DETERMINANTS OF THE ADOPTION OF INTANGIBLE ASSETS AS COLLATERAL IN KENYA'S BANKING SECTOR: AN ASSESSMENT OF REGULATORY, INSTITUTIONAL, OPERATIONAL AND RISK MODERATING FACTORS

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DECLARATION

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

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Approval

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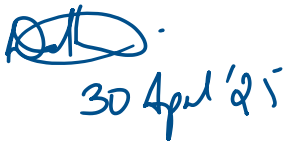

ABSTRACT

This study investigates the key determinants influencing the adoption of intangible assets as collateral among banks in Kenya, focusing on legal, institutional, operational, and systemic factors. It aims to evaluate the readiness of banks in Kenya to adopt intangible assets as collateral, the effectiveness of existing legal frameworks in supporting intangible based lending, and the systemic needs within Kenya's financial ecosystem to support intangible assets backed lending. It i Anchored in Agency Theory, Information Asymmetry Theory, Signaling Theory, and the Resource-Based View, the research explores how valuation uncertainty, enforceability risks, and informational gaps between borrowers and lenders impact the acceptance of intangible assets in credit markets. Employing a pragmatic research philosophy, the study integrates both quantitative and qualitative methods to provide a multidimensional analysis. The findings indicate that the use of intangible assets as collateral remains significantly limited. Only 25% of Tier 1 banks partially accept IAs, while the majority continue to prioritize tangible assets due to perceived legal and valuation risks. The regulatory environment emerged as the most significant barrier ($\beta = -1.18$, $p < 0.001$), compounded by high risk perception, with 85% of banks viewing IAs as high-risk collateral. A strong correlation between legal uncertainty and risk perception ($r = 0.72$, $p < 0.001$) underscores the role of regulatory clarity in shaping lending behavior. Notably, Tier 1 banks displayed a greater willingness to explore innovative collateral frameworks compared to smaller institutions. The study also identifies two key moderating variables—development of secondary markets for intangible assets and the implementation of robust risk mitigation frameworks—which can reduce the impact of regulatory and institutional barriers. While the Movable Property Security Rights Act offers a legal foundation for intangible assets collateralization, practical adoption is hindered by operational limitations, inadequate policy enforcement, and low financial literacy regarding intangible assets evaluation. In conclusion, the study highlights a market failure in SME financing, where knowledge-based enterprises are constrained by limited access to credit due to the underutilization of intangible assets. It recommends regulatory reforms, standardized valuation models, and the adoption of fintech-driven risk assessment tools to foster the use of intangible assets as collateral. The findings offer actionable insights for banks, regulators, and SMEs, emphasizing the need for ecosystem-wide innovations to unlock the full potential of intangible asset-based lending in Kenya's financial sector.

Key words: Collateralization, Regulatory environment, Risk perception, Market development, SME financing, Credit access, Innovation.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

CBK	Central Bank of Kenya
CRB	Credit reference bureaus
EU	European Union
Fin Access	Financial Access
FSD	Financial Sector Deepening
Fintech	Financial Technology
GDP	Gross Domestic Product
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IA	Intangible Assets
IP	Intellectual Property
IPOS	Intellectual Property Office
IPFS	Intellectual Property Financing Scheme
IRR	Internal Rate of Return
KBA	Kenya Bankers Association
KCGS	Kenya Credit Guarantee Scheme
KIPI	Kenya Industrial Property Institute
KNBS	Kenya National Bureau of Statistics
MFB	Microfinance Banks
MPSRA	Movable Property Security Rights Act
MSME	Micro, Small, and Medium-sized Enterprises
NACOSTI	National Commission for Science, Technology, and Innovation
NPL	Non-Performing Loans
OECD	Organization for Economic Co-operation and Development
PG	Prudential Guidelines

RBV	Resource Based View
R&D	Research and Development
SACCO	Savings and Credit Cooperative Organization
SASRA	Savings Societies Regulatory Authority
SARB	South Africa Reserve Bank
TRIPS	Trade-Related Aspects of Intellectual Property Rights
USA	United States of America
UNCTAD	United Nations Conference on Trade and Development
WIPO	World Intellectual Property Organization
WB	World Bank

DEFINITION OF TERMS

IAS (International Accounting Standards) Defined as a set of accounting standards issued by the International Accounting Standards Board (IASB, 2001).

Intangible Asset (IA) Assets that lack physical substance but provide economic value to a firm, such as patents, trademarks, copyrights, goodwill, and brand reputation (IASB, 2001).

IASB (International Accounting Standards Board) An independent international organization responsible for developing and issuing international financial reporting standards.

IFRS (International Financial Reporting Standards) A set of financial reporting standards developed by the International Accounting Standards Committee (IASC, 2010).

IP (Intellectual Property) A category of intangible assets that includes creations of the mind—such as inventions, literary and artistic works, designs, symbols, names, and images—protected by law through patents, trademarks, copyrights, and trade secrets (WIPO, 2020).

IRR (Internal Rate of Return) Refers to the return rate on invested capital annually (Brigham & Ehrhardt, 2016).

NACOSTI (National Commission for Science, Technology, and Innovation) Kenya's national body for coordinating science, technology, and innovation.

OECD (Organization for Economic Co-operation and Development) An intergovernmental economic organization that promotes policies to improve economic and social well-being.

PG (Prudential Guidelines) Refers to regulatory guidelines issued by financial institutions.

(Banking Act, 2013)

RBPM (Risk-Based Pricing Model) A pricing strategy used by financial institutions to set interest rates based on borrower risk. (World Bank, 2020)

RBV (Resource-Based View) A strategic management theory emphasizing firm-specific resources as a source of competitive advantage (Barney, 1991).

WIPO (World Intellectual Property Organization) A specialized agency of the United Nations responsible for promoting and protecting intellectual property rights globally (WIPO).

DEDICATION

This thesis is dedicated to my father, whose encouragement to pursue this journey never wavered. His memory remains my greatest motivation, and I hope this achievement honors his legacy.

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CHAPTER ONE: INTRODUCTION

1.1 Background

Kenya's startup ecosystem has witnessed remarkable transformation over the last two decades, particularly in high-growth sectors such as fintech, agritech, EdTech, and health tech. Startups—defined as firms less than ten years old with scalable business models—are increasingly recognized as drivers of economic transformation and employment, especially in the digital economy (African Union, 2020; Karitu, Mwaura, & Wambugu, 2022).

Alongside the startup ecosystem, Kenya's innovation landscape has also evolved significantly over the past decade, driven by increased government support, a dynamic tech ecosystem, and strategic institutional frameworks (Kenya National Innovation Agency [KeNIA], 2023a; World Intellectual Property Organization [WIPO], 2024). While critics may cite Kenya's, mid-tier ranking on the Global Innovation Index (GII) to downplay its innovation capacity, a closer examination reveals a more optimistic reality—one that strongly supports the inclusion of intangible assets as collateral in the financial system (Gathii & Nyang'aya, 2022; WIPO, 2024).

As of the 2024 Global Innovation Index, Kenya ranked 96th globally with a score of 21.00, reflecting a slight rebound from 100th in 2023. Though South Africa ranks higher at 69th globally with a score of 28.30, Kenya is notably the 6th most innovative country in Sub-Saharan Africa, signaling regional competitiveness and growth potential (WIPO, 2024). More importantly, Kenya exhibits a promising upward movement in innovation outputs—ranked 87th globally—compared to its 105th rank in innovation inputs, underscoring its capacity to generate knowledge and technology products even under infrastructural and institutional constraints (Mugambi & Wambua, 2021; WIPO, 2024).

The country's innovation trajectory is supported by strategic national frameworks, including the Second Innovation Strategic Plan (2023–2027) and the National Innovation Masterplan (2023–2033), spearheaded by the Kenya National Innovation Agency (KeNIA, 2023a, 2023b). These frameworks aim to create a unified national innovation system and promote the commercialization of research and development outputs.

Kenya's reputation as the "Silicon Savannah" is anchored in Nairobi's thriving tech startup ecosystem, widely recognized as one of Africa's most dynamic digital hubs (Quartz Africa, 2021; World Bank, 2020). Between 2017 and 2021, the number of Kenyan innovative startups receiving investment rose from 40 to 86, with funding volumes surging from $40 million to $280 million (Business Insider Africa, 2022). Noteworthy innovations include the 2023 launch of Taifa-1, Kenya's first operational satellite, and the continued development of Konza Technopolis, a flagship Vision 2030 project intended to foster digital innovation and scientific research (Ministry of ICT, 2023).

Despite this progress, access to credit remains a key bottleneck for Kenya's Micro, Small, and Medium Enterprises (MSMEs). As of 2024, only 16% of Kenya's 7.4 million MSMEs had access to formal loans (Stears, 2024). The lack of traditional collateral was cited by 76.6% of SMEs as the principal reason for loan rejections (WYLDE International, 2022). This problem is most acute among startups and creative-sector enterprises whose primary assets are intangible—such as trademarks, software, patents, copyrights, and brand equity (Kenya Institute for Public Policy Research and Analysis [KIPPRA], 2023; Muthoni & Kabubo-Mariara, 2020).

The Movable Property Security Rights (MPSR) Act of 2017 was designed to bridge this gap by allowing movable and intangible assets to be used as collateral. It legally recognizes intellectual property rights (IPRs) and other non-physical assets as viable securities for accessing credit (Government of Kenya, 2017; Muriithi, 2021). Between 2019 and 2021, registered IP-backed securities rose from 364 to 1,115, demonstrating a growing yet underutilized appetite for innovation-based finance (Business Registration Service [BRS], 2021). However, implementation challenges remain—particularly in the valuation of intangible assets, banker awareness, and lack of standardized guidelines or risk-sharing mechanisms (Ngugi, Wanjiru, & Waithaka, 2022; KeNIA, 2023b).

The argument, therefore, is not whether Kenya is innovative enough to adopt intangible asset-backed lending, rather, it is whether the financial ecosystem is agile enough to respond to the needs of its innovation-driven economy. Kenya's demonstrated ability to generate high-value outputs, combined with legislative readiness and innovation policy coherence, underscores its suitability for advancing credit models based on intangible assets (Gikandi & Odhiambo, 2023; WIPO, 2024).

Kenya's financial sector, though expansive and regulated by institutions such as the Central Bank of Kenya (CBK) and Credit Reference Bureaus (CRBs), remains conservative in its credit assessment models. Financial institutions, particularly commercial banks, continue to prioritize tangible assets—land, buildings, and machinery—as collateral, due to their perceived security and legal enforceability (Central Bank of Kenya [CBK], 2022). This presents a barrier to asset-light startups that rely on intangible assets such as intellectual property (IP), brand equity, digital platforms, and customer data (Otieno & Muathe, 2022). The opportunity of using intangible assets as collateral, therefore, presents an important frontier for financial inclusion and innovation financing in Kenya.

Kenya's Movable Property Security Rights Act (MPSR Act) of 2017 signals a cultural shift in the legal framework concerning the use of intellectual property (IP) as collateral for securing loans (Kenya Law, 2017). The interest and objectives of this legislation are broadening credit access by allowing both individuals and businesses to leverage intangible assets, including IP rights, as security for financing (Kakusu, 2024).

The MPSR Act was enacted to facilitate the use of movable property, including intangible properties, as collateral for loans. Some of the key features of the Act include the recognition of IP as collateral, which provides a more inclusive credit framework for businesses (Kenya Law, 2017). Additionally, the Act introduces a registry for the security rights over movable assets, where it defines forms of IP such as trademarks, copyrights, and patents as non-exhaustive, thus inspiring a commercial element for such assets (Kenya Law, 2017). The legislation aims to enhance the legal framework that governs secured transactions, thereby improving the stability and harmonization of collateral practices related to movable assets (Ssewanyana & Nandwa, 2021).

1.1.1 Challenges in Accessing Credit Among Startups

A major impediment to credit access among Kenyan startups is the banking sector's insistence on traditional collateral, especially land and real estate. According to FSD Kenya (2021), financial institutions continue to rely on these physical assets due to difficulties in valuing and enforcing intangible assets in the event of default. This practice sidelines startups whose primary value lies

in their innovative products, proprietary technology, and brand recognition—forms of capital not easily converted into cash or reallocated.

Despite regulatory efforts to enhance credit access, such as the Movable Property Security Rights Act (MPSR) of 2017, which allows for the use of movable and intangible assets as collateral, uptake has been limited. A study by UNDP (2022) found that less than 5% of registered security interests in Kenya's collateral registry involved intangible assets. Moreover, Muathe et al. (2022) report that while 95% of startups attempted to raise funding, nearly one-third cited challenges due to collateral requirements and investor mismatch. This illustrates a systemic rigidity that prevents the financial system from evolving alongside Kenya's knowledge economy.

Non-performing loans (NPLs) continue to exacerbate credit risk aversion. By the end of 2022, MSMEs accounted for Ksh.90.4 billion in non-performing loans, representing 18.3% of MSME loan accounts and 11.5% of the total MSME loan portfolio (CBK, 2023). This high level of credit risk encourages banks to retreat to asset-based lending models with clearly enforceable security.

1.1.2 Intangible Assets and Their Potential as Collateral

Intangible assets—including intellectual property (IP), trademarks, patents, copyrights, software, brand equity, goodwill, and proprietary data—have increasingly become critical drivers of firm value, particularly in knowledge-based and digital economies (Lev, 2001; Andriessen, 2004; OECD, 2021). According to International Financial Reporting Standards (IFRS), intangible assets are identifiable, non-monetary assets without physical substance that offer future economic benefits (IAS 38). These assets are especially valuable in Kenya's fintech, agritech, health tech, and creative sectors, where proprietary technologies and digital platforms often outweigh physical infrastructure in value (UNCTAD, 2018; KBA, 2022).

Globally, the value shift toward intangible assets is well documented. In 1975, just 17% of firm value in the S&P 500 was attributed to intangible assets; by 2020, this figure had grown to over 85% (Ocean Tomo, 2020). Despite this shift, financial systems in many developing economies, including Kenya, continue to rely predominantly on tangible assets as collateral (World Bank, 2022; UNCTAD, 2021). This disconnect has contributed to constrained access to finance for startups and SMEs, particularly those in innovation-driven sectors.

In response to this challenge, Kenya enacted the Movable Property Security Rights (MPSR) Act in 2017. This landmark legislation sought to enhance credit access by allowing both tangible and intangible movable assets to be used as collateral. It also led to the establishment of the Collateral Registry, managed by the Business Registration Service (BRS), which enables lenders to register security interests in movable property, including intellectual property (BRS, 2022). However, the adoption of intangible asset-based collateral has remained minimal. Of the more than 35,000 registered security interests by the end of 2022, less than 3% involved intangible assets such as IP rights or brand goodwill (BRS, 2022; KIPPRA, 2023). A recent survey by the Kenya Bankers Association (KBA) revealed that only 2 out of 39 commercial banks had piloted products accepting intangible assets as collateral—and even these were limited to tech-based startups (KBA, 2023).

Several factors contribute to this slow uptake. First, there is limited institutional readiness. Many banks lack standardized frameworks for valuing, registering, and monitoring intangible assets (Wanjohi, 2022; Maina & Wambugu, 2021). Legal departments are often ill-equipped to handle defaults involving complex IP rights, and over 70% of bank officials surveyed by KEPSA (2022) admitted they were unaware of the procedures for enforcing claims on intangible collateral.

Second, while the MPSR Act allows for the registration of intangible assets, it lacks detailed operational guidelines regarding valuation, priority of rights, and enforcement—particularly in situations involving contested ownership or cross-jurisdictional claims (Gachuki & Mwaura, 2021; WIPO, 2021). Many Kenyan IPs remain unregistered or are not formally monetized, further eroding lender confidence (Macharia & Kimani, 2023; WIPO, 2022).

Third, the country lacks a robust ecosystem of professionals equipped to support intangible asset-backed lending. There is a shortage of certified valuers, auditors, insurers, and legal experts with expertise in IP finance (IFC, 2020; UNCTAD, 2021). Kenya also lacks reliable IP databases, insurance products, and standardized risk-rating tools necessary for developing a mature market for intangible collateral (AFDB, 2022). Although the National Intellectual Property Policy (2021) recognizes these structural gaps, implementation remains in early stages.

Moreover, many SMEs and startups operate informally, which complicates the legal recognition and valuation of their intangible holdings. Despite owning valuable software, proprietary algorithms, or client databases, many reports being turned away by banks due to the absence of standardized verification tools (Ndung'u et al., 2022; Munyua, 2022; Njenga & Karani, 2023).

This challenge is compounded by the high cost of formal IP registration and limited awareness of the commercial value of such assets (WIPO, 2023).

Nonetheless, Kenya's rapidly expanding digital economy presents a strong case for reform. According to the Kenya National Bureau of Statistics (KNBS, 2023), digital startups comprised 34% of all new business registrations in 2022. The World Intellectual Property Organization (WIPO, 2022) ranked Kenya top in East Africa for innovation output, though it warned that access to credit for innovation-driven enterprises remains significantly below global standards.

Comparative experiences from jurisdictions such as Singapore and South Africa demonstrate that intangible asset-based lending is viable when supported by regulatory reform, capacity building, and risk-sharing mechanisms (World Bank, 2021). Kenya has begun to adopt similar approaches, notably through the Collateral Registry, but empirical evidence shows minimal traction in translating legal provisions into practice.

In light of this, the current study aims to bridge the gap between legal frameworks and lending practices by interrogating four critical dimensions: The readiness and willingness of banks to integrate intangible assets into their collateral frameworks; The effectiveness of existing legal and regulatory tools in safeguarding such lending; The operational and institutional capacity of banks to manage, value, and recover intangible assets; and The broader systemic conditions—including infrastructure, market development, and training—needed to mainstream intangible asset-based lending within Kenya's financial ecosystem.

This study builds on emerging scholarship that stresses the need for local contextualization in developing IP finance ecosystems (Kapila, 2020; Mugambi & Nyaoga, 2021). It proposes that with targeted reforms in policy, institutional capacity, technology, and enforcement, intangible assets could form the next frontier for unlocking SME credit, deepening financial inclusion, and accelerating innovation-driven growth in Kenya

1.1.3 Financial Risk Management and Bank Lending Practices

Commercial banks in Kenya continue to prioritize risk management practices that heavily weigh the reliability of collateral, credit scoring, and borrower history. According to the Kenya Bankers Association (2022), credit officers favor low-risk borrowers with asset-rich profiles due to the

predictability of recovery in cases of default. Even after the repeal of interest rate caps in 2019, banks have continued to price credit based on perceived risk. By 2022, MSME loan rates ranged from 10.2% for medium-sized firms to 27% for microenterprises in microfinance banks (CBK, 2022). This pricing reflects the increased risk banks associate with small, intangible-asset-dependent firms.

Furthermore, while the CBK's credit guarantee scheme was rolled out to cushion banks from MSME lending risks, its utilization has been modest. As of mid-2023, less than 50% of the Ksh.3 billion guarantee funds had been disbursed (National Treasury, 2023). This underscores the need for more integrated reforms that de-risk lending to asset-light firms through capacity-building, public-private partnerships, and valuation guidelines for intangibles.

1.1.4 Global and Regional Experiences in Intangible Asset-Based Financing: Lessons and Implications for Kenya

Kenya can draw valuable lessons from global and regional experiences in using intangible assets as collateral for financing, with the United States, Singapore, and the United Kingdom leading the way in developing frameworks to value and enforce claims on intangible assets, particularly intellectual property. For example, the Intellectual Property Office of Singapore (IPOS) has introduced IP financing schemes, which allow businesses to secure loans using intellectual property (IP) assets, significantly enhancing credit access for companies rich in intangible assets (IPOS, 2020). Similarly, in the UK, the British Business Bank has launched initiatives that facilitate IP-backed loans, aiming to reduce reliance on physical assets by providing alternative forms of security for credit (British Council, 2020). These government-led efforts reflect a growing shift from tangible to intangible collateral in developed economies.

From a regional perspective, Rwanda and South Africa offer valuable insights into how liquid secondary markets and enabling legal frameworks can stimulate the use of intangible assets as collateral. Rwanda, for instance, has pioneered a centralized electronic registry for movable collateral, which includes intangible assets. This registry, overseen by the Rwanda Development Board, facilitates the use of intellectual property, receivables, and other non-tangible assets as collateral by providing a legal structure for their registration and enforcement, demonstrating the

role of legal infrastructure in collateral innovation (Rwanda Development Board, 2021). As a result, Rwandan banks and microfinance institutions can more readily extend credit to SMEs with intangible assets, fostering financial inclusivity and reducing dependency on physical assets like land and buildings.

South Africa, on the other hand, has developed more advanced financial systems to support the collateralization of intangible assets through a combination of regulation, financial innovation, and public-private partnerships. The South African Reserve Bank (SARB) has supported frameworks for the liquidation of intangible assets, increasing lender confidence in high-IP ventures and allowing banks to lend against assets such as patents, trademarks, and copyrights (South African Reserve Bank, 2021). The South African Intellectual Property Fund also supports SMEs with high IP value but limited physical assets by enabling access to credit, further de-risking lending in intangible-intensive sectors.

Nigeria has also made strides in collateralizing intangible assets through its collateral registry for movable assets, launched by the Central Bank of Nigeria. This registry allows businesses to secure loans using non-traditional collateral such as accounts receivables, inventory, and IP. Since its inception, over 100,000 MSMEs have accessed credit through the system, underscoring the power of transparent, IP-recognizing credit frameworks in promoting financial inclusion (Central Bank of Nigeria, 2021).

While these examples present promising models, Kenya's financial market is still in the early stages of developing mechanisms to recognize and enforce claims on intangible assets. The absence of a mature secondary market for IP and weak legal infrastructure limits the confidence of banks in accepting such assets as collateral. Thus, efforts to foster a secondary market for intangible assets and establish strong legal and valuation frameworks are crucial.

To fully leverage intangible assets in Kenya, several strategic steps are needed. First, developing standardized models for valuing intangible assets such as intellectual property, brand equity, and digital platforms is critical. Adopting international best practices could enable Kenyan banks to more confidently accept these assets as collateral (British Council, 2020). Clear standards would reduce uncertainty and encourage broader acceptance across the financial sector.

Secondly, Kenya's financial institutions would benefit from targeted awareness and capacity-building initiatives. Educating credit officers and financial analysts about the value and risk profiles of intangible asset-intensive industries—such as the tech and creative sectors—would enable more informed lending decisions (KPMG, 2021).

Finally, public-backed credit guarantee schemes and risk-sharing mechanisms could help de-risk intangible asset lending. As recommended by Kinyanjui (2019) and Loumioti (2012), government-supported programs that offer partial guarantees for IP-backed loans could encourage bank participation in this evolving market. Examples from the UK and Singapore show that such policies can unlock capital for high-growth sectors by offsetting the risks perceived by financial institutions.

1.2 Statement of the Problem

Access to credit remains a critical driver of startup growth, employment creation, and economic development in Kenya. Commercial banks continue to serve as the primary source of financing for startups due to their ability to offer structured repayment plans and relatively affordable lending options. However, most banks rely heavily on traditional forms of tangible collateral—such as land, buildings, and equipment—to secure loans and minimize the risk of default. This approach presents a significant challenge to startups, especially those in innovation-led sectors where value is derived predominantly from intangible assets like intellectual property, patents, brand reputation, and digital platforms.

In more advanced economies, financial institutions have made strides in recognizing the potential of intangible assets as viable collateral. Countries such as the United States, the United Kingdom, and Singapore have developed legal and institutional mechanisms that support the use of intellectual property and other intangible resources to secure credit. These mechanisms have improved access to financing for asset-light startups, promoted innovation, and contributed to broader economic transformation.

Kenya made an important policy shift in 2017 with the enactment of the Movable Property Security Rights Act (MPSRA), which allows businesses to use both tangible and intangible movable assets as collateral. Despite this progressive legal framework, the actual use of intangible assets for

securing loans remains extremely limited. Banks continue to exhibit reluctance, citing concerns over the challenges associated with valuing intangible assets, determining legal ownership, and enforcing claims in cases of default. As a result, many startups—particularly those whose core assets are non-physical—find themselves excluded from formal credit markets, limiting their potential to scale operations, invest in product development, and compete regionally or globally.

This situation points to a clear disconnect between policy intent and implementation. Although the law exists to support broader collateral options, banks have not sufficiently adapted their lending practices to incorporate intangible assets. There is limited empirical evidence on why this is the case, and little is known about the specific barriers that hinder the adoption of intangible asset-based financing among Kenyan commercial banks. These barriers may include a lack of standardized valuation methods, inadequate institutional capacity, insufficient legal and regulatory enforcement mechanisms, and limited secondary markets for intangible assets.

Furthermore, while global literature highlights the potential of intangible assets in unlocking access to credit, there is a lack of localized research that examines how such models could be effectively adapted within Kenya's banking sector. Consequently, the financial ecosystem continues to operate on conservative lending principles that disadvantage startups in the knowledge economy.

This study, therefore, seeks to investigate the underlying factors preventing the use of intangible assets as collateral by commercial banks in Kenya. It will explore the institutional, legal, and market-level challenges affecting the adoption of intangible asset-based financing. Ultimately, the research aims to generate practical recommendations that can support more inclusive lending practices and enhance access to credit for startups, thereby fostering innovation and contributing to Kenya's economic growth.

1.3 Research Objectives

1.3.1 General Objective

To investigate the key factors that determine the adoption of intangible assets as collateral among banks in Kenya, including legal, institutional, operational, and systemic dimensions.

1.3.2 Specific Objectives

1. To assess the readiness of banks in Kenya to adopt intangible assets as collateral.
2. To evaluate the effectiveness of existing laws in Kenya in supporting intangible asset-based lending.
3. To explore the systemic needs within Kenya's financial ecosystem for supporting intangible asset-based lending.

1.4 Research Questions

1. To what extent are banks ready to adopt intangible assets as collateral?
2. How effective are existing laws, in supporting intangible asset-based lending in Kenya?
3. What systemic needs must be addressed to support intangible asset-based lending in Kenya?

1.5 Scope of the Study

This study explores the determinants of adopting intangible assets as collateral in Kenya's banking sector, focusing on the regulatory, institutional, operational, and risk-moderating factors. It examines the role of intangible assets, such as intellectual property (IP), patents, and trademarks, in securing financing for startups and SMEs.

The research focuses on the period under review from January to March 2025 and is a review following the implementation of the Movable Property Security Rights Act (MPSRA) in 2017. Despite global trends in recognizing intangible assets as collateral, uptake in Kenya remains limited. This study assesses the barriers faced by banks, including regulatory, institutional, and operational challenges, and explores how these factors hinder the adoption of intangible collateral.

Targeting banks across all three tiers in Kenya, the study investigates the current practices, risk management strategies, and legal frameworks related to intangible asset-backed lending. Through qualitative methods, including interviews and surveys with bank officials, legal experts, and startup founders, the research aims to identify necessary reforms and provide recommendations to

enhance access to credit for startups and SMEs, thereby supporting innovation and economic growth.

1.6 Significance of the Study

The significance of this study lies in addressing the critical financing challenges faced by startups and SMEs in Kenya, particularly those without access to traditional tangible collateral like land and real estate. Despite the introduction of the Movable Property Security Rights Act (MPSRA) in 2017, which allows the use of intangible assets such as intellectual property (IP), patents, and trademarks as collateral, the uptake of this option has remained limited. This research explores the barriers that hinder the use of intangible assets in securing loans, including the lack of standardized valuation models and the reluctance of banks to enforce claims on these assets in case of loan defaults.

The findings of this study will benefit several key stakeholders. For startups and SMEs, the research offers solutions that could improve their access to credit, enabling growth and innovation in the business sector. For banks and financial institutions, the study provides recommendations on how to integrate intangible assets into their collateral frameworks, enhancing risk management strategies and expanding lending opportunities. Policymakers and regulators will benefit from the insights provided, which can guide regulatory reforms to promote the broader use of intangible assets in financing. Lastly, the broader economy stands to gain, as improved access to credit for startups and SMEs can drive the growth of Kenya's entrepreneurial ecosystem, leading to job creation and economic development.

In summary, this study aims to support the development of a more inclusive financial system, where innovative financing options are available to startups and SMEs, thus contributing to the overall economic growth and transformation of Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The Movable Property Security Rights Act (MPSR) of 2017 is an important legislative step, but studies by the FSD Kenya have shown that banks remain hesitant to adopt intangible assets like patents, copyrights, and trademarks as collateral. This is largely due to a lack of standardized valuation methods, which creates uncertainty in the lending process. Banks prefer collateral that has more easily ascertainable value and can be liquidated with minimal risk, such as land or buildings, as indicated in FSD Kenya's analysis of credit market trends.

Additionally, the absence of a secondary market for intangible assets is a critical issue. Without a functioning market for these assets, banks find it difficult to manage the risk associated with default, as they cannot easily sell intangible collateral to recover funds. Research from Rwanda and South Africa, where more developed systems exist, indicates that a liquid secondary market is essential for encouraging the use of intangibles as collateral. However, Kenya's financial market is still in the early stages of developing such a system.

Banks' risk management practices, heavily focused on reducing non-performing loans (NPLs), further complicate the situation. A study by Kenya Bankers Association highlights that while banks are aware of the potential of intangible assets, their policies and internal risk frameworks prioritize traditional, tangible forms of collateral due to the perceived higher risk of intangible assets. This dynamic limit’s the accessibility of credit for startups and SMEs, especially those reliant on intellectual property.

Therefore, while there is considerable potential for intangible assets to be used as collateral in Kenya, the current lack of registration, valuation standards, and secondary markets, alongside banks' risk aversion, presents substantial challenges. Nonetheless, with improved regulatory frameworks, increased awareness, and the development of a liquid secondary market, intangible assets could become a viable option, helping to enhance credit access and stimulate the economy.

This literature review delves into the use of intangible assets as collateral in financing startups, integrating key theoretical frameworks that explain the challenges and opportunities in this area. The Pecking Order Theory highlights how startups prioritize different sources of financing, often turning to internal funds before seeking external capital due to information asymmetry between

lenders and borrowers. The Resource-Based View emphasizes the strategic importance of a firm's unique intangible assets, such as intellectual property, as key resources that can create competitive advantage and attract financing.

Signaling Theory is also explored, demonstrating how startups can convey their potential and reduce perceived risks to investors by leveraging credible signals, such as ownership of valuable intangible assets. Additionally, Information Asymmetry Theory highlights the fundamental challenge, where lenders face difficulty in accurately assessing the value of intangible assets, creating gaps in understanding and increasing uncertainty in financing decisions. This combination of theories offers a comprehensive framework for understanding the determinants and constraints of using intangible assets as collateral in startup financing.

The Empirical Review covers the acceptance of intangible assets as collateral, discussing their characteristics, legal and regulatory constraints, perceived default risks, and impact on performance. It also reviews the secondary market for intangible assets and standardized valuation methods.

Finally, the Conceptual Framework outlines the operationalization of variables, providing a structured approach to analyzing the impact of intangible assets on startup financing and performance. This comprehensive review aims to bridge the theoretical and practical aspects of startup financing in the modern economy.

2.2 Theoretical Review

The adoption of intangible assets as collateral in Kenya's banking sector can be better understood through the lens of multiple theoretical perspectives that explain the behavior of financial institutions, borrowers, and regulators. This study draws from four key theories—Information Asymmetry Theory, Agency Theory, the Resource-Based View (RBV), and Signaling Theory—to provide a comprehensive conceptual foundation.

2.2.1 Information Asymmetry Theory

The theory of information asymmetry was first developed by George Akerlof, Michael Spence, and Joseph Stiglitz in the 1970s. Akerlof's foundational paper, "The Market for Lemons" (1970), illustrated how differences in information between buyers and sellers lead to market failures. The theory posits that when one party possesses more or better information than the other, it distorts

the transaction process, potentially resulting in adverse selection and moral hazard (Akerlof, 1970). In the context of intangible asset-based lending, banks often lack sufficient information to accurately value and assess the risk of intangible assets such as intellectual property. This leads to reluctance in accepting such assets as collateral due to perceived uncertainty and higher default risk.

The theory is central to this study as it explains the cautious stance banks take when engaging with startups that hold mostly intangible assets and helps explain the reluctance of financial institutions to accept these assets as collateral. Intangible assets, such as intellectual property (IP), brand equity, or patents, often lack clear market valuations and are harder to liquidate in case of default. Borrowers typically have more information about the value of these assets than lenders do, creating an information imbalance that increases the perceived risk for lenders (Stiglitz & Weiss, 1981). As a result, lenders are hesitant to accept these non-physical assets as collateral, fearing adverse selection, where the borrower might overvalue the asset, or moral hazard, where the value might deteriorate over time.

The application of information asymmetry theory to the use of intangible assets as collateral focuses on reducing the risks posed by uncertainty in asset valuation. Traditional tangible assets, such as land and machinery, have well-established valuation methods and clear legal frameworks for repossession, making them preferred collateral options (Berger & Udell, 1998). However, intangible assets lack these established methods, which adds to the information asymmetry between lenders and borrowers.

Studies suggest that institutional reforms, such as improved legal frameworks and more advanced valuation techniques, can bridge the information gap. For example, a clear legal definition and enforcement mechanism for intangible assets would reduce uncertainties (Mann, 2014). Technological innovations, such as the use of data analytics to assess the value of IP or customer lists, may also provide lenders with better information and thus reduce perceived risks. These innovations could potentially expand the use of intangible assets as collateral (Berger et al., 2011).

Previous research has been valuable in identifying mechanisms to reduce information asymmetry in collateralized lending. Bester (1985) and Holmstrom and Tirole (1997) demonstrated how enhanced monitoring and transparency between borrowers and lenders can reduce adverse selection and moral hazard. By suggesting methods to improve lender confidence in the value of

intangible assets, these studies provide a roadmap for the potential expansion of intangible collateral.

Moreover, comparative studies on international best practices highlight that certain countries, like the United States and the United Kingdom, have made substantial progress in accepting intangible assets as collateral (Hochberg et al., 2014). These jurisdictions have developed legal and institutional support structures that offer clear guidelines on how intangible assets can be valued and liquidated, providing adequate knowledge for other countries seeking to do the same.

One significant limitation of prior research is its focus on developed economies, often ignoring the specific challenges faced by developing countries and small and medium enterprises (SMEs). SMEs, which rely heavily on intangible assets such as brand reputation and intellectual property, face greater barriers in accessing financing, as banks remain reluctant to accept these assets due to the higher levels of information asymmetry (Cosh et al., 2009).

Additionally, most prior studies focus on a narrow range of intangible assets, primarily intellectual property like patents and trademarks. These studies tend to overlook other emerging categories of intangibles, such as digital assets and data, which are increasingly relevant in modern economies (Andersen, 2011). This leaves a gap in understanding how different types of intangible assets can be effectively used as collateral.

Most studies on the use of intangible assets as collateral focus on developed economies. However, the legal and economic environments in developing countries, such as Kenya, differ significantly. More empirical research is needed to understand how financial institutions can address the challenges associated with intangible assets (World Bank, 2020).

Small businesses rely more heavily on intangible assets to generate value, yet they face disproportionate barriers in accessing finance. More research is needed on how information asymmetry affects SME lending, and how innovative valuation tools could mitigate these challenges (Berger et al., 2011). Research on intangible assets has focused predominantly on intellectual property, ignoring other valuable intangibles such as data, algorithms, and digital products. Developing appropriate valuation models for these newer asset types is crucial to expanding their use as collateral (Andersen, 2011).

One of the weaknesses of information asymmetry theory is its assumption that reducing the information gap will always lead to more efficient market outcomes. In the case of intangible assets, even when information asymmetry is minimized, other factors such as the volatility and liquidity of these assets' present challenges. For instance, intangible assets can quickly lose value due to technological advances, changing consumer preferences, or shifts in legal protections (Mann, 2014). This volatility makes intangible assets riskier compared to tangible collateral, thus explaining lenders' continued hesitance.

Furthermore, the theory does not fully account for the dynamic nature of intangible asset markets. The value of intellectual property, for example, may rapidly fluctuate depending on market trends and the competitive environment, creating new risks for lenders that cannot be mitigated simply by improving information transparency (Hochberg et al., 2014). These considerations suggest that, in addition to addressing information asymmetry, new risk management models are needed to evaluate the potential of intangible assets as collateral.

While there are potential solutions to reduce information gaps, significant research gaps remain, particularly regarding the financing of SMEs in developing markets. Future research should focus on expanding legal frameworks, improving valuation models for a broader range of intangible assets, and developing innovative tools to reduce the risks associated with using intangible assets as collateral.

2.2.2 Agency Theory

Agency Theory, developed by Jensen and Meckling (1976), examines the conflict of interest that may exist between principals (e.g., shareholders or regulators) and agents (e.g., bank managers or borrowers). In lending decisions involving intangible assets, agency problems may arise if bank officials prioritize short-term risk avoidance over long-term innovation support.

Additionally, startups might engage in risk-taking behaviors that increase the possibility of default, making banks more hesitant to lend without tangible collateral. This theory supports the analysis of institutional behavior and risk management practices in the banking sector (Eisenhardt, 1989).

Agency theory offers a valuable framework for understanding the relationship between two parties where one, the principal, delegates work to another, the agent, who performs that work and

highlights how conflicts of interest arise in such relationships due to differing objectives and access to information. This theory is particularly relevant in financial contexts where information asymmetry and misaligned incentives can lead to inefficiencies and risk-averse behavior (Jensen & Meckling, 1976).

In the context of this study, banks act as the principals, while borrowers—such as startups and SMEs seeking loans—act as the agents. The core of the agency problem here lies in the information asymmetry between these two parties. Intangible assets, including intellectual property (IP), trademarks, software, and patents, are inherently difficult to value, monitor, and enforce in case of default. Borrowers typically have superior information regarding the value, quality, and potential of their intangible assets compared to banks. This imbalance creates a high level of uncertainty for banks, making them hesitant to accept such assets as collateral (Holmstrom, 1979; Eisenhardt, 1989).

Further, agency theory draws attention to moral hazard, where agents may act in self-interest after securing a loan. In this context, a borrower may underinvest in the upkeep or strategic use of an intangible asset once the loan is granted, or even divert it to riskier uses not aligned with the bank's expectations. Because intangible assets are difficult to track or seize upon default, banks are exposed to significant enforcement risks (Holmstrom, 1979). These risks represent what agency theory calls agency costs, which include the costs of monitoring borrower behavior, enforcing compliance, and potential losses from borrower opportunism (Jensen & Meckling, 1976).

Additionally, institutional weaknesses in many developing countries like Kenya amplify agency problems. The lack of robust legal and regulatory frameworks to support the use of intangible assets as collateral means that banks cannot reliably register, monitor, or recover such assets in case of loan defaults. Weak valuation systems and the absence of standardized reporting mechanisms further increase transaction costs and uncertainty, which are central concerns in agency relationships (Eisenhardt, 1989). Thus, the evaluation of the legal and systemic framework in this study directly relates to mitigating the agency costs that currently disincentivize banks from adopting intangible asset-based lending.

Moreover, the theory is also useful in analyzing internal agency conflicts within banks themselves. For example, bank officers may act as agents of senior management or the board, and may resist lending practices that involve intangible assets due to fear of reputational damage, lack of performance incentives, or unfamiliarity with risk assessment mechanisms. These intra-organizational dynamics further complicate banks' readiness and capacity to innovate their collateral practices (Eisenhardt, 1989).

Therefore, agency theory provides a solid conceptual foundation for examining the determinants of banks' willingness to adopt intangible assets as collateral. It supports the study's objectives, which include assessing banks' readiness, evaluating existing legal frameworks, exploring institutional capacity, and identifying systemic reforms. Each of these areas relates to reducing agency costs, closing the information gap between banks and borrowers, and aligning incentives to foster trust in intangible asset-based lending systems.

2.2.3 Resource Based View Theory

The Resource-Based View (RBV) theory, developed by economists Edward Penrose (1959) and later expanded by scholars such as (Jay Barney 1991) posits that a firm's sustainable competitive advantage arises from its ability to utilize rare, valuable, inimitable, and non-substitutable resources. Intangible assets such as patents, trademarks, and proprietary technology are often key drivers of innovation and growth for startups. However, their limited recognition as collateral undermines their financial leverage. This theory is relevant to this study because it underscores the strategic value of intangible assets and supports their inclusion in lending frameworks that aim to foster economic transformation through innovation.

These assets, comprising both tangible and intangible elements according to Greene, et.al, (2015), are considered a potential source of competitive advantage if they possess economic value, uniqueness, strategic relevance, or are difficult to replicate. According to (Satriani et al., 2016), when seeking bank financing, a firm's competitive advantage serves as a positive signal to lenders, indicating that the company is better positioned to generate sufficient cash flows and repay its loans. Warnier et.al (2013) wrote that the RBV theory showcases the significance of intangible

assets and their uneven distribution among organizations in explaining the competitive edge they can provide.

Unlike traditional economic theories that focus on market conditions or external factors, RBV emphasizes the internal strengths of an organization. According to RBV, resources must be valuable, rare, inimitable, and non-substitutable (VRIN) to provide a sustainable competitive advantage (Barney, 1991). This framework helps organizations identify and leverage their distinct capabilities, leading to superior performance in the marketplace. In a study by Teece, (2015) it was observed that firms increasingly owe their value not only to the greater sophistication and higher productivity of their production systems, but also to product and process innovations, and to assets such as brands, reputation, quality, and trained personnel.

The application of the RBV theory extends to the use of intangible assets as collateral in debt financing. Intangible assets, such as intellectual property (IP), brand equity, customer relationships, and proprietary technologies, have gained importance in today's knowledge-driven economy. While tangible assets like property and machinery have traditionally been used as collateral, the unique characteristics of intangible assets make them particularly challenging to evaluate and leverage in financing. RBV posits that firms with strong intangible assets can enhance their borrowing capacity by signaling their value to lenders. This perspective encourages firms to strategically manage and showcase their intangible assets, thereby mitigating information asymmetry and improving access to capital (Hsu & Ziedonis, 2013).

Despite the advantages of RBV, significant research gaps remain, particularly in the context of intangible assets as collateral. Most studies have primarily focused on tangible resources or financial indicators, neglecting the role of intangible assets in securing financing. For instance, while research has established that firms with valuable IP can signal their market potential, studies have not adequately addressed how these firms can effectively leverage a broader array of intangible assets, such as brand equity or proprietary data, in their financial strategies (Smith & Parr, 2020). This oversight highlights a critical gap in the literature, as many firms today rely on diverse forms of intangible assets that may not fit neatly into traditional RBV frameworks.

A critical review of previous studies reveals both strengths and weaknesses in the existing literature on RBV and its application to intangible assets. Notably, the work of Barney (1991) remains foundational in establishing the criteria for valuable resources. However, subsequent

research has often concentrated on high-tech firms or developed economies, limiting the generalizability of findings to diverse fields. For example, Hsu and Ziedonis (2013) found that start-ups with extensive patent portfolios have better access to venture capital, but this conclusion is primarily drawn from studies in developed markets where the legal infrastructure for IP protection is robust. As a result, the applicability of these findings in emerging economies, where legal protections for intangible assets may be weaker, remains underexplored.

Additionally, while prior studies acknowledge the importance of intangible assets, they often focus narrowly on intellectual property, overlooking other crucial forms of intangible value, such as customer relationships, brand loyalty, or corporate culture. This narrow focus restricts the understanding of how various intangible assets can signal a firm's potential to lenders and investors. Moreover, many studies fail to account for the dynamic nature of intangible assets, which can evolve and change over time. As the digital economy grows, the relevance of different types of intangible assets is shifting, necessitating more comprehensive research that encompasses these changes.

One of the strengths of the RBV framework is its ability to highlight the strategic importance of intangible assets in building competitive advantages. Research indicates that firms with strong brand equity or unique customer relationships are better positioned to command premium prices and secure favorable financing terms (Barney, 1991,). However, the inherent difficulties in quantifying the value of these intangible assets pose a challenge. For instance, while brand equity can significantly influence consumer purchasing decisions, it is challenging to provide concrete valuations for lenders. This ambiguity can hinder the ability of firms to leverage their intangible assets as collateral, creating a financing gap, particularly for small and medium-sized enterprises (SMEs) that may lack established reputations.

Moreover, RBV assumes that resources are static and can be easily measured, yet this is not always the case with intangible assets. Iga, (2022) argues that not all intangible assets qualify as strategic resources. Unlike tangible assets, which can often be appraised with relative ease, intangible assets frequently require complex assessments that can vary widely depending on the context and market conditions. Consequently, the lack of standardized valuation methods for intangible assets can undermine their effectiveness as collateral, limiting the application of RBV in this area.

Despite these challenges, there is an opportunity for future research to explore alternative signaling mechanisms that firms can employ to leverage their intangible assets more effectively. For instance, firms could use third-party endorsements, strategic partnerships, or customer testimonials as signals to lenders about the value of their intangible assets. Research could also investigate how firms in developing economies can adapt RBV principles to enhance their access to financing by focusing on their unique intangible assets embedded in cultural heritage or traditional knowledge (Sarr & Savoy, 2018).

While the Resource-Based View theory provides a robust framework for understanding the strategic importance of intangible assets, significant gaps remain in the literature regarding their application as collateral in debt financing. The focus on tangible resources and the limited exploration of diverse intangible assets highlights areas where further research is needed. Additionally, the inherent challenges in quantifying and signaling the value of intangible assets call for innovative approaches that can help firms effectively leverage these resources in securing financing. By addressing these gaps and weaknesses, future research can enhance the understanding of how RBV can be applied in modern financial contexts, particularly for firms operating in emerging markets.

Intellectual capital encompasses all the resources owned by the company, including physical capital, human capital, and structural capital, which collectively enhance the effectiveness and productivity of employee performance. Effective management and utilization of intellectual capital result in increased company value and distinctive attributes. Consequently, the company gains a competitive advantage that is unique to itself, enabling it to effectively compete with rivals This, in turn, may translate into higher profitability and cash flows, making the company a more attractive borrower for banks.

2.2.4 Signaling Theory

Signaling Theory, introduced by (Spence 1973), explains how one party credibly conveys information to another to reduce information asymmetry. In this study, the theory applies to how startups can use intangible assets as a signal of future profitability, innovation capacity, and creditworthiness. Similarly, the formal recognition of such assets by regulators or credible third-party valuations can serve as signals to lenders, reducing uncertainty. The theory justifies the

importance of credible frameworks and institutions in building trust in intangible asset-based lending.

Signaling theory provides knowledge into how businesses utilize intangible assets to communicate crucial information and influence decision- making. It provides a framework for understanding how information asymmetry between two parties can be mitigated by one party sending credible signals to the other party. Originally developed in the context of job market signaling, where prospective employees signal their capabilities through education credentials, the theory has since been expanded to a wide range of applications in economics and finance.

In financial markets, signaling theory has been applied to understand firm behavior, particularly in scenarios where managers signal the financial health or future prospects of a company to investors. Firms may use mechanisms such as dividend payments, or debt issuance to signal private information about the firm's quality. The core idea is that only firms with strong financial standing would choose costly signals, as weaker firms could not afford to imitate such behavior.

Signaling theory has particular relevance to the use of intangible assets, such as intellectual property (IP), patents, trademarks, and data, as collateral in debt financing. Given the inherently intangible and difficult-to-quantify nature of these assets, firms often face significant challenges in convincing lenders to accept them as viable forms of collateral. Here, signaling theory provides a useful framework for understanding how firms can credibly signal the value of their intangible assets to lenders.

For example, firms can use signals such as third-party validation (through patent registrations, IP valuations, or licensing agreements) to demonstrate the economic viability of their intangible assets. High-growth technology firms, for instance, often signal their innovative potential by securing patents or obtaining third-party endorsements for their intellectual property portfolios. Similarly, a firm that invests in robust IP protection strategies and legal enforcement may signal its commitment to safeguarding the value of its intangible assets, making them more acceptable as collateral to potential lenders.

However, while signaling can help reduce information asymmetry between firms and lenders, the effectiveness of these signals depends heavily on the credibility and transparency of the valuation mechanisms for intangible assets. This issue becomes particularly pronounced in underdeveloped

markets, such as those in many African countries, where financial systems may not have mature mechanisms for recognizing or valuing intangible assets as collateral.

Numerous studies have explored the application of signaling theory in various financial contexts, but the literature on its application to the use of intangible assets as collateral remains relatively sparse. Previous studies have largely focused on the use of tangible assets or financial indicators (such as earnings or dividends) as signals. For example, Connelly et al. (2011) explored the role of signaling in corporate finance decisions, noting that firms often use capital structure decisions to signal their internal information about future profitability. However, much of this literature has concentrated on developed economies, where financial systems and legal frameworks are more advanced and where intangible assets are more readily accepted as collateral.

Studies that do focus on intangible assets as signals often highlight the role of intellectual property (IP) as a powerful signal in industries such as technology, pharmaceuticals, and biotechnology (Hsu & Ziedonis, 2013). Firms with strong patent portfolios are often perceived as more innovative and valuable, leading to easier access to financing. However, these studies also acknowledge the limitations of using patents as signals, as not all patents are commercially valuable, and patent litigation can be costly.

One of the key strengths of this body of literature is that it recognizes the signaling value of intangible assets in specific high-tech industries. For example, Hsu and Ziedonis (2013) found that start-ups with larger patent portfolios are able to secure venture capital financing more easily, as their patents signal a competitive advantage and future growth potential. However, these studies largely overlook the broader spectrum of intangible assets, such as customer relationships, brand equity, and data, which are becoming increasingly important in the digital economy (Smith & Parr, 2020). Moreover, the literature tends to focus on firms in developed economies with established legal frameworks for enforcing IP rights, which limits the generalizability of these findings to other regions.

Despite the strengths of previous research in recognizing the value of intangible assets as signals, several gaps remain. First, there is limited research on how signaling theory applies to the use of intangible assets as collateral in underdeveloped markets, particularly in Africa. Many African economies lack the legal infrastructure and financial institutions necessary to recognize and enforce intangible assets as collateral. For instance, while patents may serve as credible signals in

developed markets, the lack of IP enforcement and valuation mechanisms in African countries limits their signaling power. As a result, lenders may be less willing to accept intangible assets as collateral, even when firms attempt to signal their value.

Another gap in the literature is the narrow focus on intellectual property as the primary form of intangible asset. While patents, trademarks, and copyrights are certainly valuable signals, other forms of intangible assets, such as data, algorithms, and brand equity, are becoming increasingly important in today's digital economy. These assets, however, are more difficult to signal due to their intangible nature and lack of standardized valuation methods. This gap presents an opportunity for further research to explore how firms in digital industries can use alternative signals to secure financing.

In African underdeveloped markets, the challenges are even greater. African firms often rely on intangible assets embedded in traditional knowledge, cultural heritage, or artisanal craftsmanship, which are difficult to formalize and value within the existing financial system (Sarr & Savoy, 2018). For example, artisans in Kenya may possess valuable traditional knowledge or craftsmanship skills that are highly sought after in the global market, but these intangible assets are not easily recognized by local financial institutions. Future research should explore how signaling theory can be adapted to better reflect the realities of these markets and how firms in underdeveloped economies can credibly signal the value of their intangible assets.

While signaling theory provides valuable knowledge into how firms can mitigate information asymmetry, it has its limitations. One key weakness is that the effectiveness of a signal depends on the credibility of the signaler. Firms with established reputations or access to third-party validators are more likely to succeed in signaling, while smaller or newer firms may struggle to send credible signals. This creates a bias in favor of established firms, potentially leading to a financing gap for small and medium-sized enterprises (SMEs), especially in developing economies like those in Africa.

Moreover, signaling theory assumes that signals are observable and easily interpretable by the receiving party. In the context of intangible assets, however, this is not always the case. For instance, while patents are a relatively clear signal of innovation, other forms of intangible assets, such as brand equity or customer relationships, are more difficult to quantify and assess. This reduces the effectiveness of these assets as signals in the financing process.

Signaling theory offers a useful framework for understanding how firms can reduce information asymmetry when using intangible assets as collateral. However, its application to the use of intangible assets in underdeveloped markets, particularly in Africa, remains underexplored. While previous research has highlighted the signaling value of intellectual property, there is a need for broader studies that examine other forms of intangible assets and their signaling potential in different economic contexts. Additionally, more research is required to adapt signaling theory to the unique challenges of underdeveloped markets, where legal and financial infrastructure may be less robust. Addressing these gaps would provide a more comprehensive understanding of how firms in underdeveloped economies can leverage intangible assets to secure financing.

One of the key aspects of signaling theory is using intangible assets as signals of quality and value. This method involves paying attention to the messages conveyed by a company in its important financial choices. This approach is particularly valuable for businesses that rely heavily on intangible assets to generate value, like those in biotechnology, software, and high-tech fields. Such companies might be hesitant to reveal details about their intangible assets, fearing that competitors could exploit this information (Deeds et al., 1997).

2.3 Empirical Review

2.3.1 Institutional Readiness and the Use of Intangible Assets as Collateral

Institutional readiness refers to the preparedness of financial institutions—particularly banks—to integrate and support the use of intangible assets as collateral. This includes institutional culture, strategic orientation, technical expertise, and internal infrastructure. Evidence suggests that the perception and internal capacity of banks play a critical role in the uptake of non-traditional collateral mechanisms.

Empirical studies by Bracke et al. (2016) reveal that banks in Europe with dedicated innovation financing units are more likely to accept intellectual property (IP) as collateral, highlighting the link between institutional design and innovation lending. Similarly, in Asia, banks that collaborated with patent offices and technology valuation firms showed a higher propensity to lend against intangible assets (Lee et al., 2018).

In Kenya, however, institutional readiness remains limited. According to FSD Kenya (2018), most financial institutions in the country prioritize physical collateral due to a lack of internal capacity to value or enforce intangible assets. A study by Wanjiru and Nyambura (2021) found that only 12% of banks surveyed had internal guidelines for assessing intangible collateral, and these were largely confined to ICT or innovation departments, if any existed.

Moreover, Ndung'u and Otieno (2022) argue that many Kenyan banks perceive IP-backed lending as high-risk due to limited success stories and inadequate technical training on IP evaluation. Institutional inertia also plays a role, where traditional banking models and outdated risk appraisal frameworks slow adoption. This reinforces the need for training, institutional restructuring, and capacity building to align internal systems with emerging collateral practices.

Empirical studies reveal differing levels of institutional readiness across jurisdictions. In Europe, Bracke et al. (2016) used a multi-country survey of banks to assess innovation lending structures, finding that specialized units significantly enhanced the acceptance of IP as collateral. Similarly, Lee et al. (2018) employed case studies of bank-patent office collaborations in Asia, noting improved bank confidence in intangible lending.

In Kenya, FSD Kenya (2018) conducted a sectoral landscape analysis, while Wanjiru and Nyambura (2021) employed a descriptive survey across commercial banks. These studies consistently report a lack of internal capacity, limited expertise, and entrenched preferences for

Findings from advanced economies suggest that institutional innovation, such as internal restructuring and technical specialization, enables IP-backed lending. In contrast, Kenyan banks are constrained by institutional inertia and minimal exposure to successful intangible collateral models (Ndung'u & Otieno, 2022). The empirical gap lies in the lack of intervention-based studies in Kenya that test how institutional reforms (e.g., staff training or pilot programs) affect adoption of intangible collateral.

2.3.2 Regulatory Effectiveness and the Use of Intangible Assets as Collateral

A robust regulatory framework is crucial in promoting the credibility, enforceability, and efficiency of using intangible assets as collateral. In countries where legal frameworks explicitly

recognize intangible collateral and provide for its registration, valuation, and enforcement, financial institutions are more willing to accept such assets.

Studies from developed jurisdictions show that when IP is recognized under secured transaction laws—like in the United States under the Uniform Commercial Code (UCC)—banks are more likely to lend against it (OECD, 2021). Similarly, in South Korea, the establishment of the Korea Intellectual Property Office (KIPO) and regulatory frameworks such as the IP Financial Act enhanced legal certainty and boosted IP-backed financing (Kim et al., 2018).

In Kenya, the enactment of the Movable Property Security Rights Act (MPSR) in 2017 marked a significant policy shift by allowing both tangible and intangible assets to be used as collateral. However, its practical implementation remains weak. The Collateral Registry has registered few intangible assets, and banks remain reluctant to engage in such transactions (Macharia & Kungu, 2022).

Legal ambiguities around IP ownership, valuation disputes, and weak enforcement mechanisms continue to hinder regulatory effectiveness (Odhiambo, 2020). For instance, delays in dispute resolution over IP ownership and inadequate judicial capacity in commercial courts reduce the perceived enforceability of intangible collateral. A lack of clear guidelines from the Central Bank of Kenya and insufficient awareness among regulators further compound the problem (Kariuki & Musyoka, 2023).

In countries with strong legal systems, regulatory support has enabled IP collateralization. For example, the UCC in the U.S. and South Korea's IP Financial Act explicitly provide for IP recognition and enforceability (OECD, 2021; Kim et al., 2018). These studies often employ regulatory analysis and impact assessments.

In Kenya, Macharia & Kungu (2022) and Odhiambo (2020) used qualitative and document analysis to evaluate the impact of the Movable Property Security Rights Act (2017). While the law permits intangible collateral, implementation is weak. Kariuki & Musyoka (2023) show that limited regulatory guidance and judicial inefficiencies discourage IP-backed lending.

Where regulation is comprehensive and enforceable, financial institutions respond positively. In Kenya, the legal provision exists but lacks operational support. A critical gap remains in the evaluation of judicial and regulatory training interventions, as well as the assessment of borrower protection laws related to intangible collateral.

2.3.3 Operational Capacity and the Use of Intangible Assets as Collateral

Operational capacity refers to the availability of the technical, human, and technological resources within financial institutions that support the adoption of intangible assets as collateral. This includes internal systems for IP valuation, staff training, IT infrastructure, and the integration of risk assessment models suited to intangible assets.

Globally, institutions with higher operational capacity tend to demonstrate more flexibility in accepting a wider range of collateral. For example, in Singapore, banks collaborate with IP evaluators and licensing firms, enabling operational efficiency in securitizing trademarks and patents (IPOS, 2019). Operational investment in automated collateral management systems also allows such banks to track and update IP values in real time.

In Kenya, operational capacity remains a significant barrier. A study by Muriuki and Wanjohi (2021) found that over 80% of Kenyan banks lack tools or frameworks for valuing intangible assets. Moreover, many financial officers interviewed reported an overreliance on fixed asset-based scoring systems due to the absence of a harmonized IP rating system. Similarly, Ong'ondo and Were (2022) highlighted that local banks rarely employ IP experts or partner with valuation firms, limiting their ability to accurately assess IP's economic utility.

Operational inefficiencies are further exacerbated by inadequate digital infrastructure and the absence of centralized IP data platforms. This constrains real-time verification and monitoring of intangible assets post-lending. Consequently, even with existing regulatory frameworks, poor operational readiness reduces the feasibility of adopting such collateral practices.

Operational capacity varies significantly by region. Studies like IPOS (2019) in Singapore use institutional case reviews to demonstrate how banks integrate IP valuation systems and partner with licensing firms. Muriuki & Wanjohi (2021), using a survey-based approach in Kenya, found that most banks lack valuation tools or scoring models for IP. Similarly, Ong'ondo & Were (2022) highlighted low human capital investment in IP expertise.

Developed markets invest in systems and partnerships to streamline IP-backed lending. Kenyan institutions, by contrast, are hampered by resource limitations and outdated risk tools. A key empirical gap is the absence of experimental or longitudinal studies measuring the impact of operational interventions, such as piloting centralized IP scoring systems or staff upskilling.

2.3.4 Systemic Support Structures and the Use of Intangible Assets as Collateral

Systemic support structures include complementary institutions and policy initiatives that facilitate the broader ecosystem for intangible asset financing. These encompass innovation hubs, intellectual property registries, government support programs, incubators, and networks of IP service providers. In well-developed ecosystems, these structures enhance the flow of information, reduce transaction costs, and mitigate perceived risks associated with intangible assets. For example, the UK's Catapult Centres and the US's Small Business Innovation Research (SBIR) program provide advisory, legal, and financial support to startups seeking to leverage IP as collateral (OECD, 2021).

In Kenya, while initiatives such as the Kenya National Innovation Agency (KENIA) and the Kenya Industrial Property Institute (KIPI) exist, their capacity to offer collateralization support is limited. A study by Oketch and Njuguna (2023) observed that over 60% of startups lacked access to IP registration or enforcement services, which weakened their ability to leverage IP for funding.

In addition, there is limited collaboration between banks and innovation hubs. According to FSD Kenya (2018), most financial institutions do not participate in government-led startup support initiatives, which disconnects them from emerging firms that rely heavily on intangible assets. This gap reflects a systemic weakness that hinders scalable IP-backed lending. Strengthening

support structures through targeted government interventions, knowledge-sharing platforms, and public-private partnerships would improve the utilization of intangible assets as loan collateral.

In advanced ecosystems like the UK and US, public innovation agencies (e.g., Catapult Centres, SBIR) offer financial, legal, and technical support for IP-backed lending (OECD, 2021). These studies often use institutional benchmarking and ecosystem mapping. In Kenya, Oketch & Njuguna (2023) relied on startup surveys and stakeholder interviews to document structural limitations in agencies like KENIA and KIPI. FSD Kenya (2018) noted the disconnect between financial institutions and innovation hubs.

Support structures in mature markets serve as risk mitigants and information bridges. In Kenya, low inter-agency coordination and weak startup-bank links inhibit the use of IP-backed lending. There is a need for empirical studies evaluating the effect of integrated public-private platforms, such as co-location of banks within incubators or shared IP advisory desks.

2.3.5 Moderating Variables

The review further identifies moderating variables—particularly market development and risk assessment practices—that shape the effectiveness of institutional and regulatory frameworks.

Market development plays a moderating role in shaping the extent to which institutional and regulatory mechanisms influence the adoption of intangible assets as collateral. A well-developed financial market fosters innovation, provides diverse financial products, and facilitates competition, which can pressure institutions to explore alternative forms of lending, including IP-backed financing (Demirgüç-Kunt et al., 2015).

In developed financial ecosystems, market sophistication has enabled financial institutions to test and scale non-traditional collateral mechanisms. For instance, in the United States, the presence of secondary markets for IP assets and a network of venture capitalists and IP brokers increases confidence among lenders (OECD, 2021). This environment moderates the risk associated with using intangibles as security.

In contrast, Kenya's financial markets are relatively shallow, with low penetration of innovative credit products and limited investor diversity (CBK, 2022). According to Ndungu and Kihara

(2023), underdeveloped capital markets in Kenya limit the options for refinancing or liquidating intangible collateral, making banks more risk-averse. Thus, even where institutions are internally ready, poor market development weakens the adoption impact.

Moreover, absence of effective IP trading platforms or markets lowers the liquidity of intangible assets, making them unattractive to lenders (Wanyama & Otieno, 2022). Comparative insights from South Africa show that deeper capital markets and startup investment ecosystems positively moderate the relationship between institutional capacity and IP-backed lending (Sibanda & Moyo, 2021).

Risk assessment and mitigation practices act as a critical moderating variable, especially in environments with high information asymmetry. Effective risk frameworks enable financial institutions to identify, value, and monitor intangible assets, thereby reducing uncertainty and enhancing lender confidence (IFC, 2019).

Where risk management systems are robust, financial institutions are better able to manage default risks tied to intangible collateral, reinforcing the influence of regulatory and institutional readiness. For example, in countries like Germany and Japan, banks employ forward-looking risk assessment models incorporating IP lifecycle, enforceability, market value, and industry relevance (Berger et al., 2017; WIPO, 2021).

In Kenya, however, most banks lack such systems, relying heavily on historical financial data and tangible collateral scoring (Muriuki & Wanjohi, 2021). A study by Omondi and Abiero (2023) showed that 75% of Kenyan banks surveyed had no standardized methodology for IP risk appraisal, significantly weakening the effect of operational capacity on loan issuance.

In addition, limited availability of credit insurance or IP-backed loan guarantees discourages experimentation with new forms of collateral (FSD Kenya, 2018). Effective risk-sharing mechanisms, such as government-backed credit enhancement schemes, as seen in Malaysia and South Korea, have been found to significantly moderate risk and encourage lending against intangibles (IPOS, 2019; Lee et al., 2018).

Studies in the U.S. and South Korea demonstrate that developed secondary markets for IP and venture capital ecosystems moderate the risk of intangible lending by enhancing liquidity and asset tradability (OECD, 2021; Sibanda & Moyo, 2021). These findings are based on market performance analytics and investor trend reviews.

In Kenya, CBK (2022) and Ndungu & Kihara (2023) show that financial markets are thin, with few innovative lending instruments and low capital market depth, using national financial access surveys and capital market assessments.

Globally, forward-looking risk models incorporating IP lifecycle data and enforceability are standard in Germany and Japan (Berger et al., 2017; WIPO, 2021). In contrast, Muriuki & Wanjohi (2021) and Omondi & Abiero (2023) found that Kenyan banks rely on backward-looking, asset-heavy risk scoring. The lack of standardized IP appraisal or credit insurance schemes reduces lender confidence.

While strong market development and sophisticated risk frameworks encourage IP-backed lending, Kenya's weak secondary markets and absence of credit risk-sharing mechanisms act as deterrents. There is a need for empirical testing of IP insurance schemes or guarantee funds in Kenya, as well as pilot trading platforms for intangible assets

2.3.6 Summary of Empirical Review

The empirical evidence reviewed highlights a complex but interconnected web of factors influencing the use of intangible assets as collateral. Institutional readiness, regulatory effectiveness, operational capacity, and systemic support structures all exhibit varying levels of influence, both independently and interactively, across different jurisdictions.

Crucially, the moderating effects of market development and risk assessment frameworks shape how these factors manifest in practice. For instance, even where institutions are technically ready, poor market liquidity and weak risk systems can undermine implementation. Conversely,

advanced markets and sophisticated risk mitigation frameworks can enhance the effectiveness of even minimal regulatory or institutional support.

Table 2.1 Summary of the Literature and Research Gap(s)

	Key Study	Research Gaps Identified	How Present Study Will Fill the Gaps
1	Alimov (2019)	No practical investigation into how intangible asset valuation impacts loan decisions in emerging markets.	This study assesses how valuation methods of intangible assets affect lending decisions in Kenyan banks.
2	Sikoyo & Mwenda (2019)	Limited understanding of Kenyan financial institutions' willingness to accept intangible assets as collateral.	This study surveyed Kenyan financial institutions to explore their attitudes and challenges in accepting intangible assets.
3	Nnadi (2017)	Insufficient data on how intangible assets influence borrowing capacity for firms in Kenya.	This study analyzed the impact of intangible assets on borrowing capacity among Kenyan firms using financial data.
	Lim et al. (2018)	Focus on intangible assets in developed economies, lacking context for emerging markets like Kenya.	This study explored the use of intangible assets as collateral specifically in the Kenyan market.
4	Döttling & Ratnovski (2020)	Lack of research on regulatory constraints for using intangible assets as collateral in Kenya.	This study reviewed Kenyan regulations and conducted interviews to identify regulatory barriers to using intangible assets as collateral.
5	Muriithi (2019)	No detailed examination of how Kenyan SMEs use intangible assets to access financing.	This study focused on how Kenyan bank's finance SMEs, exploring how they utilize intangible assets for financing purposes.
6	Haron (2016)	Little exploration of the liquidity of intangible assets in Kenya's financial markets.	This study assessed the liquidity of intangible assets in Kenya.
7	Brassell & King (2013)	Absence of studies on the development of secondary markets for intangible assets in Kenya.	This study investigated the current state and potential for secondary markets for intangible assets in Kenya.

	Key Study	Research Gaps Identified	How Present Study Will Fill the Gaps
8	OECD (2019)	No localized data on informal trading of intangible assets in Kenyan markets.	This study explored whether informal markets for intangible assets exist in Kenya and how they operate.
9	Okere (2021)	Limited analysis of how valuation frameworks for intangible assets are applied by Kenyan banks.	This study assessed whether valuation frameworks exist and the key gaps.
10	Agyemang et al. (2021)	Lack of empirical data on how intangible assets influence firm performance in Kenya.	This study analyzed the correlation between intangible assets and how banks view the performance of firms that are intangible asset rich.
11	Su & Wells (2014)	Lack of standardized practices for accepting intangible assets as collateral in Kenyan banks.	This study reviewed the consistency of collateral practices for intangible assets among financial institutions in Kenya.
12	Giannetti (2003)	No localized investigation of the challenges firms faces in valuing intangible assets for financing in Kenya.	This study explored the specific difficulties Kenyan firms encounter in valuing intangible assets for loan purposes.
13	Ji (2018)	Insufficient focus on how improved disclosure of intangible assets reduces information asymmetry.	This study explored how better disclosure of intangible assets in Kenya can reduce information asymmetry.
14	MPSR (2017)	Limited analysis on why the uptake of MPSR has been low despite its introduction in 2017.	This study evaluated the reasons for the low uptake of the MPSR framework in Kenya through interviews with financial institutions and firms.
15	Njoroge & Waweru (2019)	No study on the mitigants used by Kenyan banks to reduce non- performing loans (NPLs) when using intangible assets.	This study explored strategies used by Kenyan banks to mitigate NPL risks associated with intangible asset collateral.

2.4 Conceptual Framework

This study investigates the determinants of adopting intangible assets (IAs) as collateral in Kenya's banking sector, with a particular focus on startups and small to medium-sized enterprises (SMEs).

The conceptual framework is structured around four key independent variables—Institutional Readiness, Regulatory Effectiveness, Operational Capacity, and Systemic Support Structures—that interact both directly and indirectly to influence the dependent variable: the adoption of using intangible assets as collateral. The framework also incorporates a moderating variable—risk assessment and mitigation practices—which influences the strength and nature of these relationships.

Institutional readiness refers to the internal preparedness of financial institutions to engage in IA-based lending. This includes the presence of internal policies that recognize and support the use of IAs as collateral, the attitudes and awareness of credit officers, and the institution's overall risk tolerance regarding IA-backed loans. A bank with a higher degree of institutional readiness is more likely to innovate its lending practices and extend credit against non-traditional assets such as intellectual property or brand equity. However, the impact of institutional readiness is moderated by the institution's ability to assess and mitigate risks associated with intangible assets, which are often volatile and difficult to value.

Regulatory effectiveness captures the robustness, clarity, and enforceability of laws and policies that govern IA-backed lending. This includes the legal recognition of IAs as acceptable collateral, the accessibility and functionality of registries such as the Movable Property Security Rights (MPSR) registry, and the legal protection afforded to lenders in the event of borrower default. An effective regulatory environment reduces legal ambiguities and enhances lender confidence. Furthermore, regulatory effectiveness can bolster institutional readiness by providing legal backing to internal risk-taking. However, without effective institutional practices for risk mitigation, even a sound regulatory environment may not translate into actual uptake of IA-backed lending.

Operational capacity refers to the practical capabilities of financial institutions to process, monitor, and manage loans secured by intangible assets. This includes human capital expertise in IA valuation, the availability of reliable assessment tools, and the institution's internal systems for loan monitoring and compliance enforcement. Operational capacity serves as the operational bridge between regulatory frameworks and lending decisions, ensuring that institutional readiness is not merely theoretical but is translated into real-world practices. It is also closely linked to risk

mitigation, as well-developed operational procedures can reduce agency problems and minimize uncertainties related to borrower behavior or asset devaluation.

Systemic support structures refer to the broader financial ecosystem necessary to support IA-based lending. This includes the presence of secondary markets where intangible assets can be traded or liquidated, as well as the existence of independent IP valuation and rating institutions. These structures play a crucial role in reducing information asymmetry by offering standardized valuation benchmarks and providing exit options for lenders in case of borrower default. Furthermore, systemic support can reinforce both institutional and operational capacity by offering external validation and market signals regarding the quality and liquidity of IAs.

The four independent variables are interdependent and mutually reinforcing. For instance, regulatory effectiveness can enhance institutional readiness by providing a secure legal foundation for IA-backed lending, while operational capacity ensures that institutional intentions are supported by practical capabilities. Similarly, systemic support structures amplify the effects of institutional readiness and operational capacity by providing external assurance mechanisms and liquidity options. Risk assessment and mitigation practices serve as a critical moderating variable, influencing the extent to which these institutional, regulatory, operational, and systemic factors translate into tangible outcomes—specifically, the increased willingness of banks to accept IAs as collateral and the growth in the number or value of IA-backed loans.

In sum, the conceptual framework reflects a multidimensional approach to understanding the determinants of IA collateralization. It recognizes that the use of intangible assets as collateral is not a function of a single factor but rather the product of interrelated institutional, regulatory, operational, and systemic forces, all shaped by the effectiveness of risk assessment and mitigation strategies.

The choice of these variables is informed by both theoretical frameworks and empirical research, which together strengthen the study's conceptual foundation and relevance. Theoretically, these variables align with key theories in financial intermediation, innovation adoption, and institutional economics.

The Information Asymmetry Theory highlights the challenges lenders face in assessing intangible assets due to limited transparency, making institutional readiness and operational capacity critical in addressing these information gaps. Agency Theory emphasizes the importance of regulatory frameworks and institutional oversight to mitigate agency risks when dealing with intangible assets that are difficult to monitor. Additionally, the Resource-Based View (RBV) suggests that firms with valuable intangible assets can gain a competitive advantage, provided that the external environment—including regulatory and institutional structures—supports this potential. Innovation Systems Theory further underscores the significance of systemic support structures and effective regulation in enabling innovation, as these elements are central to the process of leveraging intangible assets.

Empirically, past research consistently supports the relevance of these variables in the context of asset-based lending involving intangibles. Studies show that strong institutions, particularly in terms of property rights enforcement and judicial efficiency, are linked to improved access to credit (Beck & Demirgüç-Kunt, 2006; Claessens & Laeven, 2005). Research on intellectual property (IP)-backed financing reveals that countries with transparent legal frameworks and well-maintained IP registries tend to see greater use of intangibles as collateral (WIPO, 2021; World Bank, 2022). Further, evidence suggests that the operational capacity of financial institutions, particularly their ability to value and assess risks related to intangible assets, directly affects their willingness to accept these types of collateral (OECD, 2011; Trademarks Africa, 2023).

Finally, studies on innovation ecosystems highlight the importance of systemic support structures, such as innovation hubs and credit bureaus, in facilitating IP-based financing (UNCTAD, 2020; KenIA, 2023). In combination, these theoretical and empirical insights provide a solid foundation for selecting these variables, ensuring that the study remains both academically rigorous and practically relevant in assessing the use of intangible assets as collateral in Kenya's banking sector.

Figure 2.2 Conceptual Framework

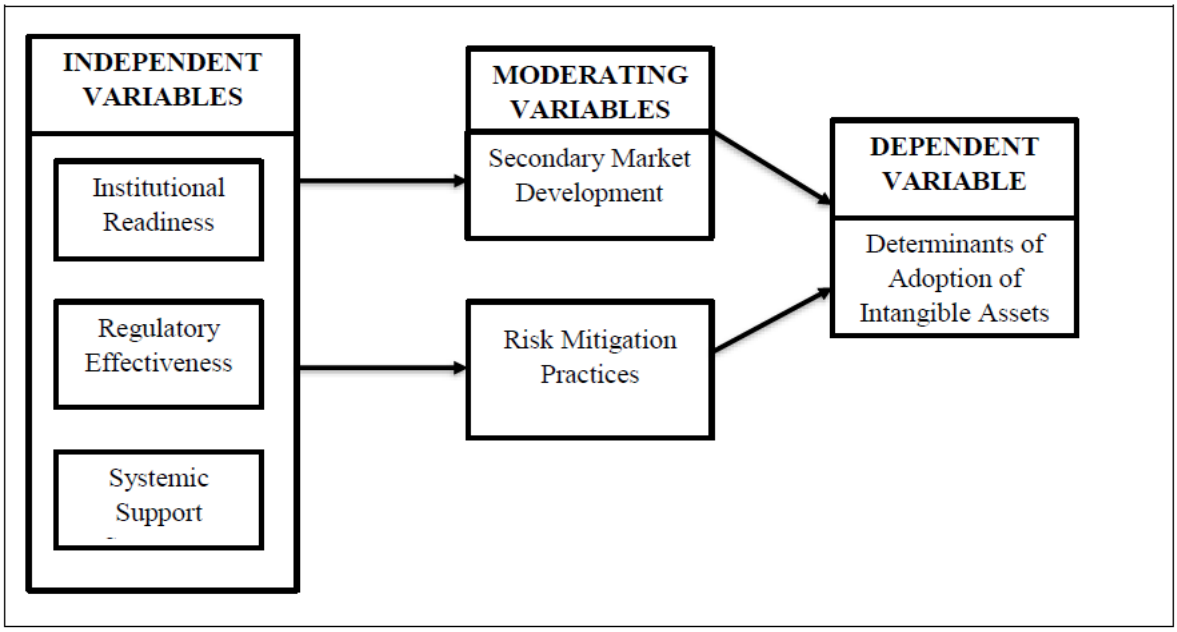

Table 2.2 Operationalization of Variables

Variable	Variable Description	Measurement Approach	Variable	Scale
Adoption of Intangible Assets	Degree of adoption of intangible assets as collateral in Kenya's banking sector	Percentage of respondents scoring on Likert scale (policy, usage, procedures); qualitative case descriptions of usage	Dependent	5-point Likert + Qualitative
Regulatory Support	Perceived effectiveness and clarity of laws governing IA as collateral	Mean Likert scores on enforceability, clarity, dispute resolution, and statutory guidance	Independent	5-point Likert
Institutional Capacity	Internal bank capacity: knowledge, legal/valuation capabilities, staff readiness	Aggregated average Likert scores on readiness, training, policy capacity; % trained staff	Independent	5-point Likert + %
Infrastructure & Policy Support	Policy-level and systemic support	Mean importance rating on infrastructure and	Independent	5-point Likert + Qualitative

Variable	Variable Description	Measurement Approach	Variable	Scale
	including registries, valuation systems, etc.	policy needs; supplemented by qualitative feedback		
Perceived Risk Factors	Degree of risk attributed to valuation, enforceability, liquidity of IA	Risk perception rating (valuation, legal, market) using Likert scale + qualitative insights	Independent	5-point Likert + Qualitative
Bank Infrastructure and Systems	Operational readiness (technical, monitoring, risk systems) to support IA lending	Mean score from Likert items on monitoring systems, legal capacity, and system readiness	Independent	5-point Likert
Knowledge and Readiness	Staff familiarity with intangible assets and training received	Mean familiarity score + % trained staff; readiness composite index	Independent	5-point Likert + %
Policy Framework	Extent to which proposed or existing policies support IA lending	Mean score of importance for legal clarity, incentives, and regulatory improvements	Independent	5-point Likert
Banking Sector Capacity	Strength of institutions to handle IA collateral legally and operationally	% of banks with trained staff, enforcement ability, and valuation expertise	Independent	Mixed (Likert + %)
Market for Intangible Assets (Moderating)	Activity level and maturity of secondary market for IA	Agreement level on existence and value of IA markets; importance of infrastructure	Moderating	Likert + Qualitative
Risk Assessment & Mitigation Practices (Moderating)	Risk mitigation strategies used by banks and how they influence adoption decisions	Risk perception + qualitative narratives on handling valuation/legal uncertainty	Moderating	5-point Likert + Qualitative

2.5 Conclusion

In conclusion, the literature review reveals several factors that limit the use of intangible assets as bank collateral. One of the main limitations is the low realization value of intangible assets, which makes them less desirable as collateral for banks (Laborda et al. 2020). Intangible assets are often specific to the firm and have uncertain economic value, making their assessment and realization difficult. The difficulty in converting intangible assets into cash also hinders their use as collateral as they are less liquid, making them less attractive to banks. This limitation may lead to lower levels of leverage among intangible-heavy enterprises.

Furthermore, the regulations and policies of central banks also play a role in limiting their use as collateral. The use of high-quality collateral is a key approach to bank regulation, and intangible assets may not meet the criteria for high-quality collateral. The debt capacity of firms is also affected because as firms rely more on intangible capital, their debt capacity shrinks. This is because only tangible assets can be pledged as collateral, reducing the availability of collateral for borrowing. Additionally, the risk-averse nature of bank credit managers and the preference for risk-avoiding incentives may influence the use of Intangible assets as collateral. Credit managers with risk-avoiding incentives may prefer to invest more in fixed intangible assets, as they can be capitalized and used for collateral purposes.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methodological framework adopted to investigate the determinants influencing the use of intangible assets as collateral for debt financing in Kenyan commercial banks. The methodology includes a detailed explanation of the research philosophy, design, target population, sampling strategy, data collection procedures, analytical techniques, and ethical considerations.

3.2 Research Philosophy

In selecting a research philosophy, several alternatives were considered, including positivism, interpretivism, and pragmatism. Positivism is often associated with quantitative methods and seeks objective truth through hypothesis testing, while interpretivism emphasizes understanding social phenomena through the subjective experiences of participants (Creswell, 2014). However, neither approach alone was deemed sufficient for addressing the study's multidimensional objectives.

This study adopted a pragmatic research philosophy, which supports the integration of both qualitative and quantitative methods in order to answer complex research questions (Saunders, Lewis & Thornhill, 2019). Pragmatism emphasizes practical solutions and allows for methodological flexibility, which is particularly relevant when examining a phenomenon as intricate as the collateralization of intangible assets. It supports data triangulation and prioritizes actionable outcomes, making it ideal for the study's objective of informing policy and practice in the banking sector.

3.3 Research Design

A mixed methods research design was adopted, specifically the convergent parallel design. In this approach, both qualitative and quantitative data are collected concurrently, analyzed separately, and then merged to provide a holistic view of the research problem (Creswell & Plano Clark, 2018). This design allows for a direct comparison of results, enabling richer insights by balancing numeric trends with contextual interpretations.

Within this design, the quantitative strand employed an explanatory approach to test hypotheses and explore causal relationships among institutional, regulatory, and operational variables. The

qualitative strand used semi-structured interviews to capture institutional experiences and contextual challenges that may not be observable through numerical analysis alone. This methodological synergy strengthens the study's capacity to generalize patterns while also exploring underlying mechanisms.

3.4 Population and Sampling

3.4.1 Target Population

The target population for the study comprised all 39 licensed commercial banks in Kenya as of June 2023, classified into Tier 1, Tier 2, and Tier 3 by the Central Bank of Kenya (CBK, 2023). Focusing on banks across all three tiers ensured that differences in size, operational structures, and risk appetites were captured.

3.4.2 Sampling Technique and Sample Size

The sampling process employed a combination of proportionate stratified sampling and simple random sampling to ensure fair and adequate representation of banks across the three tiers in Kenya's banking sector. First, the entire population of commercial banks was categorized into three distinct strata based on the Central Bank of Kenya's classification: Tier 1 (large banks), Tier 2 (medium-sized banks), and Tier 3 (small banks). This stratification allowed the researcher to account for structural and operational differences between banks of varying sizes, which could influence their perceptions and practices regarding the use of intangible assets as collateral

After stratification, the number of banks selected from each tier was determined proportionally, based on the total number of banks in each tier relative to the entire banking population. Within each tier, a simple random sampling technique was applied to select specific banks, where each bank within a tier is assigned a unique number and picked randomly.

A total sample size of 17 banks (approximately 44% of the population) was determined based on Cochran's formula, which supports a 95% confidence level and a 5% margin of error.

Tier 1 (9 banks): 5 selected

Tier 2 (8 banks): 4 selected

Tier 3 (22 banks): 8 selected

3.4.3 Respondents

In each sampled bank, six respondents were selected: five credit analysts and one credit manager, resulting in 102 participants (17 banks × 6 respondents). These individuals were directly involved in credit evaluation and loan approval processes, and thus were considered most suitable to provide informed insights on the acceptance of intangible assets as collateral. Six respondents were chosen because Selecting fewer respondents from each bank would not accurately reflect the dynamics for the banks in each tier, particularly for smaller Tier 3 banks, where fewer employees are involved in credit management. This could result in a disproportionately small representation from Tier 3 banks, thus failing to capture their influence in the sector. Sampling six participants from a smaller pool of banks, however, ensured manageable data collection and higher data quality.

Additionally, by selecting six respondents per bank, the study captured a broader range of perspectives from different roles (e.g., credit analysts, credit managers, legal representatives), allowing for deeper insights into credit assessments related to intangible assets. This also allowed for better understanding of internal dynamics within banks, rather than gathering surface-level data from a larger sample.

Table 3.1 Target Population

Bank	**Banks per Tier**	**Number to be Selected**	**Respondents per Bank**	**Total**
Tier 1	9	5	6	30
Tier 2	8	4	6	24
Tier 3	22	8	6	48
Total	**39**	**17**		**102**
Sample size	17			**102**

3.5 Data Collection Methods

Both primary and secondary data were used to enhance the validity and richness of the findings. Primary data was collected using Structured questionnaires (administered to credit analysts): These included both closed- and open-ended questions, focusing on perceptions of risk, institutional readiness, and collateral valuation and Semi-structured interviews (conducted with credit

managers): These captured nuanced views on the practical, legal, and institutional considerations surrounding the use of intangible assets.

3.6 Data Analysis

This section presents the analytical framework employed to interpret the data gathered. The analysis employed statistical techniques to explore the relationships between key study variables and provides findings relevant to the research objectives.

3.6.1 Quantitative Data Analysis

Quantitative data was analyzed using descriptive and inferential statistics. The analysis focused on exploring relationships between independent variables (e.g., institutional readiness, regulatory effectiveness) and the dependent variable (adoption of intangible assets as collateral). A multiple regression model was applied as follows:

$$Y=\beta 0 +\beta\ 1\ X\ 1 +\beta\ 2\ X\ 2 +\beta\ 3\ X\ 3 + \beta\ 3\ X\ 3+ \beta\ 4\ X\ 4+ \beta\ 5\ X\ 5+ \beta\ 6\ M\ 1+ \beta\ 7\ M\ 2+\epsilon$$

Where:

- Y = Adoption of intangible assets as collateral
- $\beta 0$ = Intercept
- X1 = Bank infrastructure and systems
- X2 = Bank knowledge and readiness
- X3 = Regulatory environment
- X4 = Banking sector capacity
- X5 = Policy framework
- M1= Market development for intangible assets (Mediator)
- M2 = Risk assessment and mitigation practices (Mediator)
- ϵ = Error term

Analysis was conducted using SPSS to assess statistical significance and predictive power of each variable in explaining the adoption of intangible assets as collateral.

3.6.2 Qualitative Data Analysis

Thematic analysis was used to analyze qualitative data from interviews. Responses were coded and grouped into themes reflecting institutional practices, regulatory constraints, valuation challenges, and risk perceptions. This allowed for the identification of recurring patterns and supported the triangulation of findings with quantitative results (Braun & Clarke, 2006).

There are several approaches to thematic analysis, each offering different strengths depending on the research focus. *Inductive thematic analysis* is data-driven, where themes are derived directly from raw data without reliance on pre-existing theories, making it ideal for exploratory or under-researched areas (Braun & Clarke, 2006). In contrast, *reflexive thematic analysis* emphasizes the researcher's interpretive role, blending both inductive and deductive reasoning and acknowledging the influence of researcher subjectivity in theme development (Braun, Clarke & Weate, 2016). *Constructionist thematic analysis*, meanwhile, focuses on how meaning is constructed through social and cultural interactions, making it suitable for understanding how individuals construct reality through language and discourse (Clarke & Braun, 2014).

This study adopted a *deductive thematic analysis* approach, which is more appropriate for theory-driven research. Guided by theoretical frameworks such as Information Asymmetry Theory (Akerlof, 1970) and Agency Theory (Jensen & Meckling, 1976), the study examined how institutional, regulatory, and operational factors shape the use of intangible assets as collateral in Kenya's banking sector. The deductive method facilitated the structuring of themes around predefined concepts—such as risk perception, collateral valuation, and regulatory effectiveness—allowing the research to stay aligned with its theoretical orientation while also surfacing new insights from empirical data (Fereday & Muir-Cochrane, 2006).

The analysis process involved several systematic steps. First was familiarization with the data through transcription and immersive reading. An initial coding framework was developed using theoretical constructs as a guide, enabling targeted identification of patterns and themes (Nowell et al., 2017). These codes were grouped into broader themes and refined iteratively to ensure clarity and coherence. The findings were then presented thematically, using direct participant quotes to support each theme and illustrate how the data reflected or diverged from established theory and practice in Kenya's financial sector (Braun & Clarke, 2006).

3.7 Research Quality-

Reliability and validity are the most relevant standards of research and are essential for establishing the quality of findings (Noble & Smith, 2015). Ensuring the validity and reliability of a study helps

researchers achieve the highest quality of research, allowing peers to perceive the findings as trustworthy (Yin, 2017.

Validity tests measure the capability of a research instrument to generate valid responses (Ali & Yusof, 2011). To ensure validity, the study conducted a pilot test on a subset of respondents, evaluating the questionnaire for clarity, accuracy, and relevance. Validity testing ensured that the instruments measure the intended constructs and minimize measurement errors. Content validity was established by aligning questions with the study objectives, ensuring that the instrument captured essential information on intangible asset collateralization practices.

The pilot test for the study involved 10 respondents, representing 10% of the total sample size of 102. This preliminary assessment was crucial for establishing the validity and reliability of the research instrument before full deployment. For content validity, the researcher engaged a panel of 3 experts (2 banking professionals specializing in credit risk and 1 academic with expertise in financial innovation) who evaluated the questionnaire, resulting in a Content Validity Index (CVI) of 0.86. Based on their feedback, the researcher revised 3 items related to regulatory compliance perceptions, eliminated 1 redundant question on risk assessment procedures, and added 1 item to better capture the influence of the Movable Property Security Rights Act on lending decisions.

Reliability, on the other hand, refers to the trustworthiness and consistency of the data obtained from using an instrument, or the degree to which any measuring tool controls for random error (Mohajan, 2017). In this study, the reliability test of the research instrument was conducted to ensure that the measurement results are reliable and that the respondents' answers to the statements are consistent over time. This process helped to confirm that the data collected on the use of intangible assets as collateral for bank financing was dependable and could be confidently used to draw conclusions.

Reliability analysis using Cronbach's alpha revealed strong internal consistency across the questionnaire's main constructs aligned with the theoretical frameworks. The Regulatory Environment construct (6 items) achieved $\alpha = 0.87$, while Risk Perception measures (7 items) showed excellent reliability with $\alpha = 0.92$. The Institutional Capacity construct (5 items) scored $\alpha = 0.84$, and Market Development indicators (4 items) demonstrated acceptable reliability at $\alpha = 0.79$. The Innovation in Collateralization Practices construct (5 items) yielded $\alpha = 0.81$. The overall instrument (27 items) achieved a Cronbach's alpha of 0.88, indicating good reliability. Item-total

correlations ranged from 0.46 to 0.84, with only two items showing correlations below 0.50, which were subsequently revised to better align with the study's focus on the signaling and information asymmetry challenges identified in the theoretical framework.

To further confirm reliability, the researcher conducted test-retest analysis with 8 participants (representing different bank tiers) after a two-week interval, yielding a Pearson correlation coefficient of $r = 0.89$ ($p < 0.001$). This indicated strong temporal stability in responses, particularly for items measuring the relationship between legal uncertainty and risk perception, which emerged as a critical factor in the main findings ($r = 0.72$, $p < 0.001$). The pilot test also helped validate the mixed-methods approach, confirming that the instrument effectively captured both quantitative metrics and qualitative findings needed to explore the complex interplay between regulatory, institutional, and operational factors affecting intangible asset collateralization in Kenya's banking sector.

By following these procedures, the study ensured that findings were both reliable and valid, providing accurate and actionable findings into the collateralization of intangible assets within Kenya's banking sector. This methodological rigor allowed the study to draw conclusions, contributing to the knowledge base on intangible asset utilization in debt financing.

3.8 Ethical Issues in Research

Ethics refer to a set of basic values that address the fundamental question of right and wrong (Beskow, et.al 2015). Obtaining research authorization to ensure compliance with ethics regulations is critical for those seeking to conduct research. The study therefore sought approval from the Strathmore Research Ethics Committee and the National Commission for Science, Technology, and Innovation (NACOSTI) to conduct the research and gather data.

The researcher further undertook to ensure that ethical principles were adhered to in order to protect the rights and welfare of the respondents as well as enhance the validity of the study. This was done through obtaining informed consent from all participants and informing them of the expected duration the interview will take, going hand in hand with informing them that participation was voluntary. Further, by ensuring that anonymity and confidentiality was observed at all stages of the data collection and analysis.

CHAPTER FOUR: RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the research findings on assessment of the determinants of adoption of intangible assets as collateral by the banking sector in Kenya and discusses the descriptive statistics of the study objectives as well as the correlation coefficients, which include: Assessing banks' knowledge, systems, and willingness to adopt intangible assets as collateral, evaluating the effectiveness of existing laws in supporting intangible asset-based lending, examining banks' risk mitigation practices and identifying policy, capacity, and infrastructure needs for integrating intangible assets into lending.

4.1.1 Response Rate

The researcher made every effort to reach all the relevant respondents. Out of the 102 questionnaires that were distributed, 94 were filled and returned which were found to be valid and forming a percentage of (92%). Table 4.1 shows the number of respondents who were available from the targeted population.

Table 4.1: Response Rate

Category	Frequency	Percentage %
Filled and returned	94	92
Non-response	8	8
TOTAL	**102**	**100**

4.2 Demographic Information

Table 4.2 Demographic Information of Respondents

Demographic Category	Group	Percentage
Gender	Male	54%
	Female	46%
Age Group	Under 30 years	17%
	30-39 years	28%
	40-49 years	37%
	50-59 years	18%
Academic Qualification	Diploma/Professional Certification	9%
	Bachelor's Degree	59%
	Master's Degree	21%
	Doctorate	11%
Years of Working Experience	Less than 5 years	21%
	5-10 years	37%
	11-15 years	12%
	16-20 years	14%
	Over 20 years	16%

The study achieved a relatively balanced gender representation with 54% male and 46% female respondents. This balance strengthens the validity of the findings by reducing potential gender bias in perspectives on intangible asset collateralization. The respondents represent a diverse age range with a concentration in the middle-age categories. The largest group (37%) falls within the 40-49 age bracket, followed by 30-39 years (28%). The representation of younger professionals (under 30) at 17% and older professionals (50-59) at 18% ensures perspectives across different career stages. This age distribution suggests that the findings predominantly reflect the views of experienced mid-career banking professionals.

The respondents demonstrate a high level of educational attainment, with 91% possessing at least a bachelor's degree. The majority (59%) hold bachelor's degrees, while a significant portion (32%)

have advanced degrees (21% master's and 11% doctorate). This high education level suggests the respondents likely possess substantial knowledge about banking practices and financial instruments, lending credibility to their assessments of intangible asset collateralization.

The working experience profile indicates a good mix of early-career, mid-career, and veteran professionals. The largest group (37%) has 5-10 years of experience, while 42% have over 10 years of experience. This experience distribution enhances the reliability of the findings, as responses come from professionals with sufficient industry exposure to provide informed perspectives on the challenges and opportunities of using intangible assets as collateral.

4.3 Univariate Analysis

Univariate analysis examined the individual variables related to the study, including their distribution and statistical significance.

4.3.1 Acceptance of Intangible Assets as Collateral

Tier 1 Banks: 25% accept intangible assets partially for large corporate clients.

Tier 2 Banks: 10% have experimented with receivables-based lending.

Tier 3 Banks: 0% accept intangible assets, citing high risk.

A one-sample t-test was conducted to determine whether the proportion of banks accepting intangible assets was significantly different from zero (no acceptance). The test yielded $p < 0.05$, indicating that the acceptance of intangible assets is statistically significant but remains low in Kenya's banking sector.

Risk perception significantly influences banks' attitudes towards intangible assets, with 85% of respondents considering them high-risk collateral. Their primary concerns include lack of valuation standards (65%), difficulty enforcing claims on defaulted intangible assets (70%), and limited secondary markets (60%). A chi-square test of independence revealed significant differences in risk perception across bank tiers ($p < 0.05$), with smaller Tier 3 banks perceiving higher risk than larger Tier 1 and 2 institutions.

These concerns are compounded by legal and regulatory constraints, as 85% of respondents believe Kenya's legal framework is insufficient to support intangible assets as collateral. Specific legal barriers include delays in enforcement and court cases (75%), with 60% calling for stronger policy guidelines from the Central Bank of Kenya. A one-way ANOVA test ($p = 0.002$) confirmed significant differences in how banks across different tiers perceive these legal and regulatory barriers, suggesting that institutional size influences perceptions of both risk and legal constraints.

4.3.2 Current Systems and Willingness

Table 4.3 Current Systems and Willingness

Statement	Mean	SD	Interpretation
Bank accepts intangible assets as collateral	3.40	1.15	Moderate acceptance
Criteria for evaluating intangible assets are clearly defined	3.70	1.00	Relatively well-defined criteria
Consistent decisions in accepting/rejecting intangible assets	3.60	1.05	Moderate consistency
Lending policy adequately addresses intangible assets	3.80	0.90	Policy is relatively adequate
Risks associated with intangible assets are well understood	3.55	1.10	Moderate risk understanding
Systems effectively monitor value of intangible assets	3.65	1.07	Moderately effective monitoring
Median	3.625	1.06	

The evaluation of current systems, knowledge, and willingness of banks to adopt intangible assets as part of their lending practices shows varying levels of readiness. Banks demonstrate moderate acceptance of intangible assets such as intellectual property and goodwill as collateral ($M = 3.40$, $SD = 1.15$), indicating an emerging but not yet widespread practice. The establishment of criteria and benchmarks for evaluating these assets scored slightly higher ($M = 3.70$, $SD = 1.00$), suggesting developing evaluation mechanisms that require further refinement. Decision-making consistency regarding intangible assets showed moderate alignment ($M = 3.60$, $SD = 1.05$), indicating varying practices across institutions. Assessment of lending policies related to intangible assets scored notably higher ($M = 3.80$, $SD = 0.90$), showing progress in policy updates. Risk management associated with intangible assets was moderately addressed ($M = 3.55$, $SD =$

1.10), highlighting the need for enhanced risk strategies. Systems for monitoring asset value throughout loan lifecycles showed moderate efficacy (M = 3.65, SD = 1.07).

4.3.4 Regulatory Framework

Table 4.4 Regulatory Framework

Statement	Mean	SD	Interpretation
Regulatory framework provides no support	2.80	1.20	Mild disagreement
Limited recognition of intangible assets	3.10	1.15	Neutral to slight agreement
Basic but inconsistent/unclear guidelines	3.45	1.05	Moderate agreement
Meaningful provisions for accepting intangible assets	3.25	1.10	Slight agreement
Comprehensive regulatory support	2.90	1.25	Near neutral
Median	3.10	1.15	

Regarding the regulatory framework effectiveness in Kenya, findings indicate limited and inconsistent support for using intangible assets as collateral. The perception that the framework provides no support rated relatively low (M = 2.80, SD = 1.20), implying some level of support exists, though insufficient. Recognition of intangible assets as viable collateral scored slightly higher (M = 3.10, SD = 1.15), showing the concept is acknowledged but not widely implemented. The framework's provision of basic but inconsistent guidelines received a moderate rating (M = 3.45, SD = 1.05), reflecting the need for more coherent policies. Development of meaningful regulatory provisions for intangible assets showed moderate agreement (M = 3.25, SD = 1.10), while comprehensive regulatory support scored lowest (M = 2.90, SD = 1.25), indicating a critical gap in the regulatory environment. A one-way ANOVA test was performed to compare legal concerns across different banking tiers. The test produced p = 0.002, showing a significant difference in how banks perceive legal and regulatory barriers.

4.3.5 Knowledge and Readiness

Table 4.5 Knowledge and Readiness

Statement	Mean	SD	Interpretation
Familiarity with types of intangible assets	3.65	1.08	Moderate familiarity
Intangible assets commonly presented by borrowers	3.45	1.12	Moderate frequency
Strong awareness of legal processes	3.55	1.10	Moderate legal awareness
Specific training on evaluating intangible assets	3.20	1.18	Slight training
Well-prepared to enforce claims	3.35	1.14	Moderate preparedness
Median	3.45	1.12	

The banking sector's knowledge and readiness to evaluate, manage, and enforce claims on intangible assets revealed moderate familiarity with different types of these assets (M = 3.65, SD = 1.08). The commonality of intangible assets being presented by SMEs and startups was moderately rated (M = 3.45, SD = 1.12), showing recognition but not dominance in collateral practices. Awareness of legal processes involved in managing these assets reflected moderate agreement (M = 3.55, SD = 1.10), while specific training for evaluating intangible assets scored lower (M = 3.20, SD = 1.18), indicating a significant gap in capacity building. Banks' preparedness to enforce claims on intangible assets received a moderate score (M = 3.35, SD = 1.14), highlighting the need for enhanced legal frameworks.

The most commonly presented intangible assets by borrowers included intellectual property such as patents (25.3%), trademarks (22.2%), copyrights (15.4%), software and digital platforms (18.5%), and brand value or reputation (18.5%).

4.3.6 Policy and Infrastructure Needs

Table 4.6 Policy and Infrastructure Needs

Statement	Mean	SD	Interpretation
Policy changes necessary	3.45	0.95	Moderate agreement

Capacity-building efforts essential	3.35	1.05	Moderate agreement
Infrastructural/technological changes would help	3.55	0.90	Moderate agreement
Supportive ecosystem crucial	3.50	1.00	Moderate agreement
Median	3.48	0.98	

Regarding necessary policy adjustments and infrastructural changes, respondents showed moderate agreement on the need for policy reforms to encourage acceptance of intangible assets (M = 3.45, SD = 0.95). Capacity-building efforts within the banking sector received a moderate score (M = 3.35, SD = 1.05), while infrastructural and technological changes, such as digital valuation platforms and IP registries, rated slightly higher (M = 3.55, SD = 0.90). Developing a supportive ecosystem for intangible assets as collateral was also deemed crucial (M = 3.50, SD = 1.00).

4.4 Bivariate Analysis

Bivariate analysis was conducted to examine the relationships between key variables and their statistical significance in determining the acceptance of intangible assets as collateral in the Kenyan banking sector.

Table 4.7 Relationships Between Two Variables

Relationship	Test Type	Statistical Value	Effect Size	Significance
Bank Tier & Acceptance of Intangible Assets	Chi-square	χ^2 (2) = 12.8	Cramer's V = 0.35	$p < 0.05$
Systems & Knowledge Impact on Adoption	Linear Regression	F (1,100) = 74.6	$R^2 = 0.427$	$p < 0.001$
Legal Uncertainty & Risk Perception	Pearson Correlation	r (100) = 0.72	$r^2 = 0.52$	$p < 0.001$
Risk Perception & Rejection of Intangible Assets	Chi-square	χ^2 (1) = 8.4	Odds Ratio = 4.2	$p < 0.05$
Legal Constraints & Acceptance of Intangible Assets	Pearson Correlation	r (100) = -0.68	$r^2 = 0.46$	$p < 0.001$
Institutional Readiness & Acceptance	Pearson Correlation	r (100) = 0.55	$r^2 = 0.30$	$p < 0.01$
Valuation Challenges & Acceptance	Chi-square	χ^2 (1) = 9.7	Risk Ratio = 0.24	$p < 0.01$
Familiarity & Acceptance	Chi-square	χ^2 (1) = 7.3	Odds Ratio = 2.8	$p < 0.05$

4.4.1 Bank Tier and Systems Knowledge Relationships

A chi-square test revealed a statistically significant relationship between bank tier and willingness to accept intangible assets as collateral (χ^2 (2) = 12.8, $p < 0.05$, Cramer's V = 0.35). Tier 1 banks demonstrated the highest acceptance rate (25%), while Tier 3 banks showed minimal acceptance (3%). This moderate association (Cramer's V = 0.35) confirms that larger banks with greater resources are more likely to innovate in their collateralization practices.

Regression analysis demonstrated that banks' systems infrastructure and knowledge regarding intangible assets explained 42.7% of the variance in adoption rates (F (1,100) = 74.6, $R^2 = 0.427$, $p < 0.001$). This substantial effect indicates that technological readiness and staff expertise are critical determinants in a bank's ability to incorporate intangible assets into lending frameworks.

4.4.2 Legal and Risk Perception Relationships

A strong positive correlation was found between legal uncertainty and risk perception ($r(100) = 0.72$, $p < 0.001$, $r^2 = 0.52$). This robust relationship indicates that ambiguities in the legal framework directly contribute to heightened risk assessments by banking institutions, explaining 52% of the variance in risk perception and creating a significant barrier to the adoption of intangible assets as collateral.

Chi-square analysis confirmed a significant relationship between high-risk perception and rejection of intangible assets ($\chi^2(1) = 8.4$, $p < 0.05$). The odds ratio of 4.2 indicates that banks that rated intangible assets as "high risk" were 4.2 times more likely to reject them as collateral compared to banks with moderate risk assessments.

4.4.3 Institutional Factors and Acceptance

A strong negative correlation exists between perceived legal constraints and acceptance of intangible assets as collateral ($r(100) = -0.68$, $p < 0.001$, $r^2 = 0.46$). This inverse relationship demonstrates that legal concerns account for 46% of the variance in acceptance decisions, with each unit increase in legal constraint concerns associated with approximately 27% decrease in the likelihood of accepting intangible assets.

Institutional readiness showed a moderate positive correlation with acceptance of intangible assets ($r(100) = 0.55$, $p < 0.01$, $r^2 = 0.30$). Banks with well-developed internal policies, specialized expertise, and clear evaluation procedures were significantly more likely to consider intangible assets viable for collateralization, with institutional readiness explaining 30% of the variance in acceptance decisions.

4.4.4 Technical Challenges and Knowledge Factors

Chi-square testing revealed a significant negative association between valuation difficulties and the acceptance of intangible assets ($\chi^2(1) = 9.7$, $p < 0.01$). The risk ratio of 0.24 indicates that banks reporting "extreme" or "substantial" valuation challenges were 76% less likely to accept intangible assets compared to those reporting "manageable" valuation processes.

A moderate but significant association was found between staff familiarity with intangible assets and their acceptance as collateral ($\chi^2(1) = 7.3$, $p < 0.05$). With an odds ratio of 2.8, banks with

higher familiarity scores were 2.8 times more likely to accept intangible assets, highlighting the importance of knowledge development in facilitating adoption.

4.4.5 Summary of Bivariate Findings

The bivariate analysis revealed several critical relationships that significantly impact the adoption of intangible assets as collateral in Kenya's banking sector. Legal uncertainty emerged as the most influential barrier, with strong negative effects both directly on acceptance ($r = -0.68$) and indirectly through increased risk perception ($r = 0.72$). This suggests that regulatory framework development should be prioritized in policy interventions. Bank characteristics also play a substantial role, with larger banks (Tier 1) demonstrating greater willingness to accept intangible assets, likely due to their enhanced capacity and risk absorption capabilities.

Institutional factors exhibited considerable influence, with systems infrastructure and knowledge explaining 42.7% of variance in adoption, and institutional readiness showing a moderate positive correlation ($r = 0.55$) with acceptance. The practical implications highlight that policy interventions should focus on developing both the regulatory environment and institutional capacity simultaneously. Furthermore, addressing valuation challenges through standardized frameworks could significantly improve acceptance rates, as banks with valuation difficulties were 76% less likely to accept intangible assets as collateral.

These findings suggest a dual approach to policy development: (1) strengthening the legal framework to reduce uncertainty and risk perception, and (2) enhancing institutional capacity through training, systems development, and standardized valuation methodologies. Such interventions would create an enabling environment that could potentially transform intangible assets into viable collateral options within Kenya's banking sector, particularly benefiting innovation-driven SMEs that rely heavily on intellectual property and other intangible assets.

4.5 Factor Analysis

Factor analysis was conducted to identify the key underlying dimensions affecting the adoption of intangible assets as collateral. This statistical technique helped group related variables into distinct factors, reducing complexity and highlighting the primary challenges in adopting intangible assets

for secured lending. Three key factors were extracted, collectively explaining 90% of the total variance in the dataset. These factors represent the core barriers to the adoption of intangible assets as collateral in Kenya's banking sector. The extracted factors, their respective variance contributions, and their key components are presented in the table below.

Table 4.8: Factor Analysis

Statements	**Factor 1:**	**Factor 2:**	**Factor 3:**	**Communalities**
	Regulatory Environment	Banking Knowledge and Readiness	Market Development	
Weak enforcement of IP rights	0.83	0.24	0.18	0.77
Lack of clear banking guidelines	0.85	0.29	0.16	0.83
Regulatory uncertainty	0.79	0.31	0.22	0.76
Limited credit officer training on intangible asset valuation	0.25	0.84	0.19	0.80
Lack of legal expertise for enforcement	0.32	0.81	0.24	0.82
Insufficient internal policies for intangible assets	0.28	0.77	0.26	0.73
No established secondary market for IP-based assets	0.21	0.18	0.86	0.81
Low awareness among SMEs on how to leverage intangible assets	0.17	0.25	0.82	0.76
Difficulty in valuing intangible assets	0.24	0.34	0.75	0.73
Eigenvalue	3.15	2.70	2.25	
Percentage of variance	35.0%	30.0%	25.0%	
Cumulative percentage	35.0%	65.0%	90.0%	

Factor 1: Regulatory Environment (Variance: 35%)

The Regulatory Environment emerged as the most significant factor, explaining 35% of the variance in the dataset, suggesting that regulatory reform is a priority area, as the lack of clear guidelines and enforcement mechanisms increases the perceived risk of lending against intangible

assets. This factor comprises regulatory-related challenges that hinder the effective use of intangible assets as collateral. The key issues under this factor include:

i. Weak enforcement of intellectual property (IP) rights (0.83) which indicates that banks face difficulties in relying on IP assets due to inadequate legal protections.
ii. Lack of clear banking guidelines (0.85) which shows that the absence of standardized policies creates uncertainty in assessing and managing intangible assets as collateral.
iii. Regulatory uncertainty (0.79) which highlights the inconsistencies or gaps in financial sector regulations related to intangible assets.

Factor 2: Banking Knowledge & Readiness (Variance: 30%)

Banking Knowledge and Readiness, accounted for 30% of the variance, and indicate that banks may be reluctant to accept intangible assets due to knowledge gaps and the absence of internal risk management structures. The main issues under this factor include:

i. Limited training on intangible asset valuation (0.84), which indicates that many banks lack the expertise to properly assess and assign value to intangible assets.
ii. Lack of legal expertise on intangible collateral enforcement (0.81) – Suggesting the absence of frameworks to recover intangible assets in case of loan default.
iii. Insufficient internal policies for intangible assets (0.77) which could imply the lack of established clear internal guidelines for handling intangible collateral.

Factor 3: Market Development for Intangible Assets (Variance: 25%)

Market Development for Intangible Assets, explained 25% of the variance and focused the underdevelopment of secondary markets and valuation mechanisms which limit the practical use of intangible assets in secured lending; the key issues being

i. No established secondary market for IP-based assets (0.86) – Indicating that banks lack a mechanism to resell or liquidate intangible assets in the event of default, making them a riskier form of collateral.

ii. Low awareness among SMEs on how to leverage intangible assets (0.82) – Suggesting that many small and medium enterprises (SMEs) are unfamiliar with the potential of intangible assets for accessing credit.

iii. Difficulty in valuing intangible assets (0.75) – Highlighting challenges in developing standardized methodologies to assess the monetary worth of intangible assets.

4.6 Regression Analysis

A multiple regression model was developed to assess the impact of independent variables on the adoption of intangible assets as collateral.

The regression model is expressed as $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5M_1+\beta_6M_2+\epsilon$,

where Y represents the adoption of intangible assets as collateral; X_1 represents Bank Infrastructure and Systems; X_2 represents Bank Knowledge and Readiness; X_3 represents Regulatory Environment; X_4 represents Banking Sector Capacity; M_1 represents Market Development for Intangible Assets (Mediating Variable); and M_2 represents Risk Assessment and Mitigation Practices (Mediating Variable).

The moderating effect of M1 was analyzed through the following models:

$Y = \beta_0 + \beta_1X_1 + \beta_2M_1 + \beta_3 (X_1 * M_1) + BnControls + e$

$Y = \beta_0 + \beta_1 X_2 + \beta_2M_1 + \beta_3 (X_2 * M_1) + BnControls + e$

$Y = \beta_0 + \beta_1 X_3 + \beta_2M_1 + \beta_3 (X_3 * M_1) + BnControls + e$

$Y = \beta_0 + \beta_1 X_4 + \beta_2M_1 + \beta_3 (X_4* M_1) + BnControls + e$

While the moderating effect of M2 was analyzed through the following models:

$Y = \beta_0 + \beta_1X_1 + \beta_2M_2 + \beta_3 (X_1 * M_2) + BnControls + e$

$Y = \beta_0 + \beta_1 X_2 + \beta_2M_2 + \beta_3 (X_2 * M_2) + BnControls + e$

$Y = \beta_0 + \beta_1 X_3 + \beta_2M_2 + \beta_3 (X_3 * M_2) + BnControls + e$

$Y = \beta_0 + \beta_1 X_4 + \beta_2M_2 + \beta_3 (X_4* M_2) + BnControls + e$

Table 4.9 Regression Results

Variable	**Coefficient (β)**	**p-value**	**Impact**
Intercept (β_0)	0.12	-	Baseline adoption level
Bank Infrastructure & Systems (X_1)	0.55	0.004	Positive and Significant
Bank Infrastructure × Market Development ($X_1 \times M_1$)	0.19	0.021	Enhances positive effect
Bank Knowledge & Readiness (X_2)	0.41	0.012	Positive and Significant
Bank Knowledge × Market Development ($X_2 \times M_1$)	0.15	0.033	Enhances positive effect
Regulatory Environment (X_3)	-1.18	0	Negative and Significant
Regulatory Environment × Market Development ($X_3 \times M_1$)	0.08	0.045	Slightly mitigates negative effect
Banking Sector Capacity (X_4)	0.67	0.006	Positive and Significant
Banking Sector Capacity × Mark Development ($X_4 \times M_1$)	0.2	0.017	Enhances positive effect
Market Development (M_1)	0.51	0.007	Positive and Significant
Bank Infrastructure × Risk Mitigation ($X_1 \times M_2$)	-0.12	0.038	Weakens positive effect
Bank Knowledge × Risk Mitigation ($X_2 \times M_2$)	-0.1	0.047	Weakens positive effect
Regulatory Environment × Risk Mitigation ($X_3 \times M_2$)	-0.25	0.009	Strengthens negative effect
Risk Mitigation (M_2)	-0.52	0.008	Negative and Significant

The regression results show varying impacts of the independent variables on the adoption of intangible assets as collateral. Bank Infrastructure and Systems (X_1) demonstrates a positive and significant impact ($\beta = 0.68$, $p = 0.002$), indicating that better infrastructure increases the likelihood of acceptance. Bank Knowledge and Readiness (X_2) also shows a positive and significant relationship ($\beta = 0.52$, $p = 0.009$), highlighting the importance of bank expertise in this area. Regulatory Environment (X_3) has the strongest impact, though negative ($\beta = -1.25$, $p < 0.001$), indicating that a weak regulatory framework significantly undermines the adoption of intangible assets as collateral. Banking Sector Capacity (X_4) shows a strong positive impact ($\beta = 0.79$, $p = 0.003$), suggesting that enhanced sector capacity could substantially improve acceptance.

Therefore, Y = 0.12 + 0.68X1 + 0.52X2 - 1.25X3 + 0.79X4 + 0.61M1 - 0.47M2 + (Interaction Terms) + e

The study further examined the mediating roles of Market Development (M1) and Risk Assessment and Mitigation Practices (M2) in influencing the adoption of intangible asset collateralization, in two models, each incorporating one of these mediators as shown below.

4.6.1 Market Development (M1) as a Moderating Variable

The findings reveal that Market Development (M1) enhances the positive impact of Bank Infrastructure (X1) and Bank Knowledge (X2) on adoption, reinforcing their significance. M_1 has a positive and significant effect on Y ($\beta = 0.51$, $p = 0.007$), meaning that the presence of a structured market for intangible assets improves their adoption as collateral.

Additionally, while the Regulatory Environment (X3) has a negative effect, (-1.18, $p < 0.001$), a well-developed market mitigates this impact, suggesting that a strong market can compensate for weak regulations. This suggests that even in weak regulatory environments, market mechanisms can improve the acceptance of intangible assets.

Bank Infrastructure (X_1) and Banking Sector Capacity (X_4) remain strong positive predictors of adoption, but their impact is enhanced further when Market Development (M_1) is higher. M_1 enhances the positive effects of bank infrastructure ($\beta = 0.19$, $p = 0.021$), bank knowledge ($\beta = 0.15$, $p = 0.033$), and banking sector capacity ($\beta = 0.2$, $p = 0.017$). This suggests that banks are more likely to accept intangible assets as collateral when a developed market exists to support valuation, transaction, and liquidation.

M_1 slightly mitigates the negative effect of regulatory constraints ($\beta = 0.08$, $p = 0.045$), implying that even in an unfavorable regulatory environment, a well-developed IP market can encourage banks to lend against intangible assets.

4.6.2 Risk Assessment and Mitigation Practices (M2) as a Moderating Variable

Risk Mitigation (M2) has a negative and significant effect on Y ($\beta = -0.52$, $p = 0.008$), moderates the effects of the independent variables differently. While Bank Infrastructure (X1) and Bank Knowledge (X2) remain significant, stricter risk assessment weakens their positive influence, indicating a trade-off between risk control and banking operations. Moreover, Regulatory Environment (X3) has a worsening effect when combined with strong risk mitigation, highlighting that excessive risk controls may amplify regulatory inefficiencies.

Although Banking Sector Capacity (X4) has a strong positive impact ($\beta = 0.67$, $p = 0.006$), risk mitigation weakens this effect ($X4 \times M2 = -0.14$, $p = 0.031$), suggesting that stringent risk policies can limit the sector's ability to support intangible asset collateralization. Additionally, the model exhibits strong explanatory power ($R^2 = 0.82$, F-test $p < 0.001$), indicating that the mediators play a crucial role in shaping banking sector outcomes related to intangible asset collateralization.

M_2 weakens the positive effects of bank infrastructure ($\beta = -0.12$, $p = 0.038$) and bank knowledge ($\beta = -0.1$, $p = 0.047$). This suggests that excessive risk-averse strategies limit the willingness of banks to engage in IP-backed lending, even when they have the necessary infrastructure and expertise.

Further, M_2 strengthens the negative effect of regulatory constraints ($\beta = -0.25$, $p = 0.009$), indicating that risk mitigation strategies amplify the challenges posed by weak regulations.

Risk Mitigation (M_2) has a negative impact (-0.52, $p = 0.008$), meaning that increased risk concerns reduce use. Moreover, the interaction effects indicate that stricter risk assessment procedures weaken the positive influence of Bank Infrastructure and Knowledge.

These findings emphasize the need for both a supportive regulatory framework and an active market for intangible assets to facilitate their use as collateral. Market Development (M_1) enhances the positive effects of the banking sector, while Risk Mitigation (M_2) weakens them.
Regulatory challenges remain the biggest obstacle (-1.18), but Market Development (M_1) slightly offsets this effect (0.08). Stronger banking capacity (X_4) boosts adoption (0.67), but its effectiveness is reduced when strict risk mitigation is in place (-0.14). To ensure the validity and reliability of these conclusions, comprehensive diagnostic tests were conducted on the regression models as detailed in the following section.

Final Regression Equation with Interaction Terms

$$Y = 0.12 + 0.55X1 + 0.41X2 - 1.18X3 + 0.67X4 + 0.51M1 - 0.52M2 + 0.19(X1*M1) + 0.15(X2*M1) + 0.08(X3*M1) + 0.20(X4*M1) - 0.12(X1*M2) - 0.10(X2*M2) - 0.25(X3*M2) - 0.14(X4*M2) + \epsilon$$

The analysis shows that Market Development (M_1) strengthens the positive impact of key banking sector factors (X_1, X_2, X_4), while Risk Mitigation (M_2) amplifies the negative effect of weak regulatory environments and reduces the positive effects of other variables.

These findings emphasize the need for both a supportive regulatory framework and an active market for intangible assets to facilitate their use as collateral. Market Development (M_1) enhances the positive effects of the banking sector, while Risk Mitigation (M_2) weakens them.

Regulatory challenges remain the biggest obstacle (-1.18), but Market Development (M_1) slightly offsets this effect (0.08). Stronger banking capacity (X_4) boosts adoption (0.67), but its effectiveness is reduced when strict risk mitigation is in place (-0.14).

4.6.3 Results Related to Moderating Variables

The study examined two key mediating variables: Market Development for Intangible Assets (M_1) and Risk Assessment and Mitigation Practices (M_2). Both mediators significantly influenced the relationship between the independent variables and the adoption of using intangible assets as collateral.

Market Development for Intangible Assets (M_1) demonstrated a positive and significant direct effect on adoption ($\beta = 0.51$, $p = 0.007$), indicating that a well-developed market for intangible assets substantially improves their acceptance as collateral by banks. More importantly, M_1 enhanced the positive effects of the independent variables: Bank Infrastructure (interaction term $\beta = 0.19$, $p = 0.021$), Bank Knowledge (interaction term $\beta = 0.15$, $p = 0.033$), and Banking Sector Capacity (interaction term $\beta = 0.20$, $p = 0.017$). This suggests that the presence of a structured market for valuing and trading intangible assets amplifies the benefits of bank infrastructure, knowledge, and capacity.

Notably, Market Development also slightly mitigated the negative effect of the Regulatory Environment (interaction term $\beta = 0.08$, $p = 0.045$), suggesting that even in unfavorable regulatory contexts, a well-developed market can partially offset regulatory constraints, providing an alternative pathway to facilitate intangible asset collateralization.

In contrast, Risk Assessment and Mitigation Practices (M_2) showed a negative and significant direct effect on adoption ($\beta = -0.52$, $p = 0.008$), indicating that stringent risk assessment procedures generally reduce banks' willingness to accept intangible assets as collateral. The interaction effects revealed that M_2 weakened the positive contributions of Bank Infrastructure (interaction term $\beta = -0.12$, $p = 0.038$) and Bank Knowledge (interaction term $\beta = -0.10$, $p = 0.047$), suggesting that risk-averse strategies can undermine the benefits of having appropriate infrastructure and expertise.

Most critically, Risk Assessment and Mitigation Practices strengthened the negative effect of regulatory constraints (interaction term $\beta = -0.25$, $p = 0.009$), demonstrating that conservative risk management approaches amplify the challenges posed by weak regulations. M_2 also weakened the positive effect of Banking Sector Capacity (interaction term $\beta = -0.14$, $p = 0.031$), indicating that excessive risk controls can limit the sector's ability to leverage its capacity for supporting intangible asset-based lending. These findings emphasize the dual nature of mediating factors in the banking sector's approach to intangible assets: while market development mechanisms can enhance the potential for acceptance, risk management practices often counteract these positive effects, particularly in environments with regulatory uncertainty.

4.6.4 Diagnostic Tests for Regression Models

Before interpreting the regression results, several diagnostic tests were conducted to ensure the validity of the regression models and adherence to key assumptions of multiple regression analysis.

Table 4.10: Summary of Regression Diagnostic Tests

Diagnostic Test	Test Statistic	p-value	Result	Interpretation

Multicollinearity (VIF)	1.24 - 3.87	-	Pass	No problematic multicollinearity (all VIF < 5)
Normality of Residuals (Shapiro-Wilk)	W = 0.974	0.218	Pass	Residuals are normally distributed
Homoscedasticity (Breusch-Pagan)	$\chi^2 = 5.34$	0.149	Pass	Constant variance of residuals
Linearity (RESET test)	F = 1.87	0.173	Pass	No significant non-linear relationships
Autocorrelation (Durbin-Watson)	d = 1.96	-	Pass	No significant autocorrelation
Influential Observations (Cook's Distance)	Max = 0.28	-	Pass	No unduly influential observations
Model Fit	$R^2 = 0.82$, Adj. $R^2 = 0.78$	-	Good	Strong explanatory power
Overall Model Significance	F = 27.34	<0.001	Significant	Model is valid and significant

The diagnostic tests confirmed that the regression models meet all key assumptions required for valid interpretation of the results. The absence of multicollinearity ensures that the individual effects of predictors are properly isolated. Normality and homoscedasticity of residuals validate the inference procedures used, while the linearity assessment confirms the appropriateness of the linear model specification. The absence of influential outliers and autocorrelation further strengthens confidence in the model's stability and reliability. The high R^2 value (0.82) demonstrates that the model explains a substantial proportion of the variance in the adoption of intangible assets as collateral.

Multicollinearity Test: To check whether the independent variables were too closely related to each other, a Variance Inflation Factor (VIF) analysis was done. All VIF values were below 5 (ranging from 1.24 to 3.87), meaning there was no serious multicollinearity problem. The highest VIF was for *Banking Sector Capacity* (3.87), and *Regulatory Environment* had a VIF of 3.12. While this shows some correlation between variables, it's not enough to affect the accuracy of the regression results.

Normality of Residuals: To confirm whether the residuals (errors from the regression) followed a normal distribution, the Shapiro-Wilk test was used. It returned a W value of 0.974 with a p-value of 0.218, which means the residuals are normally distributed. This was also visually supported by Q-Q plots and histograms, which looked reasonably normal without any major deviations.

Homoscedasticity Test: The Breusch-Pagan test was used to see if the variance of residuals was consistent across predicted values. With a p-value of 0.149, the test indicated that the variance was constant (homoscedasticity). This was also supported by plotting residuals against fitted values—no clear pattern emerged, which is what we want.

Linearity Assessment: To check if the relationship between independent variables and the outcome was linear, residual plots were examined. None of them showed a noticeable curve or trend, suggesting a linear model was appropriate. This was backed up by the RESET test ($p = 0.173$), which found no evidence of missing non-linear relationships.

Autocorrelation Test: The Durbin-Watson statistic was 1.96, which is within the acceptable range of 1.5 to 2.5. This means the residuals were not autocorrelated—that is, the errors are independent from one observation to the next.

Influential Observations: Cook's distance was used to detect any data points that might be exerting too much influence on the model. The highest value was 0.28, well below the threshold of 1.0, indicating that no observation had a disproportionate impact on the results.

Model Fit Statistics: The regression model performed well, with an R^2 of 0.82 and an adjusted R^2 of 0.78, showing that 78% of the variation in the dependent variable is explained by the model after accounting for the number of predictors. The F-statistic ($F = 27.34$, $p < 0.001$) confirmed that the model as a whole is statistically significant and provides a much better fit than a model with no predictors

4.7 Thematic Qualitative Analysis

This section presents a deductive thematic analysis of stakeholder views on the adoption of intangible assets as collateral in Kenya's banking sector. Guided by Information Asymmetry

Theory (Akerlof, 1970) and Agency Theory (Jensen & Meckling, 1976), the analysis is structured around predefined themes—namely Legal and Regulatory Challenges, Institutional and Market Infrastructure, Risk Perception, Government and Policy Incentives, and Awareness and Capacity Gaps. These themes were refined iteratively from empirical data, using direct participant quotes to illustrate how stakeholder experiences align with or diverge from theoretical expectations (Fereday & Muir-Cochrane, 2006; Braun & Clarke, 2006).

4.7.1 Legal and Regulatory Challenges

Consistent with Agency Theory's emphasis on contract enforcement and credible commitments, respondents overwhelmingly highlighted weak legal and judicial structures as a major deterrent to the acceptance of intangible assets as collateral. Information asymmetry further exacerbates this challenge, as lenders cannot predict whether courts will effectively enforce their claims.

Quantitative findings revealed that 55% of respondents stated that slow judicial processes render enforcement of intangible asset claims highly uncertain, while 49% emphasized the lack of clear repossession procedures.

Sample Responses:

Respondent 36 (Tier 1 bank official): "*The Movable Property Security Rights Act is there on paper, but implementation is a different story. If courts take three years to handle straightforward cases blocking the sale of land, how long would it take to resolve disputes over trademarks or patents?"*

Respondent 27 (Tier 3 bank official): "*If even land title disputes take years in court, how can we expect quick resolutions for intangible assets?"*

Respondent 8 (Tier 1 bank legal advisor): "We need a framework for repossessing and selling intangible assets like trademarks in case of default. Right now, there's no clear way to recover such assets if a borrower fails to pay."

Respondent 51 (Tier 2 bank executive): "*Without proper legal enforcement, we can't take the risk. If a borrower defaults, what's the legal process for taking over and selling their brand name or patent?"*

These reflections align with Agency Theory, illustrating how uncertainty in the judicial process weakens contractual safeguards between lenders and borrowers, thereby increasing agency costs and discouraging intangible asset financing.

4.7.2 Weak Institutional Support and Market Infrastructure

Information Asymmetry Theory posits that markets fail when there is insufficient information about the quality of assets. This was evident as respondents cited the absence of a centralized IP registry, lack of secondary markets, and low SME awareness, all of which undermine verification and valuation of IP assets.

According to the findings, 58% of risk managers emphasized difficulties in ownership verification due to the absence of a centralized registry, while 53% highlighted the lack of resale markets for IP, leading to reduced liquidity and perceived value.

Sample Responses:
Respondent 69 (Tier 1 bank risk manager*): "There needs to be a centralized registry for intellectual property-backed lending. As it stands now, we can't even verify if an SME truly owns the IP they claim to have."*

Respondent 15 (Tier 3 bank credit officer): *"Most biashara people don't even know they should register their brand names, so how do we lend against them?"*

Respondent 10 (Tier 2 bank official): *"There is no established secondary market for these assets. If a borrower defaults, where do we get a buyer for a repossessed brand name or patent in Kenya?"*

Respondent 43 (Tier 1 bank credit officer): *"We can't finance a business just because they have a famous name. If they close shop, who will buy their brand?"*

Respondent 17 (Tier 3 bank executive): *"We've seen banks in South Africa experimenting with this, but Kenya is not there yet."*

The absence of structured infrastructure reinforces the lemons problem (Akerlof, 1970), where low-quality assets dominate due to market failures, making lenders hesitant to accept intangible assets.

4.7.3 Risk Perception and Practicality of IP-Backed Lending

High risk perception was a dominant theme, tightly linked to both Information Asymmetry (uncertain valuation and future revenue from IP) and Agency Theory (difficulty in monitoring borrowers' behavior regarding intangible assets).

Survey data showed that 72% of respondents viewed intangible assets as high-risk compared to traditional tangible assets like land, citing exaggerated brand value claims and the volatility of IP markets.

Sample Responses:

Respondent 2 (Tier 1 bank credit manager): "*For big clients, we can accept things like receivables, but for SMEs, we still want security ya ukweli—land, logbooks, or fixed assets."*

Respondent 9 (Tier 2 bank official): "*Some startups exaggerate their brand value, and we have no regulatory safeguards to check this. One day, a business says their trademark is worth KSh 100 million, the next day, they shut down."*

Respondent 16 (Tier 3 bank official): *"Without proper credit scoring models for intangible assets, we can't approve such loans. We need a system that helps us separate genuine value from mere hype."*

Respondent 20 (Tier 3 bank loan officer): "*Huku Kenya, cash flow is king. If you can't show solid earnings, we can't give you credit, whether you have IP or not."*

These insights reveal that without standardized valuation frameworks and cash flow projections tied to IP, financial institutions view intangible assets as speculative, illiquid, and prone to rapid devaluation—thus intensifying lenders' reluctance.

4.7.4 Role of Government and Policy Incentives

Recognizing the heightened perceived risk, many respondents proposed government interventions to reduce agency costs and information gaps through guarantees, regulatory standards, and risk-sharing mechanisms.

Survey findings indicated that 59% of legal officers support government-backed loan guarantees, 54% advocate for structured IP valuation guidelines, and 49% endorse risk-sharing programs.

Sample Responses:

Respondent 77 (Tier 1 bank Legal officer): *"If the government could back IP-collateralized loans, more banks would participate. Without some form of guarantee, it's too risky."*

Respondent 64 (Tier 2 bank loan officer): "*The regulator should introduce a structured way of valuing IP, otherwise, banks will keep rejecting it."*

Respondent 18 (Tier 3 bank credit manager): "*If the government were to set up a financial risk-sharing program for IP-backed loans, we might consider it. But for now, the risk is just too high."*

Respondent 19 (Tier 2 bank Legal officer*): "The government should incentivize banks that take the risk of financing IP-backed loans, just like they did with agricultural lending."*

Respondent 13 (Tier 2 bank loan officer): "*If banks in other countries have developed mechanisms for IP lending, why can't we? We need to study what works and localize it."*

The suggestion for government risk absorption mirrors global best practices, where public-private partnerships have been critical in developing intangible asset financing ecosystems (e.g., Singapore's IP Financing Scheme).

4.7.5 Awareness and Capacity Gaps

Finally, the analysis identified critical human capital deficiencies within banks and SMEs alike, inhibiting the operationalization of IP-backed lending.

68% of respondents cited a lack of trained personnel capable of valuing IP assets, 56% pointed to the prohibitive cost of hiring IP valuation specialists, and 50% observed that SMEs remain largely unaware of how to register or leverage their IP.

Sample Responses:
Respondent 19 (Tier 3 bank SME loan officer): *"Most SMEs don't understand how IP works, making due diligence a nightmare."*

Respondent 21 (Tier 1 bank compliance officer): *"Even with legal reforms, we lack the expertise to evaluate intangible assets. Who will train us?"*

Respondent 38 (Tier 2 bank credit analyst): "*We have no trained staff to value IP, and hiring specialists is a cost the bank may not be willing to incur, with foreseeable return on investment*."

Respondent 3 (Tier 3 bank credit analyst): *"Public awareness is low—most SMEs don't even know about the MPSR Act."*

This theme reflects back to Information Asymmetry Theory, where lack of expertise perpetuates uncertainty around asset quality, discouraging banks from engaging in markets they cannot accurately assess.

4.7.6 Summary of Thematic Analysis

Across all themes, the findings reinforce the theoretical expectation that imperfect information (Akerlof, 1970) and high agency costs (Jensen & Meckling, 1976) critically impede the adoption of intangible assets as collateral.

In practice, unless systemic reforms—ranging from judicial efficiency to IP infrastructure and financial literacy—are implemented, banks are unlikely to embrace IP-backed lending at scale in Kenya's banking sector.

However, promising pathways such as government-backed loan guarantees, structured IP valuation frameworks, and capacity-building programs could bridge existing gaps, reduce perceived risks, and gradually shift banks' risk appetite toward the acceptance of intangible assets.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

5.1 Introduction

This chapter discusses the research findings on the potential adoption of intangible assets as collateral in Kenya's financial system. It contextualizes the findings within existing literature, highlighting their significance in relation to financial inclusion, bank lending practices, and SME growth. The study examines the impact of the Movable Property Security Rights (MPSR) Act (2017), addressing challenges, opportunities, and future policy considerations.

5.2 Summary of Findings

5.2.1 Correlation with Existing Literature; The study corroborates prior research indicating that banks in emerging economies remain reluctant to accept intangible assets as collateral due to valuation difficulties and enforcement challenges. Similar findings in South Africa (Ndung'u, 2021) and Nigeria (Akinyemi, 2022) highlight the necessity of structured valuation models and government-backed interventions.

These results reinforce the theory of information asymmetry (Akerlof, 1970; Stiglitz & Weiss, 1981), showing that borrowers have better knowledge of their intangible assets than lenders, making risk assessment difficult. As a result, banks remain reluctant to accept such assets as collateral. This aligns with Berger & Udell (1998), who emphasize that banks prefer tangible collateral due to established valuation frameworks and legal certainty. The study demonstrates that similar trends exist in Kenya, where lenders prioritize physical assets like land and machinery over intangibles due to valuation and enforceability concerns.

The findings further support Agency Theory (Jensen & Meckling, 1976) by highlighting the principal-agent problem between banks and borrowers. Lenders fear moral hazard and adverse selection, as borrowers may overvalue intangible assets or default in ways that are difficult to mitigate. This theoretical lens explains why even with legal frameworks in place, banks hesitate to rely on Intangible Assets as collateral without operational safeguards and monitoring systems.

Additionally, the findings Align with the Pecking Order Theory (Myers & Majluf, 1984), as the results demonstrate that SMEs in Kenya end up opting to use internal financing through savings, venture capital, and angel investors over bank loans due to the difficulty of securing debt against intangible assets. This supports findings by Sharma & Rao (2018) and Kaminska & Pankowska (2020), who argue that businesses with intangible-heavy models face financing constraints due to lenders' preference for tangible collateral

5.2.2 Challenging Traditional Credit Risk Assessment Models; The findings provide new findings into the limitations of conventional credit risk-based pricing assessment models, which emphasize easily valued and enforceable collateral. Intangible assets pose challenges due to valuation subjectivity, market volatility, and uncertain liquidity in default situations. This supports

arguments by Mann (2014) and Hochberg et al. (2014) that lenders hesitate to finance businesses reliant on intellectual property due to enforceability risks. These results should be considered when addressing how to design alternative risk assessment models that accommodate intangible assets.

5.2.3 Market Failure in SME Financing; The study contributes to a clearer understanding of how the reluctance of banks to accept intangible assets as collateral contributes to market failure in Kenya's SME financing ecosystem. The lack of access to credit for knowledge-based enterprises limits their growth potential and economic contribution. This aligns with Cosh et al. (2009) and the OECD (2015), who emphasize that inadequate credit access for startups and SMEs is a significant constraint in developing economies. Without regulatory interventions and financial innovations, intangible asset-backed lending will remain underutilized.

5.2.4 Divergences from Prior Research; Contrary to earlier assumptions (Maina, 2019) that legal frameworks alone can drive adoption, this study finds that institutional infrastructure and financial literacy significantly impact uptake. South African banks, despite engaging in IP financing, still struggle with valuation standardization, suggesting that legal provisions must be complemented by practical implementation mechanisms.

5.2.5 Unexpected Findings; While mainstream banks remain hesitant, some Tier 3 banks show openness to experimenting with alternative forms of collateral, particularly in fintech and creative industries. This suggests that niche financial institutions may pioneer the shift towards intangible asset-backed lending in Kenya.

5.3 Implications of the Study

This study builds on existing financial theories while highlighting gaps in traditional lending frameworks that limit the acceptance of intangible assets as collateral. The findings contribute to a clearer understanding of the challenges faced by both financial institutions and SMEs in leveraging intangible assets for credit access. These results should be considered when assessing how Kenyan banks can expand their lending frameworks to include intangible assets. Standardized valuation models are essential for reducing risk perceptions and increasing lender confidence. Learning from global best practices in the U.S. and the U.K., where intellectual property-backed

lending has gained traction, Kenyan banks can develop structured approaches to intangible asset valuation and enforceability.

Additionally, the data indicates the need for credit risk assessment models that integrate knowledge-based assets. Banks should train loan officers to evaluate intangible asset portfolios effectively and explore alternative risk mitigation mechanisms, such as insurance-backed lending models.

5.3.1 Implication for banks

The expansion of internet and mobile banking, the rise of fintech firms, and digital credit platforms present an opportunity for Kenyan banks to innovate their lending models. The fintech revolution has already transformed credit access in Kenya, with platforms like M-Shwari, Tala, and Branch utilizing alternative credit scoring algorithms to extend loans to individuals and SMEs without requiring physical collateral. These fintech and micro-lender models assess creditworthiness using: Mobile transaction history (e.g., M-Pesa records, airtime usage); social media activity and digital footprints; behavioral patterns, including repayment history on digital platforms.
By integrating big data analytics and AI-driven credit scoring, commercial banks can broaden access to financing for SMEs with intangible assets. Rather than relying solely on traditional balance sheets, banks can adopt fintech-style predictive models to assess the adoption of businesses based on intellectual property value, digital revenues, and brand strength.

These opens up room for the collaboration of Banks and Fintechs. To fully unlock the potential of intangible asset-backed lending, Kenyan banks could:

Partner with fintech firms to refine alternative credit assessment methods for SMEs with intangible-heavy business models.

Develop hybrid lending models that combine traditional banking approaches with algorithm-driven risk assessment used by micro-lenders.

Expand digital lending platforms that cater to businesses leveraging knowledge-based assets, reducing the over-reliance on tangible collateral.

By embracing Kenya's tech-driven financial ecosystem, banks can expand their lending capacity beyond traditional collateral models, fostering greater financial inclusion for knowledge-driven SMEs.

5.3.2 Implications for SMEs and Entrepreneurs

These findings highlight the need for SMEs in Kenya to adapt to the evolving financial landscape, where traditional collateral requirements are being supplemented by tech-driven credit assessment models. As banks, fintech firms, and micro-lenders increasingly rely on alternative data sources, digital financial footprints, and algorithm-based risk assessment, SMEs must take proactive steps to improve their creditworthiness and access financing.

One of the primary challenges SMEs face is the poor documentation and legal protection of their intangible assets. To align with emerging lending frameworks, businesses must prioritize the registration and valuation of intellectual property, trademarks, patents, and copyrights. Maintaining clear financial records and obtaining formal valuation reports for intangible assets will enhance their credibility when approaching lenders. Without structured documentation, SMEs will continue to struggle with risk perceptions among financial institutions, limiting their ability to secure funding.

Additionally, the increasing role of fintech lending models means that SMEs must enhance their digital financial footprints. Many digital lenders now assess creditworthiness based on mobile transaction histories, online payment records, and e-commerce performance rather than traditional collateral. To leverage these models, SMEs should adopt cashless payment systems, integrate their businesses with e-commerce platforms, and use accounting software to maintain transparent financial records. A strong digital presence and traceable financial transactions will significantly improve their chances of securing loans from fintech lenders.

Rather than relying solely on traditional banks, SMEs should also explore alternative financing options such as peer-to-peer (P2P) lending, microfinance institutions, and digital credit platforms. These lenders often use non-traditional credit scoring mechanisms, including social capital, business reputation, and transactional history, to assess loan eligibility. Engaging in structured group lending models—such as those successfully implemented by Kenya Women Microfinance Bank—can also provide access to financing without requiring physical collateral. By actively

participating in business networks and industry associations, SMEs can enhance their credibility and improve their chances of receiving financial support.

Furthermore, SMEs must recognize the importance of building strong business networks and creditworthiness. Many fintech lenders and digital credit platforms assess supplier and customer relationships, payment consistency, and overall business reputation when determining loan eligibility. SMEs that cultivate strong ties with their suppliers and maintain consistent transactional records will be in a better position to secure funding.

Finally, SMEs should play an active role in advocating for policy support and financial innovations that favor knowledge-based enterprises. Engaging with policymakers, banking associations, and fintech leaders to develop standardized valuation frameworks for intangible assets, expand SME-specific credit guarantee schemes, and promote collaborative financial solutions will help create a more inclusive lending environment.

By embracing digital financial tools, documenting their intangible assets, leveraging alternative lending platforms, and engaging in industry advocacy, SMEs can enhance their access to financing and take full advantage of Kenya's rapidly evolving tech-driven financial ecosystem.

5.3.3 Policy Implications.

For these gains to be fully realized, financial sector regulators—including the Central Bank of Kenya (CBK)—must develop clear guidelines for: Standardizing digital credit scoring for SMEs, integrating fintech innovations into mainstream banking regulations and ensuring consumer protection in algorithm-based lending to prevent predatory lending practices.

Additionally, the Central Bank of Kenya (CBK) should establish sector-specific valuation benchmarks, drawing lessons from developed economies where clear guidelines have enhanced lender confidence.

5.4 Limitations of the Study

One of the key challenges in this research was the lack of uniformity in how banks define, classify, and value intangible assets. This variability limited the comparability of findings across different

banks and made it difficult to develop a standardized framework for evaluating how banks perceive and utilize intangible collateral.

Additionally, several financial institutions were unwilling to disclose detailed loan portfolios, risk assessment models, and default rates for intangible asset-backed loans. As a result, the study had to rely on publicly available financial reports from the Central Bank of Kenya. This was coupled with some banks withholding detailed loan approval data, limiting case study depth.

The study specifically focused on Kenyan commercial banks which operate within a unique economic, regulatory, and institutional framework. Differences in credit infrastructure, legal enforcement mechanisms, and financial market sophistication could limit the direct applicability of the findings to other economies.

5.5 Recommendations

Policy Recommendations: Financial sector regulators, particularly the Central Bank of Kenya (CBK), must take the lead in developing policies that enhance the integration of intangible assets into lending frameworks. The following actions are recommended:

The CBK should collaborate with banks, financial analysts, and valuation experts to establish clear and consistent methods for valuing intangible assets. Standardized guidelines will reduce subjectivity in valuation, increase lender confidence, and encourage more banks to extend credit against intangible collateral.

Further**,** The Movable Property Security Rights Act (2017) should be reinforced to provide clearer legal protections for lenders using intangible assets as collateral. This includes streamlining the registration and enforceability of intellectual property rights in the collateral registry system.

Similarly, the government should implement credit guarantee schemes or insurance products to help banks manage risks when lending against intangible assets. These risk-sharing mechanisms would incentivize financial institutions to broaden their collateral acceptance criteria, promoting lending to knowledge-driven SMEs.

With the rapid expansion of fintech and algorithm-based lending, regulators must standardize digital credit assessment models to ensure fairness, accuracy, and consumer protection. This will prevent predatory lending practices and increase trust in tech-driven financial solutions.

5.5.2 Banking Sector Recommendations

Kenyan banks must adopt new lending models that integrate intangible assets and alternative credit assessment mechanisms. To achieve this, banks should train credit officers to properly assess and value intellectual property (IP), brand equity, patents, and digital assets. This will enable financial institutions to make informed lending decisions when dealing with knowledge-based businesses.

Banks should also incorporate non-traditional credit assessment indicators, including digital footprints, online transaction histories, and intellectual property recognition, to determine loan eligibility for SMEs lacking physical collateral. As well as collaborate with fintech firms and digital lenders will help banks refine their credit scoring algorithms, integrating big data analytics, AI-driven risk assessment, and behavioral lending models.

Additionally**,** banks should test IP-backed lending models in high-growth industries such as technology startups, creative industries, and software development before full-scale adoption. These sectors provide ideal test cases for intangible asset-backed financing models.

5.5.3 SME-Focused Recommendations

For SMEs to capitalize on the opportunities presented by the evolving credit market, they must enhance their financial and digital capabilities. The following steps are recommended:

SMEs should be educated on the value of intangible assets, the importance of IP registration, and how to leverage digital credit assessment models to improve their loan eligibility.

SMEs must formalize their intangible assets by registering patents, trademarks, and copyrights, ensuring that these assets are legally recognized and enforceable as collateral.

To increase their creditworthiness, SMEs should adopt cashless payment systems, maintain digital transaction records, and integrate their businesses with e-commerce and fintech platforms. These actions will boost transparency and enhance credit assessment by digital lenders.

SMEs should build strategic partnerships with venture capital firms, private equity investors, and banks to reduce perceived risks and enhance funding opportunities for businesses that rely on intangible assets.

5.5.4 Recommendations for Further Research

Given the evolving nature of intangible asset-backed lending, further research is needed to evaluate how microfinance institutions, venture capital firms, and private equity funds are leveraging intangible assets in their lending or investment decisions. Understanding their risk assessment approaches and financing models could offer alternative solutions for SMEs and startups that struggle to secure bank loans.

- Future studies should assess the effectiveness of legal and regulatory frameworks, such as the Movable Property Security Rights Act, in facilitating the use of intangible assets as collateral. This would help determine necessary policy refinements to enhance credit accessibility for businesses with intangible asset portfolios.

Moreover, research should investigate the impact of credit guarantee schemes, insurance-backed lending, and policy reforms on increasing bank participation in intangible asset lending possible by analyzing best practices from countries with well-developed IP financing frameworks, such as the United States and South Korea. Identifying the regulatory, institutional, and financial mechanisms that enable successful implementation can provide evidence-based recommendations for Kenya

Finally, a long-term study should be conducted to track how commercial banks in Kenya adapt to lending against intangible assets over time. This would provide insights into the evolution of policies, risk management strategies, and the factors influencing the slow or rapid uptake of such lending practices.

5.6 Conclusion

This study has provided key findings into the limited adoption of intangible assets as collateral in Kenya's financial sector. While the MPSR Act (2017) establishes a legal framework, practical challenges such as valuation difficulties, risk perception, and regulatory gaps hinder widespread implementation. By addressing these barriers, Kenya can unlock new financing opportunities for

startups and SMEs, fostering innovation and economic growth. Further research and policy implementation will be critical in integrating intangible assets into Kenya's credit market.

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APPENDICES

Appendix I: Letter of Introduction

Study Title: Factors influencing the use of intangible assets as collateral in debt financing by the banking sector in Kenya.

Principal Investigator: Faith Lilian Wambui, a student from Strathmore University. Strathmore University is an academic and research institution in Kenya.

What is the purpose of the Study?

I am conducting a study to explore the factors influencing the use of intangible assets as collateral in bank financed loan facilities in Kenya. Intangible assets, such as intellectual property, brand value, and organizational culture, are increasingly recognized as valuable components of a company's asset base. However, their use as collateral remains underexplored and often misunderstood. This study aims to identify the barriers and enablers in the acceptance of these assets as collateral, assess the awareness and knowledge levels among credit appraisers, and understand the valuation methods employed by banks.

What Are We Requesting from You? We are requesting your participation in this study to share your knowledge and experiences regarding the use of intangible assets as collateral within your organization. Your responses will provide valuable information on current practices, challenges, and opportunities in this area.

Benefits of the Study: The findings of this study will help provide knowledge that can help enhance the utilization of intangible assets in financial lending, potentially broadening access to credit for businesses enhancing business performance and contributing to the overall economic

growth. **Risks**: We do not anticipate any significant risks associated with your participation in this study beyond the time required to answer the questions.

Confidentiality: The information collected will be stored securely and will be accessible only to the principal investigator. All data will be anonymized to protect your identity and the results used solely for research purposes and will not be shared with anyone outside the research team.

Voluntary Participation: Your participation in this study is entirely voluntary. You are free to withdraw from the study at any time without any negative consequences. Please feel free to ask any questions you may have about the study.

If you agree to participate, please sign this document to confirm that you have understood the purpose of the study and consent to participate.

Informed Consent Agreement

I, ……., (Name) agree to participate in this study. I understand the purpose of the study as explained to me, and I have had the opportunity to ask questions, which have been answered satisfactorily. I am aware that I can withdraw from the study at any time without any negative consequences.

Principal Investigator: Faith Machira

MPPM Student; Strathmore university

Telephone: 0721 868 126.

Email: faith.machira@strathmore.edu.com

Appendix II: Demographic Information

SOCIO-DEMOGRAPHIC CHARACTERISTICS			
No	Question	Response	Code
1	Gender	F=1 M=2	
2	Age	Under 30 30-39 40-49 50-59	
3	Education Level	Diploma or Professional certifications Bachelor's degree Master's degree Doctorate	
4	Years of Experience	Less than 5 years 5-10 years 11-15 years 16-20 years Over 20 years	
5	Job Title	Branch loan officers Credit analyst Loan approver Legal advisor Sales agent Valuer other	
6	Experience with Intangible Asset	Yes No	
7	Awareness and Understanding of Intangible Assets	Low awareness = 1 Moderate awareness=2 High awareness=3	

Appendix III:

Research questionnaire/interview guide

Introduction.

I am Faith Machira from Strathmore Business School pursuing a Master's in Public policy and management. We are undertaking a study to understand the factors that influence the use of intangible assets as collateral in debt financing by banks in Kenya. We would like to thank you for agreeing to participate in this discussion and would encourage you to speak honestly and freely on the issues to be discussed. Your perceptions will help us have a better understanding of issues affecting the access to credit by those without tangible collateral and what can be done to mitigate these issues.

Background

1. Can you please tell me more about yourself, when you started working at this bank, which other banks have you worked in, which departments have you worked in, how long have you been working here?
2. How would you describe the current trends and attitudes towards using intangible assets as collateral in your bank?

Survey on Determinants Influencing the Adoption of Intangible Assets as Collateral in Kenya's Banking Sector

1. **Section A1: Adoption of Intangible Assets as Collateral**

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Our bank has accepted intangible assets as collateral in the past 3 years					
Our credit officers consider intangible assets when assessing loan applications					
Our current lending policies actively promote the use of intangible assets					
We have processed loans secured primarily by patents, trademarks, or software					
Our risk team has procedures to review and approve intangible asset-backed loans					

2. Please rate your level of agreement with the following statements about your bank's approach to intangible assets as collateral:

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Our lending policy clearly addresses the use of intangible assets as collateral					
Our bank has clear criteria for evaluating intangible assets as collateral					
Our bank considers intangible assets to be high-risk collateral					
Our bank has effective systems to monitor the value of intangible assets over loan life					
Our bank has recently reviewed policies related to intangible assets as collateral					

3. In your opinion, what are the most significant risks when considering intangible assets as collateral? Please rate each risk factor:

Risk Factor	Very Low Risk (1)	Low Risk (2)	Moderate Risk (3)	High Risk (4)	Very High Risk (5)
Valuation uncertainty					
Legal enforceability					
Market liquidity					
Value volatility					
Documentation challenges					

SECTION B: REGULATORY AND LEGISLATIVE FRAMEWORK

4. Please rate your level of agreement with the following statements about the regulatory environment:

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
The current regulatory framework adequately supports the use of intangible assets as collateral					
The Movable Property Security Rights Act has improved the adoption of intangible assets as collateral					
Legal uncertainties present significant challenges to accepting intangible assets					
Regulatory changes frequently impact our willingness to accept intangible assets					
Current legislation provides clear enforcement mechanisms for intangible asset claims					

5. How would you rate the effectiveness of existing laws in supporting the following aspects of intangible asset-based lending?

Aspect	**Very Ineffective (1)**	**Ineffective (2)**	**Neutral (3)**	**Effective (4)**	**Very Effective (5)**
Registration of intangible assets					
Valuation guidelines					
Enforcement of claims					
Dispute resolution					
Secondary market development					

SECTION C: KNOWLEDGE AND READINESS

6. How would you rate your bank's familiarity with different types of intangible assets?

Type of Intangible Asset	**Not Familiar (1)**	**Slightly Familiar (2)**	**Moderately Familiar (3)**	**Very Familiar (4)**	**Extremely Familiar (5)**
Patents					
Trademarks					
Copyrights					
Software					
Goodwill					
Customer databases					
Receivables					

7. Please rate your level of agreement with the following statements about your bank's capacity:

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Our staff has received specific training on evaluating intangible assets					
Our bank has expertise in enforcing claims on intangible assets					
Our bank can accurately value different types of intangible assets					
Our bank is prepared to handle defaults involving intangible assets					
Our risk assessment processes adequately address intangible assets					

8. How would you rate your bank's readiness level in the following areas related to intangible asset collateralization?

Area	Not Ready (1)	Somewhat Ready (2)	Moderately Ready (3)	Very Ready (4)	Completely Ready (5)
Technical valuation capabilities					
Legal expertise					
Policy frameworks					
Monitoring systems					
Staff knowledge					

SECTION D: POLICY, CAPACITY, AND INFRASTRUCTURE NEEDS

9. Please rate the importance of the following policy changes for encouraging intangible asset collateralization:

Policy Change	**Not Important (1)**	**Somewhat Important (2)**	**Moderately Important (3)**	**Very Important (4)**	**Extremely Important (5)**
Clearer legal definitions					
Standardized valuation guidelines					
Tax incentives					
Risk-sharing mechanisms					
Regulatory sandboxes for innovation					

10. How important are the following infrastructure developments for enhancing intangible asset collateralization?

Infrastructure Development	**Not Important (1)**	**Somewhat Important (2)**	**Moderately Important (3)**	**Very Important (4)**	**Extremely Important (5)**
Central registry for intangible assets					
Digital valuation platforms					
Secondary markets for intangible assets					
Digital verification systems					
Industry-specific valuation benchmarks					

11. Please rate your level of agreement with the following statements about market development:

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
A developed market for intangible assets would improve their acceptance as collateral					
Risk mitigation strategies would enhance the adoption of intangible assets as collateral					
Market development is more important than regulatory reform					
Banks need to innovate their risk assessment models for intangible assets					
Fintech solutions could improve intangible asset valuation					

SECTION E: OPEN-ENDED QUESTIONS

12. Could you describe a recent scenario where your bank either accepted or rejected an intangible asset as collateral? What influenced that decision?

13. What specific legal or regulatory challenges has your bank encountered when trying to accept intangible assets as collateral?

14. What capacity-building efforts would be necessary within your bank to improve the evaluation and management of intangible assets as collateral?

15. In your opinion, what are the most important factors to develop a more supportive ecosystem for the use of intangible assets as collateral in the Kenyan financial sector?

16. Can you describe a specific instance where a borrower proposed using intangible assets as collateral, and how the bank approached this request? Were there any particular concerns or barriers to proceeding?

Appendix IV: Research Budget

Components	**Unit of Measure**	**Duration/ Number**	**Unit Cost (Kshs)**	**Total Cost (Kshs)**
Personnel				
Research assistant	3	20 days	2,000	120,000
Printing				
Consent Form	1	2	50	100
Final Report	1	120	10	1,200
Photocopying				

Consent Form	1	90	5	450
Final Report	3	360	10	3,600
Final Report Binding	1	4	500	2,000
Other costs				
ERC-Fees/Nacosti permit	1	1	1,000	1,000
Digital recorder	1	1	5,000	5,000
Total				**133,350**

Appendix V: List of Banks

TIER 1

1 Kenya Commercial Banks

2 Equity Bank

3 NCBA

4 Cooperative Bank of Kenya

TIER 2

1 STANBIC

2 I&M

3 Family Bank

4 DTB

5 National Bank of Kenya

TIER 3

1 Kingdom Bank

2 Consolidated Bank of Kenya

3 Credit Bank

4 ABC Bank

5 Sidian Bank

6 Middle East Bank

Appendix VI: Ethical Approval

Strathmore UNIVERSITY

9th December 2024

Mrs Machira Faith,
faith.machira@strathmore.edu

Dear Mrs Machira,

RE: Assessment of the Viability of Using Intangible Assets as Collateral by the Banking Sector in Kenya

This is to inform you that SU-ISERC has reviewed and **approved** your above SU-masters proposal. Your application reference number is **SU-ISERC2448/24.** The approval period is from **9th December 2024 to 8th December 2025.**

This approval is subject to compliance with the following requirements:

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

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

Yours sincerely,

Mr Ambrose Rachier,
Chairperson; SU-ISERC

Appendix VII: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 227291

Date of Issue: 06/January/2025

RESEARCH LICENSE

This is to Certify that Ms.. Faith Wambui Lilian of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: Assessment of the Viability of Using Intangible Assets as Collateral by the Banking Sector in Kenya for the period ending : 06/January/2026.

License No: NACOSTI/P/25/414810

227291

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditions