THE EFFECT OF CREDIT RISK MANAGEMENT ON LOAN PORTFOLIO QUALITY: EVIDENCE FROM STATE-OWNED DEVELOPMENT FINANCE INSTITUTIONS IN KENYA

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

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Approval

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ABSTRACT

Development Finance Institutions (DFIs) are crucial for economic growth by providing long-term funding, but they have been struggling with poor loan portfolio quality, threatening the sustainability of their financing operations. This study aimed to examine the impact of credit risk management on loan portfolio quality, focusing on loan and credit risk identification, credit risk control, moral hazard behavior, and loan size. An explanatory research design was used, incorporating primary data from semi-structured questionnaires. The sample included credit/investment officers and managers from selected state-owned DFIs, targeting nine respondents from each of the thirteen DFIs, and data analysis utilized descriptive statistics and logistic regression, with model data reduction via diagnostic tests. The findings uncovered that loan size had a positive and significant effect while moral hazard had a negative and significant effect on the loan portfolio quality in state owned DFIs. Credit risk identification and credit risk control were found to have an insignificant effect on loan portfolio quality of state-owned development finance institutions in Kenya. Additionally, DFIs that are regulated were also found to have better loan portfolio qualities compared to those that were not regulated by CBK. The study recommends that state-owned DFIs should increase loan amounts by mobilizing additional resources for lending, expanding collateral options, and building long-term relationships with responsible borrowers. It also advises mitigating financial losses from moral hazard behavior through robust credit risk assessment and mitigation processes, including thorough due diligence, borrower track record evaluation, and advanced risk assessment models. These measures will help financial policymakers and practitioners achieve growth and sustainability of DFIs, and ensure development finance practitioners remain accountable given their limited resources.

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LIST OF ABBREVIATIONS

AFC - Agricultural Finance Corporation

ADC -Agricultural Development Corporation

AADFI - Association of African Development Finance Institutions

CBK - Central Bank of Kenya

CMA - Capital Markets Authority

CRB - Credit Reference Bureau

DBK -Development Bank of Kenya

DFCK - Development Finance Company of Kenya

DFI - Development Finance Institution

ICDC - Industrial and Commercial Development Corporation

IDB - Industrial Development Bank

IRA - Insurance Regulatory Authority

KES - Kenya Shillings

KIE - Kenya Industrial Estates

KTDC - Kenya Tourist Development Corporation

MFI - Micro Finance Institution

NACOSTI -National Commission for Science, Technology & Innovation

NPL - Non-performing loan

RBA - Retirement Benefits Authority

SACCO - Savings and Credit Co-operative

SASRA - Sacco Societies Regulatory Authority

SME - Small and Medium Enterprises

TFC - Tourism Finance Corporation

DEFINTION OF TERMS

Credit Risk	Refers to the potential of financial loss to a lender due to a borrower's failure to repay a loan advanced or meet the related contractual obligations. (Al Zaidanin & Al Zaidanin, 2021).
Credit Risk Identification	Refers to the processes and procedures undertaken by lenders to identify the inherent credit risks in a lending transaction (Pradhan & Shah, 2019).
Credit Risk Control	Refers to mechanisms employed by lenders to mitigate the chances of financial loss resulting from a borrower's failure to meet their loan obligations (Ahmed & Malik, 2015).
Loan Portfolio Quality	Refers to the overall performance and health of a financial institution's loan portfolio considering the level of NPLs. High level of NPLs signify a low loan portfolio quality (Laryea, Ntow-Gyamfi, & Alu, 2016).
Loan Size	Refers to the amount of loan advanced to a borrowing entity (Sangwan & Nayak, 2021).
Moral Hazard	Refers to the tendency of borrowers taking on higher risks or acting irresponsibly when they believe they are absolved from the full consequences of their actions (Mishkin, 1991).
State Owned DFI	Refers to an institution with a mandate of offering loans and its shareholding majority owned by the Government of Kenya (Kenya Institute of Public Policy Research and Analysis, 2006).

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Background of the Study

The financial services industry in Kenya consists of commercial and mortgage banks, institutions, microfinance institutions and Savings and Credit Co-operatives (SACCOs). It also includes financial markets infrastructure providers and non-bank financial institutions such as insurance companies, pension companies, stock exchange, and Development Finance Institutions (DFIs), (Central Bank of Kenya, 2019). After attaining its independence, Kenya initiated plans that were aimed at furthering economic development. Part of the plans included the formation of DFIs mandated to stimulate growth in the various sectors of the economy. In fulfilling their development objective, DFIs are able to offer loan repayment periods and interest rates that might be unattractive to other financial providers. Additionally, DFIs provide financing to institutions that might be considered too risky or unprofitable for other financial providers. This therefore, exposes DFIs credit risks that necessitate the development implementation of appropriate mechanisms to manage the associated credit risks (Wójtowicz , 2018).

Management of credit risk has grown to be a critical activity by which an organization implements strategies aimed at reducing or eliminating the risk of loan non-payment by a counterparty (Gichuhi and Omagwa, 2020). Avoiding the risk, accepting partial or total outcome of a certain risk, passing on the risk to another entity and reducing the adverse effects of a particular risk are some of the strategies employed by organizations to address any potential risks (Greuning & Bratanovic, 2009). Literature by Sharifi, Haldar and Rao (2019) states that identification of credit risk has a modulating effect on the lender's asset quality as measured by growth in non-performing loans (NPLs). High NPLs are mostly blamed for banks collapse which may sometimes have a systemic effect on the whole financial services industry leading to a financial crisis (Reinhart & Rogoff, 2011).

According to Agarwala and Agarwala (2019), high NPLs restricts credit creation and credit growth as a result of the depletion of capital allocated for lending through loan loss provisions and write offs (Fiador et al., 2020;Piatti & Cincinelli, 2019). High NPLs coupled with inadequate recovery measures deprives the productive sectors their much-needed credit leading

to an economic slowdown (Thomas & Vyas, 2018). Additionally, DFIs may be at a risk of collapse when their borrowers fail to repay the loans advanced to them (Mutunga, 2019).

1.1.1 Loan Portfolio Quality by DFIs

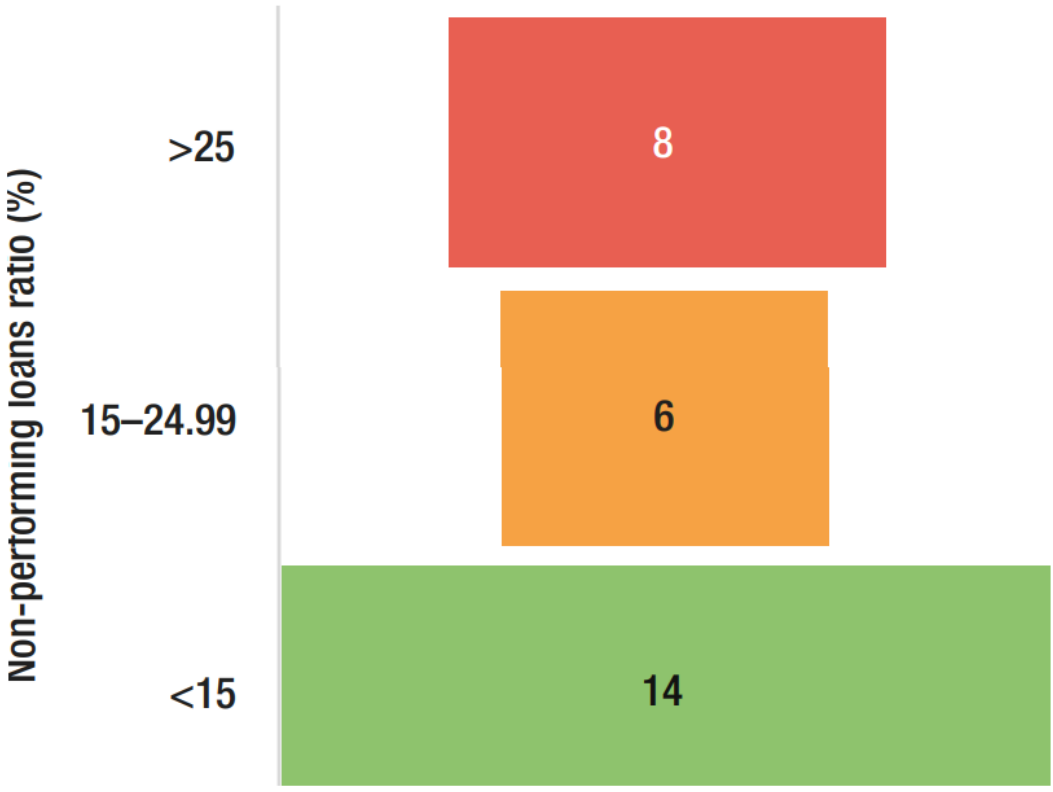
Loan portfolio is the full distribution of the kinds of loans that an institution can provide to a body either as an individual or corporate institution (Shim, 2019). Loan portfolio quality refers to the amount of loan that is due but yet to be paid compared to the total loan book as measured by the ratio NPLs to the total outstanding loans. NPLs are loans whose repayments have been outstanding for a period exceeding ninety days and does not generate any revenue to the lender (Laryea, Ntow-Gyamfi, & Alu, 2016). It can also be referred to as the loan repayment performance of clients with outstanding loans (Fersi & Boujelbène, 2021). NPLs have been used to determine the quality of loan portfolio in banks and other lending institutions (Ozili, 2019). Many of the past studies have grouped the determinants of NPLs into macroeconomic (external) and microeconomic (internal) (Fiador & Sarpong-Kumankoma, 2020; Laryea et al., 2016).

Banks with significant government shareholding have been reported to have poorer loan qualities and a higher risk of failure as compared to mutually owned and privately-owned banks (Iannotta, Nocera & Sironi, 2007). A Deterioration of a lenders loan book quality may have implications such as high loan loss provisions which reduce profitability and erode a lenders capital. Additionally, a deteriorating loan book quality reduces expected cash flows which may negatively affect a lender's operations. Other studies have also demonstrated the ability of the NPLs in adversely affecting the going concern of a financial institution (Arhin, Issifu, Akyeampong& Opoku, 2019).

In a survey conducted by Ferrari, Mare and Skamnelos (2017) on state owned DFI's operating in Europe and Central Asia between 2011 to 2015, it was averred that the NPL ratio increased significantly during the period under review. The increase in NPL's in state owned DFI's was correlated to an increase in NPL's within the state-owned commercial banks and are both attributed to their direct lending operations. Ferrari et al. (2017) however cautioned that the definition of NPLs vary across and within countries especially if the state owned DFIs are not under a similar regulatory framework as the one applied to other banking institutions. Another survey by the World Bank Group (2018) reported that over 50% of the DFIs surveyed had weaker asset qualities relative to the prevailing banking average in their country of operation.

United Nations Economic Commission for Africa, (2022) and Overseas Development Institute, (2021) both analysed the loan portfolio qualities among state owned DFIs in Africa and both agree that the state owned DFIs have a challenge of poor loan portfolio qualities. Using the Overseas Development Institute, (2021) used the Prudential Standards, Guidelines and Rating System by the Association of African Development Finance Institutions (AADFI) in their analysis which reported that 50% of the state owned DFIs had NPL percentages in excess of than 15%.

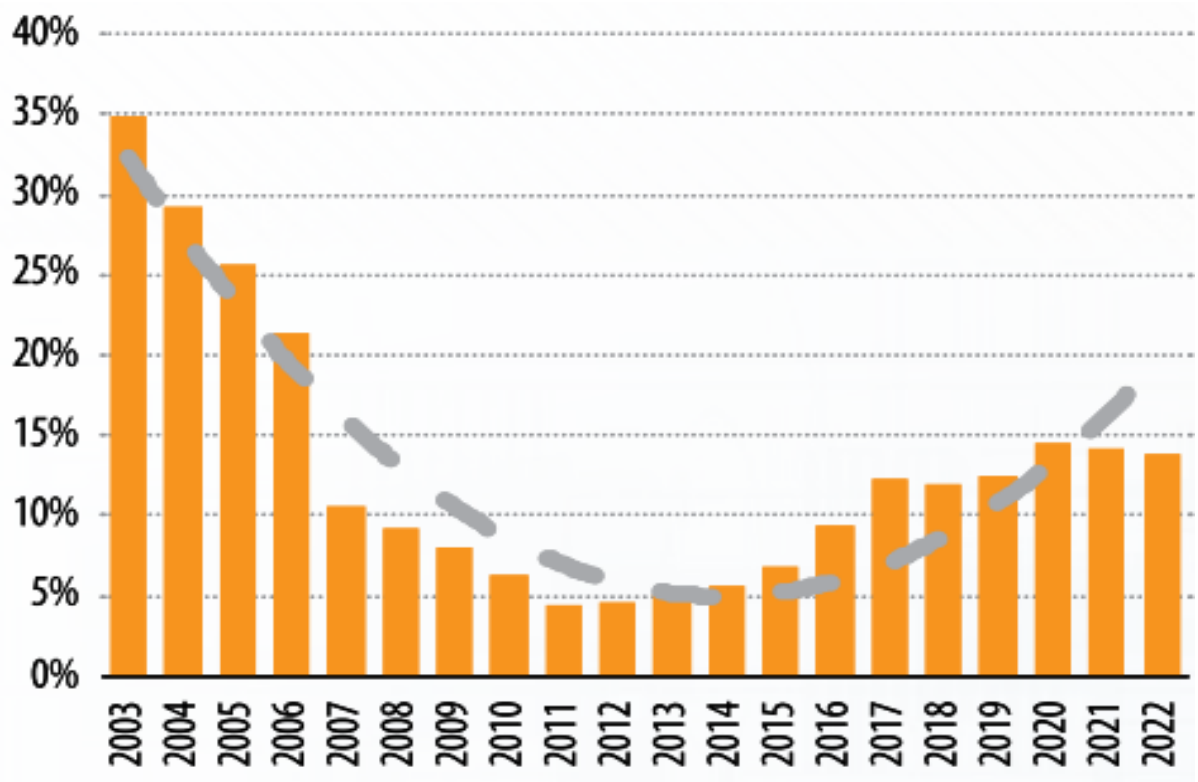
Figure 2. 1Non-performing loan ratio of State Owned DFIs in Africa from 2014-2019



Source: Overseas Development Institute, (2021)

Commercial banks in Kenya have been witnessing a deterioration of their asset quality. This is evidenced from the increase in the banking sector non-performing loan ratio (NPL's) which is a ratio of the gross NPL's to gross loans. As of December 2020, banking sector NPL ratio stood at 14%, a considerable increase from the lows experienced around 2011 -2021 (Central Bank of Kenya, 2021). Kenya Bankers Asscociation , (2023) in its State of The Banking Industry Report noted a gradual rise in the growth of non performing loans in Kenya;s banking industry as elaborated in Figure 2.2 below.

Figure 2. 2 Non-performing loan ratios of Commercial Banks in Kenya from 2003-2022



Source: Kenya Bankers Asscociation , (2023)

High NPLs are a major risk factor as they are mostly blamed for banks collapse (Laryea et al., 2016) which may sometimes have a systemic effect on the whole industry leading to a financial crisis (Reinhart & Rogoff, 2011). According to Fiador et al.(2020) and Piatti and Cincinelli (2019), high NPL also call for increased loan loss provisions which depletes the amount of capital available for lending thereby restricting credit creation. It therefore critically important for financial institutions to develop systems and measures aimed at reducing NPL's through identification of credit risk (Campanella, Gangi, Mustilli, & Serino, 2020).

Studies have had contradictory findings regarding the management of credit risk among privately and publicly owned lending institutions. Khatun and Saadat (2019) and Asfaw et al. (2016) avered that DFIs had the worst loan portfolio qualities in comparison with banks whereas Ferrari et al. (2017) found no difference in the loan portfolio qualities among the DFIs and commercial banks. This study aims to bridge the research gap by providing insights on the loan portfolio qualities among state owned DFI's in Kenya.

1.1.2 Credit Risk Management

Credit risk management refers to management plans by lenders for calculated chance that a body lent finances will not return or will default in payment of the loan principle plus interest (Al Zaidanin& Al Zaidanin, 2021). Credit risk management is a critical element in the operations of a financial system as it aids in reducing the probability of default by borrowers and pre-empt the occurrence of NPLs (Laryea et al., 2016). Proper credit risk management practices are crucial to the stability of the financial system. It is even more crucial for lenders whose capital base is constrained to a point that additional NPLs could make the lender collapse. Abiola and Olausi (2014) recommended the establishment of credit departments staffed with properly selected, trained and remunerated personnel who are guided by a clear loan policy.

The credit policy provides a guideline on evaluating a borrower's creditworthiness, methods of recovering the moneys advanced to the borrowers and loan durations (Goc & Ek, 2019). The credit policy dictates the type of sectors a lender can finance, the limits of credit exposure and the type of loan products offered. Financial Institutions also rely on their credit policies in pricing of their credit facilities while at the same time taking into consideration the cost of funding, including write offs arising from bad loans (Ngumi, 2015). It is imperative that financial institutions realize the importance of credit risk and initiate actions aimed at identifying and avoiding events that could negatively affect its operations (Rehman, Muhammad, Sarwar, & Raz, 2019).

Management of credit risk has been regarded as one of the crucial success factors in any organization engaged in debt transactions. The activities include identifying risks that the organization is exposed to and instituting various actions to mitigate the risks. This involves conducting a credit risk identification process to appraise the creditworthiness of a prospective borrower and estimating their probability of default (Ibtissem & Bouri, 2013).

Wójtowicz (2018) categorized the credit risk management process into two namely credit risk identification and evaluation and; credit risk control. Credit risk identification and evaluation involves the use of risk rating models to analyse and price the for inherent credit risks while credit risk control involves the use of pricing, monitoring and implementation mechanisms to manage the identified risks. Kariuki (2017) recommended lending organizations to implement stringent credit appraisal and mitigation processes in addition to monitoring techniques to avoid the negative effects brought about by non-repayment of disbursed amounts.

In Kenya, according to AFC's strategic plan for the period 2018-2022, a poor loan portfolio quality was listed as one of their weak points (Agricultural Finance Corporation, 2018). This was attributed to inadequate loan recovery mechanisms and the absence of a debt management system. As at March 2018, 43% of AFC's loan book had overdue loan repayments that were outstanding for more than a year with 35% of the total loan book considered unrecoverable. Part of AFCs strategy to manage the NPLs include increasing their lending to medium sized to large scale farmers and SMEs as they have previously demonstrated better loan repayment performance. AFC witnessed a deteriorating loan portfolio quality during the period 2015-2019 where the ratio of NPLs to Total Assets increased from 51.2% to 67.1% (Chege, 2021). The case study on the effect of credit risk management on loan default at AFC confirmed the possibility of managing loan defaults through the use of the credit risk management techniques. All studies referenced above do not provide an insight on the credit risk management in the context of lending institutions based in Kenya except the studies from Kariuki (2017) and Chege, (2021). Kariuki (2017) based was study on deposit taking SACCO's and whereas Chege, (2021) was based on a state owned DFI, it only focused on one DFI, AFC. This study adds value by providing insights credit risk management in AFC and other stated owned DFIs in Kenya.

1.1.2.1 Credit Risk Identification

Credit risk identification refers to assessment of credit facility based on credit history, repayment capacity, available capital, terms and conditions as well as definable collateral by the debtor (Pradhan & Shah, 2019). The risk identification process includes reviewing the borrower's past records and analytically assessing the feasibility and viability of the investment. The process is meant to address the challenge of adverse selection experienced by lenders arising from the information asymmetry between them and the prospective borrowers. Credit risk identification involves both quantitative and qualitative analyses to establish among others the character and repayment capacity of a prospective borrower (Wójtowicz , 2018). The quantitative analyses include a review of historical books of accounts and previous loan repayments. The qualitative analyses include a review of market trend projections, industry and management specific insights or any other information that might infer a borrower's repayment capacity. In the analyses, a credit offer's training and experience is critical in the qualitative analysis of credit risk while quantitative analysis depended on the statistical and analytical models to adequately assess the credit risk.

Credit officers play an integral role in the management of credit risk as they are in responsible for lead generation, credit appraisal, credit monitoring and collection (Mori, Richard, & Swai, 2019). The evaluation also includes a determination of the financial need of the customer to avoid underfinancing or over financing by the lender. Underfinancing or over financing a borrower has a propensity to increase NPLs as it makes the borrower more likely to divert the loan proceeds (Geitangi, 2015).

Additionally, there exists research gaps on the effectiveness of the credit risk management strategies among the different lending institutions. Gichuhi and Omagwa (2020) reported a positive and significant effect of credit appraisal on the loan portfolio performance contradicting with Muthoni, Mwangi and Muathe (2020) who reported no correlation between credit appraisal and the loan portfolio performance. Campanella et al. (2020) also did not find any correlation between the credit risk identification criteria and the level of NPLs.

1.1.2.2 Credit Risk Control

This includes conducting site visits and requesting for banking and financial records from the borrower. It also includes conducting stress tests, periodic performance reviews on the borrowers and staff training on the recovery and management of NPLs (Thomas & Vyas, 2018). Post disbursement, lenders are required to undertake monitoring and other credit administrative actions with the aim of ensuring compliance with the loan covenants (Oo, 2019). Monitoring plays a critical role in the management of development loans as the loan disbursements are made progressively and more so if the milestones are completed to the lender's satisfaction (Ghent & Rossen, 2016).

According to Kizza and Muduwa (2019), the survival of financial institutions mainly depends on the income generated through provision of credit facilities. Kizza and Muduwa (2019) added that in this process, lending institutions are at a risk of loss through bad loans which has to be managed if the institutions are to survive and ensure sustained growth. Kenya has had a history of some banks collapsing as result of poor loan appraisal and monitoring techniques. Some of the banks approved and disbursed loans out of political pressure thereby disregarding the credit evaluation process and inadequate or absence of security for the borrowing (Odawo, Makokha, & Namusonge, 2019). Other banks experienced loan defaults due to among others, levying exorbitant interest rates, related party lending and coercion of staff with the aim of expediting the credit appraisal process (Gathaiya, 2017). To achieve success, financial institutions need to implement systems of identifying any inherent risks and developing action plans to mitigate

the risks (Odawo et al., 2019). This is in addition to having a diversified loan portfolio (Wu & Wu, 2021).

Kofi Akwaa-Sekyi & Gené, (2016) reported that credit risk controls have a positive and significant effect on the loan portfolio quality. Their study differed with (Kim, Song, & Zhang, 2011) who found no correlation between the controls and credit risk. Kofi..et al, (2016)based their study on Spanish banks whereas Kim..et al, (2011) studied China's A share listed companies. This study aims to bridge the research gap on the context of state owned DFI's in Kenya

1.1.3 Moral Hazard Behaviour

Moral hazard in financial terms refers to the state in which one party in an agreement has more information than the other while being protected by the prevailing laws from liability thus making it difficult to be held accountable (Rathbun, Powers & Anders, 2019). Moral hazard behaviour in the provision of credit occurs after a loan has been disbursed to a borrower and thereafter the borrower undertakes activities that the lender may consider immoral since they may increase the likelihood of the borrower defaulting on the loan (Mishkin, 1991). After disbursement of the loan, the borrower is often with a higher level for information compared to the lender. Arising from the uneven level information between the lender and the borrower, the borrower may opt to undertake actions regarded as moral hazards to the disadvantage of the lender. The situation arises where after a transaction is undertaken between two parties, one party makes decisions that are unfavourable to the counterparty as a result of the uneven level of information between the transacting parties.

Involvement of Government in the provision of credit to individuals and businesses often has a risk of encountering moral hazard behaviour on the part of the borrowers. Such behaviour includes the diversion of loan proceeds to cost items not previously approved at the time of loan appraisal. Borrowers may also choose not to remit the loan repayment back to the lender even in cases when the investments are posting positive cash flows (Dobbie & Skiba, 2013). This often leads to a deterioration of the loan portfolio quality, increase in loan loss provisions and subsequent write-offs if the loans become unrecoverable. Being taxpayers, individuals and businesses that are beneficiaries of Government financing may develop a sense of entitlement to the Government lending thereby bring about moral hazard behaviour causing the government to lose out on their return on investment.

The lending by institutions such as the state owned DFI's are usually for specific purposes however after the loan has been disbursed to the borrower, the decision to put the funds to its intended use it transferred to the borrower. The situation is exacerbated by the fact that the borrower now has a higher level of information compared to the lender yet they may not bear the full recourse of the inherent loss. After disbursing the loan to the borrower, the lending institution has a lesser control over the outcome of the investment and its level of information on the transaction becomes inferior to that of the borrower. Additionally, funding by Government agencies often come with longer repayment periods compared what is available in the credit market. The long tenures are often associated with ineffective monitoring mechanisms thereby condoning the probability of borrower exhibiting moral hazard behaviour (Arslan-Ayaydin, Barnum, Karan, & Ozdemir, 2014).

The moral hazard effect in credit interventions by the Governments is further entrenched by the frequent bailouts or loan write offs extended though the DFIs. According to the Agricultural Finance Corporation (2018), the loan write-offs has been one of the major contributors to the deterioration of the corporation's loan portfolio quality. Gine and Kanz (2014) also found a significant negative effect of government bailouts on the loan repayment performance of bank loans in India. In their strategic plan, Agricultural Finance Corporation (2018) proposed to change their model from direct lending to the borrower to lending through other intermediaries such as banks however according to Gine and Kanz (2014), there still exists the moral hazard risks in indirect lending due to the expectations of future government interventions on their loan repayment obligations.

Arslan-Ayaydin et al. (2014) studied the moral hazard behaviour among firms that had received loans from the Turkish government and meant to be utilized in research and development activities while Simotwe, Zeller and Phiri, (2006) analysed the moral hazard behaviour in Malawi's microfinance sector with a joint liability structure. This study aims to bridge the research gap on moral hazard behaviour in the context of state owned DFI's in Kenya

1.1.4. Loan Size

Loan size can be defined as the amount of loan advanced to a borrowing entity (Sangwan & Nayak, 2021). It can be both to an individual borrower or a collective set of borrowers with similar characteristics such as sector, location and loan terms. In a portfolio of a number of borrowers, the average loan size can be used to describe the variations in between the different

borrowers. Studies have shown loans bearing varied repayment performances depending on the size of the loan (Savitha & Kumar, 2016; Arslan-Ayaydin, Barnum, Karan, & Ozdemir, 2014). The size of the loan is usually determined by the lender depending on the purpose of the loan, repayment capacity of the borrower, collateral offered and the prevailing conditions that may affect the repayment performance of the loan.

Matthews and Yin (2019) analysed the loan deal terms among the private and state-owned banks in the Chinese banking industry and averred that the state-owned banks are associated with higher loan sizes as compared to the privately-owned banks. Matthews and Yin (2019) went on to argue that the size of the borrowing entity and its existing debt burden are more likely to affect the loan size while the collateral offered by the borrower had no effect on the loan size. Mason (2014) averred that the loan size is usually determined by the information available to the lender that will help in analysing the borrower's ability to pay. When it comes to the loan recovery, Magri (2007) posits that mean loan size has a positive correlation to the share of loan recovered. Weber and Musshoff (2021) as well as Banna and Alam (2021) both averred that there is a higher probability of recovering larger loans as compared to the smaller loans. However, this contradicts with Syomane, Wahome and Ariemba (2018) as well as Ganguly and Roy (2021) who found no significant relationship between loan size and the likelihood of defaulting on the loan.

1.1.5 Overview of State-Owned Development Finance Institutions in Kenya

In 2015, United Nations Member States including Kenya resolved to adopt the Sustainable Development Goals aimed at addressing various developmental challenges facing the member states. The goals included the eradication of poverty in all its form in addition to provision of decent and productive employment for all by 2030. It is by the same time that Kenya aims to have transformed its economy to a middle-income status in line with its Vision 2030 development blue print. Due to the significant amount of investment required to achieve these goals, the financial services sector plays a key role in the efforts made towards achieving these development objectives. According to the Vision 2030 blue print, all the financial sector players including the DFI's are critical players in promoting financial access and achievement of investment objectives.

DFI's main intervention in development is to provide long term funding to the key sectors of the economy that have demonstrated favourable projected returns and a significant developmental impact. Their operations are meant to address market failures brought about by

the market information asymmetry in addition to addressing the inefficiencies in the fiscal and monetary interventions by the government (Weiping & Daren, 2020). Studies have also demonstrated the role of state-owned banks playing a countercyclical function through credit expansion in times of economic or financial crisis (Choi, Gutierrez, & Peria, 2016;Ferrari, Mare, & Skamnelos, 2017).

In the course of delivering on their mandate, DFIs are also expected to remain financially sustainable (World Bank Group; 2018;Abrahams, 2015). Giordano and Ruiters (2016) opined that DFIs may fail to fulfil its development mandate in the absence of the right systems and resources. Despite their role in maintaining stability in the credit market especially during times of financial volatility, public banks have performed poorly in terms of credit allocation as well as loan recovery and NPL management (Bertay, Demirgüç-Kunt, & Huizinga, 2015; Thomas & Vyas, 2018).

Kenya Institute of Public Policy Research and Analysis, (2006) listed seven state owned DFIs operating in Kenya namely, Agricultural Finance Corporation (AFC), Agricultural Development Corporation (ADC), Development Finance Company of Kenya (DFCK), Industrial and Commercial Development Corporation (ICDC), Industrial Development Bank (IDB), Kenya Industrial Estates (KIE) and Kenya Tourist Development Corporation (KTDC). KTDC subsequently rebranded to Tourism Finance Corporation (TFC) following the enactment of the Tourism Act of 2011 while DFCK was converted to a fully-fledged commercial bank in 1996 and renamed Development Bank of Kenya (Ntongai, 2020).

Being state corporations the DFI's are governed through the State Corporations Act and managed by a Board of Directors appointed by the Cabinet Secretary of the parent ministry. The DFI's function in a market characterised by factors such as competition in addition to the overall unpredictability and dynamic nature of the economies (Mutunga, 2019). Kenya, like many other countries in the post-colonial period, formed DFIs as a way of addressing the inefficiencies in mobilization and allocation of financial resources within an economy. During the 1990's some of the DFI's ventured into commercial banking which involved holding of customer deposits, forex trading and settlement of banking transactions. Most of them were however faced with challenges such as undercapitalization, breach of single obligor limits and high default rates. This, added to the increased regulatory requirements by Central Bank of Kenya, made the DFI's to convert their business models by ceasing commercial bank services to only focus on developmental lending.

State-owned DFIs play a crucial role in addressing market failures within specific industries while striving to meet targeted social and developmental objectives. However, they face challenges such as operational inefficiencies, political interference, and balancing profit-oriented motives with developmental goals. Additionally, their loan portfolios are generally weaker compared to other financial institutions like banks and microfinance institutions, partly due to disbursements to non-viable investments and politically connected individuals, as well as non-adherence to established credit policies.

Unlike other financial service providers regulated by entities such as the CBK, CMA, SASRA, RBA, and IRA, state-owned DFIs operate without direct government regulatory oversight. They are not required to comply with globally recognized capital requirements like the Basel Requirements. However, the Association of African Development Finance Institutions (AADFI) has developed benchmarks and best practices for self-assessment to promote continuous improvement. These guidelines also help supervisory or regulatory institutions develop mechanisms for managing the unique activities of DFIs.

1.2 Statement of the Problem.

DFI's engaged in lending activities have been reported to have a worse loan portfolio quality compared to other lending institutions such as commercial banks (Khatun & Saadat, 2019; Asfaw, Bogale, &Teame, 2016). This had been evident from the higher than average NPL ratios compared to average NPL ratio in banking sector in their country of operation (De Luna-Martinez et al, 2018). DFIs have often been regarded as having a limited ability in assessing a borrower's debt service capacity leading to the emergence of NPLs, debt amnesty arrangements, and financial losses that ultimately have to be borne by the taxpayers (De Luna-Martinez et al, 2018). This is coupled with the fact that DFIs operate with less stringent requirements on risk and collateral compared to the commercial banks has been an area of concern as it has varied negative externalities (Weiping & Daren, 2020). Central Bank of Kenya, (2013) stated that high non-performing loans among the state owned DFIs was prevalent, a factor that made the DFIs not being able to comply with the existing banking prudential guidelines.

The existing studies present contradictory findings regarding credit risk management among privately and publicly owned lending institutions. While Khatun and Saadat (2019) and Asfaw et al. (2016) claim that DFIs have poorer loan portfolio qualities compared to banks, Ferrari et al. (2017) found no difference between the two. Additionally, there is a research gap concerning

the effectiveness of credit risk management strategies across different lending institutions, with studies like Gichuhi and Omagwa (2020) and Muthoni, Mwangi, and Muathe (2020) showing conflicting results on the impact of credit appraisal on loan portfolio performance.

Moreover, there are inconsistent findings regarding the relationship between loan size and the likelihood of default, with some studies indicating a higher recovery probability for larger loans, while others find no significant relationship. Regional studies also highlight varying determinants of loan defaults, such as market differentiation in South Africa (Kibuuka and Shandu, 2020) and central bank policies in Nigeria (Okon and Zephaniah, 2022). Local studies by Kibet (2020) and Masai (2020) attribute poor loan portfolios to the agricultural sector in Kenya. The current study aims to fill these gaps by examining credit risk management, moral hazard, loan size, and loan quality in state-owned DFIs in Kenya.

1.3 Research Objectives

1.3.1General Objectives

To scrutinize the influence of credit risk management techniques on the loan portfolio quality of state-owned Development Finance Institutions in Kenya.

1.3.2 Specific Objectives

The study seeks to:

1. Ascertain the influence of credit risk identification methods on the loan portfolio quality of state-owned Development Finance Institutions in Kenya.
2. Investigate the effect of credit risk control techniques on the loan portfolio quality of state-owned Development Finance Institutions in Kenya.
3. Assess the effect of loan size on the loan portfolio quality in state owned Development Finance Institutions in Kenya.
4. Determine the effect of moral hazard behaviour on the loan portfolio quality in state owned Development Finance Institutions in Kenya.

1.4 Research Questions

1. What is the effect of credit risk identification on the loan portfolio quality in state owned Development Finance Institutions in Kenya?
2. What is the effect of credit risk controls on the loan portfolio quality in state owned Development Finance Institutions in Kenya?

3. What is the effect of loan size on the loan portfolio quality in state owned Development Finance Institutions in Kenya?
4. What is the effect of moral hazard behaviour on the loan portfolio quality in state owned Development Finance Institutions in Kenya?

1.5 Research Hypothesis

The study based on testing the following hypotheses;

H_{01} There is no effect of credit risk identification on the loan portfolio quality in state owned Development Finance Institutions in Kenya

H_{02} There is no effect of credit risk controls on the loan portfolio quality in state owned Development Finance Institutions in Kenya.

H_{03} There is no effect of loan size on the loan portfolio quality in state owned Development Finance Institutions in Kenya

H_{04} There is no effect moral hazard behaviour on the loan portfolio quality in state owned Development Finance Institutions in Kenya

1.6 Scope of The Study

The study focus is to scrutinize the influence of credit risk identification techniques, credit risk control techniques, loan size and moral hazard behaviour on the loan portfolio quality of Development Finance Institutions in Kenya. Aspects that was analysed are identification of credit risk, credit control, loan size, moral hazard behaviour and loan portfolio quality among the DFIs. The respondents for this research are all the state-owned Development Finance Institutions in Kenya as listed by the Kenya Institute of Public Policy Research and Analysis, (2006) with additions of other state owned instituitons with mandates relating to provision of credit. The study was based on primary data collected and analysed in the first quarter of 2024.

1.7 Significance of the Study

The state-owned DFIs have been reported to enhance Kenya's economic development (Njoroge, 2024). To support this, the study aims at bridging the knowledge gap by providing a better understanding on the influence of credit risk management practices, loan size and moral hazard behaviour on the quality of loan portfolios in DFIs. Policy makers and development

finance practitioners would be able to obtain further insights on how to achieve growth and sustainability of DFIs.

1.7.1 Policy Makers

The Kenya Vision 2030 economic blueprint has the financial sector as one of the key growth enablers through their role in the mobilization and allocation capital required to achieve the desired economic growth rate. DFIs are one of the key institutions mandated by the Government to promote growth and development. For this reason, the DFIs need to be effective in the administration of public sector policies while at the same time maintaining accountability and enhancing governance. Policy makers would also be able to use the DFIs to channel their economic, social and developmental agendas while at the same time focusing on capital preservation.

The State Owned DFI's pay a key role in times of financial crises as they go against the conventional lending practices that are more conservative and adopt a counter cyclical financing model so at to reduce the credit crunch effects (Bertay, Demirgüç-Kunt, & Huizinga, 2015). They are however negatively affected with challenges of inadequate credit risk management practices, poor loan portfolio qualities, political interference and poor governance. United Nations Economic Commission for Africa, (2020) emphasized on the need for the state owned DFIs to create an environment that would enable them carry on their operations in line with international best practises.

1.7.2 Development Finance Practitioners

The study would go a long way in helping development finance practitioners achieve financial stability by being cognizant of the factors that influence loan quality within their organizations. The study also intends to promote collaborative activities among the DFIs aimed at improving their due diligence processes as well as improve on their project monitoring so as to achieve an improved loan portfolio quality in the long run. The collaborative efforts include sharing of information in addition to the transfer of knowledge and skills with the aim of maximizing the overall impact of their financing activities. Additionally, since most of the DFIs are state owned and financed from the public coffers, the study would assist the development finance practitioners in being accountable for what they deliver considering the limited resources.

DFIs are mandated to provide finance to sectors of the economy that do not meet requirements from mainstream financial institutions like commercial banks due to perceived higher credit risks. For this reason, DFIs need to incorporate effective credit management strategies that would maintain low levels of loan defaults. This would ease the pressure on the DFI's to charge high interest rates due to the higher financing risks, thereby maintaining their mandates of providing low cost finance to the underserved sectors of the economy.

1.7.3 Scholars

The study would provide a foundation to future researchers intending to study a related field through the identification of current research gaps and suggesting areas that need to be scrutinized. Specifically, the study results and findings could be a pointer towards the reengineering of theories dealing in the field of finance. This would be an addition to the field of knowledge and data base of both development finance institutions as well as credit risk management. Furthermore, study findings could incite other scholars to carry out similar studies for examining theories used in the current study or different studies but testing the current issues on credit risk management.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This Chapter provides a review of the theoretical and empirical literature relating to credit risk management, loan size and loan portfolio quality. The theories that are pertinent to the study in addition to its relevance are explained. Thereafter, a review of literature on how the research variable relates is provided in addition to a summary of the identified research gaps. The chapter is concluded by a write up on the conceptual framework.

2.2 Theoretical Review

The study theoretical review is a section highlighting the theories that anchor and support the focus of the study. In the current study, the anchoring theory is the asymmetrical information theory as propagated by Akerlof (1970) and supported by the financial intermediation theory as propagated by Gurley and Shaw (1955). For each theory, a defition is followed by assumptions, the critique and financially application in othere similar studies from global, regional and local environment. Finally, a justification for application in the current study is provided. This multitheoretical approach is necessary due to the nature of the study in which DFIs and loaning are the basis of the study thus making it possible to relate to each with a specisifc theory. In this case, the two theories, asymmetircal information theory and the financial intermediation theory and suitable for the current study.

2.2.1 Asymmetrical Information Theory

The theory was proposed by George Akerlof in 1970. Akerlof (1970) contended that on one hand, buyers are able to obtain and analyse market statistics with the aim of assessing the value of a good. On the other hand, sellers in the same market have a deep understanding only of the specific good they are selling. As a result, the seller gets an opportunity to sell goods of a lower quality compared to what is available in the market. Information asymmetry exists in the market whereby one party obtains useful market information that cannot be accessed by the other party in the transaction. The theory demonstrates that the party with more knowledge on a product often has an advantage of negotiating better terms as compared to the counterparty (Abdi & Jagongo, 2019). This brings about under-pricing arising from the information mismatch between the parties in the market (Tsang & Blevins, 2015).

The theory however goes against the efficient market hypothesis which assumes that there is perfect information in the market and that asset prices have already factored all the relevant information. According to Caputo, Giudice, Evangelista and Russo (2016), a party's ability to have a dominant competitive advantage is proportionately dependent on the reception of the information the party feeds to the market. Caputo et al. (2016) add that a companies' ability to receive favourable market reception depends on the whether the image being portrayed by the information provided to the market meets the markets expectations.

In the debt markets, there exists an uneven level of information between the borrowers and lenders majorly on the borrower's ability and willingness to repay the loan (Charles & Mori, 2017). As a result of the uneven information, lenders may not have all the necessary information to enable them make an objective an informed decision bringing about adverse selection. To mitigate this, financial institutions need to develop and implement structures aimed at identifying credit risk and thereafter develop strategies on how it will be mitigated (Oo, 2019). Information asymmetry in a lender and borrower relationship can also bring about moral hazard perpetuated by either party in the transaction. Moral hazard in a lending relationship occurs when the borrower deliberately fails to fulfil their contractual obligations with the lender after the loan has been disbursed. The borrower may choose to hide or divert the income received from the financed venture so as to avoid paying back the amounts advanced by the financier (Tchamyou, 2019). This study is informed by this theory since there may be information asymmetry arising from a debt transaction whereby the lender fails to obtain all the necessary information before advancing a loan to a borrower.

Lending institutions however lack the ability of obtaining all the necessary information to enable them exhaustively assess the borrower's default risk. This is due to the fact that most of the time there exists un-envisaged risks and uncertainties that make it impossible for the financial institution to obtain complete information for them to make an informed decision (Song, Yu, & Lu, 2018). Nonetheless, studies have shown that the employment of experienced and well-trained credit officers reduces level of information asymmetry (Mori, Richard, & Swai, 2019). Information asymmetry also prevails in when there is uncertainty in the debt markets which studies have shown its limiting effect on the availability of credit (Caglayan & Xu, 2017;Mori, Richard, & Swai, 2019).

Existing literature by Qu and Wongchoti (2018) states that the level of utilization of credit facilities is dependent on the level of information asymmetry with higher level credit usage

experienced in companies that are open to providing company information, all other factors held constant. Likewise, firms with high degree of information asymmetry encounter difficulties in securing finance from banks and public lenders (Abad, Sanchez-Ballesta, & Yague, 2017).

Early studies had shown the information asymmetry between the state owned DFIs and the borrowers would be aggravated through the absence of a pricing mechanism that would provide the right balance between achieving mandated socio-economic objectives while at the same time maintaining a sustainable financing model (Jorgensen, 1967). This is mainly attributed to having limited resources that are provided for by the Government and other partnering agencies. Moral hazard in the borrower's obligation to the DFI is perpetuated by periodic write off of loans owed to the state owned DFI. This has been one of the major contributors to deteriorating loan portfolio quality especially among the state owned DFI's. (Gine & Kanz, 2014;Agricultural Finance Corporation, 2018)

This theory informs this study mainly because there exists uneven level of information between the DFIs and their prospective borrowers which may prevent the DFI from getting all the information before making a decision on a funding request. To address this, DFIs undertake their own due diligence procedures as part of its credit risk identification and control mechanisms aimed at bridging the information gap so as to analyse all the inherent risks and make the appropriate decision. The level of information is shifted after disbursement and for the state owned DFI's moral hazard risks arise. This theory also speaks to the unpredictability of interest rates and foreign exchange rates. Banna and Alam (2021) suggested that loan terms such as loan size are influenced by the information available to the lender for the purpose of analysing the borrower's loan repayment capacity. Additionally, DFI's have the role of addressing market inefficiencies as a result of the information asymmetry in the debt markets (Weiping & Daren, 2020).

2.2.2 Financial Intermediation Theory

The theory was proposed by John Gurley and Edward Shaw in 1955. Gurley and Shaw (1955) stated that financial intermediaries are institutions that provide a link between parties in a financial transaction that will eventually reallocate excess funds from one party to a party that has a funding deficiency. They have varied ownership structures and play an important role in financial markets by creating systems through which investors are able to transact in the financial market (Cheng, Qian, & Reeb, 2016; Tagoe, 2016).

Financial intermediaries came into existence mainly because the non-existence of complete and perfect markets characterized by high cost of transaction, inadequate information and regulatory constraints. In lending, financial intermediaries provide a platform through which the ultimate lenders with idle funds are able to link up ultimate borrowers with a financing need. The lenders and the borrowers usually have different preferences on the amounts invested or borrowed respectively in addition to the extent of the financial engagement (Huebner, Vuckovac, Fleisch, & Ilic, 2019).

Information asymmetry arises when lenders possess idle funds but face uncertainty about their future spending needs and lack knowledge about potential borrowers, while prospective borrowers clearly understand their borrowing requirements and repayment capacity but do not know where to source loans. This mismatch creates a paradoxical situation where both parties are unable to connect, providing an opportunity for financial institutions to bridge the gap and facilitate lending. However, in scenarios where there is a high likelihood of loan defaults and insufficient risk mitigation measures, lenders tend to shy away from these transactions (Huebner et al., 2019). Additionally, financial intermediaries, who serve to connect these lenders and borrowers, often suffer from market volatilities, which can significantly impede their efficiency and effectiveness in fulfilling their intermediary roles (Caglayan & Xu, 2017).

Financial intermediation involves pooling funds from savers for lending to those in need (Bongomin et al., 2018). Intermediaries thrive in imperfect markets with conducive regulatory environments but reduce activities when the operating environment deteriorates (Moraes, Antunes, & Rodrigues, 2019). Although financial intermediation assumes limited information sharing, studies show that collaboration and information sharing can reduce costs and improve performance (Panahifar et al., 2018). State-owned development banks act as financial intermediaries to address credit market inefficiencies while achieving economic, social, and developmental goals (Ferrari et al., 2017). DFIs use credit risk identification to make informed lending decisions and minimize NPLs. Increased credit risk leads to reduced financial intermediation, creating market inefficiencies (Mlachila & Sanya, 2016). DFIs and state-owned banks counter credit market procyclicality by providing needed credit during periods of high perceived risk (Bertay et al., 2012).

2.3 Empirical review

This study analysed the relationship between credit risk management and loan portfolio quality among state owned DFIs in Kenya. This section highlights a review of empirical literature

concentrated on analysing prior research studies regarding the other similar institutions as well as the study variables. This empirical review identifies the research gaps that the study aimed to address.

2.3.1 Credit Risk Identification and Loan Portfolio Quality

Sharifi et al. (2019) and Kariuki (2017) used both a mixed method design and multiple linear regression in their study in their analysis of the effect of credit risk management on NPLs and financial perfomance respectively. Sharifi et al. (2019) focussed their study on commercial banks in India whereas Kariuki (2017) focussed on savings and credit cooperatives (SACCOs) in Kenya. Gichuhi and Omagwa (2020) and Fersi and Boujelbène (2021) used an explanatory design in their study on the effect of credit appraisal on the loan portfolio performance and the effect of behavioural bias among credit officers in the loan portfolio quality respectively. Gichuhi and Omagwa (2020) base their study on SACCO's and used descriptive and inferential analysis whereas Fersi and Boujelbène (2021) based their study on microfinance institutions; and used generalized least square regression in their analysis. Muthoni, Mwangi and Muathe (2020) also used a mixed method approach and descriptive and inferential analysis when studying the credit management practices among commercial banks in Kenya.

Sharifi et al. (2019) reported an inverese correlation between credit risk identification and the growth of NPLs and directly correlated to credit risk performance, as well as reporting that privately-owned banks managed their credit risk better compared to publicly owned banks. Kariuki (2017) found credit risk identification to have a positive and significant effect on financial performance. Gichuhi and Omagwa (2020) also reported a positive and significant effect of credit appraisal on the loan portfolio performance while Fersi and Boujelbène (2021) found the overconfidence bias in the credit officer to have a negative effect on the loan portfolio quality. Fersi and Boujelbène (2021) also reported a negative correlation between asset size and credit risk, suggesting that the larger the size of the financial institution, the less the exposure to credit risk.

Muthoni, Mwangi and Muathe (2020) contradicted with Gichuhi and Omagwa (2020) as their study reported no correlation between credit appraisal and the loan portfolio performance. Campanella et al. (2020) also did not find any correlation between the credit risk identification criteria and the level of NPLs when they conducted a study on banks in Italy. Gambo, Bambale and Ibrahim (2019) used loan to deposit ratio, credit risk, capital adequacy risk, and solvency

risk as a measure of credit risk management when analyzing its effect on the performance of Nigerian banks. Their study analyzed secondary data from the banks' annual reports and adopted a multiple regression and correlation analysis and indicated that loan quality had an insignificant effect on return on assets.

Sharifi et al. (2019) as well Gichuhi and Omagwa (2020) have differing findings withMuthoni, Mwangi and Muathe (2020). In addition, Fersi and Boujelbène (2021) observed negative effect of overconfidence bias on loan portfolio quality yet they had the negative correlation between asset size and credit risk. Further, Gambo et al. (2019), in their study recommended the formulation of credit risk mitigation framework that encompasses a comprehensive loan appraisal process, proactive monitoring and the end to end process from on boarding, appraisal, disbursement, monitoring and collection.

2.3.2 Credit Risk Control and Loan Portfolio Quality

Khan and Ahmadi (2019) examined the similarity or lack thereof between credit risk management techniques in publicly owned and privately banks in Afghanistan whereasElizabeth, Oluoch and Nyangau (2019) based their research on microfinance institutions in Nairobi County in Kenya. Muturi & Rotich (2016) did a similar study as Elizabeth et al. (2019) but their research had a wider scope by basing the research on all microfinance banks in Kenya. Khan & Ahmadi (2019), Elizabeth et al. (2019)and Muturi & Rotich (2016) used a descriptive research design as well as descriptive and inferential statistics in their analysis.

Khan and Ahmadi (2019) revealed that both publicly and privately-owned banks manage credit risks through processes such as; in depth credit appraisal, requesting for security and background checks on the loan applicants. The findings agreed with findings from Sharifi et al., (2019) that demonstrated that privately owned banks utilized better risk management techniques as compared to public banks. Muturi & Rotich (2016) found out that the adoption of credit risk management techniques had a positive and significant effect on the quality of the loan book and concluded by emphasizing on the need of implementing credit risk management techniques as it is essential to the long-term success of any microfinance institution. Elizabeth et al. (2019)reported credit risk control to have a positive and significant effect on the loan performance while Ahmed & Malik, (2015) found credit risk control to have a positive and insignificant effect on loan perfomance.

Using a monitoring performance index, Piatti and Cincinelli (2019) analysed the quality of the credit monitoring process in a sample of 298 Italian banks using a panel regression model. Piatti and Cincinelli (2019) stated that monitoring processes are effective in managing NPLs but up to a certain threshold. Above the threshold which may point to high NPL ratios, monitoring processes cease to have an effect on the NPLs. Piatti and Cincinelli (2019) added that setting out a target threshold of NPLs through an NPL strategy in addition to having robust monitoring mechanisms have a positive impact on NPL ratio.

Using both primary and secondary data, Khafid, Fachrurrozie and Semarang (2020) found out that credit risk, as measured by the ratio of bad credit to total credit, has a positive and significant effect on non-performing loans. The same study revealed that loan monitoring does not have a moderating effect on the relationship between credit risk and of non-performing loans. Chege (2021) studied the effect of credit management on loan defaults in the Agricultural Finance Corporation. The study utilized the mixed method approach and revealed a positive and significant relationship between credit monitoring and evaluation; and loan defaults.

Fatima and Rao (2017) studied the loan recovery strategies in selected banks in India while also comparing the strategies of public and private banks. The loan recovery strategies include proposing more flexible repayment plans for borrowers who have demonstrated their inability to service higher loan repayments. Fatima and Rao (2017) found no significant difference in the recovery strategies between the public and private banks. This however contradicts with Thomas and Vyas (2018) who used the McKinsey 7S model and reported that private banks have better loan recovery strategies compared to private banks. Nonetheless, Thomas and Vyas (2018) and Fatima and Rao (2017) averred that proper loan recovery strategies are critical in the reduction and management of NPLs.

2.3.3 Loan Size and Loan Portfolio Quality

World Bank Group (2018) conducted a survey of national development banks and concluded a majority of the DFIs surveyed had weaker loan portfolio qualities compared to the national banking average. Geitangi (2015) used a descriptive survey research design to analyse the effect of credit risk management on the loan portfolio performance of Kenya commercial banks. Okenwa, Agbaeze and Onyejiaku (2019) utilized a cross-sectional survey design to study the influence of risk management techniques on credit access from development finance institutions. Geitangi (2015) and Okenwa et al.(2019) used both primary and secondary data

collected from administering semi structured questionnaires and the annual reports respectively. Geitangi (2015) & Okenwa et al.(2019) analysed their data using descriptive and inferential statistics.

Geitangi, (2015) confirmed the use and importance of credit risk identification and credit risk control techniques on the management of loan portfolio performance by commercial banks in Kenya. Okenwa et al.(2019) concurred with findings from Campanella et al., (2020) andSharifi et al. (2019), that emphasizes on the development and institution of credit risk management techniques to minimize the chances of the borrower defaulting. Okenwa et al.(2019)also established that the uptake of development loans is influenced by the policies adopted by the DFIs to address credit risk.

Zhongming, Mpeqa, Ding and Musah (2019) and Akram and Rahman (2018) did an analysis of credit risk management among banks with Zhongminget al, (2019) focusing on banks in China while Akram and Rahman (2018) focused on Islamic banks and conventional banks in Pakistan. Zhongminget al, (2019) used asset size, inflation, non-performing loans, real gross domestic product, net earnings and financial leverage as measures of credit risk and return on assets as an indicator of bank performance while Akram and Rahman (2018) measured the loan quality using eight individual as well as average ratios namely; Growth of total assets, Growth of gross loans, NPLs (impaired loans)/gross loans, Reserve for NPL/gross loans, Reserve for NPL (impaired loans)/impaired loans, Impaired loans less Reserve for impaired loans/Equity, Loan impairment charges/average gross loans and Net charge-off/average gross loans. Zhongminget al, (2019) found out that distressed borrowers negatively impact bank performance; in addition to possessing a unidirectional causality with the return on assets while Akram and Rahman (2018) revealed that loan quality has a positive and significant effect on credit risk management.

2.3.4 Moral hazard Behaviour and Loan Portfolio Quality

Arslan-Ayaydin et al. (2014) studied the moral hazard behaviour among firms that had received loans from the Turkish government and meant to be utilized in research and development activities. Simotwe, Zeller and Phiri, (2006) analysed the moral hazard behaviour in Malawi's microfinance sector with a joint liability structure. Asimakopoulos, Avramidis, Malliaropulos and Travlos (2016) used a loans database submitted to the Bank of Greece by commercial banks in Greece to analyse behaviour that lead to borrowing companies purposely defaulting on their loan obligations. Dinc & Yönder, (2022) studied the role of strategic default among

the loans issued to real estate companies in a setting where the contract does not provide for cross default provisions.

In their analysis, Asimakopoulos et al. (2016) used a probit regression model after developing two binary dependent variables. Arslan-Ayaydin et al. (2014) however undertook a regression analysis using the Huber- White sandwich estimator. Simotwe et al. (2006) used a moral hazard model developed by Stiglitz (1990) which was thereafter extended by Ghatak and Guinnane (1999) to factor in the cost of peer monitoring. Dinc & Yönder, (2022) used a binary logistic regression with the inclusion of a linear probability model to analyze the effect of strategic default on the renegotiation of loan contracts.

Arslan-Ayaydin et al. (2014) reported a negative relationship between risk of moral hazard and the loan performance of the project. Additionally, the borrowers are reported to be more prone to moral hazard behaviour if they are advanced more loans relative to their size leading to a decline in the performance of their investment and the subsequent loan repayments. Simotwe, Zeller and Phiri, (2006) revealed that the borrower's reluctance to service their loan obligations was the main cause of loan defaults and a deteriorating portfolio quality. Due to the group lending structure, peer monitoring among the group members was found to reduce the amount of loan monitoring however loan monitoring by the financial institution was seen to complement the efforts of managing the moral hazard behaviour among the borrowers. Arslan-Ayaydin et al. (2014) averred that firms are least likely to be affected my moral hazards as the loan size increases. They went ahead to state that the increase in loan size should be relative to the size of the borrowing entity otherwise loan performance started deteriorating.

On the contrary, Dinc & Yönder, (2022) found out that strategic default more often leads to a renegotiation of the loan contracts which has been reported to improve the loan portfolio quality (Dardac, Barbu, & Boitan, 2011). Ghatak and Guinnane (1999) however argued that peer monitoring can be too expensive thereby negating its role in mitigating the moral hazard effects among borrowers. Asimakopoulos et al. (2016) reported a positive and significant relationship between strategic default, which is defined as the borrower's unwillingness to service their loan obligations, and loan amount. Their study reported that medium sized firms are more prone to moral hazard behaviour as compared to small and large sized firms. Their study also revealed that economic uncertainties are more likely to exacerbate moral hazard behaviour among borrowers whereas borrowers with high value collateral are less likely to exhibit moral hazard behaviour.

2.3.5 Loan Size and Loan Portfolio Quality

Chikalipah (2018) analysed the relationship between loan size and credit risk in the microfinance industry in sub Saharan Africa after arguing that borrower can be motivated to default on loan repayments based on the loan amount. Savitha and Kumar (2016) used a multinomial regression analysis to review the loan repayment behaviour in the agricultural loans in in India. Dermaine and Carvalho (2005) conducted a case study on the largest Italian bank at the time to analyse the determinants of loan recovery rates. Using the generalised method of moments technique, Chikalipah (2018) reported that loan size had a positive and significant effect on credit risk whileSavitha and Kumar (2016) utilized secondary data obtained from a private bank and concluded that larger loans are more likely to cause a deterioration of the loan quality as compared to smaller loans. Dermaine and Carvalho (2005) utilized a multivariate analysis and revealed that the loan size has a negative and significant effect on the loan recovery rate.

Grunert and Weber (2009) used regression analysis to analyse data on defaulted loans in a German bank and averred that there is a higher probability of recovering larger loans as compared to the smaller loans. Similarly, Jimenezand Saurina (2004) analysed the probability of default among loans in the Spanish lending institutions from records provided by the Bank of Spain. Their study inferred that larger loans had lower chances of going into default as compared to smaller loans. Syomane, Wahome and Ariemba (2018) however had contradicting findings from Grunert and Weber (2009) and Jimenez and Saurina (2004) as their study found no signficant relationship between loan size and the likelihood of defaulting on the loan. This is after analyzinng the determinst of loan default among SMEs in Kitui County.

Arslan-Ayaydin, et al. (2014) reported a positive relationship between loan size and the performance of the loan repayments. This was attributed to the institution of elaborate monitoring mechanisms as the loan size increases thereby reducing the risk of poor loan performance. This concurred with Dobbie and Skiba (2013) who stated that there is a lower risk of default in borrowers with larger loans. Arslan-Ayaydin, et al. (2014) based their study on loans issued by the Government whereas Dobbie and Skiba (2013) based their study on pay day loans.

Muhammad, Bambale and Ibrahim (2019) studied the relationship between the loan size and loan repayment performance among SME's in Nigeria using structured questionnaires while Savitha and Kumar (2016) analysed loan repayment behaviour in the agricultural loans in in

India using secondary data. Muhammad et al(2019) argued that the loan size is a determinant to the loan repayment performance and their study went ahead to confirm a positive and significant relationship between the two. Savitha and Kumar (2016) concluded that large amounts of loans are more likely to cause a deterioration of the loan quality as compared to smaller loans. Similarly, a study conducted on SMEs in Ireland confirmed default rates increase when there is an increase in the loan amounts compared to the to the SME's asset size (McCann & McIndoe-Calder, 2012). Large amounts of loans also increases the chances of the moral hazard attributes from the borrower (Simotwe, Zeller, & Phiri, 2006).

Other scholars have however had contradictory findings as their studies revealed that larger loan amounts tend to have lower default rates compared to small loan amounts. Jimenez and Saurina (2004) analysed the probability of default among loans in the Spanish lending institutions from records provided by the Bank of Spain. Their study inferred that larger loans had lower chances of going into default as compared to smaller loans. Jimenez and Saurina (2004) argued that this is the case as the lenders are more keen on instituting advanced credit risk management strategies due to the higher loss given default from the larger loans. Grunert and Weber (2009) also analysed data from a German bank and reported that larger loans have higher chances of recovery as compared to the smaller loans. This as the case since the bank ensures proper credit risk identification and control techniques on the large exposure loans due to the potentially higher individual credit losses.

2.4 Summary of literature and research gaps

The current literature highlights the crucial role of credit risk management in maintaining the quality of loan the portfolios in lending institutions. However, most studies focus on the relationship between credit risk management and overall profitability, often neglecting the direct impact on loan portfolio performance. The literature reviewed mainly concentrated on credit risk techniques used by commercial, mortgage, and microfinance banks within regulated environments, which may not be relevant to DFIs that have different lending terms and risk appetites, focusing on performance-based returns rather than profit-based outcomes.

A significant gap exists concerning the impact of credit risk management on the loan portfolio quality of DFIs. Studies specifically addressing DFIs are sparse, with Okenwa et al. (2019) being one of the few related works, yet it emphasizes the effect of credit risk management on credit uptake instead of the quality of the loan book. Moreover, existing research such as Fiador et al. (2020) and Mpofu and Nikolaidou (2018) on the loan portfolio qualities of banks reported

conflicting findings on the impact of economic growth. These inconsistencies highlight the need for targeted research on DFIs, which operate under different economic and governance conditions compared to other financial institutions. Additionally, research like that of Achou and Tenguh (2008) and Li and Zou (2014) emphasizes the importance of robust credit risk management but does not specifically address DFIs, thereby leaving a gap in understanding the unique challenges faced by these institutions. Dinc & Yönder (2022) found that strategic defaults often led to renegotiation of loan contracts, which improved loan portfolio quality, contrasting with Zeller and Phiri, (2006) argument that strategic default deteriorates the quality of the loan portfolio.

Further compounding the research gap, studies comparing credit risk control strategies in private and public banks, like those by Fatima and Rao (2017) and Thomas and Vyas (2018), have produced contradictory findings regarding their effectiveness in managing loan portfolio quality. Additionally, research on the impact of loan size on default rates, such as those by Savitha and Kumar (2016) and McCann and McIndoe-Calder (2012), also shows conflicting results. The inconsistencies extend to the methodologies used in studies on credit risk management, with differences in research designs and statistical techniques leading to varied conclusions. For example, Brown and Moles (2014) and Bessis (2015) highlight different aspects of credit risk management effectiveness, further complicating the understanding of its impact on loan portfolio quality. Given these inconsistencies and the unique challenges faced by DFIs, this study aims to examine how credit risk management techniques specifically affect the asset quality of state-owned DFIs, thereby filling a crucial gap in the literature.

This study aims to fill these gaps through a comprehensive comparative analysis that systematically synthesizes findings from various studies. The research identifies underlying patterns and reconcile discrepancies regarding credit risk identification, credit appraisal, moral hazard behavior and loan size impacts. The study will also provide context-specific insights as well as offering a nuanced understanding of the factors affecting loan portfolio quality with a specific focus on the state owned DFIs. By integrating findings on credit risk identification, credit risk control, moral hazard behavior and loan size from various contexts, the study provides a more robust approach to managing credit risk and enhancing loan portfolio quality.

The various research gaps from the literature reviewed are summarized in Table 2.1 below

Table 2. 1: Summary of findings and research gaps.

Author	Title	Findings	Research Gap/Filling up the gap
Sharifi, Haldar & Rao (2019)	The relationship between credit risk management and non-performing assets of commercial banks in India	Credit risk is inversely correlated to the growth of NPLs	This has a contextual gap as the unit of study was commercial banks of which the findings may not be applicable to DFIs The current study focuses on DFIs
Gichuhi & Omagwa, (2020)	Credit Management and Loan Portfolio Performance of SACCOs in Nyandarua County	Credit appraisal has a positive and significant effect on loan portfolio performance	This has a contextual gap as the unit of study was SACCOs of which the findings may not be applicable to DFIs The current study focused on the DFIs
Khafid, Fachrurrozie, & Semarang, (2020)	Investigating the Determinants of Non-Performing Loan: Loan Monitoring as a Moderating Variable	Credit risk has a positive and significant effect on non-performing loans	This has a conceptual gap as it did not examine the effects of credit risk management techniques on the loan portfolio quality. The current study in addition to other variables examined credit risk management
Muturi & Rotich (2016)	Effect of Credit Management Practices on Loan Performance in Deposit Taking Microfinance Banks in Kenya	The study revealed that adoption of credit risk management techniques had a positive and significant effect on the quality if the loan book	This has a contextual gap as the unit of study was microfinance banks of which the findings may not be applicable to DFIs The current study focused on DFIs
Piatti & Cincinelli, (2019)	Does the threshold matter? The impact of the monitoring activity on	Monitoring processes are effective in managing NPLs, but up to a certain threshold where it becomes ineffective	This has a conceptual gap as it did not consider the effect of credit risk control on the loan portfolio quality. Result may also not be applicable to DFIs as

Author	Title	Findings	Research Gap/Filling up the gap
	non-performing loans : Evidence from the Italian banking system		they have different business model compared to the banks. The current study focuses on DFIs
Geitangi, (2015)	The Relationship Between Credit Risk Management Practices and the Performance of Loan Portfolio in Commercial Banks in Kenya	Confirmed the use and importance of credit risk identification and credit risk control techniques on the management of loan portfolio performance by commercial banks in Kenya	This has a contextual gap as the findings may also not be applicable to DFIs as they have different business model compared to the commercial banks. This current study focused of DFIs
Arslan-Ayaydin et al. (2014)	How is Moral Hazard Related to Financing R&D and Innovations	The risk of moral hazard is negatively related to the loan performance of the project	This has a contextual gap as the study focused on loans advanced by the Turkish Government and its findings may not be applicable to subject of this study. This study was localised in Kenya on government funded DFIs
Campanella, Gangi, Mustilli, & Serino, (2020)	The effects of the credit selection criteria on non-performing loans: Evidence on small and large banks in Italy	Credit risk identification and no effect on the non-performing loans	This has a conceptual gap as it did not consider the effect of credit risk control on the loan portfolio quality. Result may also not be applicable to DFIs as they have different business model compared to the banks. Credit risk control was a key variable in current study

Author	Title	Findings	Research Gap/Filling up the gap
Grunert & Weber, (2009)	Recovery Rates of Commercial Lending: Empirical Evidence for German Companies	Loan size had a negative and significant effect on loan recovery rates	This has a conceptual and contextual gap as their data set was from one bank and may not be applicable to other lending institutions. The current study had a case study on a sample of DFIs
Elizabeth, Oluoch, & Nyangau, (2019)	Effect of Credit Risk Management On Loan Performance Of Deposit Taking Microfinance Institutions In Nairobi County, Kenya	Credit risk control has significance and positive influence on loan performance of microfinance institutions	This has a contextual gap as the unit of study was microfinance banks of which the findings may not be applicable to DFIs Unlike microfinance institutions, the focus of current study was DFIs

Source: Author (2024)

2.5 Conceptual Framework

According to (Creswell & Creswell, 2017), conceptual frameworks are constructed from a variety of overarching concepts and theories that assist a researcher in properly pinpointing the issue they are investigating, formulating their inquiries, and discovering pertinent literature. This study scrutinizes the influence of credit risk management techniques, loan size and moral hazard behaviour on the loan portfolio quality in the state-owned Development Finance Institutions (DFI's) in Kenya. As shown in Figure 2.1 below, there are four predictor variables that comprise of credit risk identification, credit risk control, loan size and moral hazard behaviour. The dependent variable is loan portfolio quality in state owned DFI's.

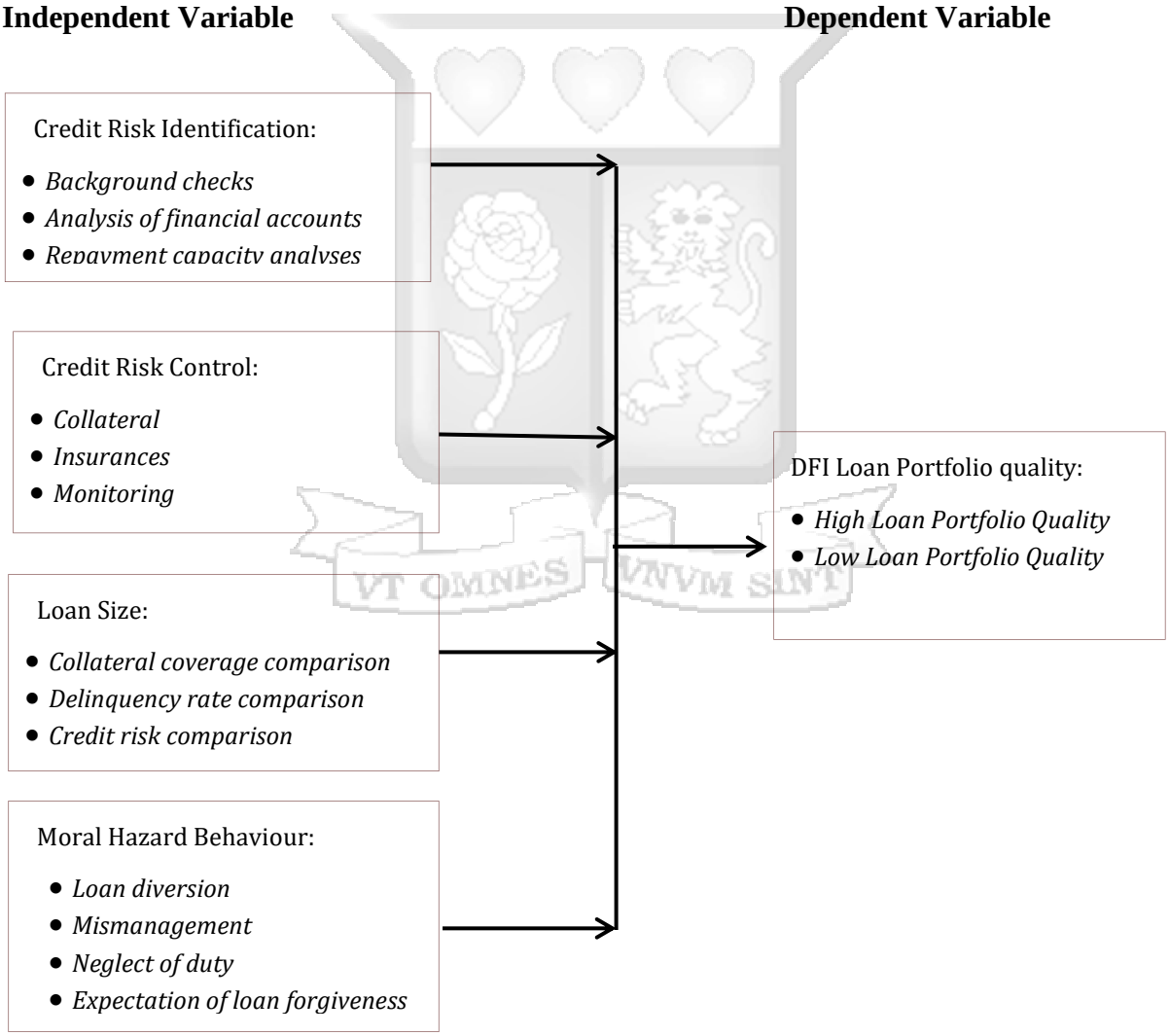


Figure 2. 2 Conceptual Framework

2.5.1 Credit Risk Identification

These are processes and procedures undertaken by lenders to identify the inherent credit risks in a transaction. It also involves the measurement of the risks identified so as to be able to take the appropriate action. It also involves the use of risk rating models to analyse and price the for inherent credit risks. The credit risk identification strategies expected to be employed by the DFI's include, conducting background checks on the borrower, analysing the market conditions and; scrutinizing the borrower's capacity and experience. Other studies that have used a 5-point Likert scale in the measurement of credit risk identification include Kibuuka and Shandu (2020) as well as Nyasaka (2017). This study hypothesized that there is no effect of credit risk identification on the loan portfolio quality in state owned Development Finance Institutions in Kenya

2.5.2 Credit Risk Control

Credit risk control is a function of credit risk management that involves the use of pricing, monitoring and implementation mechanisms to manage the identified risks. After identifying the possible risks in borrowing transactions, the DFIs have three options to base their decision. They can choose to accept the risk with all its consequences, choose to mitigate the risk or choose to reject the risk and decline the loan application. Questionnaires with a five-point Likert scale was used to measure the credit risk identification techniques employed by the DFIs. The credit risk control strategies expected to be employed by the DFI's include, conducting monitoring visits to the borrower, requesting for collateral that adequately covers the borrowing and; developing and adhering to pre-defined exposure limits. Other studies that have used a 5-point Likert scale in the measurement of credit risk control include Ganguly and Roy (2021). as well asSharifi, et al. (2019). This study hypothesized that there is no effect of credit risk controls on the loan portfolio quality in state owned Development Finance Institutions in Kenya.

2.5.3 Loan Size

From the existing literature reviewed, loan size has been established to have an effect on the loan repayment performance (Yibrie & Ramakrishna, 2017;Muhammad, Bambale, & Ibrahim, 2019). Moreover, if a borrower is advanced more funds than he/she needs, the excess funds may be diverted to none essential spending thereby increasing the risk of defaulting on loan

repayments. The study aims to find out if loan size among the DFIs has an effect on the loan portfolio quality. Matthews and Yin (2019) and; Sangwan and Nayak (2021) measured the loan size as the amount of money for each loan contract. The effect of loan size on loan portfolio quality was measured a 5-point Likert scale. This study hypothesized that there is no effect of loan size on the loan portfolio quality in state owned Development Finance Institutions in Kenya

2.5.4 Moral Hazard Behaviour

Moral hazard behaviour in the context of this study relate to the conduct of the borrower that occurs after obtaining a loan from a lender. Arslan-Ayaydin et al. (2014) used a 5-point Likert scale to measure the extent of moral hazard behaviour in projects that are financed by Government borrowing. Dobbie and Skiba (2013) used regression discontinuity and regression kink estimates in analysing the moral hazard effects in pay day loans. Simotwe, Zeller and Phiri (2006) used a moral hazard model developed by Stiglitz (1990) which is phased into individual lending and group lending. The model was extended by Ghatak and Guinnane (1999) to factor in the cost of peer monitoring. This study hypothesized that there is no effect of moral hazard behaviour on the loan portfolio quality in state owned Development Finance Institutions in Kenya.

2.5.5 Loan Portfolio Quality

Loan portfolio quality is an assessment of the loan book to identify the amount of loans that are non-performing compared to the total loan book. A loan book with a high non-performing loan ration is considered to have a poor loan book quality. Fersi and Boujelbène (2021) used NPLs that have been outstanding for more than 30 days as a measure of the loan portfolio quality. Other studies have classified non-performing loans as loans that have defaulted on their loan repayments for a period more than ninety days (Masai, 2020; Weber & Musshoff, 2021; Okon & Zephaniah, 2022). The study analysed the loan portfolio quality through a dichotomous scale and their respective NPL ratios. This study hypothesized that there

2.5.6 Operationalisation of the Study's Variables

Table 2.2: Operationalisation of the study's variables

Variable	Source	Variable Measurement	Type	Supporting theory	Variable Definition	Supporting Literature
	Dependent Variable					
Loan Portfolio quality	Primary data	Nominal Scale	Binary Data	Financial intermediation theory	1 – High loan portfolio quality (Probability of Low percentage of NPLs) 0 – Low loan portfolio quality (Probability of High percentage of NPLs)	Silva, Lopes, Correia, & Faria, (2018)
	Independent Variables					
Credit Risk Identification	Primary data	5- point Likert Scale	Ordinal Data	Information asymmetry theory	The extent to which credit risk identification affects loan portfolio quality	Nyasaka, (2017), Geitangi, (2015) and Wójtowicz , (2018).
Credit Risk Control	Primary data	5- point Likert Scale	Ordinal Data	Information asymmetry theory	The extent to which credit risk control affects loan portfolio quality	Chege, (2021), Sharifi, Haldar , and Rao, (2019)Wójtowicz , (2018).
Loan Size	Primary data	5- point Likert Scale	Ordinal Data	Financial intermediation theory	The extent to which loan size affects loan portfolio quality	Savitha and Kumar (2016), Abdi and Jagongo (2019)
Moral Hazard Behaviour	Primary data	5- point Likert Scale	Ordinal Data	Information asymmetry theory	The extent to which moral hazard behaviors affects loan portfolio quality	Simotwe, Zeller, and Phiri, (2006)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section elaborates the steps intended to be taken in executing the study. It illustrates the adopted research philosophy, illustrates the research design to be used, describes the population of the study and elaborates the methods intended to be used in data collection. This section also elaborates how authenticity and plausibility of the data was achieved in addition to any ethical considerations therein.

3.2 Research philosophy

The study adopted an ontological research doctrine with a positivist epistemological orientation. The ontological research philosophy deals with the study of what actually occurs in its natural form. This was relevant to this study as the concepts of credit risk management and loan portfolio quality are already through the existence of a vast variety of written documents. Additionally, various ways of measuring the variables have already been developed. Research rationality takes the form of a critical part in creating learning and presumptions as seen by subject specialists globally (Chege, 2021). Broadly, the world of research encompasses philosophy and epistemology. These two provide distinctive perspectives about the research procedure and learning methodology. Epistemological approach relate to what is adequate information and whether social investigations and characteristic investigations can have similar strategies and standards to ponder reality or not. The positivist theory avers that for one to be convinced about an occurrence, there needs to be a physical observation and measurement of the variables at play (Kibuuka & Shandu, 2020). The philosophy was adopted in this study as it supposes the existence of a phenomenon that is independent from its actors.

3.3 Research design

This research intends to use an explanatory research design which entails information gathering so as to gain a precise description of the relationship between the study variables. Explanatory research design entails the gathering sentiments from concerned parties on their, sentiments, knowledge and

point of view with regards to a particular phenomenon or occurrence. The research design is preferred since the study aims to investigate how credit risk management influences the quality of the loan portfolio in development finance institutions. Rehman, Muhammad, Sarwar, & Raz, (2019), Fersi & Boujelbène, (2021), and Wangui, (2010) also utilized the explanatory research design when studying how credit risk management affects various aspects of performance in other lending institutions. The method is ideal for the study as the researcher is able to collect information that was used to agree or disagree with a statement or an expectation. The study used quantitative techniques in the examination of the relationships that exist among the research variables.

3.4 Population of the Study

The respondents for this research are thirteen State Owned DFIs who provide finance for various developmental initiatives. According to Grosh, (1991) and Kenya Institute of Public Policy Research and Analysis, (2006) seven state owned DFIs operating in Kenya. In addition to the DFIs listed by Grosh, (1991) and Kenya Institute of Public Policy Research and Analysis, (2006) the study incorporated 6 additional state owned institutions engaged in the provision of credit among other financial services.

One hundred and seventeen (117) respondents were targeted being nine (9) representatives from each of the thirteen (13) listed DFIs. The selection of the number of respondents is in order to prioritize obtaining in-depth insights from specific number of respondents from each institution with specific expertise or roles within the institutions (Newing, 2011). The selection of the state owned DFIs in Kenya is that they are instrumental in countering the proyclical nature of credit supply as witnessed from other financial institutions during an economic slowdown. Additionally, the state owned DFI's operations are not regulated as is the case with other financial services providers in the banking, capital markets, savings and credit cooperatives, pensions and insurance sectors.

Table 3.1: Population of DFI

S/No.	State-Funded DFI
1	Agricultural Finance Corporation (AFC)
2	Kenya Industrial Estates (KIE)
3	Industrial and Commercial Development Corporation (ICDC)

4	Development Bank of Kenya (DBK)
5	IDB Capital (IDB)
6	Tourism Finance Corporation (TFC)
7	Agricultural Development Corporation (ADC)
8	Women Enterprise Development Fund (WEDF)
9	Uwezo Fund
10	Micro Small and Medium Enterprises Authority (MSEA)
11	Higher Education Loans Board (HELB)
12	Kenya Youth Employment & Opportunities Project (KYEOP)
13	Youth Enterprise Development Fund (YEDF)

3.5 Sample Design and Technique

The main purpose of sampling is that unlike dealing with a very large population in totality, a representative sample would be cost-effective, convenient, manageable, and less time consuming and be used to make inferences about population parameters of the population they represent. According to Saunders, Lewis and Thornhill (2019), sampling is only necessary in cases where it is impractical to collect data from the entire population, where there is budgetary constraint, where time constraint is expected and where the population size is unmanageable.

For the current study, primary data was obtained from the 13 DFIs targeting 9 respondents per institution as shown in Table 3.2. The study utilized purposive sampling to select a set of key executive personnel drawn from the 13 DFIs outlined as respondents for the questionnaire.

Table 3.2: Sample Size

S/No.	State-Funded DFI	Number of Respondents
1	Agricultural Finance Corporation (AFC)	9
2	Kenya Industrial Estates (KIE)	9
3	Industrial and Commercial Development Corporation (ICDC)	9

4	Development Bank of Kenya (DBK)	9
5	IDB Capital (IDB)	9
6	Tourism Finance Corporation (TFC)	9
7	Agricultural Development Corporation (ADC)	9
8	Women Enterprise Development Fund (WEDF)	9
9	Uwezo Funds	9
10	Micro Small and Medium Enterprises Authority (MSEA)	9
11	Higher Education Loans Board (HELB)	9
12	Kenya Youth Employment & Opportunities Project (KYEOP)	9
13	Youth Enterprise Development Fund (YEDF)	9

3.6 Data Collection Methods

The study utilized primary data in its analysis of the relationship between credit risk management and loan portfolio quality in the state owned DFIs. A questionnaire was used for collecting descriptive data from the 13 DFIs with a 5-point Likert scale. The questionnaires were administered to the credit/investment officers and credit/investment managers working in the state owned DFI's in Kenya. Through questionnaires, a researcher is able to obtain much information within a short period of time (Muturi, 2020). Some questionnaires were dropped at the offices of the DFIs and later picked after they have been filled while some were filled through the wait and fill method. The wait and fill method allowed the researcher get more insights from the respondents relating to the phenomenon being studied as well as ensuring the data collection is conducted in a timely manner. The drop and pick method was useful in providing flexibility in the time of providing a response in cases where the respondents are not able to fill the questionnaire at the time it is being administered (Ronoh, 2019).

3.7 Data Analysis

Data analysis includes ways of working with data to support the goal and plans of research (Cooper & Schindler, 2019). Data that was obtained for the research was analyzed quantitatively with the help

of a statistical tool known as SPSS version 23. Data analysis included descriptive statistics and inferential statistics.

Descriptive statistics was used to describe the status of the state funded DFIs in terms of loan portfolio credit risk management and loan portfolio quality. Descriptive statistics entail determining measures of central tendency and measures of dispersion of the study variables' measurement items to explore the distribution properties. Spread sheets was used for data manipulation to compute ratios, and further analyzed to generate descriptive statistics that was presented using charts. For statistical modelling, regression model was fitted to determine the causal relationships between loan portfolio and credit risk management. A logistic regression models was fitted using SPSS considering the data obtained from the field as provided by the respondents in state owned DFIs.

3.8 Diagnostic Tests

The study conducted diagnostic tests to ensure results are not biased. Results with minimum bias involve normality, reliability and validity testing (Saunders *et al*., 2019). The three tests were carried out on the data collected. Both reliability and validity for the data should not be confused with reliability and validity for testing the data collection instrument.

Normality

In order to fully test for normality, this study was applied skewness and Kurtosis method. This enabled a tolerance limit derived by computers to maintain the given level of confidence which is 99 percent of the population with 95 percent confidence.

Validity

Validity describes the situation in which all the error terms for independent variables is similar. A random pattern of points in the study results would indicate acceptance of the data for full analysis while a constant term would make the data be rejected. In simple terms Cooper and Schindler (2019) describes validity as the homogeneity of variance which means that the response variables have the same variance.

3.9 Data Analysis

The collected data was dissected through descriptive analysis to investigate the extent to which credit risk management practices influence the quality of the loan portfolio quality in public DFI's. Inferential statistics correlation and regression analysis was used to establish the relationship between credit risk management practices and the quality of the loan portfolio in public DFI's. The inferential analysis was employed to determine the relationship between the independent variables and the dependent variable.

Credit risk management was measured from 1-5 Likert scale questions. A binary logistic regression model was employed in investigating the relationship between the independent and the dependent variables. The model treats the credit portfolio performance of DFI's as the dependent variable whereas the independent variable was credit risk management practices. A binary logistic regression analysis was applied in data analysis as it was able to provide a detailed description of the extent to which the independent variables impact the dependent variable (Shikanga, 2020). A binary logistic regression is appropriate for this study as the dependent variable can either be high or low. Other studies that had a similar type of data and used the same regression model include Geutsche and Ziegler, (2019) and Owiti, (2022). The feedback on the credit risk management practices, loan size and moral hazard behaviour was assessed by generating indices based on the responses derived from the Likert-Scaled questions.

The empirical model is elaborated therein as:

$$\boldsymbol{Log\ (P/1-P) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon_i}$$

Where:

$\boldsymbol{P}$ = Probability of the Loan Portfolio Quality being High

$\mathbf{1 - P}$ = Probability of loan portfolio quality being Low

$\boldsymbol{X_1}$ = Credit Risk Identification Techniques

$\boldsymbol{X_2}$ = Credit Risk Control Techniques

$\boldsymbol{X_3}$ = Loan Size

X_4 = Moral hazard behaviour

β_0 = Constant or intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = Corresponding coefficients for the respective independent variable

ε_i = Error Term

3.10 Ethical Considerations

All authorisations from the university graduate school were obtained as well permits from the national government in compliance with the Science, Technology and Innovation Act, 2013 approval for a research licence was sought from National Commission for Science, Technology & Innovation (NACOSTI) before commencement of the data collection. Additionally, the data obtained from the respondents were treated in confidence while limiting the use of the data to only the research being conducted.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This section reported the results from the survey. The analysis examined response and non-response rates to evaluate the quality of information provided. This comprehensive review ensured the researcher understood the collected data to draw meaningful conclusions. Findings presented were based on a thorough examination of the data supported by established research methods. Relevant literature and previous studies were also referenced to provide context on the topic. The outcomes for descriptive analysis are found in section 4.2. The analysis for diagnostics is detailed in section 4.3. Further outcomes relating to regression analysis is revealed in section 4.4 while discussion of the regression result is provided in section 4.5

4.1.1 Response Rate

The researcher leveraged the information from Figure 4.1, containing responses as well as non-responses, to approximate the response rate of survey respondents. By analyzing the quantity of replies received compared to the full number of people engaged, the researcher was able to compute the proportion of individuals who offered a reply. This allowed them to gauge participant engagement levels by estimating the percentage of the sample respondents who completed the survey questionnaire.

	Frequency	**Percentage**
Filled and returned	86	73.50%
Non-returned	33	26.50%
Total	**119**	**100%**

Figure 4.1: Response Rate
Source: Field Survey (2024)

The survey outcomes demonstrated that out of the 119 questionnaires issued out to the audience 73.5% were duly filled and retrieved by the researcher thus leaving only 26.5% of the un-retrieved questionnaire in the survey. This implies that the responses from the field are adequate for the survey analysis. By this, the responses rate supersedes the 50% rate of retrieval proposed by Goodman and Pedersen (2022) suggesting a baseline target response of half of all distributed questionnaires. However, in this case, the response rate surpassed that threshold by a wide margin since majority of

the questionnaires issued were retrieved. This demonstrates an exceptionally high level of engagement from participants. It ensures the dataset is complete with no missing values, allowing for reliable statistical analysis and inferences to be made from the findings.

4.2 Descriptive Analysis

This portion of the survey considered the description of the survey respondents cut across percentages, frequencies as well as measures of central tendency (mean) and variability (standard deviation) were calculated for each question. Breaking down the outcomes into these statistical viewpoints helped identify clearly the proportion and actual number of respondents within each possible answer category for each survey item. This provided valuable insight into the respondent profile and how demographically diverse the sample was. Furthermore, trend analysis of relevant secondary data sourced was conducted to provide important context on how the factors examined in the survey have changed and developed over time. Examining historical movement and patterns supplemented the primary survey findings. It allowed the researcher to gauge whether perspectives and views tracked with objective reality or deviated from economic/societal trends on the issues targeted. With regard to the aforementioned, the outcomes are documented therein. Figure 4.2 provides a summary of the analysis of response patterns along gender lines, job designation and years of service in the organization.

Variable	Categories	Frequency	Percentage (%)
Gender	Male	57	66.3
	Female	29	33.7
Designation	Credit/Investment Officer	12	14.0
	Credit/Investment Analyst	12	14.0
	Credit/Investment Manager	12	14.0
	Relationship Officer	12	14.0
	Other	38	44.0
Years in the Organization	Less than Five years	20	23.3
	Six to Ten years	33	38.4
	Eleven to Fifteen years	24	27.9
	Over Fifteen years	9	10.5

Figure 4.2: Descriptive Summary of Survey Variables
Source: Field Survey (2024)

4.2.1 Gender of the Respondents

The survey collected data on the gender of respondents to determine the male-to-female ratio among participants. Figure 4.2 illustrates the gender breakdown, revealing that 66.3% of the respondents were male (57 individuals) and 33.7% were female (29 individuals). The higher male representation could be due to the nature of work in state-owned development finance institutions in Kenya, which might be challenging for women to fully commit to, possibly due to other opportunities.

4.2.2 Designation of the Respondents

The survey also gathered information on the respondents' designations within state-owned development financial institutions in Kenya, as shown in Figure 4.2. The participants included 14% credit/investment officers, 14% credit/investment managers, 14% credit/investment analysts, and 14% relationship officers, with the remaining 44% holding other staff positions. This diverse representation across various roles within the credit and investment departments enhances the study's validity and generalizability by capturing a wide range of professional perspectives.

4.2.3 Years in the Organization

The survey investigated the respondents' tenure at state-owned development finance institutions to assess their knowledge of credit risk management and loan portfolio quality. The results indicated that 23.3% of respondents had less than 5 years of experience, 38.4% had 5-10 years, 27.9% had 11-15 years, and 10.5% had over 15 years of experience. This distribution suggests a mix of new and experienced staff, with a significant portion having substantial institutional knowledge and expertise in credit assessment and management, which is crucial for maintaining the quality of the loan portfolio.

4.2.4 Credit Risk Identification

Proper risk assessment allows institutions to only lend to viable borrowers with ability and willingness to repay. This reduces defaults and non-performing loans. In relation to this, this survey evaluated the role of credit risk identification in the quality of state-owned development finance institutions in Kenya and the outcomes are disclosed in Table 4.1.

Table 4.1: Respondents Responses on Credit Risk Identification

Items	Mean	Median	St. Dev.
Evaluation of the prospective borrower's repayment capacity	4.51	4	.79
The training and experience of the prospective borrower	4.5	4	.83
Analysis of historical loan statements	4.52	4	1.02
Analysis of the prospective borrower's financial accounts	4.44	4	.87
Undertaking site visits	4.70	5	.45
Listing checks from the Credit Reference Bureaus	4.76	5	.42
Feasibility study analysis	4.60	4	.72
Conducting portfolio performance reviews	4.69	4	.46
Independent information checks	4.22	4	.88
Properly of staffed appraisal department	4.73	5	.44
The potential borrower's experience	4.62	4	.61
The borrower's contribution to the investment	4.73	5	.44
Use of credit scoring models	4.44	4	.86
Analysis of the projected cash flows	4.80	5	.40
Analysis of the prevailing conditions such as industry trends, economic trends, exchange rate trends on the projected loan prepayment performance	4.79	5	.41
N=86 Av. Mean = 4.61; St. Dev. = 0.64			

Source: Field Survey (2024)

With regard to evaluation of the prospective borrower's repayment capacity was a statement made pertaining to credit risk identification. The mean value of 4.51 was indicated indicating a "great extent" of implementation. This suggests that development finance institutions in Kenya thoroughly evaluate the repayment capacity of prospective borrowers, which could decrease credit risk. The training and experience of the prospective borrower was reported by a mean of 4.5 and 0.83 standard deviation. This suggests that development finance institutions in Kenya place significant importance on the training and experience of prospective borrowers as a credit risk control measure.

Analysis of historical loan statements as noted by a mean of 4.52 and standard deviation of 1.02. This suggests that there is some analysis of historical loan statements to assess credit risk, which is

comprehensive. The participants replied with a great extent as witnessed by a mean and standard deviation of 4.44 and 0.87 that analysis of the prospective borrower's financial accounts is widely practiced. This suggests that development finance institutions in Kenya analyze the financial accounts of prospective borrowers to a great extent, but there may be room for improvement.

The outcome of the study disclosed a mean of 4.7 and standard deviation of 0.45 referring to great extent regarding undertaking site visits. This suggests that development finance institutions in Kenya conduct site visits to assess credit risk, but the extent of these visits may vary. The participants respondents with great extent regarding to listing checks from the Credit Reference Bureaus. The mean value is 4.76 and standard deviation of 0.42 suggested that development finance institutions in Kenya use credit information from Credit Reference Bureaus to a great extent, but it may not be a widespread practice.

Furthermore, it was realized by a mean of 4.6 and corresponding standard deviation of 0.72 that the participants were in for options of moderate extent that feasibility study analysis was performed. This suggests that development finance institutions in Kenya conduct feasibility studies to assess credit risk and manage defaults. Conducting portfolio performance reviews was acknowledged by a mean and standard deviation of 4.69 and 0.46. This implies that development finance institutions in Kenya periodically review the performance of their loan portfolios as a credit risk identification measure.

Independent information checks was observed by a mean of 4.22 which has a corresponding standard deviation of 0.88. This mean affirmed "Great Extent" of implementation. This signifies that development finance institutions in Kenya rely on independent information checks to some extent to assess credit risk. Furthermore, the outcome revealed that majority of the participants were in for great extent as noted by 4.73 mean and 0.44 standard deviation that staff appraisal department is properly done. The mean indicated that development finance institutions in Kenya prioritize having a properly staffed appraisal department to assess credit risk.

The observation noted with a mean of 4.62 and standard deviation of 0.61 acknowledged with option of great extent that the potential borrower's experience was widely practiced. This suggests that the experience of potential borrowers is considered to a great extent in assessing credit risk. The outcome further affirmed by 4.73 mean and 0.44 standard deviation noted that majority of the participants

aligned with the views of a great extent with the borrower's contribution to the investment affects the probability of default. The outcome demonstrates that the borrower's contribution to the investment is considered as a credit risk control measure.

Use of credit scoring models was acknowledged by a mean of 4.44 and standard deviation of 0.86 noting a great extent the use of credit scoring models. The mean value suggests that development finance institutions in Kenya use credit scoring models to a great extent, but it may not be a widely adopted practice. The evaluation noted with 4.8 mean and 0.40 standard deviation observing agreement with the options of moderate extent about analysis of the projected cash flows. The outcome demonstrates that development finance institutions in Kenya analyse projected cash flows to assess credit risk.

It was noted in the survey by a mean of 4.79 and standard deviation of 0.41 that to a great extent analysis of the prevailing conditions such as industry trends, economic trends, exchange rate trends on the projected loan prepayment performance. This illustrates that development finance institutions in Kenya consider prevailing conditions such as industry trends, economic trends, and exchange rate trends as credit risk control measures. The outcome regarding the statements under credit risk identification had an average mean and standard deviation of 4.61 and 0.64 indicating moderate extent of the participants response regarding credit risk identification as it affect loan portfolio quality among the development finance institutions in Kenya.

4.2.5 Credit Risk Control

Credit risk control is a crucial aspect of financial management, especially in the banking sector, where effective management of credit risk directly impacts the quality of a loan portfolio. Therefore, effective credit risk control is essential for maintaining a high-quality loan portfolio by ensuring prudent risk selection and employing portfolio management concepts to understand and mitigate risks effectively. In view of this, the participants were interrogated on credit risk control among the development finance institutions that are state-own in Kenya and the findings are demonstrated in Table 4.2.

Table 4.2: Respondents Responses on Credit Risk Control

Items	Mean	Median	St. Dev
Adequate collateral	4.65	5	.52
Loan classification according to their repayment performance	4.66	5	.60
Periodic monitoring visits to the place of operations of the borrower	4.68	5	.46
Charging of loan penalties for any late repayments	4.76	5	.42
Risk based pricing models	4.77	5	.41
Execution of enforceable loan agreements between the institution and the borrower	3.91	4	1.15
Insuring collateral against adverse events	4.03	4	.91
Limiting maximum amount of lending to an individual borrower	3.98	4	1.09
Limiting maximum of lending to a specific industry	4.03	4	1.06
Undertaking periodic reviews the macroeconomic risks that may affect the loan repayment performance	4.05	4	1.05
Reminders to the borrowers about their outstanding loan obligations	4.03	4	1.10
Information sharing with the Credit Reference Bureaus	3.94	4	1.12
Efficient reporting mechanism for the identified credit risks	3.93	4	1.15
Tailoring loan repayments to the seasonal cash flows of the borrower	3.96	4	1.13
Monitoring the borrower's cash flows	3.94	4	1.12
N=86; Mean Av.= 4.23; St. Dev = 0.89			

Source: Field Survey (2024)

The responses for adequate collateral indicate that the respondents rated adequate collateral as great extent as affirmed by mean of 4.65 and 0.52 standard deviation. This suggests that there is high perception that collateral requirements are not fully adequate in controlling credit risk. Regarding loan classification according to their repayment performance, the majority of respondents rated this item as great extent implying that there is a belief that loan classification based on repayment performance is effective in credit risk control. The outcome is validated by a mean of 4.66 and 0.6 standard deviations.

With regard to periodic monitoring visits to the place of operations of the borrower, the responses for this item are spread across the scale, with the respondents noting to a great extent. The mean value is 4.68 and 0.46 standard deviation, indicating that development finance institutions in Kenya conduct regular on-site visits to assess the operations of borrowers, potentially decreasing credit risk. Pertaining to charging of loan penalties for any late repayments, the majority of respondents rated this item as great extent, indicating that there is a belief that loan penalties are effective in credit risk control. The mean value is 4.76 with a standard deviation of 0.42, indicating a "great extent" of implementation. This suggests that loan penalties for late repayments are enforced to a great extent.

The response for risk-based model as per the respondents had a mean value is 4.77 alongside standard deviation of 0.41, indicating a "great extent" of implementation. This suggests that development finance institutions in Kenya extensively use risk-based pricing models to price loans according to the credit risk profile of borrowers. With regard to execution of enforceable loan agreements between the institution and the borrower, the responses for this item are spread across the moderate extent option. This suggests that there is some perception that the execution of enforceable loan agreements is moderately effective in credit risk control. The mean and standard deviation values are 3.91 and 1.15, indicating a "moderate extent" of implementation. This suggests that enforceable loan agreements are somewhat in place, but there may be room for improvement in ensuring their effectiveness.

Insuring collateral against adverse events had responses indicating that moderate extent, suggesting that there is a belief in the effectiveness of insuring collateral against adverse events for credit risk control. The outcome mean and standard deviation of 4.03 and 0.91, indicates a great extent of implementation. This suggests that some collateral may be insured against adverse events, but it may not be a widespread practice. The outcome observed to a moderate extent about limiting the maximum amount of lending to an individual borrower as observed by majority of the participants. The mean value is 3.98 and 1.09 deviation on standard indicates a "moderate extent" of implementation. This suggests that there are some limits in place to control exposure to individual borrowers, but there may be room for improvement.

With regard to limiting the maximum amount of lending to a specific industry, the respondents acknowledged with moderate. This is confirmed by mean and standard deviation values of 4.0349 and

1.06, indicating a "great extent" of implementation. This suggests that there are majority of the participants who noted that limits are put in place to control exposure to specific industries but there may be room for improvement. Undertaking periodic reviews of macroeconomic risks has majority of the respondents who opted for moderate extent. The mean value is 4.05 and 1.05 standard deviation indicated a "great extent" of implementation. This suggests that development finance institutions in Kenya are actively reviewing macroeconomic risks that may affect loan repayment performance.

With regards to reminders to borrowers about outstanding loan obligations, the participants opted for great extent. The mean value is 4.03 and 1.10 standard deviations indicated a "great extent." This suggests that borrowers are reminded about their outstanding loan obligations to a moderate extent thus, creating room for improvement in the effectiveness of these reminders. With regard to information sharing with Credit Reference Bureaus, majority of the participants opted for moderate extent with information sharing with the Credit Reference Bureaus. The mean value is 3.96 and 1.20 standard deviations indicating a "moderate extent." This suggests that development finance institutions in Kenya actively share information with Credit Reference Bureaus, which help in assessing the creditworthiness of borrowers.

The survey noted that efficient reporting mechanism for identified credit risks was acknowledged by majority of the respondents to a moderate extent. The mean value is 3.94 and 1.12 deviation from standard, indicating a "Moderate Extent." This suggests that there is some level of reporting mechanism for identified credit risks, but there may be room for improvement in terms of efficiency. Tailoring loan repayments to the seasonal cash flows of the borrower as noted by the participants who noted with moderate extent, a mean value of 3.93 was noted with a standard deviation of 1.15, indicating a "Moderate Extent." This suggests that loan repayments are somewhat tailored to the seasonal cash flows of borrowers, but there may be room for improvement.

The outcome revealed that majority of the participants opted for moderate extent regarding monitoring the borrower's cash flows. The mean value is 3.96 and 1.13 standard deviation was revealed indicating a "Moderate Extent" of implementation. This suggests that the cash flows of borrowers are somewhat monitored, but there may be room for improvement. From the outcome of the items regarding credit

risk control, a mean and standard deviation value of 4,23 and 0.89 were realized implying that the respondents opted for moderate extent about the control of credit in the studied institutions in Kenya.

4.2.6 Loan Size

The size of a loan can significantly impact loan portfolio quality. Larger loan sizes generally tend to increase credit risk and the likelihood of loans becoming overdue, impacting the overall quality of a loan portfolio. The study delved into investigating how loan size affect the loan portfolio quality in Kenya, state-owned development finance institutions where the outcomes are illustrated in Table 4.3.

Table 4.3: Respondents Responses on Loan Size

Item	Mean	Median	St. Dev
Large loans are more secured compared to small loans	3.84	4	1.19
Larger loans are more likely to be overdue	3.90	4	1.18
Borrowers of larger loans are more likely to repay their loans	3.73	4	1.11
Credit risk is more likely to increase with an increase in the loan amount per borrower	4.01	4	1.13
Loan management strategies employed increase in intensity with the size of the loan	4.04	4	1.03
Default has been decreasing among the large loans	3.91	4	1.21
The cost of managing loans decreases with the loan size	3.84	4	1.19
N= 86; Mean Av.= 3.85; St. Dev = 1.17			

Source: Field Survey (2024)

With respect to large loans are more secured compared to small loans, the majority of respondents rated this item as moderate extent, suggesting that there is a perception that large loans are more secured compared to small loans. The participants opted for moderate extent as vowed by mean of 3.84 and 1.19 deviation from standard values. This indicates that there is a belief that larger loans have stronger collateral or security, potentially reducing the credit risk associated with these loans. With regard to larger loans are more likely to be overdue, the responses for this item indicate a relatively even distribution indicating a moderate extent. The participants opted for great extent as acknowledged by a mean of 3.90 and deviation from standard value of 1.18. This suggests that there is moderate uncertainty regarding whether larger loans are more likely to become overdue.

Pertaining to borrowers of larger loans are more likely to repay their loans, the responses for this item are spread across the scale indicating a moderate extent. The affirmation of these statements is revealed by mean of 3.73 and 1.11 standard deviations. This suggests that there are perceptions that borrowers of larger loans are more likely to repay their loans, potentially due to stronger financial capacity and implementation of enhanced credit risk controls. Relating to credit risk is more likely to increase with an increase in the loan amount per borrower, the responses for this item indicate a great extent revealed by mean value of 4.0116 and standard deviation of 1.13235. This suggests that there are perceptions that credit risk may increase with larger loan amounts, potentially due to the higher exposure to larger borrowers.

Regarding loan management strategies employed increase in intensity with the size of the loan, the responses for this item indicate a great extent as affirmed by 4.04 mean and standard deviation of 1.03. This suggests that few participants belief that loan management strategies become more intensive as the loan size increases, potentially reflecting the need for stronger risk management for larger loans. Pertaining to default has been decreasing among the large loans, the responses for this item are spread across the scale indicating a moderate extent as affirmed by mean value of 3.91 and 1.21 standard deviation. This suggests that a relatively number of the participants' perception that default rates have been decreasing among larger loans, potentially due to improved risk assessment and borrower selection.

The cost of managing loans decreases with the loan size which the majority of respondents rated this item as moderate extent, suggesting that there is a belief that the cost of managing loans decrease moderately with the loan size. The outcome is avowed by mean and standard deviation value of 3.84 and 1.19. This indicates that managing larger loans may moderately result in significant cost savings for DFIs. The responses of the study aligned with the moderate extent as noted by the composite mean value of 3.85 alongside 1.17 deviations from standard mean values suggesting that loan size plays a role in the determination of loan portfolio quality to a moderate extent among the development finance institutions in Kenya.

4.2.7 Moral Hazard Behavior

Moral hazard behaviour can significantly impact the quality of a loan portfolio. In the context of lending, moral hazard occurs when one party, such as a borrower, changes their behaviour after entering into an agreement, knowing that they are not fully bearing the risks associated with their actions. The survey interrogated the participants and the output is recorded in Table 4.4.

Table 4.4: Respondents Responses on Moral Hazard Behaviour

Item	Mean	Median	St. Dev
Wilful defaulting by the borrower	4.79	5	.40
Misuse of loan proceeds	4.83	5	.37
Mismanagement of the project/investment	4.75	5	.45
Investment in riskier projects/ investments	4.80	5	.40
Neglect of duty or responsibility	4.81	5	.39
Expectation of a loan forgiveness from the institution	4.79	5	.40
The Kenya government provides insurance for loans	4.83	5	.37
The Kenya government can bail out a failing DFI loan portfolio	4.75	5	.45
N= 86; Mean Av.= 4.79; St. Dev = 0.41			

Source: Field Survey (2024)

The options range from 1 (no extent) to 5 (very great extent), indicating the respondents' assessment of various factors related to moral hazard behaviour in the studied institutions. The outcome uncovered that wilful defaulting by the borrower had majority of respondents rated this item as great extent, suggesting that wilful defaulting by borrowers is a widespread issue. This is affirmed by a mean and standard deviation of 4.79 and 0.40. This indicates that borrowers generally fulfil their repayment obligations, reducing the moral hazard associated with intentional defaults.

With regard to misuse of loan proceeds, the respondents observed with great extent as confirmed by mean of 4.83 and 0.37 standard deviation. This suggests that there is a high risk that the borrower might divert loan proceeds for use of items not approved. The outcome noted with a great extent regarding mismanagement of the project/investment. The mean of 4.75 and 0.45854 standard deviation confirmed participants alignment with the options of great extent. This suggests that there is an insignificant perception of mismanagement of projects or investments, which can contribute to moral hazard behaviour.

With regard to investment in riskier projects/investments, the responses for this item noted with great extent. The confirmation of the outcome is noted in the mean of 4.80 and 0.40 deviation from standard mean. This indicates that DFIs in Kenya are negatively affected when borrowers invest in riskier projects increasing the moral hazard associated with excessive risk-taking. Pertaining to neglect of duty or responsibility, the responses for this item aligned with the option of great extent. The responses are confirmed by 4.81 mean values and 0.39 standard deviation. This suggests that neglect of duty or responsibility is perceived to be a significant issue among DFIs in Kenya.

The study noted that with regard to expectation of loan forgiveness from the institution, the responses for this item indicate that the majority of respondents rated this item as great extent, suggesting that the expectation of loan forgiveness is widespread. The responses were confirmed owing to the mean of 4.79 and 0.40 deviations from standard. This is important because if borrowers expect loan forgiveness, it can incentivize risky behaviour and moral hazard. With respect to the Kenya government provides insurance for loans, the responses for this item are noted with great extent. The outcome is validated by a mean and standard deviations of 4.83 and 0.37. This suggests that while some respondents believe the government provides loan insurance, it is perceived to be a widespread practice. Furthermore, the Kenya government can bail out a failing DFI loan portfolio was another statement made in the study. The responses for this item are consistent with great extent as an option which is confirmed by 4.75 and 0.45 as mean and standard deviations. This indicates that the perception of the government's ability to bail out failing DFI loan portfolios is relatively high. The confirmation of the statements is supported by the aggregate mean and standard deviation of 4.79 and 0.41 indicating that moral hazard behaviour has to a potential of great impact on the quality of loan portfolio in development finance institutions in Kenya.

4.2.8 Loan Portfolio Quality

Loan portfolio quality refers to the degree to which a lender's loan portfolio is performing as expected or predicted. A high-quality loan portfolio generates consistent income, has a low loan loss rate, and is diversified across industries and borrowers. The participants were questioned in the survey, and the results are documented in Table 4.5.

Table 4.5: Respondents Responses on Loan Portfolio Quality

	Frequency	Percent
High	8	9.3
Low	78	90.7
Total	**86**	**100.0**

Source: Field Survey (2024)

According to Table 4.5, out of the total 86 respondents, 78 respondents (90.7%) categorized the loan portfolio quality as "Low," while 8 respondents (9.3%) categorized it as "High." The table provides information about the distribution of respondents' perceptions regarding loan portfolio quality. The majority of respondents (90.7%) perceived the loan portfolio quality of state-owned development finance institutions in Kenya as "Low," while a smaller proportion (9.3%) perceived it as "High." A high percentage of respondents perceiving the loan portfolio quality as "Low" may suggest that they believe these state-owned institutions experience a high rate of delinquency leading to the deterioration of the DFIs loan portfolio quality. This negative perception could be influenced by the negative moral hazard behaviours by borrowers obtaining loans from the state owned DFIs. On the other hand, a smaller proportion of respondents (9.3%) perceived the loan portfolio quality as "Low." This suggests that a minority of the respondents had concerns about the loan portfolio quality of state-owned development finance institutions in Kenya. These concerns could be related to factors such as higher levels of non-performing loans, a perceived lack of risk management measures, or a history of loan defaults.

4.3 Trend Analysis of Non-performing Loans

Trend analysis is a statistical and analytical technique used to evaluate patterns, trends, or changes in data over time. It involves examining historical data to uncover insights into the direction or tendencies of a particular factor. The trend analysis of loan portfolio quality was demonstrated in the study.

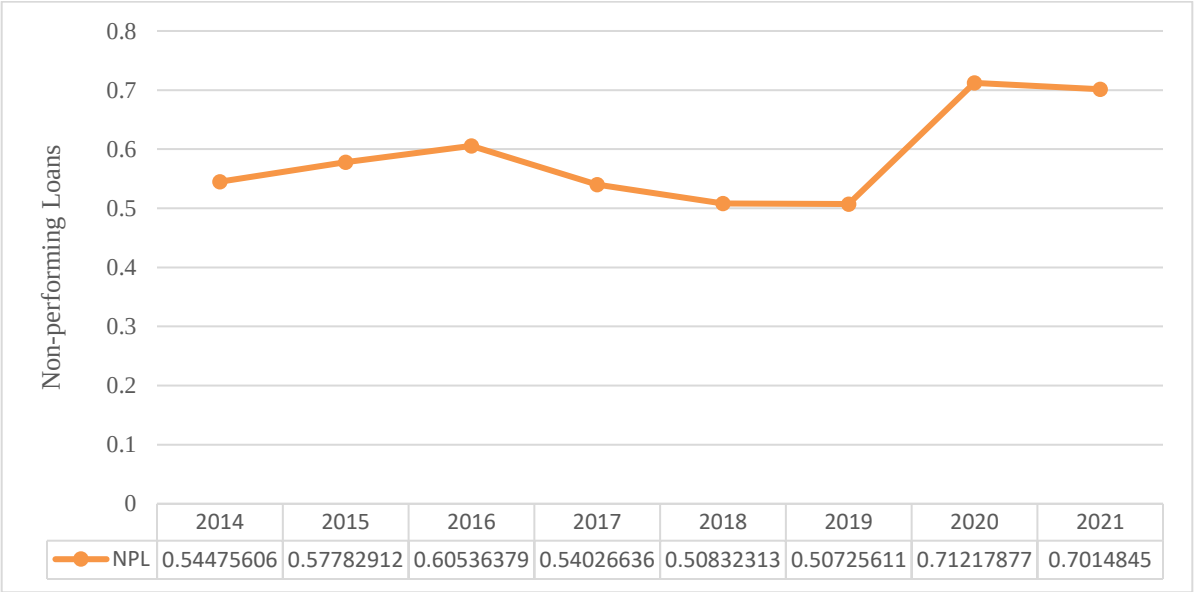
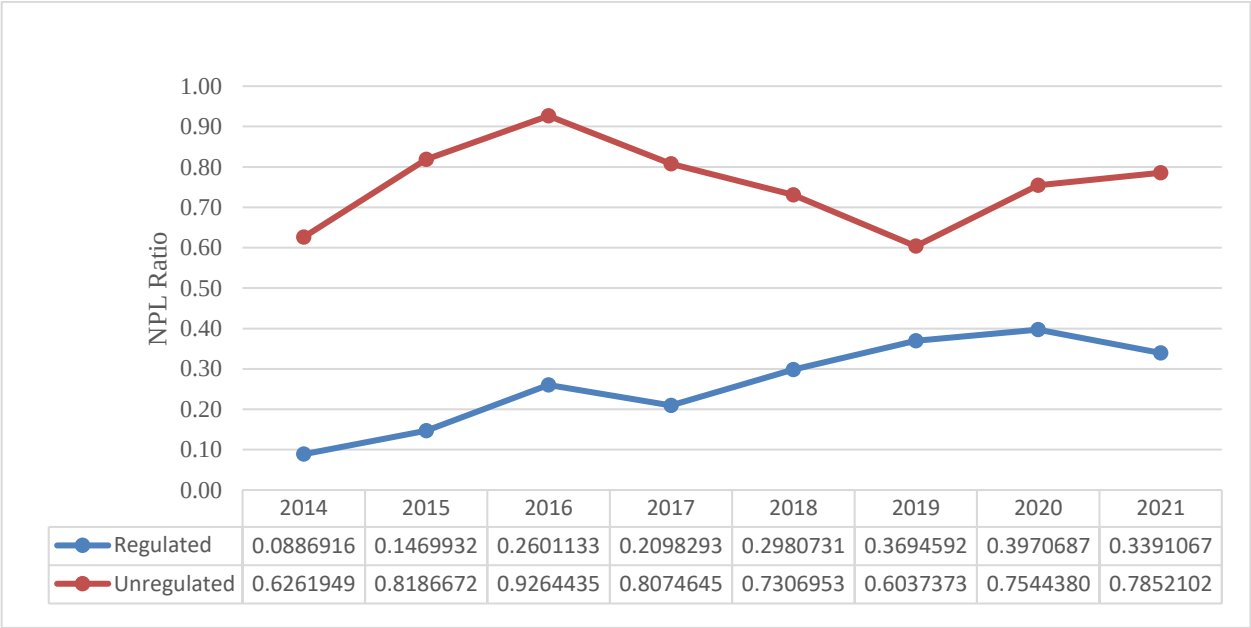


Figure 4.4: Trend Analysis of Non-performing loans

The given data represents the trend of non-performing loans (NPL) of development finance institutions (DFIs) in Kenya from 2014 to 2021. NPL refers to loans that are in default or have a high risk of default. Higher NPL ratios indicate a higher level of loan default and financial risk for the institutions involved. From 2014 to 2016, there was a gradual increase in the NPL ratio, indicating a rise in loan defaults or risky loans held by DFIs in Kenya. This trend suggests potential challenges in loan recovery, credit risk management, or economic conditions during that period. In 2017, there was a slight decrease in the NPL ratio, indicating some improvement in loan performance. This could be attributed to efforts made by DFIs to mitigate risks and improve their loan portfolios. The NPL ratio continued to decline in 2018 and 2019, reaching its lowest point of 0.507256. This suggests that DFIs in Kenya were able to reduce the level of non-performing loans and improve their loan recovery and risk management practices during this period. However, the NPL ratio increased significantly in 2020 and 2021. The NPL ratio reached its highest point in 2020 at 0.712179 and remained relatively high in 2021 at 0.701485. This indicates deterioration in loan performance and a higher risk of default. The increase in NPLs during this period could be attributed to various factors such as economic downturns, business disruptions, or the impact of the COVID-19 pandemic which distorted the repayment ability of these institutions in Kenya.

4.3.1 Comparative Analysis of Non-performing Loans in Regulated and Unregulated DFIs



	2014	2015	2016	2017	2018	2019	2020	2021
Regulated	0.0886916	0.1469932	0.2601133	0.2098293	0.2980731	0.3694592	0.3970687	0.3391067
Unregulated	0.6261949	0.8186672	0.9264435	0.8074645	0.7306953	0.6037373	0.7544380	0.7852102

Figure 4.5: Trend Analysis of Non-performing loans for Regulated and Unregulated DFIs
Source: Field Survey (2024)

The given data represents the trend of non-performing loans (NPL) of development finance institutions (DFIs) with a comparison of in terms of whether the DFI is regulated by CBK or not. Financial Institutions that are regulated by CBK have to comply to the Prudential Guidelines that require the institutions to implement robust risk management frameworks that includes minimum standards on loan underwriting and monitoring. This is enforced through the periodic compliance audits by CBK.

From 2014 to 2021, the regulated DFIs are reported to have better loan portfolio quality as compared to the DFIs that are not under any purview of a regulatory body. The regulated DFI has the highest NPL ratio of 0.397067 in 2019 and lowest NPL ratio of 0.0886916 in 2014 compared to the unregulated DFIs highest NPL ratio of 0.9264435 in 2016 and lowest NPL ratio of 0.6037373 in 2019. This trend suggests that the prudential regulations enforced by CBK may have a positive effect in the management of an institution's loan portfolio quality.

4.4 Diagnostic Tests

The survey conducted diagnostic test to ensure that none of the assumption under the least squares regression approach is violated. This is to ensure reliability and validity of the survey's outcomes. In the words of Kerlinger (1998), if any of the fundamental assumptions underlying classical linear regression is violated, it raises uncertainties about the reliability of the conclusions made. In this study, various diagnostic techniques were employed to examine crucial aspects such as normality, multicollinearity, heteroscedasticity and serial correlation test.

4.4.1: Iteration Tests

In logistic regression analysis, iteration refers to the process of estimating the model's coefficients through an iterative algorithm. The most commonly used algorithm for logistic regression estimation is called maximum likelihood estimation (MLE). The MLE process involves iteratively updating the parameter estimates until convergence is achieved. The outcome of the iteration test is noted in Table 4.6.

Table 4.6 Iteration Results

Iteration		-2 Log likelihood	Coefficients
			Constant
Step 0	1	56.880	-1.628
	2	53.359	-2.146
	3	53.230	-2.271
	4	53.230	-2.277
	5	53.230	-2.277

a. Constant is included in the model.
b. Initial -2 Log Likelihood: 53.230
c. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Source: Field Survey (2024)

The outcome disclosed that a constant term is included in the logistic regression model. It represents the baseline probability of the dependent variable when all independent variables are zero. The initial -2 log likelihood value is 53.230. The -2 log likelihood is a measure of the model's fit to the data, and it represents the deviance of the model from the observed data. The estimation process terminated at iteration number 5 because the parameter estimates changed by less than 0.001. This criterion is often

used as a stopping criterion to determine when the model has reached convergence, meaning that the parameter estimates have stabilized and further iterations are unlikely to significantly improve the model fit. The -2 log likelihood values for each iteration indicate the improvement in model fit as the estimation process progresses. In this case, the initial -2 log likelihood was 53.230, and it remained the same from the fourth iteration onwards. This suggests that the model reached a stable state after the fourth iteration, as there were no further changes in the likelihood. The coefficients represent the estimated values of the independent variables in the logistic regression model. In this case, two coefficients are reported: -1.628 and -2.146. These coefficients correspond to the constant and an unspecified independent variable, respectively. Overall, this logistic regression iteration history suggests that the model converged after five iterations, and the parameter estimates stabilized after the fourth iteration.

4.4.2 Omnibus Test

In logistic regression, the Omnibus Test of Model Coefficients is a statistical test used to assess the overall significance of the coefficients in the logistic regression model. The Omnibus Tests of Model Coefficients help determine whether the combination of independent variables, including credit risk management variables, has a significant impact on loan portfolio quality. The detailed result of the test is presented in Table 4.7.

Table 4.7 Omnibus Tests of Model Coefficients Results

		Chi-square	df	Sig.
Step 1	Step	4.630	4	.327
	Block	4.630	4	.327
	Model	4.630	4	.327

Source: Field Survey (2024)

The findings presented in Table 4.7 unearthed the chi-square statistic, degrees of freedom (df), and the associated p-value (Sig.). In this result, the chi-square value is 4.630, and the degrees of freedom are 4. The associated p-value is 0.327. Since the p-value is greater than the typical 0.1 threshold, it indicates that the model coefficients, including the credit risk management variables, do not have a statistically significant effect on loan portfolio quality at this significance level.

4.4.3 Model Summary Test

In logistic regression analysis, the Model Summary provides various metrics and statistics to evaluate the performance and goodness of fit of the logistic regression model. These metrics help assess how well the model fits the observed data and the proportion of variance explained by the model. The outcome drawn from the model summary is presented in Table 4.8.

Table 4.8 Model Summary Results

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	48.600[a]	.052	.114

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Source: Field Survey (2024)

The model summary presents several metrics for evaluating the logistic regression model's performance and goodness of fit. The -2 log likelihood is a measure of how well the logistic regression model fits the observed data. A lower -2 log likelihood value indicates a better fit, suggesting that the model's predicted probabilities align more closely with the actual outcomes. In this result, the -2 log likelihood is 48.600, indicating that the model fit the data reasonably well. The Cox & Snell R Square is a pseudo-R^2 measure that estimates the proportion of the variance in the outcome variable explained by the logistic regression model. It ranges from 0 to 1, with higher values indicating a greater proportion of explained variance. The Cox & Snell R Square is 0.052, suggesting that approximately 5.2% of the variance in loan portfolio quality is explained by the credit risk management variables included in the model. The Nagelkerke R Square is also a pseudo-R^2 measure that improves upon the Cox & Snell R Square by adjusting for the maximum possible value of R^2. It provides an estimate of the proportion of the maximum possible improvement in model fit achieved by the logistic regression model. Like the Cox & Snell R Square, it ranges from 0 to 1, with higher values indicating a greater proportion of explained variance. In your result, the Nagelkerke R Square is 0.114, indicating that the model explains approximately 11.4% of the maximum possible improvement in model fit.

4.4.4 Hosmer and Lemeshow Test

The Hosmer and Lemeshow Test produces a chi-square statistic, degrees of freedom (df), and the associated p-value (Sig.). The test divides the range of predicted probabilities into several groups or bins and compares the observed frequencies of the outcome variable with the expected frequencies predicted by the logistic regression model within each bin. The detailed results of the test are presented in Table 4.9.

Table 4.9 Hosmer and Lemeshow Test Results

Step	Chi-square	df	Sig.
1	11.356	8	.182

Source: Field Survey (2024)

The outcome indicated that the chi-square value is 11.356, and the degrees of freedom are 8. The p-value associated with the test is 0.182. The p-value indicates the probability of obtaining a chi-square value as extreme as, or more extreme than, the observed value, assuming the null hypothesis is true. In this case, the null hypothesis is that there is no difference between the observed and predicted probabilities. If the p-value is greater than the chosen significance level (0.1), it suggests that there is no significant difference between the observed and predicted probabilities, indicating a good fit of the logistic regression model to the data. Conversely, if the p-value is below the significance level, it suggests that there is a significant difference, indicating a poor fit of the model. The outcome demonstrated that the p-value is 0.182, which is greater than 0.1. This indicates that there is no significant difference between the observed and predicted probabilities at the chosen significance level. Therefore, based on the Hosmer and Lemeshow Test, the logistic regression model appears to have a good fit to the data in terms of the relationship between credit risk management and loan portfolio quality.

4.5 Interpretation of Regression Results

The evaluation of the survey hypotheses was attained by utilizing logistic regression approach. The regression analysis was conducted to determine the marginal effect of the explanatory variables on the explained factors (loan portfolio quality) among the development finance institutions in Kenya. Drawing from the analysis, Table 4.10 displays the outcomes of the individual effects of the factors that explained loan portfolio quality utilizing 5% level of significance. The magnitudinal effect of all

the factors linked to credit risk management on loan portfolio quality was further unveiled in Table 4.10.

Table 4.10: Logistic Regression Analysis

	B	S.E.	Wald	df	Sig.	Exp(B)	%Δ Odd Ratio
CRI	-.380	1.435	.070	1	.791	.684	-0.316
CRC	.151	2.142	.005	1	.944	1.163	0.163
LSZ	2.977	1.579	3.556	1	.059	19.622	18.622
MHB	-2.469	1.315	3.524	1	.060	.085	-0.915
Constant	-3.833	6.191	.383	1	.536	.022	-0.978

Source: Field Survey (2024)

The outcome in Table 4.10 revealed the coefficient (B) for the constant term -3.833. It denotes the expected value of the loan portfolio quality when credit risk management is zero. This suggests that even without any credit risk management, there is a likelihood of a baseline level of loan portfolio quality in these institutions. The logistic regression results indicated that the coefficient of loan size is positive ($\beta = 2.977$) and statistically significant (p-value = 0.059) at a 10% level of significance. This implied that an increase in the loan size increases the chances increasing loan portfolio quality of these institutions in Kenya. Moral hazard behaviour has a negatively ($\beta = -2.469$) signed coefficient and is statistically significant (p= 0.060) at a 10% level of significance. This implies that moral hazard behaviour has the probability of decreasing the loan portfolio quality of these institutions in Kenya. The results indicated that the credit risk identification has a negative ($\beta = -0.316$) and statistically insignificant (p= 0.791) effect while the parameter estimate for the credit risk control showed a positive ($\beta = 0.151$) and statistically insignificant (p= 0.944) effect on the loan portfolio quality.

4.6 Discussion of Findings of the Regression Analysis

The analysis of the study was conducted in view of the specific objectives of the survey which followed from the hypothetical testing of the claim made about the survey. The evaluation of the claim followed that credit risk identification, credit risk control, loan size and moral hazard behaviour significance was tested at 0.1 threshold of significance regarding their effect on the loan portfolio

quality of state-owned development finance institutions in Kenya. The hypothetical testing resulted from the objectives stated in the survey as discussed therein.

4.6.1 Effect of Loan Size on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

Loan size effect was examined on the loan portfolio quality in state-owned development finance institutions in Kenya. As per Table 4.10 on the regression findings, loan size was found to have a significant ($p = 0.059$) and positive ($\beta = 2.977$) effect on the loan portfolio quality of the state-owned development finance institutions in Kenya

H_{03} *There is no effect of loan size on the loan portfolio quality in state owned Development Finance Institutions in Kenya*

The outcome of the survey negates the above null claim which proposed that loan size has no significant effect of the loan portfolio quality of these development finance institutions in Kenya leading to its rejection. The findings imply that for every unit increase in loan size, there was a predicted increase of 2.977 in the log odds of loan portfolio quality.

4.6.2 Effect of Moral Hazard Behavior on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

The effect of moral hazard behaviour was examined on loan portfolio quality in state-owned development finance institutions in Kenya. Considering this objective, it was disclosed that moral hazard behaviour has a significant ($p = 0.060$) and negative ($\beta = -2.469$) effect on the loan portfolio quality of state-owned development finance institutions in Kenya.

H_{04} *There is no effect moral hazard behaviour on the loan portfolio quality in state owned Development Finance Institutions in Kenya*

The outcome of the survey as contradicts with the null statement which noted that moral hazard behaviour has no significant effect of the loan portfolio quality of these development finance institutions in Kenya. The outcome led to the rejection of the null hypothesis, thus indicating that, for every unit increase in moral hazard, there was a predicted decrease of 2.469 in the log odds of loan portfolio quality.

4.6.3 Effect of Credit Risk Identification on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

The study sought to analyse the effect of credit risk identification on loan portfolio quality in state-owned development finance institutions in Kenya. In relation to the stated objective, the outcome yielded that credit risk identification disclosed an insignificant ($p = 0.791$) and negative ($\beta = 0.380$) effect on loan portfolio quality.

H_{01} *There is no effect of credit risk identification on the loan portfolio quality in state owned Development Finance Institutions in Kenya*

The outcome conforms with the hypothesis which noted that credit risk identification has no effect on the loan portfolio quality of development finance institutions in Kenya thus the null claim was accepted.

4.6.4 Effect of Credit Risk Control on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

The effect of credit risk control was evaluated on the state-owned development finance institutions' loan portfolio quality in Kenya. Following this, the survey unveiled that credit risk control has an effect that is insignificant ($p = 0.944$) and positive ($\beta = 0.151$) on loan portfolio quality of these institutions in Kenya.

H_{02} *There is no effect of credit risk controls on the loan portfolio quality in state owned Development Finance Institutions in Kenya.*

With regards to the investigation's outcome which observed that credit risk control has no significant effect on loan portfolio quality in Kenyan development finance institutions that are state-owned, findings led to the acceptance of the null statement.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarized the key results, provided an overall interpretation, offered recommendations, and proposed ideas for further investigation. To structure the summary, the objectives that initiated the study were used as a framework. The conclusions and suggestions were built upon the insights uncovered by the research. This chapter also gives more information about how this work adds to the overall understanding of the topic area.

5.2 Summary of Findings

The state-owned DFIs play a key role in the implementation of a Government's developmental agenda. They have however been reported to invest in risker frontiers which leads to worse loan portfolio quality compared to other lending institutions such as commercial banks (Khatun & Saadat, 2019; Asfaw, Bogale, & Teame, 2016). This is coupled with the fact that DFIs operate with less stringent requirements on risk and collateral compared to the regulated financial institutions has been an area of concern as it has varied negative externalities more so on the financial stability of the institutions. From the foregoing, the study sought to fill in the identified research gaps on loan portfolio qualities in state owned DFIs.

The study's major aim was to examine the effect of credit risk management on loan portfolio quality of state-owned development finance institutions in Kenya. Particularly, the effect of credit risk identification, credit risk control, loan size and moral hazard behaviour on loan portfolio quality of state-owned development finance institutions in Kenya was investigated. The research adopted the Asymmetrical Information Theory and the Financial Intermediation Theory in guiding the study. A positivist philosophy was employed in the study with an explanatory research design being used as it entailed gathering sentiments from the concerned parties. The population for this study were 13 state-owned DFIs engaged in the provision of credit among other financial services. The study relied on primary data from semi-structured questionnaires and secondary data from the DFI's annual books of accounts. The collected study data was analysed using both descriptive and inferential tests.

According to descriptive analysis and at 0.1 level of significance, loan size had a positive and significant effect while moral hazard had a negative and significant effect on the loan portfolio quality in state owned DFIs. Credit risk identification and credit risk control were found to have an insignificant effect on loan portfolio quality of state-owned development finance institutions in Kenya. Furthermore, the trend analysis displayed that loan portfolio quality in the State Owned DFIs fluctuated over the studied period. Additionally, DFIs that are regulated were also found to have better loan portfolio qualities compared to those that were not regulated by CBK.

5.3 Discussions of Findings

This section presents the discussion of the study findings. The study findings are presented in line with the objectives of the study. The study sought to determine the effect of credit risk management on loan portfolio quality among state-owned DFIs as the general objective of the study. The aspects for credit risk management that were found to have a significant effect on loan portfolio quality are discussed below.

5.3.1 Effect of Loan Size on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

Investigating into the effect of loan size on the loan portfolio quality of state-owned development finance institutions in Kenya, the outcome uncovered that loan size had a positive and significant effect ($\beta = 2.977$, p-value = 0.059) on the state-owned development finance institutions loan portfolio quality in Kenya. The outcome denotes that for every unit increase in loan size, there was a predicted increase of 2.977 in the log odds of loan portfolio quality. This implies that loan size plays a major role in the quality of loan portfolio in the state owned DFIs. Therefore, increasing the size of loans would improve the quality of loan portfolio in these institutions in Kenya. The findings could imply that the state owned DFIs have a keen emphasis on monitoring of larger loans thereby making their delinquencies much less than the smaller loans. The asymmetrical information theory is validated by the study findings as the loan terms such as loan size are influenced by the information available to the lender for the purpose of analysing the borrower's loan repayment capacity.

The study outcome is similar to the findings of Chikalipah, (2018) and Muhammad et al. (2019) who also reported loan size to have a positive effect on loan portfolio quality. The findings however contradicts with Savitha & Kumar, (2016) who reported that larger loans are more likely to cause a deterioration of the loan quality as compared to smaller loans. The uniqueness of these studies' outcomes could be linked to the contextual differences recorded in the studies as Savitha & Kumar, (2016) and Muhammad et al. (2019) based their study on bank loans while Chikalipah, (2018) analysed loans advanced by MFIs.

In reality, the size of loans issued directly impacts the loan portfolio quality of a lender. Larger loans typically carry higher inherent risks due to their potential impact on the lender's financial stability in case of default. Lenders however mitigate this often by implementing more thorough due diligence, approval and monitoring mechanisms for high loan amounts. Whereas most for the studies report a positive and significant relationship between loan size and loan repayment perfromance other studies such as Savitha and Kumar (2016) and (McCann & McIndoe-Calder, 2012) reported contrary findings to the extent that default rates increase when there is an increase in the loan amounts. Large amounts of loans have also been reported to increases the chances of the moral hazard attributes from a borrower (Simotwe, Zeller, & Phiri, 2006).

5.3.2 Effect of Moral Hazard Behaviors on Loan Portfolio Quality in State-owned Development Finance Institutions in Kenya

The survey determined the effect of moral hazard behaviours on the loan portfolio quality of state-owned development finance institutions in Kenya. The outcome of the investigation as displayed showed that moral hazard behaviours had a significant and negative effect (β = -2.469, p-value = 0.060) on the loan portfolio quality of state-owned development finance institutions in Kenya. The results suggest that for every unit increase in moral hazard, there was a predicted decrease of 2.469 in the log odds of loan portfolio quality. The outcome displayed that moral hazard behaviours does play a major role in the determination of loan portfolio quality these institutions in Kenya. The study noted that moral hazard behaviours by borrowers from the state owned DFIs is widespread which can incentivize risky lending behaviour. The study findings validate the asymmetrical information theory

as the level of information is shifted after disbursement and for the state owned DFI's moral hazard risks arise.

The outcome is comparable to Arslan-Ayaydin et al. (2014) who reported a negative relationship between risk of moral hazard and the loan performance of the project. Simotwe, Zeller and Phiri, (2006) had similar findings as they reported that borrowers' reluctance to service their loan obligations was the main cause of loan defaults and a deteriorating portfolio quality. Gine and Kanz (2014) also found existence the moral hazard risks in lending due to the expectations of future government interventions on their loan repayment obligations. On the contrary, Dinc & Yönder, (2022) found out that strategic default more often leads to a renegotiation of the loan contracts which has been reported to improve the loan portfolio quality (Dardac, Barbu, & Boitan, 2011). Asimakopoulos et al. (2016) also reported a positive and significant relationship between strategic default, which is defined as the borrower's unwillingness to service their loan obligations, and loan amount. The uniqueness of these studies' outcomes could be linked to the contextual differences recorded in the studies.

In reality, moral hazard behaviours among borrowers of the state-owned development finance institutions can significantly impact the quality of the loan portfolio. When borrowers perceive that they are insulated from the consequences of default because it is a government initiative, they may act in a way considered to be immoral by the lender, leading to increased default rates. This behaviour can result in a higher incidence of non-performing loans within the portfolio, ultimately diminishing its quality and increasing the financial burden on taxpayers. Some studies such as the one by Dinc & Yönder, (2022) reported findings that are against this reality. Dinc & Yönder, (2022) reported that willfull defaulting will often lead to a renegotiation of the loan repayment terms and a loan restructure that would upgrade the loan to performing status, leading to an improvement in the loan portfolio quality (Dardac, Barbu, & Boitan, 2011). This was attributed to situations where the lender would have to take a haircut at the point of realizing collateral securing the loan.

5.4 Conclusion

The survey investigated into the effect of credit risk management on loan portfolio quality of state-owned development finance institutions in Kenya. The outcome led to the unfolding of a variety of discoveries and subsequent conclusion regarding the specific factors of credit risk management in the

state-owned development finance institutions in Kenya. In line with this objective, the survey uncovered that loan size had a positive and a weak significant effect while moral hazard behaviour had a negative and a weak significant effect on the loan portfolio quality in state owned DFIs. The outcome displayed that loan size and moral hazard behaviours does play a role in the determination of loan portfolio quality these institutions in Kenya.

Delving into the effect of loan size on the loan portfolio quality and in consideration of the findings, the study concludes that increasing the amount of loan issued has the potential to improve on the quality of the loan portfolio in the state owned DFIs. This could be alluded to the enhanced loan appraisal and monitoring mechanisms applied by the state owned DFIs specifically to higher loan amounts as they have a higher impact if default occurs.

Arising from the outcome the study also concludes that managing the effects of moral hazard behaviour by borrowers had the potential of improving the loan portfolio quality of state-owned development finance institutions in Kenya. The outcome displayed that moral hazard behaviours are prevalent among borrowers which increases the delinquency rates among loans issued by the state owned DFIs. Therefore, when borrowers engage in moral hazard behaviour, such as taking excessive risks, neglect of duty or exhibiting opportunistic behaviour, it negatively affects the quality of the loan portfolios of state-owned DFIs in Kenya.

5.5 Recommendations

5.5.1 Recommendations for policy

Government as the majority shareholder should consider providing additional financial resources to state-owned Development Finance Institutions (DFIs) to enable them to increase the size of loans offered. The study has demonstrated that increasing the loan size offered by DFIs positively impacts the quality of their loan portfolios. By expanding the loan amounts, DFIs can better cater to the financing needs of their customers who are often underserved by the traditional financial institutions. This approach not only fosters economic growth by stimulating investment and entrepreneurship but also mitigates the risk of default, as larger loans can facilitate more substantial and sustainable business ventures.

Institutionally, the study recommends development finance institutions in Kenya should develop and implement thorough credit policies that would enhance their credit risk management processes. The credit policy should provide for robust credit assessment procedures, conducting thorough due diligence on borrowers, and monitoring loan investments regularly. By identifying and mitigating potential credit risks early on, institutions can improve their loan portfolio quality.

With regards to the regulatory policy and arising from the findings that the DFIs regulated by CBK had better loan portfolio qualities compared to the DFIs that were not regulated, the policy makers of the respective DFIs can consider implementing the robust risk management frameworks provided in the prudential regulations. This adoption should however not dilute the state owned DFIs mandate of promoting economic development through the various financial interventions.

5.5.2 Recommendations for practice

The recommendations of the survey were made in reference to the significant factor in the study. The development finance institutions should maintain stringent credit underwriting standards. By conducting comprehensive credit assessments, institutions can accurately evaluate the creditworthiness of borrowers and make informed lending decisions. This includes analysing financial statements, assessing cash flow projections, and evaluating the borrower's ability to repay the loan.

Development finance institutions in Kenya should establish loan size limits based on their risk appetite and capacity to manage larger loans. By setting appropriate limits, institutions can mitigate the potential risks associated with large loans. This can help prevent overexposure to individual borrowers and ensure a more diversified loan portfolio.

To mitigate the adverse effects from the moral hazard behaviours, state-owned DFIs need to implement stringent underwriting standards, monitoring mechanisms, and enforcement measures so as to reduce default risk and ensure the sustainability of the loan portfolio. When evaluating loan applications, development finance institutions should conduct thorough credit assessments regardless of the loan size. This includes analyzing the borrower's financial statements, assessing their repayment capacity, and evaluating their creditworthiness. Rigorous credit underwriting standards should be applied consistently to all loans, regardless of their size.

5.6 Contribution to Knowledge

The study's findings have expanded our knowledge of the relationships between credit risk management and loan portfolio quality of state-owned development finance institutions in Kenya. The survey has contributed to the expansion of theoretical postulations, practice and policy formulation. By expanding on the hypothetical basics of the survey's asymmetircal information theory and the financial intermediation theory, the analysis has helped to increase the applicability of these theoretical postulations to the context of state-owned development finance institutions in Kenya.

By using an empirical model to test the hypothesis that credit risk control and loan size significantly impacts the loan portfolio quality of development finance institutions (DFIs) in Kenya, the analysis contributed new insights. As a result, the existing body of knowledge on the empirical links between credit risk management and loan portfolio quality of state-owned DFIs in Kenya has been expanded with additional evidence.

5.7 Study Limitations

The study encountered several limitations as elaborated here. Firstly, the study is limited to the subjective measures of credit risk management which are based on opinions and perceptions of respondents as the objective measures of the same from the financial reports or other secondary data was not established. Further, the data used in the study only covered a specific period, and it may not be representative of the long-term effects of corporate taxation on investor attraction. Thirdly, Aspects of credit risk management and loan portfolio quality researched here are in the context of state owned DFIs in Kenya. Therefore, there is a gap that further studies may fill by analysing the aspects of credit risk identification, credit risk control, loan size and moral hazard behaviours in other financial providers such as commercial banks, SACCOs and digital credit providers among others. These limitations may be addressed by conducting further studies to provide a more comprehensive understanding of the effect of credit risk management on loan portfolio quality.

5.8 Suggestion for Further Research

In view of the survey which sought to determine the effect of credit risk management on loan portfolio quality of development finance in state-owned institutions in Kenya, the survey suggests that further

study can be conducted to unravel why credit risk identification and moral hazard behaviour insignificantly impact loan portfolio of state-owned DFIs in Kenya.

Other studies can be performed to compare the credit risk management practices and loan portfolio quality between state-owned versus privately-owned DFIs in Kenya to understand any differences. In addition, other studies can be conducted to analyze the moderating role of macroeconomic and regulatory factors to understand how the relationship between variables changes under different conditions.

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APPENDICES

APPENDIX I: Ethical Clearance Letter

Strathmore UNIVERSITY

12th February 2024

Mr Sang George,
george.sang@strathmore.edu

Dear Mr Sang,

RE: The Effect of Credit Risk Management on Loan Portfolio Quality: Evidence from State-Owned Development Finance Institutions in Kenya

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC1948/23.** The approval period is from **12th February 2024 to 11th February 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

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
12-Feb-2024
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

APPENDIX II: Letter of Introduction

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857 00200, Nairobi, Kenya.
Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or vist www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

Monday, February 19, 2024

To Whom It May Concern

RE: FACILITATION OF RESEARCH – GEORGE SANG

This is to introduce George Sang who is a Master of Science in Development Finance (MDF) Student at Strathmore University Business School, admission number MDF/77262/19. As part of our MDF Program, George is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MDF course.

George is undertaking a research paper on "**The Effect of Credit Risk Management on Loan Portfolio Quality: Evidence from State-Owned Development Finance Institutions in Kenya.**" The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MDF seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research.

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

Yours sincerely,

Alois Njenga
Manager - Graduate Programmes.

Appendix III: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **377911**

Date of Issue: **15/February/2024**

RESEARCH LICENSE

This is to Certify that Mr.. George Sang 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: THE EFFECT OF CREDIT RISK MANAGEMENT ON LOAN PORTFOLIO QUALITY: EVIDENCE FROM STATE-OWNED DEVELOPMENT FINANCE INSTITUTIONS IN KENYA for the period ending : 15/February/2025.

License No: **NACOSTI/P/24/33249**

377911

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix IV: Study Questionnaire

Part I: General Information

Kindly respond by ticking in the boxes provided.

Name of Organization:

. . . . . .

Gender:

Male……. [ ]

Female……. [ ]

Your Designation:

Credit/Investment Officer ……..…… [ ]

Credit/Investment Manager……. [ ]

Credit/Investment Analyst……..…. [ ]

Relationship Officer……. [ ]

Other: . . . . . .

Years in the organization:

Less than five years……. [ ]

Five to Ten years……. [ ]

Eleven to Fifteen years……. [ ]

Over fifteen years……. [ ]

Part II: Credit Risk Management Practices

Credit Risk Identification.

Using the below scale, kindly rate the extent to which the below credit risk identification practices influence the loan portfolio quality within your DFI.

1- No Extent, 2- Less Extent, 3- Moderate, 4- Great Extent, 5 Very Great Extent.

		1	2	3	4	5
1	Evaluation of the prospective borrower's repayment capacity.					
2	The training and experience of the prospective borrower.					
3	Analysis of historical loan statements.					
4	Analysis of the prospective borrower's financial accounts					
5	Undertaking site visits					
6	Listing checks from the Credit Reference Bureaus					
7	Feasibility study analysis					
8	Conducting portfolio performance reviews					
9	Independent information checks					
10	Properly of staffed appraisal department.					
11	The potential borrower's experience					
12	The borrower's contribution to the investment					
13	Use of credit scoring models					
14	Analysis of the projected cash flows.					
15	Analysis of the prevailing conditions such as industry trends, economic trends, exchange rate trends on the projected loan prepayment performance.					

How does Credit Risk Identification affect the quality of the loan portfolio in your DFI? ……
……

Credit Risk Control.

Using the below scale, kindly rate the extent to which listed credit risk control practices influence the loan portfolio quality within your DFI.

1- No Extent, 2- Less Extent, 3- Moderate Extent, 4- Great Extent, 5 Very Great Extent.

		1	2	3	4	5
1	Adequate collateral					
2	Loan classification according to their repayment performance					
3	Periodic monitoring visits to the place of operations of the borrower.					
4	Charging of loan penalties for any late repayments					
5	Risk based pricing models					
6	Execution of enforceable loan agreements between the institution and the borrower.					
7	Insuring collateral against adverse events					
8	Limiting maximum amount of lending to an individual borrower					
9	Limiting maximum of lending to a specific industry					
10	Undertaking periodic reviews the macroeconomic risks that may affect the loan repayment performance					
11	Reminders to the borrowers about their outstanding loan obligations					

12	Information sharing with the Credit Reference Bureaus					
13	Efficient reporting mechanism for the identified credit risks					
14	Tailoring loan repayments to the seasonal cash flows of the borrower					
15	Monitoring the borrower's cash flows					

Loan Size.

Using the below scale, kindly indicate your level of agreements to the following statements concerning the loan size in your organization.

1- No Extent, 2- Less Extent, 3- Moderate Extent, 4- Great Extent, 5 Very Great Extent.

		1	**2**	**3**	**4**	**5**
1	Large loans are more secured compared to small loans					
2	Larger loans are more likely to be overdue					
3	Borrowers of larger loans are more likely to repay their loans					
4	Credit risk is more likely to increase with an increase in the loan amount per borrower					
5	Loan management strategies employed increase in intensity with the size of the loan.					
6	Default has been decreasing among the large loans					
7	The cost of managing loans decreases with the loan size					

Moral Hazard Behaviour

Using the below scale, kindly rate the extent to which the listed moral hazard behaviour influences the loan portfolio quality within your DFI.

1- No Extent, 2- Less Extent, 3- Moderate Extent, 4- Great Extent, 5 Very Great Extent.

		1	**2**	**3**	**4**	**5**
1	Wilful defaulting by the borrower					
2	Misuse of loan proceeds					
3	Mismanagement of the project/investment					
4	Investment in riskier projects/ investments					
5	Neglect of duty or responsibility					
6	Expectation of a loan forgiveness from the institution					
7	The Kenya government provides insurance for loans					
8	The Kenya government can bail out a failing DFI loan portfolio					

Part III: Loan Portfolio Quality.

Kindly indicate your level of agreements to ONE of the following statements concerning the loan portfolio quality in your organization.

	Tick One
The institution has a high loan portfolio quality	
The institution has a low loan portfolio quality	

Appendix V: List of Public Development Finance Institutions in Kenya

1. Agricultural Finance Corporation (AFC)
2. IDB Capital Limited (IDB)
3. Industrial and Commercial Development Corporation (ICDC)
4. Kenya Industrial Estates (KIE)
5. Tourism Finance Corporation (TFC)
6. Agricultural Development Corporation (ADC)
7. Development Bank of Kenya (DBK)
8. Women Enterprise Development Fund (WEDF)
9. Uwezo Fund
10. Micro Small and Medium Enterprises Authority (MSEA)
11. Higher Education Loans Board (HELB)
12. Kenya Youth Employment & Opportunities Project (KYEOP)
13. Youth Enterprise Development Fund (YEDF)

APPENDIX VI: Participants Information Consent Sheet

SECTION 1: INFORMATION SHEET

Investigator: GEORGE SANG

Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION SHEET–THE STUDY

2.1: Why is this study being carried out?

The study is being conducted in partial fulfilment of the requirements of the degree of Master of Science in Development Finance at Strathmore University Business School.

2.2: Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on effect of credit risk management on loan portfolio quality in your organization. If you are not able to answer all the questions successfully the first time, you may be asked to sit through another informational session after which you may be asked to answer the questions a second time. You are free to decline to take part in the study from this study at any time without giving any reasons.

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

- Credit/Investment officers in state owned Development Finance Institutions
- Credit/Investment managers in state owned Development Finance Institutions
- Accounting Officers of the state-owned Development Finance Institutions

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

Persons not working in the state-owned Development Finance Institutions identified for the study.

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

You will be approached by the researcher and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete. The questionnaire will take about 30 minutes to compete.

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

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

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

The study will contribute by providing insights on the effect of credit risk management and loan portfolio quality in state owned DFIs. Furthermore, financial policy makers and practitioners would benefit learning how to achieve growth and sustainability of DFIs. Additionally, the study will assist the development finance practitioners in being accountable for what they deliver considering the limited resources.

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

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

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

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

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

You can contact me, George Sang, at SBS, or by e-mail george.sang@strathmore.edu. You can also contact my supervisor, Dr. James Ndegwa, at the Strathmore Business School, Nairobi, or by e-mail jndegwa@strathmore.edu or by phone 0703034414

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

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

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

Please tick the boxes that apply to you;

Participation in the research study

☐ I AGREE to take part in this research

☐ I DON'T AGREE to take part in this research

Storage of information on the completed questionnaire

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

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

Participant's Signature:

Date: _____/_____/_____

DD / MM / YEAR

Participant's Name:

Time: _____/_____

(Please print name)

HR / MN

I, _____(Name of person taking consent) certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that s/he has understood the nature and the purpose of the study and consents to the participation in the study. S/he has been given opportunity to ask questions which have been answered satisfactorily.

Investigator's Signature:

Date: _____/_____/_____

DD / MM / YEAR

Investigator's Name:

Time: _____/_____

HR / MN

George Sang