and short repayment periods were frequently cited, potentially constraining long-term sustainability despite the liquidity benefits.

Overall, the ordinal regression model was statistically significant ($\chi^2 = 79.111$, $p < 0.001$) and explained about 24.1% of the variation in enterprise growth (Nagelkerke $R^2 = 0.241$). This demonstrates that digital financial tools collectively play a substantial role in influencing business growth, though other factors—such as managerial capacity, market access, and the regulatory environment—may also contribute to enterprise performance.

5.3 Conclusion

The study aimed to examine the influence of digital finance tools on the growth of Jua Kali enterprises in Makueni County, Kenya. Guided by the objectives of assessing the effects of mobile money, mobile banking, internet banking, and digital loans, the analysis confirmed that digital finance tools collectively exert a statistically significant impact on enterprise growth. These findings affirm that financial digitalization is a key enabler of business expansion, operational efficiency, and financial inclusion within Kenya's informal economy.

The results demonstrated that mobile money is the most powerful driver of growth among digital finance tools. Enterprises that actively use mobile money were found to be over five times more likely to achieve higher revenue growth, highlighting its transformative role in promoting financial accessibility, liquidity, and seamless transactions. The widespread integration of mobile money in day-to-day business activities reflects its unmatched adaptability to the needs of informal traders and microenterprises.

Similarly, internet banking and digital loans showed a statistically significant positive effect on enterprise growth. Enterprises utilizing these services exhibited stronger financial management capabilities, improved access to credit, and more efficient transaction processes. These findings emphasize that digital finance not only improves operational efficiency but also strengthens business resilience and competitiveness in the informal sector.

Conversely, mobile banking was found to have an insignificant influence on enterprise growth. This suggests that despite its availability, its adoption among Jua Kali enterprises remains low, possibly due to limited digital literacy, high transaction costs, or poor alignment with microenterprise needs. This indicates the need for banks and policymakers to enhance accessibility, simplify interfaces, and promote trust and awareness of mobile banking's benefits.

In summary, the study concludes that digital financial tools, especially mobile money, internet banking, and digital loans, serve as critical catalysts for enterprise growth in Kenya's informal economy. By improving access to finance, enabling digital

transactions, and supporting business formalization, these tools contribute to sustainable economic empowerment and poverty reduction. However, maximizing their potential requires greater financial literacy, affordable credit facilities, and supportive regulatory frameworks.

5.4 Recommendations

Based on the study findings, several actionable recommendations are proposed to strengthen the role of digital finance in promoting the growth of Jua Kali enterprises in Makueni County and beyond. The results demonstrated that mobile money had the strongest and most significant positive influence on enterprise growth. Therefore, financial institutions and mobile service providers should prioritize expanding and improving mobile money services tailored to the needs of informal enterprises. This could include developing business-oriented mobile money products such as low-cost merchant accounts, digital record-keeping systems, and integration with accounting tools to support financial management. Additionally, awareness campaigns should be intensified to educate entrepreneurs on advanced mobile money functionalities beyond basic sending and receiving of money. These could include automated payments, savings products, and microinsurance options. Enhancing such capabilities will allow micro-entrepreneurs to leverage mobile money more effectively as a tool for operational efficiency, liquidity management, and business growth.

Although mobile banking showed a positive but statistically insignificant relationship with enterprise growth, its potential as a financial inclusion tool remains untapped. To increase adoption, commercial banks should simplify their mobile banking

applications, reduce transaction fees, and enhance usability through intuitive interfaces that accommodate users with limited digital literacy. In addition, partnerships between banks, microfinance institutions, and local business associations can help provide targeted training on mobile banking use, particularly for savings, payments, and credit access. By addressing usability barriers and cost concerns, mobile banking can become more relevant and accessible to small informal businesses, helping them formalize their financial transactions and build stronger credit profiles.

Digital credit also emerged as a significant predictor of enterprise growth, but its benefits are often undermined by high interest rates and short repayment cycles. Policymakers and regulators, such as the Central Bank of Kenya, should establish stronger oversight frameworks to ensure fairness, transparency, and consumer protection in digital lending practices. Financial service providers, on their part, should design flexible repayment schedules and affordable loan products that align with the income cycles of informal traders. Furthermore, implementing financial education programs focusing on responsible borrowing and credit management would empower entrepreneurs to use digital credit more sustainably, reducing the risk of over-indebtedness while maintaining access to much-needed working capital.

The findings also highlighted the positive and significant role of internet banking in supporting enterprise growth. However, adoption levels remain modest due to limited awareness and perceived complexity. Financial institutions should therefore invest in promoting the benefits of internet banking and develop user-friendly platforms that meet the needs of micro- and small-scale entrepreneurs. Features such as simplified dashboards, real-time transaction alerts, and mobile-friendly web portals can help build

trust and convenience among users. This will not only improve financial management and transparency but also foster digital integration across different financial tools, thereby strengthening enterprise efficiency and competitiveness.

Finally, the study recommends that both the County Government of Makueni and the national government invest more in digital infrastructure and capacity building within the informal sector. Strengthening rural internet connectivity, mobile network coverage, and digital literacy programs will provide the foundation necessary for entrepreneurs to adopt and use digital financial tools effectively. Training initiatives should emphasize the importance of mobile payments, internet banking, and digital loan management, with a particular focus on young and women entrepreneurs who form a large proportion of the Jua Kali workforce. By addressing infrastructural, regulatory, and capacity-related barriers, digital finance can be transformed into a more powerful and sustainable driver of microenterprise growth, financial inclusion, and economic empowerment across Kenya's informal economy.

5.5 Suggestions for Further Studies

While this study has provided valuable insights into the role of digital finance tools in enhancing financial inclusion among Jua Kali enterprises in Makueni County, several areas warrant further investigation. Future research could explore the long-term effects of digital credit on enterprise sustainability, particularly examining default rates, credit cycles, and the behavioral dynamics of informal borrowers. Such studies would offer a deeper understanding of the risks and resilience mechanisms within informal credit ecosystems.

Moreover, future studies could incorporate qualitative methodologies to capture the lived experiences of entrepreneurs navigating digital finance platforms. This would enrich the quantitative findings with a deeper understanding of how trust is formed, shaped by individual experiences and varying levels of confidence in digital finance. Finally, as digital finance continues to evolve, there is scope to investigate emerging tools such as blockchain-based solutions, digital savings groups, and AI-driven credit scoring, assessing their relevance and adaptability to the informal sector in Kenya.

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APPENDICES

Appendix I: Letter of Introduction

Dear Sir/Madam,

I hope this letter finds you well. My name is Daniel Mutie Mutua, a postgraduate student at Machakos University, currently undertaking a research study titled “**Digital Finance and the Growth of the Jua Kali Enterprises in Makueni County**”. This study seeks to explore how digital finance platforms influence the growth Jua Kali enterprises, with a focus on mobile money transfers, mobile banking, internet banking, and digital credit platforms. Your valuable insights and experiences as part of the Jua Kali sector are vital to the success of this research.

Your participation in this study involves completing a brief questionnaire, which should take approximately fifteen minutes of your time. The questions are designed to gather information about your perceptions and experiences related to the use of digital financial tools in your business operations and their impact on revenue as growth indicator. Please rest assured that all the information you provide will remain strictly confidential and will be used solely for academic purposes. Your responses will be aggregated and anonymized to ensure that no individual data can be traced back to you.

Participation in this study is entirely voluntary. If you have any questions or concerns regarding this research, please do not hesitate to reach out to me. I truly appreciate your willingness to contribute to this study, as your feedback is instrumental in shaping our understanding of how digital finance impacts the growth of Jua Kali enterprises in Makueni County. Thank you for your time, and I look forward to your support in this endeavor.

Yours Faithfully,

Daniel Mutie Mutua

Machakos University

Appendix II: Questionnaire

Dear Respondent,

This questionnaire is designed to collect data for the study on the influence of digital finance on the growth of Jua Kali enterprises in Makueni County. Your responses will be kept strictly confidential and will be used solely for academic purposes. Please answer all questions honestly. Thank you for your time and cooperation.

Instructions:

For each question, please tick the appropriate response or provide your answer in the space provided.

Section A: Demographics

1. What is your age group?

- ☐ 18-25 ()
- ☐ 26-35 ()
- ☐ 36-45 ()
- ☐ 46-55 ()
- ☐ 56 and above ()

2. What is your gender?

- ☐ Male ()
- ☐ Female ()

3. What is your highest level of education?

- Primary ()
- Secondary ()
- Diploma ()
- Bachelor's Degree ()
- Postgraduate ()

4. How many years have you been in the Jua Kali sector?

- Less than 1 year ()
- 1-3 years ()
- 4-6 years ()
- More than 6 years ()

5. What type of business do you operate? Indicate:

Section B: Business Revenue Growth

6. What was your business's average monthly revenue *before* using digital tools?

(in Kenya Shillings):.....

7. What is your business's current average monthly revenue?

(in Kenya Shillings):

8. Please, indicate the extent to which digital finance tools have helped increase your

sales. On a scale of between 1 and 5, where 1, 2, 3, 4 and 5 represents (very low extent, low extent, medium extent, high extent, and very high extent respectively.

☐ Small extent ☐ Medium extent ☐ Great extent ☐ Very Great extent

Section C: Mobile Money Transfers

9. Do you use mobile money transfers to manage your business sales?

Yes ☐ No ☐

10. Please, indicate the extent to which mobile money transfer has helped increase your sales. On a scale of between 1 and 5, where 1, 2, 3, 4 and 5 represents (very low extent, low extent, medium extent, high extent, and very high extent respectively.

☐ Small extent ☐ Medium extent ☐ Great extent ☐ Very Great extent

11. What percentage of your total sales is received via mobile money?

☐ 0% ☐ 1–25% ☐ 26–50% ☐ 51–75% ☐ 76–100%

Section D: Mobile Banking

12. Do you use mobile banking apps (e.g KCB App) to manage your business sales?

Yes ☐ No ☐

13. Please, indicate the extent to which mobile banking has helped increase your sales.

On a scale of between 1 and 5, where 1, 2, 3, 4 and 5 represents (very low extent, low extent, medium extent, high extent, and very high extent respectively.

☐ Small extent ☐ Medium extent ☐ Great extent ☐ Very Great extent

14. What percentage of your total sales is received via mobile banking platforms?

☐ 0% ☐ 1–25% ☐ 26–50% ☐ 51–75% ☐ 76–100%

Section E: Internet Banking

15. Do you use internet banking to manage your business sales?

Yes ☐ No ☐

16. Please, indicate the extent to which internet banking has helped increase your sales. On a scale of between 1 and 5, where 1, 2, 3, 4 and 5 represents (very low extent, low extent, medium extent, high extent, and very high extent respectively.

☐ Small extent ☐ Medium extent ☐ Great extent ☐ Very Great extent

17. What percentage of your total sales is received via internet banking platforms?

☐ 0% ☐ 1–25% ☐ 26–50% ☐ 51–75% ☐ 76–100%

Section F: Digital loans

18. Do you use digital loans to acquire goods for sale?

Yes ☐ No ☐

19. Please, indicate the extent to which digital loans have helped increase your sales. On a scale of between 1 and 5, where 1, 2, 3, 4 and 5 represents (very low extent, low extent, medium extent, high extent, and very high extent respectively.

☐ Small extent ☐ Medium extent ☐ Great extent ☐ Very Great extent

20. What percentage of your total sales is financed through digital loans?

☐ 0% ☐ 1–25% ☐ 26–50% ☐ 51–75% ☐ 76–100%

Appendix III: NACOSTI Permit

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