European Journal of Economic and Financial Research
ISSN: 2501-9430
ISSN-L: 2501-9430
Available on-line at: http://www.oapub.org/soc

DOI: 10.46827/ejefr.v9i3.2011 Volume 9 | Issue 3 | 2025

CREDIT RISK MANAGEMENT, GROSS DOMESTIC PRODUCT AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

Irine Chepkirui Kalya[1i],
Irene Cherono[2]
[1]MBA Student,
Catholic University of Eastern Africa,
GABA Campus,
Eldoret, Kenya
[2]Lecturer, PhD,
Catholic University of Eastern Africa,
GABA Campus,
Eldoret, Kenya

Abstract:
The banking industry is regarded as one of the most critical players that drives an economy of any country to the desired level, and without requisite channels, the sector can be adversely affected. As a consequence, the bank's performance is crucial in carrying out its mandate as a financial intermediary. However, bank performance is influenced by a myriad of factors, including firm-related factors and gross domestic product. Based on the research questions, the study analyzed the direct relationship between credit risk management concepts, such as lending requirements, credit monitoring, credit appraisal process and financial performance of commercial banks in Kenya. Further, the investigation proceeded to determine whether gross domestic product moderates the relationship between credit risk management and the financial performance of banks. The investigation was anchored on loanable funds theory, asymmetric information theory and Rostow's economic growth model. As guided by the explanatory research design, the investigation covers all 39 commercial banks currently operating in Kenya. Data was collected using document analysis guided by longitudinal data over the period 2015 to 2022 were gathered thereby giving 288 observations. Data was then subjected to descriptive, correlation and relevant diagnostic test analysis was conducted. Furthermore, a random effect model was used in testing the study's hypotheses. The results presentation was done using tables and figures. From the findings, there was a positive and significant relationship between lending requirements (β = .04608, p = .000<.05), credit appraisal process (β = .00399, p = .000<.05), as well as credit monitoring (β = 2.79353, p = .000<.05) and financial performance. In addition, gross domestic product lacked the moderating effect in the relationship between lending requirements (β = .0044,

[i] Correspondence: email kalyairene@yahoo.com

p = .293> .05), credit monitoring (β = .023456, p = .501>.05) and financial performance. On the contrary, there was a positive and significant moderating effect of gross domestic product in the relationship between credit appraisal process and financial performance (β = .0085, p = .023<.05). A conclusion was made that lending requirements, credit appraisal process and credit monitoring have a direct effect on financial performance of commercial banks. While annual economic growth significantly moderates the effect of the credit appraisal process on financial performance, it neither moderated the effect of either credit monitoring or lending requirements on the financial performance of commercial banks in Kenya. It is recommended that commercial banks put in place stringent lending requirements to reduce default rates and improve loan quality to enhance their sustainability and financial performance in the long run. The commercial banks ought to scrutinize the credit scores of the borrowers to ensure that the borrowers are lent money according to their ability to repay based on their past borrowing records. Commercial banks under study ought to have measures in place to enhance credit monitoring. The government of Kenya also have to have measures in place that can help stabilize the economic growth of Kenya.

JEL: G21, G32, E44, E32, C23

Keywords: credit risk management, lending requirements, credit appraisal process, credit monitoring, gross domestic product (GDP), financial performance

1. Introduction

The banking sector is viewed as one of the most critical players that drives an economy of any country to the desired level, and without requisite channels, the sector can be adversely affected. In general, the concept of organizational performance is based upon the idea that an organization is the voluntary association of productive assets, including human, physical, and capital resources, for achieving a shared purpose (Phina, 2020). The essence of performance for an organization is the creation of value, as the value created by the use of contributed assets is equal to or greater than the expected value by those contributing the assets, ensuring their continued availability and existence (Gutterman, 2023). Several management research activities thus seek to unravel how value in a firm is derived. Conversely, how that value is measured is the essence of this research (Elia *et al.*, 2020).

Credit risk is most simply defined as the potential that a borrower or counterparty would fail to meet its obligations within agreed terms (Ugut, 2024). The goal of credit risk control is maximization of adjusted bank risks by maintaining the exposure of credit risks within the acceptable limits (Taiwo *et al.*, 2017). Banks ought to manage risks in individual transactions or credits and the risks in the entire portfolio (Ugut, 2024). Financial sector players like commercial banks ought to look at the interlinkage of credit risk and other risks, like liquidity and market risks, that face banks. The long-term success of any

banking organization depends on the effectiveness of the bank to manage credit risks (Scott *et al.*, 2024). Credit risk in many of the commercial banks is inherent, and banks have to adopt a strategy to mitigate any possible credit risk occurrence (Aldayel & Fragouli, 2018). As such, credit risk management is a fundamental activity in the banking sector. The survival and sustainability of many of the players in the banking sector rely on the credit risk management strategy (Mohamed & Onyiego, 2018). Commercial banks face many risks while undertaking their operations, one of the common ones is dealing with cash whose value remain unsecured because of ever-increasing defaults and non-performing loans (Karanja, 2019).

Loans form the largest source of credit risk, even though other sources exist, including in the trading and banking book (Afjal *et al.*, 2023). Banks are increasingly facing credit risk in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions (Ferdaous, 2020). Credit risks continue to be one of the major risks confronting banks globally, and as such, it remains an issue of concern to the banking sectors, policymakers and researchers (Scott *et al.*, 2024). Banks should now have a keen awareness of the need to identify, measure, control and monitor credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred (Figueiredo, 2023). As per OECD (2015), the document is released and managed by the Basel Committee to motivate credit managers in the banking sector to promote sound credit management risk practices.

Among credit risk management practices used by commercial banks are lending requirements, credit appraisal processes and credit monitoring (Maina & Njeru, 2023; Ngiay & Hong, 2023; Obae, 2022). Commercial banks have specific lending requirements for credit risk management to lessen default rates and maximize profit margins. The requirements include the assessment of borrowers for credit worthiness by evaluating factors such as debt-to-income ratio, income, credit history, as well as evaluating collaterals (Oleiwi, A. T., Ali, M., Jassim, S. H., Nadhim, M. H., Gueme, G. M., & Bujang, N., 2019). Borrowers are often classified by commercial banks into different categories. Some borrowers are classified as high-risk borrowers, while others are classified as low-risk borrowers. Low-risk borrowers are offered more favorable loan terms. Commercial banks also further factor in other regulatory requirements, including capital adequacy ratios, to enhance their financial reserves to cover potential loan defaults (Antar, 2024).

The credit appraisal process entails a systematic evaluation of the financial status of a borrower as well as their potential to repay the loan before loan approval (Githama & Gachanja, 2020). Some of the key factors commercial banks assess during the credit appraisal process include the value of the collateral availed, debt-to-income ratio, income levels, as well as loan history (Yhip, T. M., Alagheband, B. M., Yhip, T. M., & Alagheband, B. M., 2020). Credit appraisal process is often conducted with the aid of risk rating systems as well as credit scoring models to ensure that loans are advanced to individuals and businesses having the ability to repay and hence reduce credit risk and enhance the

financial performance of the commercial banks (Bhatore, S., Mohan, L., & Reddy, Y. R., 2020).

Credit monitoring is one other significant credit risk management practice. Credit monitoring entails the process of tracking the financial status of borrowers, the industry conditions, as well as their repayment history to ensure that the borrower meet their repayment obligations and reduces non-performing loans (Omokhoa, H. E., Odionu, C. S., Azubuike, Chima, & Sule, A. K., 2024). This process helps the commercial banks to detect potential defaults before they occur and hence allows them to take corrective measures to recover the loans or even help the borrowers restructure their loans as a credit risk management measure (Scott *et al.*, 2024).

Globally, credit risk has raised concerns among researchers, policymakers and banks. Commercial banks in Asia are facing the issue of high NPLs, 9.3% which is the highest globally. As per the Asian Development Bank (2019), the non-performing loans in the south are approximately $518 billion, which is relatively high compared to previous years. Investigating Asian commercial banks, Siddique *et al.* (2021) pointed out that nonperforming loans, cost-efficiency ratio and liquidity ratio significantly and negatively affected financial performance, ROA and ROE. The financial performance of Asian commercial banks is significantly positively influenced by their capital adequacy ratio and average lending rate (Siddique *et al.*, 2021). In Turkey, Ekinci and Poyraz (2019) noted that credit risk was a critical bank parameter that was negatively affecting the performance of commercial banks in the country both in terms of ROA and ROE. The non-performing loans in privately owned banks stood at 3.5%, the public-owned banks stood at 4% while the foreign-owned banks stood at 9% in Turkey (Ekinci & Poyraz, 2019). In China, credit risk in terms of NPLs was 1.67% in 2015. Twum *et al.* (2022) revealed a negative and statistically significant link between NPLs and ROE, as well as loan loss provision and the profitability of the bank. Contrastingly, the capital adequacy ratio positively and significantly influences bank performance.

Regionally within the African continent, commercial banks continue to struggle with credit risks (Léon, 2023). In Ghana, credit risk in the form of non-performing loans stood at 22.7% (Kwashie, Baidoo, & Ayesu, 2022), negatively affecting the financial performance of commercial banks in the country. In Uganda, credit risk continues to confront bank performance. Serwadda (2018) noted that bank performance was inversely influenced by NPLs, which may expose them to financial crisis and large magnitudes of illiquidity. In Tanzania, Kaimu and Muba (2021) indicated that performance was inversely significant with NPLs and negatively insignificant with the loan loss provision ratio, while positively significant with capital adequacy. Credit risk in the form of non-performing loans stood at 5.2% in Tanzania (Kaimu & Muba, 2021).

In Kenya, the banking sector plays a critical role in achieving Kenya's Vision 2030 through catalyzation of FDIs, increased savings cushioning the economy from external shocks (Republic of Kenya, 2022). Locally, the commercial banks operating in Kenya are categorized into tier I banks, tier II banks and tier III banks (Central Bank of Kenya, 2024). The categorization criteria are by market share, revenue, total assets controlled and

number of customer deposits (CBK, 2024). Commercial banks in Kenya are categorized into Tier III, II, and I bank (CBK, 2024). These categorize are based on the number of deposits, total assets, revenue and market share (CBK, 2024). There are tier III banks control 8.3 percent of the market share, 15 tier II banks that control 41.7 percent and 6 tier I banks controlling 49.9 percent of the market share (CBK, 2020). There are 43 commercial banks in Kenya, 29 local and 14 foreign (CBK, 2022). Commercial banks create a significant link between lenders and borrowers and also support holding depositors' funds, hence pooling funds for lending to customers. The Companies Act, CBK Banking Act and CBK Act regulate banks in Kenya (CBK, 2024). There are regulations, including the Kenya Bankers Association's operations structure, that are outside the CBK, which is tasked with regulating commercial banks' operations. Liquidity levels and maintaining acceptable capital adequacy before the bank begins to operate are some of the regulations for banks.

Financial performance encompasses metrics such as net interest margin, return on equity and return on assets, which serve as proxies for measuring efficacy, profitability and the overall health of a company (Ackon, 2023). Financial performance is used to measure the ability of an entity to be profitable from its principal operations, including its strengths and overall financial well-being. Financial performance is instrumental in assessing the financial and operational wellness of a company as well as comparing financial performance across sectors. It is a key measure of profitability for any company (Mamo, W. B., Feyisa, H. L., & Yitayaw, M. K., 2021).

One of the primary objectives of any commercial organization is attaining profit and is one of the indictors of the institutional and administrative prosperity of a company (Hada & Maria, 2020) The ability of banks to generate profits can be used to gauge their financial performance and hence as their ability to generate profits improves so is their financial performance (Donkor *et al.*, 2018). If the performance of the banking sector deteriorates, it would have an adverse impact on the economy. Thus, the commercial banks are aware of the need to track the macroeconomic and microeconomic conditions in order to better predict and control risks. Since the performance of banks is determined by both external and internal environments, most banks fail to meet their expectations because of these factors (Auma, 2018).

Commercial banks in Kenya continue to record unstable performance trends. ROA for Kenyan commercial banks was 2.7 percent, 3.3 percent in 2021, 1.7 percent in 2019, 2.6 percent in 2018 and 2.6 percent in 2017 indicating that the trend of profitability was unstable (Statista, 2023), and this can be attributed to rising credit risks and liquidity problems of banks. Tier 1 banks also recorded a 17.03 percent combined ROE, indicating a drastic decline in profits. Investor confidence can be eroded by the inconsistent performance of banks that results from unplanned money withdrawals, leaving the banks with inadequate deposits for customers to operate (CBK, 2022).

Banks face numerous risks because of their complex nature and the dynamic structure of the economic environment in which they operate. These risks include legal risks, nominal risks, operational risks, liquidity risk, market risk and credit risk that may

have negative effects on the profitability, equity, liabilities and market value of the banks (Vovchenko, 2021). Loans form the main income source for the commercial banks, and hence, credit risk is one of the notable risks banks face. Credit risk represents the possibility of loss of the entire or some part of the outstanding loans because of the inability to repay the loan on the due date. The cost of funding by the banks through both inferior and superior methods also rises as credit risk augments, hence the marginal cost of equity and debt. A highly credit-risked bank poses a threat to depositors because such a bank is at high risk of bankruptcy (Akomeah, J., Agumeh, R., & Siaw, F. ,2020).

The high level of NPLs in the balance of a bank reduces profitability and hence performance. Efficient credit management has gained significant attention among financial institutions for their survival and growth. Hence, risk management toward credit affects the profitability of banks (Kingu *et al.*, 2018). Effective credit risk management enables banks to support the economy as well as their profitability and sustainability (Ekinci & Poyraz, 2019). Credit risk management practices may include analyzing credit risk, creating a credit policy, credit risk monitoring, completing credit applications, credit scoring models, account review, assessing creditworthiness, commercial trade history, company details, data verification, diversifying portfolios, regulatory compliance and terms of payment (Witzany & Witzany, 2017).

Among the credit risk management practices employed by the commercial banks are the lending requirements, credit appraisal processes and credit monitoring. Commercial banks have specific lending requirements for credit risk management and ensure profitability. The requirements include the assessment of borrowers for creditworthiness by evaluating factors such as debt-to-income ratio, income, credit history, as well as evaluating collaterals (Oleiwi *et al.*, 2019). Borrowers are often classified by commercial banks into different categories. Some borrowers are classified as high-risk borrowers, while others are classified as low-risk borrowers. Low-risk borrowers are offered more favorable loan terms. Commercial banks also further factor in other regulatory requirements, including capital adequacy ratios, to enhance their financial reserves to cover potential loan defaults (Antar, 2024).

The credit appraisal process entails a systematic evaluation of the financial status of a borrower as well as their potential to repay the loan before loan approval (Karnataka State Souharda Federal Cooperative, 2020). Some of the key factors commercial banks assess during the credit appraisal process include the value of the collateral availed, debt-to-income ratio, income levels, and loan history (Yhip, T. M., Alagheband, B. M., Yhip, T. M., & Alagheband, B. M., 2020). Credit appraisal process is often conducted with the aid of risk rating systems as well as credit scoring models to ensure that loans are advanced to individuals and businesses having the ability to repay, and hence reduce credit risk and enhance the performance of the commercial banks (Bhatore *et al.*, 2020).

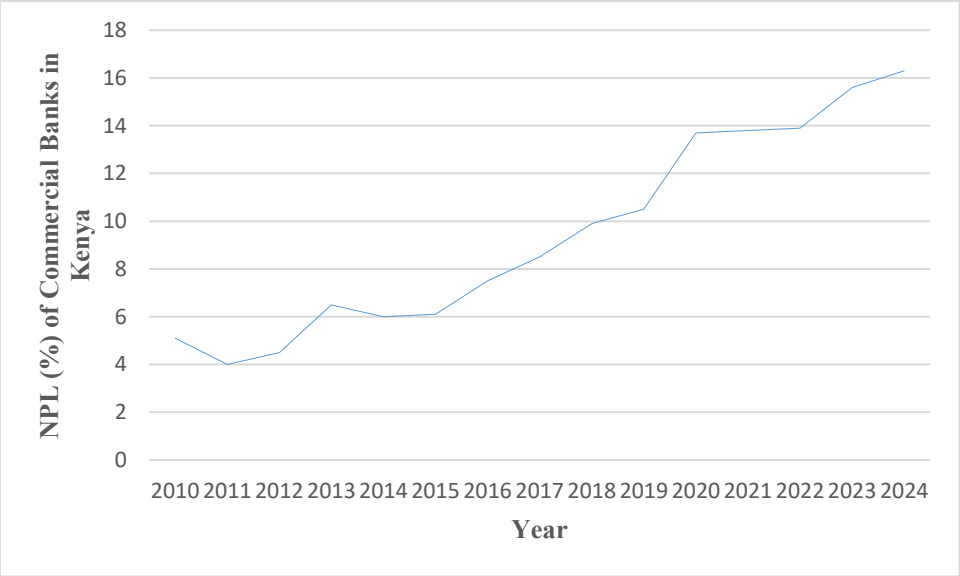
One other significant credit risk management practice is credit monitoring. Credit monitoring entails the process of tracking the financial status of borrowers, the industry conditions, as well as their repayment history to ensure that the borrower meets their repayment obligations and reduces non-performing loans (Omokhoa *et al.*, 2024). This

process helps the commercial banks to detect potential defaults before they occur and hence allows them to take corrective measures to recover the loans or even help the borrowers restructure their loans as a credit risk management measure (Scott *et al.*, 2024). A nation's GDP is the market value of all the commodities and services it generates over a given period of time. It is employed to measure the standard of living and economic progress of a country. GDP also guides investment decisions and economic policy that affects everyone. It is the total monetary or market value of all the finished services and goods produced within a country's borders in a specific time period (Cai *et al.*, 2019). It acts as a block scorecard of the economic health of any nation. GDP implies the amount of money that is involved in the final services and products that are produced in a particular nation or the amount that is imported by the final consumer within the given span of time (Jean-Paul & Martine, 2018). It is the total amount of output that was produced within the country's borders. It measures the well-being of the economy of the nation and symbolizes the worth of all the services and items made throughout an outlined timeframe in a nation under its borders. GDP is utilized by economists in determining the growth or recession of any economy (Coscieme *et al.*, 2020).

Commercial banks create a significant link between lenders and borrowers and also support holding depositors' funds, hence facilitating the creation of a pool of savings for borrowers by holding funds for depositors. CKB regulates banks in Kenya through the CBK Act (CBK, 2024). Commercial banks in Kenya are categorized into Tier III, II, and I bank (CBK, 2024). These categorize are based on the number of deposits, total assets, revenue and market share (CBK, 2024). There are tier III banks control 8.3 percent of the market share, 15 tier II banks that control 41.7 percent and 6 tier I banks controlling 49.9 percent of the market share (CBK, 2020). There are 43 commercial banks in Kenya, 29 local and 14 foreign (CBK, 2022).

In 2021, the asset quality of commercial banks (performing loans) decreased; Gross Non-performing Loans (NPL) ratio increased by 1.1 percent point to 12.7 percent in 2021, whereas it was higher at 11.6 percent a year before due to the Covid -19 pandemic that resulted in the increment of non-performing loans. The Non-Performing Loans coverage increased to 64.0 percent in the year 2021, compared to the 57.8 percent recorded in the year 2020, in line with IFRS 9, according to which the banks are supposed to make a provision on the incurred and expected credit losses. These dramatically high levels of provisional requirement, as well as escalating credit risk, resulted in a slower growth of loans in 2021 that added up to 11.7% in growth, as compared to 14.5% in 2020. The graph of performance of commercial banks in Kenya in terms of NPLs, as presented in Figure 1, indicates the statistics of this variable between 2010 and 2021.

Figure 1: Non-Performing Loans of commercial banks from 2010 to 2021



Source: NSE (2022).

As Figure 1 illustrates, the non-performing loans cases within the Kenyan commercial banks have been gradually increasing. In 2010, the Non-Performing Loans of commercial banks amounted to 5.1% that is steadily increased to 13.9 percent as in 2021. The commercial banks were meeting the asset quality test, but this tended to worsen in 2021, with the weighted average Non-Performing Loans ratio increasing by 1.1 percent points to a market cap weighted average ratio of 12.7 percent, compared with an average of 11.6 percent in the commercial banking sector in 2020. Notably, the Non-Performing Loans ratio recorded by the commercial banks is 13.9% NSE (2022), compared to the 13.5% ratio recorded in 2021, and it means declining credit performance in 2021, but it is above the 10-year average of 8.1%.

Nevertheless, asset quality improved in 2022 with a decrease of Gross Non-Performing Loan's ratio of 1.0 percentage points to 12.5, compared to 13.5 in 2021. The ratio of Non-Performing Loans among the whole banking industry amounted to 14.1 percent in the year 2022 and 16.3 percent in 2024 (Cytonn, 2023). Delinquent loans are a sign of increasing credit risks, which are probably at the expense of the performance of commercial banks. Unregulated increase of Non-Performing Loans can create macro prudential risks and financial stability, and will negatively affect the capacity of banks to invest in the economy on the recovery path. Non-Performing Loans increase the cost of capital, reduce the net interest margins of the banks, and create service and management expenses, and hence the capacity of the banks to advance new loans may suffer. Although credit risks are very important in the banking sector, there is a necessity to emphasize the impact of gross domestic product. This study, therefore, sought to determine how gross domestic product can influence the correlation that exists between credit risk management and the performance of the Kenyan commercial banks.

2. Statement of the Problem

The banking industry plays a critical role in availing credit funds, mobilization of savings and capital accumulation to industry and individuals and hence contributes greatly to the economy in Kenya (Gitogo, 2019). Despite the contributions made to the economy, commercial banks in Kenya continue to record unstable performance trends. ROA for Kenyan commercial banks was 2.7 percent, 3.3 percent in 2021, 1.7 percent in 2019, 2.6 percent in 2018 and 2.6 percent in 2017, indicating that the trend of profitability was unstable (Statista, 2023), and this can be attributed to rising credit risks and liquidity problems of banks. Tier 1 banks also recorded a 17.03 percent combined ROE, indicating a drastic decline in profits (CBK, 2022).

Some of the commercial banks in Kenya, like Imperial and Chase Banks, collapsed largely because of liquidity and credit risks (CBK, 2022). Charter Hose Bank, Imperial Bank Limited, and Dubai Bank are under receivership or have collapsed (CBK, 2022), a phenomenon linked to credit risks, liquidity crunch and adequacy problems from huge NPLs by the CBK supervisory committee. Though tier 1 banks have been recording rising profitability, they have also been struggling with rising credit risks associated with rising non-performing loans (CBK, 2023).

Empirically, there exist studies that have linked credit risk management and bank performance. For instance, sampled studies include those conducted in South Asia (Siddique, Khan and Khan, 2021) and Turkey (Ekinci & Poyraz, 2019). In Africa, similar studies have been assessed in Uganda (Serwadda, 2018), Ghana (Kwashie, Baido & Ayesu, 2022) and South Africa (Munangi & Bongani, 2020). In regard to the investigation on credit risk management and financial performance by Kauna (2019), a different approach in terms of dimension, data and analysis approach was adopted, hence the research gap. Moreover, Bindseil and Senner (2023) indicated that a successful credit management system depends on the bank's operating environment. Gross domestic product has been positively linked to credit risk (Jafari & Adibpour, 2016; Koju, Koju & Wang, 2020). As a result, to address the gap identified from the literature review, the investigation seeks to examine the interaction effect of gross domestic product on the link between credit risk management and the financial performance of commercial banks in Kenya.

2.1 Research Questions

(a) What is the effect of credit risk management on the financial performance of commercial banks in Kenya?
   1) What is the effect of lending requirements on the financial performance of commercial banks in Kenya?
   2) What is the effect of the credit appraisal process on the financial performance of commercial banks in Kenya?
   3) What is the effect of credit monitoring on the financial performance of commercial banks in Kenya?

(b) What is the moderating effect of gross domestic product on the relationship between credit risk management and the financial performance of commercial banks in Kenya?
   1) What is the moderating effect of gross domestic product on the relationship between lending requirements and the financial performance of commercial banks in Kenya?
   2) What is the moderating effect of gross domestic product on the relationship between the credit appraisal process and the financial performance of commercial banks in Kenya?
   3) What is the moderating effect of gross domestic product on the relationship between credit monitoring and the financial performance of commercial banks in Kenya?

3. Literature Review

3.1 Theoretical Framework

3.1.1 Credit Risk Theory

Robert Merton proposed the theory in 1974, and it describes the possibility of default or failure to pay the loan principal or interest by the borrowers according to the agreed contract stipulation. Its practice explores the likelihood that a borrower will default and assists in facilitating the risk of loss as well as the prevention of bank breakage (Brown & Moles, 2014). The theory specifies how a borrower can have the possibility of defaulting the loans, and it deals with default risk management through various structural models. The theory assesses the liabilities and assets of a firm in managing credit defaults (Trueck & Rachev, 2009). Credit risk is influenced by a number of factors, including the financial health of the borrower, credit ratings, among other factors (Basle Committee on Banking Supervision & Bank for International Settlements, 2000). According to the theory, the credit risk management strategies employed by firms include collaterals, diversification and credit scoring (Ibtissem & Bouri, 2013). Effective credit risk management strategies help lenders to maintain financial stability, mitigate losses, and price loans accurately (Kithinji, 2010).

Credit Risk Theory assumes that borrowers may fail to pay their loans due to changes in their credit quality or financial condition (Thakor, 2016). It presumes that default can be modeled using either structural approaches (linking default to a firm's asset value) or reduced-form approaches (treating default as a random process with certain intensities) (Jumbe & Gor, 2022). Additionally, it assumes that market participants have access to sufficient information to assess and price the risk of default appropriately (Wójcicka-Wójtowicz, 2018).

Credit Risk Theory provides a structured framework to quantify and manage the risk of borrower default, enabling more accurate pricing of credit instruments (Ahmed *et al.*, 2023). It supports the development of sophisticated risk management tools, such as credit default swaps and credit scoring models (Thakor, 2016). The theory also facilitates

regulatory compliance by aligning with standards like Basel III, which require institutions to assess and hold capital against credit risk exposures. However, the theory is not void of weaknesses (Ayadi *et al.*, 2016). Credit Risk Theory often relies on assumptions such as market efficiency, constant volatility, or perfect information that may not hold in real-world scenarios (Allen & Powell, 2011). It may oversimplify complex borrower behavior and external economic shocks, leading to inaccurate risk assessments (Allen *et al.*, 2015). Additionally, models based on the theory can be highly sensitive to input data, making them vulnerable to mis-estimation and misuse. The theory is significant to this investigation as it emphasizes the significance of managing credit defaults in enhancing the performance of banks. Credit risk theory explains the possibility of a borrower defaulting on loans and focuses on managing default risks using a number of structural models. The theory assesses the liabilities and assets of a firm in managing credit defaults.

3.1.2 Empirical Reviews

Al-hawatmah and Shaban (2020) carried out a study to determine the impact of the lending policy on the profitability of commercial banks in Jordan. There is a credit risk theory that was adopted. The investigation used a descriptive analytical approach with primary data. The investigation concluded that credit decisions are contributing to a significant portion of the profitability of the banks under review. In addition, lending requirements adopted by the Jordanian commercial banks have interpreted a significant portion of their profitability. The conclusion was that lending requirements determined the profitability of commercial banks. The investigation presented methodological, contextual and theoretical gaps. The study used primary data with a focus on banks in Jordan using credit risk theory, while the current investigation used secondary data, focusing on commercial banks in Kenya.

An investigation was conducted by Kwashie, Baidoo and Ayesu (2022) on the impact of credit risk on the performance of Ghanaian commercial banks. Agency theory, loan pricing theory, theory of moral hazard and adverse selection and information asymmetry theory were used. By collecting secondary data from 2013 to 2018, the study used a longitudinal research design. As shown by the results, NPLs negatively affect both measures of performance. Credit requirements affect the performance of banks. Contextual and theoretical gaps were noted. The investigation dwelled on commercial banks in Ghana using Agency theory, loan pricing theory, theory of moral hazard and adverse selection and information asymmetry theory, while the investigation at hand focuses on commercial banks in Kenya by investigating the effects of lending requirements, which may differ across countries based on economic conditions and banking polices.

Ekinci and Poyraz (2019) researched to determine the effect of credit risk on the performance of Turkish deposit banks. 26 banks participated, and secondary information was collected from the banks' statistical records. The loanable funds theory was used. The outcomes pointed out that credit risk negatively affects bank performance measured

using ROE and ROA. Thus, while there exists an association between credit risk management and profitability of the firms under review, this relationship could be affected by economic conditions and the quality of the credit appraisal process. Contextual and conceptual gaps were notable as the study was conducted in Turkey, with the key variables being credit risk and ROE.

Munangi and Bongani (2020) researched the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. The loanable funds theory was used to guide the study. Pooled OLS, REM and FEM were used to test the association between factors. From the outcomes, there was a negative link between NPLs and performance, pointing to lower profitability when NPLs are higher. Secondly, ROE was positively affected by growth and capital adequacy, indicating that bank development enhances its productive capacity. A conclusion was made that credit appraisal helped commercial banks reduce cases of NPLs. The investigation presented contextual and conceptual gaps as the study was conducted in South Africa.

Siddique, Khan and Khan (2021) researched how bank-specific factors and credit risk management affect the performance of South Asian commercial banks by focusing on India and Pakistan. The investigation employed the Credit Default Theory and asymmetric information theory. Secondary data were used, 10 from Pakistan and 9 banks from India and analysis used the general method of moments. From the outcomes, NPLs and lending rate negatively but significantly affected bank performance, which was significantly positively affected by CAR. The investigation concluded the need to maintain a liquidity position to maintain the competitiveness of the banks even in the dynamic markets. The investigation presented a contextual gap, as the investigation was conducted, focusing on South Asian Banks. The contexts of South Asian and Kenyan contexts may not be the same.

A study was conducted by Lawrence, Doorasamy and Sarpong (2020) on the impact of credit risk on the performance of South African Commercial Banks using secondary data. From the outcomes, LTDR, LR, CAR, NPLs and age significantly affected the performance of small banks in comparison to large banks. The investigation presented methodological and conceptual gaps as it focused on South African commercial banks, and data analysis was conducted using R-Studio software version 3.5, while the investigation at hand focused on Kenyan commercial banks and the data analysis was conducted using STAT software version 14.

A study was conducted by Kinyua, Kiiru and Njoroge (2022) on the effect of client appraisal and loan monitoring strategies on the repayment of revolving funds in Kenya (2010-2019). Loanable funds theory and Asymmetry information theory. Youth officers across the 47 counties formed the target population. The investigation used primary data, purposive sampling and a correlational research design. Outcomes pointed out that monitoring visits significantly positively affected repayment performance of revolving funds in Kenya. The conclusion was made that the rate of repayment of revolving funds was significantly associated with customer appraisal and monitoring approaches. A

methodological gap was evident, as it primarily relied on primary data while the study at hand relied on secondary data in its analysis.

4. Research Methodology

Explanatory research design was used to gain a deeper understanding of the underlying reasons for, causes of, and relationships behind a particular phenomenon that has yet to be extensively studied (Rahi, 2017). The target population consisted of 39 commercial banks (Refer to Appendix III). Three tables, 3.1, 3.2 and 3.5 display the number of commercial banks per each bank tier in Kenya, the total assets of each bank tier and the total assets of all commercial banks, respectively.

Table 1: Target Population

Bank Tier	Description	Number of Commercial Banks
Tier III	Large	9
Tier II	Medium	8
Tier I	Small	22
Total		**39**

Source: CBK (2024).

The research adopted multiple regression analysis, and the model was as follows:

Model 1: Test for direct effects (direct association between credit risk management and performance of commercial banks, Hypothesis H_{01a}, H_{01b} and H_{01c})

$$FP_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CAP_{it} + \beta_3 CM_{it} + e_{it} \quad \ldots\ldots 1$$

Model 2: Moderating effect of GDP on the nexus between lending requirements and financial performance of commercial banks (Hypothesis H_{02a})

$$FP_{it} = \beta_0 + \beta_4 LR_{it} + \beta_5 GDP_{it} + \beta_6 (LR * GDP_{it}) + e_{it} \quad \ldots\ldots 2$$

Model 3: Moderating effect of gross domestic product on the nexus between credit appraisal @process and financial performance of commercial banks in Kenya (Hypothesis H_{02b})

$$FP_{it} = \beta_0 + \beta_5 CAP_{it} + \beta_6 GDP_{it} + \beta_7 (CAP * GDP_{it}) + e_{it} \quad \ldots\ldots 3$$

Model 4: Moderating effect of gross domestic product on the nexus between credit monitoring and financial performance of commercial banks in Kenya (Hypothesis H_{02c})

$$FP_{it} = \beta_0 + \beta_8 CM_{it} + \beta_9 GDP_{it} + \beta_{10} (CM * GDP_{it}) + e_{it} \quad \ldots\ldots 4$$

Where;
β_0 = constant term,
$\beta_{1\text{-}10}$ = Beta coefficient of variables,
FP = Financial Performance,
LR = Lending Requirements,
CAP = Credit Appraisal Process,
CM = Credit Monitoring,
GDP = Gross Domestic Product,
t = Time variance,
I = Number of observations,
ε = Random error term.

5. Results

5.1 Descriptive Statistics

Descriptive outcomes included SD, mean, maximum values, minimum and. The main variables in the investigation were lending requirements, credit appraisal process, credit monitoring, GDP and financial performance. Table 2 shows the descriptive results.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Financial Performance	310	17.5385	0.90069	16.03	20.2
Lending Requirements	310	27.5092	7.00181	14.56	44.01
Credit Appraisal Process	310	692.874	56.567	545	796
Credit Monitoring	310	0.41326	0.08347	0.31	0.65
Gross Domestic Product	310	4.67077	2.12379	-0.27	7.59

Key: Obs (Observation); Std. Dev. (Standard Deviation); Min (Minimum); Max (Maximum)
Source: Research Findings (2025).

Bank financial performance showed a mean of 17.5385 and an SD of 0.90069. The minimum and maximum levels of financial performance were 16.03 and 20.2, respectively. The mean for lending requirements was 27.5092, and its respective standard deviation was 7.00181. Its minimum value was 14.56 and a respective maximum value of 44.01. The credit appraisal process had a minimum value of 545 and a maximum value of 796. Its SD was 56.567 with a mean of 692.874. Credit monitoring had a mean of 0.41326 and an SD of 0.08347. Its maximum and minimum values were 0.65 and 0.31 in that order. Finally, the annual economic growth had a minimum of negative 0.27 percent and a maximum percentage of 7.59. The mean and the respective SD were 4.67077 and 2.12379, respectively.

5.2 Correlation Analysis Results

The analysis serves to determine the direction and strength of association between credit risk management, gross domestic product and performance of banks.

Table 3: Correlation Results

	Financial Performance	**Lending Requirements**	**Credit Appraisal Process**	**Credit Monitoring**	**Gross Domestic Product**
Financial Performance	1.000				
Lending Requirements	0.3582	1.000			
	0.000				
Credit Appraisal Process	0.2359	0.2372	1.000		
	0.000	0.000			
Credit Monitoring	0.2687	0.484	0.3557	1.000	
	0.000	0.000	0.000		
Gross Domestic Product	0.4097	0.2975	-0.0264	0.0219	1.000
	0.000	0.000	0.6431	0.7007	

Source: Research Findings (2025).

From the outcomes presented, lending requirements with ban performance are positively correlated (r=0.3582, p = 000<0.05). An increase in lending requirements of commercial banks would yield a significant improvement in financial performance. Equally, credit appraisal process and financial performance were positively related at a significant level (r = 0.2359, p = 000 < 0.05). There would be a great improvement in performance through an improvement in the credit appraisal process of commercial banks. Similarly, credit monitoring portrayed a noticeable and vital positive connection to the structure of the banks (r = 0.2687, p = 000 < 0.05). Thus, an improvement in credit monitoring yields a significant improvement in performance. Annual economic growth and financial performance correlated significantly and positively (r = 0.4097, p = 000 < 0.05). An improvement in the annual economic growth would lead to a significant improvement in financial performance.

5.3 Diagnostic Tests

The tests included Hausman tests, test for heteroscedasticity, multicollinearity, autocorrelation, as well as normality. Hausman tests are conducted to determine the suitable model to be adopted, whether fixed or random. Ho test was that the appropriate model for the research was REM.

5.4 Test for Normality

The skewness and Kurtosis method was used to test the normality. The null hypothesis was that data error terms do not follow a normal distribution. In cases where the computed value of p-value is less than 0.05, then the null hypothesis is not rejected.

However, when the statistical value of p is < 0.05, then the variation in the error data is normally distributed.

Table 4: Normality Test Results

	Obs	Pr(Skewness)	Pr(Kurtosis) adj	chi2(2)	Prob>chi2
Financial Performance	310	0.544	0.355	1.312	0.062
Lending Requirements	310	0.651	0.097	0.441	0.212
Credit Appraisal Process	310	0.770	0.556	1.514	0.099
Credit Monitoring	310	0.168	0.351	3.659	0.101
Annual Economic Growth	310	0.545	0.442	0.672	0.067

Source: Research Findings (2025).

From the outcomes, the calculated p-values are >0.05 for the variables under review (0.062 > 0.05, 0.212 > 0.05, 0.099 > 0.05, 0.101 > 0.05 and 0.067 > 0.05). These findings point out that the data follows a normal distribution and hence the estimation of the time series model can be done.

5.5 Test for Multicollinearity

Variance inflation factors were used to investigate the excessive level of the correlation of the study variables and acceptable or severe level of correlation. As a decision rule, a VIF value >5 implies the presence of Multicollinearity, while a VIF value <5 indicates the absence of Multicollinearity (Shrestha, 2020).

Table 5: Collinearity Results

Variable	VIF	1/VIF
Lending Requirements	1.48	0.67696
Credit Appraisal Process	1.44	0.6937
Credit Monitoring	1.16	0.86411
Annual Economic Growth	1.13	0.8881
Mean VIF	**1.3**	

Source: Research Findings (2025).

The outcomes outlined point to the absence of Multicollinearity among the variables, as the VIF figures are < 5 (1.48 < 5, 1.44 < 5, 1.16 < 5, 1.13 < 5). This means that the data can be used for further analysis.

5.6 Test for Autocorrelation

The test involved the use of the Wooldridge Test. The null hypothesis is that there is no serial correlation in the data. FGLS is estimated when autocorrelation exists. A calculated p-value of > 0.05 signifies the absence of autocorrelation (Wooldridge, 2002).

Table 5: Autocorrelation Results

Wooldridge test for autocorrelation
H_0: no first-order autocorrelation
F(4, 305) = 1.802
Prob F = 0.1633

Source: Research Findings (2025).

The investigation failed to reject the null hypothesis, implying serial autocorrelation is absent in the data, as the F test outcome was 1.802 and the significance value was 0.1633 > 0.05. The outcomes thus indicate the absence of autocorrelation in the data, an implication that the data is suitable for further analysis.

5.7 Test for Homoscedasticity

To test heteroscedasticity, the Breusch-Pagan /Godfrey test was employed. In the null hypothesis, error variance is homoscedastic. In case the null hypothesis is rejected, then the panel data has heteroscedasticity, and this was remedied by the estimation of FGLS. P-value is significant in making a decision, whereby p-value >0.05 implies the absence of heteroscedasticity, while p-value <0.05 means the presence of heteroscedasticity (Breusch & Pagan, 1980).

Table 6: Results for Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
Ho: Constant Variance
Variables: Fitted values for Financial Performance
chi2(1) = 1.82
Prob > chi2 = 0.1621

Source: Research Findings (2025).

From the outcomes, the estimated p-value was 0.1621 > 0.05, indicating the absence of heteroscedasticity.

5.8 Panel Unit Root Tests

The Fisher-type test was employed and states that under the null hypothesis, data is non-stationary, while the alternative hypothesis says that at least the data is stationary (Aiko, 2023). In the event that a unit root is present in the data, data differencing was conducted.

Table 6: Fisher-type Test

		Inverse chi-squared (114)	Inverse normal	Inverse logit t (289)	Modified inv. chi-squared
Variable		**P**	**Z**	**L***	**Pm**
ROA	test statistic	303.3981	-9.8988	-12.6080	18.0463
	p-value	0.0000	0.0000	0.0000	0.0000
Lending Requirements	test statistic	242.8921	-8.6985	-9.8655	13.2019
	p-value	0.0000	0.0000	0.0000	0.0000
Credit Appraisal Process	test statistic	330.9325	-9.8932	-13.5736	20.2508
	p-value	0.0000	0.0000	0.0000	0.0000
Credit Monitoring	test statistic	203.9726	-7.3419	-8.0021	10.0859
	p-value	0.0000	0.0000	0.0000	0.0000
Annual Economic Growth	test statistic	413.2954	-16.0645	-18.2693	26.8451
	p-value	0.0000	0.0000	0.0000	0.0000

Source: Research Findings (2025).

The stationarity outcomes for unit root revealed that Return on Assets, lending requirements, credit appraisal process, credit monitoring and annual economic growth were stationary. This is because their P values were less than 0.05.

5.9 Test for Random and Fixed Effects

The Hausman test (1978) was used to ascertain if a random or fixed model is appropriate for this study. Failing to reject the null hypothesis implies that the fixed effect model is adopted in the investigation; otherwise, FEM is discarded, and a random model is used.

H_0: Random effect model (REM) is appropriate.
H_a: Fixed effect model (FEM) is appropriate.

Table 7: Hausman Test Results

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	re	**fe**	**Difference**	**S.E.**
Lending Requirements	0.01882	0.01267	0.00614	0.00178
Credit Appraisal Process	0.00261	0.0028	-0.0002	0.00023
Credit Monitoring	1.41877	1.59719	-0.1784	0.17184
Annual Economic Growth	1.15593	1.04593	0.110001	0.10611
chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)	0.15			
Prob>chi2	0.9744			

Source: Research Findings (2025).

From the outcomes, a chi2(3) value of 0.15 and a significance value of 0.9744 > 0.05 means that the null hypothesis is rejected and the study concludes that the random effects model is suitable (Konstantopoulos & Hedges, 2019).

5.10 Testing of the Direct Association between Credit Risk Management and Financial Performance

Panel regression analysis was conducted to ascertain the association between credit risk management and Kenyan commercial banks' performance.

5.10.1 Lending Requirements and Financial Performance

A simple panel regression model was employed to test for the direct effect of lending requirements on the performance of commercial banks.

To test null hypothesis H_{01a}, there is no significant relationship between lending requirements and performance of Kenyan commercial, panel model estimated was;

$$FP_{it} = \beta_0 + \beta_1 LR_{it} + e_{it}$$

Table 8: Panel Regression Results for Lending Requirements

Financial Performance	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Lending Requirements	0.04608	0.00684	6.73	0.000	0.03267	0.05949
_cons	16.2708	0.19424	83.77	0.000	15.8901	16.6515
wald chi2 (2)		45.34				
prob>F		0.000				
R-sq	Within	0.0605				
	Between	0.942				
	Overall	0.1283				

Source: Research Findings (2025).

From the results, the coefficient of lending requirements of the commercial banks was positive and statistically significant (β = .04608, p = .000 < .05). Thus, increasing lending requirements by a unit would yield 0.04608 units improvement in the performance of the institutions under review. Thus, lending requirements are a significant determinant of the performance of the commercial banks. Therefore, the hypothesis H_{01a} was rejected and hence lending requirements have a significant effect on bank performance.

5.10.2 Credit Appraisal Process and Financial Performance

A simple panel regression model to test for the direct effect of the credit appraisal process on the performance of Kenyan banks.

To test null hypothesis H_{01b}, there is no significant relationship between the credit appraisal process and the performance of Kenyan commercial, the panel model estimated was:

$$FP_{it} = \beta_0 + \beta_2 CAP_{it} + e_{it}$$

Table 9: Panel Regression Outcomes for Credit Appraisal Process

Financial Performance	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
Credit Appraisal Process	0.00399	0.00078	5.13	0.000	0.00246	0.00551
_cons	14.7774	0.54917	26.91	0.000	13.7011	15.8538
wald chi2 (2)		26.36				
prob>F		0.000				
R-sq	Within	0.0847				
	Between	0.6444				
	Overall	0.0556				

Source: Research Findings (2025).

From the outcomes, the credit appraisal process of the commercial banks recorded a coefficient that was positive and statistically significant (β = .00399, p = .000 < .05). Thus, increasing the credit appraisal process by a unit would yield a 0.00399 units improvement in the financial performance. Thus, the credit appraisal process determines performance significantly. This result therefore led to the rejection of the hypothesis $H_{01b,}$ and hence the credit appraisal process has a significant effect on bank performance.

5.10.3 Credit Monitoring and Financial Performance of Commercial Banks

Simple panel regression model to test for the direct influence of credit monitoring on performance.

To test hypothesis H_{01c}, there is no significant link between credit monitoring and performance; the panel model estimated was:

$$FP_{it} = \beta_0 + \beta_3 CM_{it} + e_{it}$$

Table 9: Panel Regression Results for Credit Monitoring

Financial Performance	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Credit Monitoring	2.79353	0.51937	5.38	0.000	1.77559	3.81147
_cons	16.3854	0.25448	64.39	0.000	15.8866	16.8841
wald chi2 (2)		28.93				
prob>F		0.000				
R-sq	Within	0.0879				
	Between	0.4369				
	Overall	0.0722				

Source: Research Findings (2025).

From the results, the coefficient of credit monitoring of the commercial banks was positive and statistically significant (β = 2.79353, p = .000 < .05). Thus, increasing credit monitoring by a unit would yield a 2.79353-unit improvement in the performance. Thus, credit monitoring significantly determines the financial performance. These outcomes therefore led to the rejection of the hypothesis $H_{01c,}$ and hence there is a significant association between credit monitoring and performance.

5.10.4 Moderating Effect of GDP in the Relationship between Credit Risk Management and Financial Performance

The investigation utilized panel regression analysis to test for the moderating effect of GDP in the association between credit risk management and the financial performance of commercial banks in Kenya.

5.10.5 Moderating Effect of GDP in the Relationship between Lending Requirements and Bank Performance

To begin with, the study tested H_{02a}: Gross domestic product does not significantly moderate the association between lending requirements and performance. The investigation used the model below;

$$FP_{it} = \beta_0 + \beta_4 LR_{it} + \beta_5 GDP_{it} + \beta_6 (LR * GDP_{it})$$

Where:
F = Financial Performance,
LR = Lending Requirements,
GDP = Gross Domestic Product,
t = time variance,
i = the number of observations.

Table 10: Panel Regression Results

Financial Performance	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Lending Requirements	0.05533	0.02198	2.52	0.012	0.01226	0.0984
GDP Rate	0.24376	0.10024	2.43	0.015	0.0473	0.44022
LRGDP	-0.0044	0.00414	-1.05	0.293	-0.0125	0.00377
_cons	15.4563	0.51723	29.88	0.000	14.4425	16.47
wald chi2 (2)		92.41				
prob>F		0.000				
R-sq	Within	0.0506				
	Between	0.8031				
	Overall	0.2319				

Source: Research Findings (2025).

From the outcomes, the coefficient of lending requirements was positive and statistically significant (β = .05533, p = .012 < .05). Thus, a unit improvement in lending requirements by the commercial banks yields a 0.05533 units significant improvement in performance of the commercial banks under review. Thus, the lending requirements significantly determine the performance of the institutions under investigation. Furthermore, the coefficient of the moderating variable (GDP) was positive and statistically significant (β = .24376, p = .015 < .05). This implies that improving GDP growth by a unit yields a 0.24376 units enhancement in the performance of Kenyan commercial banks. Thus, the annual GDP growth significantly determines the financial performance of commercial banks. Upon interacting lending requirements and the moderating variable (GDP), the

coefficient of the interaction term (lending requirements* GDP) was negative and statistically insignificant (β = -.0044, p = .293 > .05). Consequently, the investigation failed to reject H_{02a} and concluded that gross domestic product does not moderate significantly the nexus between lending requirements and performance of banks.

5.10.6 Moderating Effect of GDP in the Relationship between Credit Appraisal Process and Financial Performance

Secondly, the investigation tested H_{02b}, gross domestic product does not moderate significantly the association between the credit appraisal process and the financial performance of commercial banks in Kenya. The investigation used the model below:

$$FP_{it} = \beta_0 + \beta_5 CAP_{it} + \beta_6 MED_{it} + \beta_7 (CAP * MED_{it})$$

Where:
FP = Financial Performance,
CAP = Credit Appraisal Process,
CM = Credit Monitoring,
MED = Gross Domestic Product,
t = time variance,
i = the number of observations.

Table 11: Panel Regression Results

Financial Performance	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Credit Appraisal Process	0.00004	0.00192	-0.02	0.0982	-0.0038	0.00372
Annual Economic Growth Rate	-0.4175	0.26208	-1.59	0.111	-0.9312	0.09619
CSGDP	0.00085	0.00038	2.27	0.023	0.00012	0.00159
_cons	16.756	1.34012	12.5	0.000	14.1294	19.3826
wald chi2 (2)		97.49				
prob>F		0.000				
R-sq	Within	0.0983				
	Between	0.6802				
	Overall	0.2416				

Source: Research Findings (2025).

From the outcomes, the credit appraisal process was positive and statistically insignificant coefficient (β = .00004, p = .0982 > .05). Thus, a unit improvement in the credit appraisal process by the commercial banks in Kenya leads to 0.05533 units insignificant improvement in commercial banks' performance under investigation. Thus, the credit appraisal process insignificantly determines the performance of the institutions under review. Furthermore, the coefficient of the moderating variable (GDP) was negative and statistically insignificant (β = -.4175, p = .111 > .05). This implies that improving GDP growth by a unit yields a 0.4175 units insignificant decline in the performance of banks under study. Upon interacting credit appraisal process and the moderating variable (GDP), the interaction term (credit appraisal process* GDP) recorded positive and

significant statistically coefficient (β = .00085, p = .023 < .05). Consequently, the study rejected H_{02b} and concluded that gross domestic product moderates significantly the nexus between credit appraisal process and performance of commercial banks.

5.10.7 Moderating Effect of GDP in the Relationship between Credit Monitoring and Financial Performance

Lastly, the investigation tested H_{02c}: Gross domestic product does not moderate significantly the link between credit monitoring and performance of Kenyan commercial institutions. The research used the model below;

$$FP_{it} = \beta_0 + \beta_8 CM_{it} + \beta_9 MED_{it} + \beta_{10}(CM * MED_{it})$$

Where:
FP = Financial Performance,
CM = Credit Monitoring,
MED = Gross Domestic Product,
t = time variance,
i = the number of observations.

Table 11: Panel Regression Results

Financial Performance	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Credit Monitoring	1.90939	1.84566	1.03	0.301	-1.708	5.52683
Annual Economic Growth Rate	0.06434	0.13482	0.48	0.633	-0.1999	0.32858
CMGDP	0.23456	0.34844	0.67	0.501	-0.4484	0.91749
_cons	16.0052	0.70676	22.65	0.000	14.62	17.3904
wald chi2 (2)		78.83				
prob>F		0.000				
R-sq	Within	0.0971				
	Between	0.7117				
	Overall	0.2482				

Source: Research Findings (2025).

From the outcomes, credit monitoring recorded a positive but statistically insignificant coefficient (β = 1.90939, p = .301 > .05). Thus, a unit improvement in credit monitoring by commercial banks would result in a 1.90939 units insignificant improvement in the performance of banks under review. Hence, the credit monitoring is an insignificant determinant of performance. Furthermore, the coefficient of the moderating variable (GDP) was positive and statistically insignificant (β = .06434, p = .633 > .05). Hence, increasing GDP growth by a unit results in a 0.633 units insignificant improvement in financial performance. Thus, the annual GDP growth insignificantly determines the performance of commercial banks. Upon interacting credit monitoring and the moderating variable (GDP), the coefficient of interaction term (credit monitoring* GDP) was positive and insignificant statistically (β = .23456, p = .501 > .05). Consequently, the investigation failed to reject H_{02c} and concluded that gross domestic product does not

moderate significantly the association between credit monitoring and performance of commercial banks.

6. Discussion of the Findings

6.1 Direct Effect of Credit Risk Management on Financial Performance

The subsection presents the outcomes of the analysis to explore the direct association between credit risk management and financial performance.

6.2 Relationship Between Lending Requirement and Financial Performance

The coefficient of lending requirements of the commercial banks was positive and statistically significant (β =.04608, p = .000 < .05). Therefore, the hypothesis $H_{01}a$ was rejected, and as such, there exists a significant nexus between lending requirements and performance of the Kenyan commercial banks. The outcomes of Kwashie *et al.* (2022) show that NPLs have a negative impact on both measures of financial performance. The investigation concluded that credit requirements affect the performance of banks. Serwadda (2018) postulated that credit risk management impacts the performance of Ugandan commercial banks. Bank performance is inversely proportional to NPLs, and the banks may be exposed to financial crisis and large magnitudes of illiquidity. Hence, lending procedures affected bank performance. Sile *et al.* (2019) further indicated that the quality of assets had a significant link and influence on bank financial performance. The profitability of banks is affected by loan portfolio quality. Losses that result from delinquent loans form the greatest risk a bank faces, and hence the best asset quality proxies are NPL ratios. Asset quality entails the evaluation of assets of an entity for purposes of understanding the risks associated with lending money to certain client.

6.3 Association between Credit Appraisal Process and Financial Performance

The credit appraisal process of the commercial banks was positive and statistically significant coefficient (β = .00399, p = .000 < .05). This result led to the rejection of the hypothesis H_{01b} and concluded that the credit appraisal process significantly relates to the performance of Kenyan commercial institutions. The outcomes of Aliija and Muhangi (2017) pointed out that client appraisal is an important strategy for credit risk mitigation and is used by MFIs to a great extent in credit management. Client appraisal and credit performance of MFIs are strongly related. The study concluded that for MFIs to enhance their performance, they should improve their techniques of client appraisal. Wairagu (2016) concluded that commercial banks had adopted credit term policy loan ratio in determination of how much a client would borrow, applied collection policy, that credit period of funds do increase the level of loans defaults while credit appraisal through frequency of loan reviews and that commercial banks uses credit risk control practices in credit risk management to a very great extent reducing default rates indicated by reduction in level of non-performing Loans. Ndero *et al.* (2019) further showed that 78.1% of commercial banks conducted credit appraisal through the use of the 5Cs credit

appraisal technique, credit-scoring model and through credit reference bureaus, depicting a positive effect of loans and credit appraisal on bank performance.

6.4 Relationship between Credit Monitoring and Financial Performance

The coefficient of commercial banks' credit monitoring was positive and statistically significant (β = 2.79353, p = .000 < .05). Hence, the hypothesis H_{01c} was rejected and concluded that credit monitoring significantly associates with financial performance. The outcomes of Ong'era and Onditi (2016) indicated a positive link between performance and policies of lending loans of commercial banks. Moreover, technology, competition, and banking sector policies also have a significant influence on performance. The investigation found that commercial banks have invested in competent personnel for evaluating borrowers and have adopted banking technology to improve loan monitoring and follow-up.

Likewise, Kauna (2019) also postulated a significant positive link between credit risk monitoring and identification and financial performance. Credit risk identification and monitoring positively and significantly affect bank performance. There was an inverse association between credit risk control and a direct link between credit risk appraisal and performance. The results are also in tandem with Salike and Ao (2018), who noted that poor asset quality measured using NPLs or impaired loans to gross loans negatively affected banks' profits. As banks continue to extend large credit to customers, the ability to recoup the money lent remains a problem, with the majority of funds ending up as NPLs.

6.5 Moderating Effect of GDP in the Relationship Between Credit Risk Management and Financial Performance

The subsection presents the outcomes on analysis to determine the moderating effect of GDP on the association between credit risk management (lending requirements, credit appraisal process and credit monitoring) on performance.

6.6 Moderating Effect of GDP in the Relationship Between Lending Requirement and Financial Performance

The outcomes pointed out that the coefficient of lending requirements was positive and statistically significant (β = .05533, p = .012 < .05). Thus, a unit improvement in lending requirements by the commercial banks would result in a 0.05533 units significant improvement in performance of the institutions under review. Thus, the lending requirements significantly determine the performance of the institution's investigation. Yuan *et al.* (2022) indicated that loan to deposit ratio is found to be significant and negative. The study concluded that Loan to Deposit Ratio negatively affects bank performance. Al-hawatmah and Shaban (2020) further concluded that the decisions and requirements on lending loans made by banks contribute to a larger extent to profitability. The investigation concluded that lending requirements determined the profitability of commercial banks in Jordan.

Furthermore, the coefficient of the moderating variable (GDP) was positive and statistically significant (β = .24376, p = .015 < .05). This implies that a unit improvement in GDP growth yields a 0.24376 units improvement in the financial performance. Thus, the annual GDP growth determines performance significantly. The outcomes are in concurrence with the findings of Jafari and Adibpour (2016), which showed a positive and meaningful relationship between inflation, liquidity, exchange rates and bank credit risk. Bank managers should consider the factors affecting the credit risk, in the credit policy affairs, including gross domestic product. Upon interacting lending requirements and the moderating variable (GDP), the coefficient of the interaction term (lending requirements* GDP) was negative and statistically insignificant (β = -.0044, p = .293> .05). Consequently, the investigation failed to reject H_{02a} and concluded that gross domestic product does not moderate significantly the nexus between lending requirements and financial performance. The outcomes are not in agreement with the findings of Musau *et al.* (2018), which found that bank availability, accessibility and usage had a significant effect on the credit risk of the institutions under investigation. GDP growth rate partially moderated the link between credit risk and financial inclusion.

6.7 Moderating Effect of Gross Domestic Product in the Relationship between Credit Appraisal Process and Financial Performance

Credit appraisal process recorded a positive and statistically insignificant coefficient (β = .00004, p = .0982 > .05). Thus, a unit improvement in the credit appraisal process results in 0.00004 units insignificant improvement in performance of the commercial banks under investigation. Thus, the credit appraisal process is an insignificant determinant of the financial performance of the commercial banks. The findings of Ekinci and Poyraz (2019) showed a negative link between credit risk and ROE. This outcome suggested a link between profitability and credit risk management of Turkish deposit banks. Furthermore, Munangi and Bongani (2020) documented that credit risk was negatively related to performance, noting that rising NPLs were associated with declining bank profitability. Secondly, financial performance was positively affected by growth and capital adequacy, indicating that bank development enhances its productive capacity. A conclusion was made that credit appraisal helped commercial banks reduce cases of non-performing loans.

Moreover, the moderating variable coefficient (annual economic growth) was negative, but it was insignificant (0 = -.4175, p = .111 > .05). This implies that a one percent increase in the growth of GDP causes a 0.4175 percent decline in performance in the commercial banks inconsequentially. In high-income countries, Koju, Koju and Wang (2020) noted that the emergence of the industrial segment and the export are the primary factors that influence the performance of loans. According to the findings, the paper recommends the application of expansionary fiscal policy to boost per capita income and potential productivity, hence guaranteeing the safety of its banking system.

Upon interacting the credit appraisal process and the moderating variable (annual economic growth), the interaction term (credit appraisal process*annual GDP growth)

attracted a positive and statistically insignificant coefficient (β = .0085, p = .023 < .05). This implies that annual economic growth moderates significantly the link between credit appraisal process and performance. The outcomes are in concurrence with the findings of Jafari and Adibpour (2016), which showed that there is a positive and meaningful relationship between inflation, liquidity, exchange rates and credit risk. According to the results of the findings, the bank manager should have considered the factors affecting credit risk, including gross domestic product.

6.8 Moderating Effect of GDP in the Relationship between Credit Monitoring and Financial Performance

From the results, the coefficient of credit monitoring was positive and statistically insignificant (β = 1.90939, p = .301> .05). Thus, a unit improvement in credit monitoring by the commercial banks would result in a 1.90939 units insignificant improvement in performance of the commercial banks under investigation. Thus, credit monitoring is an insignificant element of credit risk management affecting bank performance. The findings of Siddique *et al.* (2021) indicated that NPLs and lending rate have significantly negatively related to ROE. Thus, banks should maintain high liquidity to survive in a competitive environment. Lawrence *et al.* (2020) further revealed that LTDR, LR, CAR, NPLs and age significantly affected the performance of small banks compared to large banks. Kinyua *et al.* (2022) also established that the frequency of monitoring visits significantly positively affected the repayment performance of the funds. The investigation concluded the existence of a strong nexus between client appraisal and monitoring strategies and performance of the funds under study.

Furthermore, the coefficient of the moderating variable (annual economic growth) was positive and statistically insignificant (β = .06434, p = .633 > .05). This implies that a unit improvement in GDP growth results in a 0.06434 units insignificant improvement in the financial performance. The outcomes are not in agreement with the findings of Musau *et al.* (2018), which found that bank availability, bank accessibility and bank usage had a significant effect on the credit risk of Kenyan banks. The rate of growth of GDP partially moderates the link between credit risk and financial inclusion.

Upon interacting with credit monitoring and the moderating variable (annual economic growth), the coefficient of the interaction term (credit monitoring*annual GDP growth) was positive and statistically insignificant (β = .23456, p = .501> .05). This implies that annual economic growth does not moderate significantly the link between credit monitoring and performance. Koju, Koju and Wang (2020) highlighted that the development of industrial sectors and exports is the main driver of loan performance in high-income countries.

GDP plays a crucial role in the relationship between credit monitoring and financial performance by providing a macroeconomic context that influences both credit risk and business outcomes. Strong GDP growth typically signals a healthy economy, reducing default risks and enhancing the effectiveness of credit monitoring in predicting and improving financial performance. Conversely, during periods of low or negative

GDP growth, increased economic uncertainty can strain credit systems and diminish the reliability of credit assessments, thereby impacting overall financial results.

6.9 Interpretation of the Findings

The investigation sought to explore the direct effect of lending requirements on financial performance. The coefficient of lending requirements of the commercial banks was positive and statistically significant. Thus, lending requirements is a significant determinant of performance. Strict lending requirements reduce default rates and enhance loan quality, supporting long-term profitability of the banks. More lenient lending policies may increase short-term revenue through higher loan volumes but can also elevate credit risk and impair financial performance over time. Annual economic growth does not moderate significantly the nexus between lending requirements and the performance of banks. Regression analysis showed that the interaction term between lending requirements and annual economic growth was statistically insignificant, indicating that changes in the economic growth rate do not meaningfully influence how lending requirements affect bank performance. This suggests that regardless of fluctuations in economic growth, the impact of lending requirements on financial outcomes remains relatively stable among commercial banks.

The coefficient of the credit appraisal process of the commercial banks was positive and statistically significant. Hence, the credit appraisal process is a significant determinant of the performance of the commercial banks. An effective and thorough credit appraisal process helps ensure that loans are given to creditworthy borrowers, reducing default risks and enhancing asset quality. This contributes to improved profitability and overall financial stability. Furthermore, annual economic growth significantly moderates the link between the credit appraisal process and the performance of Kenyan commercial banks. In periods of strong economic growth, effective credit risk management practices tend to portray a more pronounced positive impact on performance as favorable economic conditions support borrower repayment capacity and reduce default risk.

The coefficient of credit monitoring was positive and statistically significant. Thus, credit monitoring is a significant determinant of the performance of the financial institutions under review. A systematic credit appraisal process enables banks to accurately assess the creditworthiness of borrowers, hence minimizing loan default risks and improving loan portfolio quality, leading to better financial performance. Annual economic growth does not moderate significantly on the link between credit monitoring and the performance of Kenyan banks. The interaction term between credit monitoring and annual economic growth was statistically insignificant, suggesting that the effect of credit monitoring on financial performance remains consistent regardless of variations in Kenya's economic growth. This implies that improvements or declines in economic growth do not significantly alter how credit monitoring practices affect the financial outcomes.

7. Summary, Conclusions and Recommendations

In the chapter, the summary of findings, conclusions and recommendations is given.

7.1 Summary of the Findings

The study aimed at examining the credit risk management, GDP and financial performance of the Kenyan commercial banks. The aim was to determine the issue of lending requirements, credit appraisal process and credit monitoring in relation to the financial performance of the banks under consideration. The paper has also researched the influence of the GDP on the connection between the lending demands, the credit appraisal process, and credit monitoring and the bank performance. The exploration was directed by the concepts of credit risk and loanable funds, asymmetric information and (lastly) the economic growth model as outlined by Rostow. An explanatory research design was used and targeted 39 commercial banks. A simple random sampling technique was used to identify commercial banks that participated in the investigation. A sample of 36 commercial banks was arrived at using the Yamane formula. Panel secondary data was gathered over the period of 8 years (2017 to 2024) from individual audited banks' financial reports. Data entry was done on an Excel spreadsheet, which was then cleaned and uploaded to STATA software for analysis. The descriptive tests entailed the mean, minimum, maximum and SD. Correlation analysis was conducted, as well as panel regression analysis, to test the study's hypotheses.

7.1.1 Direct Relationship between Credit Risk Management and Financial Performance

At the outset, he coefficient of lending requirements of commercial banks was positive and statistically significant (β =.04608, p = .000 < .05). This result therefore led to the rejection of the hypothesis H_{01a} and made the conclusion that there is a significant nexus between lending requirements and performance. Secondly, the coefficient of the credit appraisal process of the commercial banks was positive and statistically significant (β = .00399, p = .000 < .05) and hence the hypothesis H_{01b} was rejected, and a conclusion was made of the presence of a significant association between the credit appraisal process and the financial performance of Kenyan commercial banks. Lastly, the coefficient of credit monitoring was positive and statistically significant (β = 2.79353, p = .000 < .05). This result therefore resulted in the rejection of the hypothesis H_{01c} and hence credit monitoring recorded a significant link with the performance of commercial banks under review.

7.1.2 Moderating Effect of GDP in the Relationship between Credit Risk Management and Financial Performance

Upon interacting lending requirements and the moderating variable (GDP), the coefficient of the interaction term (lending requirements* GDP) was negative and statistically insignificant (β = -.0044, p = .293> .05). Consequently, the investigation failed to reject H_{02a} and concluded that gross domestic product does not moderate significantly

the association between lending requirements and financial performance of the institutions under review. Credit appraisal process and annual economic growth interacted. The coefficient of the interaction term (credit appraisal process*annual GDP growth) was positive and statistically insignificant ($\beta = .0085$, $p = .023 < .05$). Thus, the investigation failed to reject H_{02b}, and concluded that annual economic growth significantly moderates the association between credit appraisal process and performance of banks under investigation. Finally, the regression coefficient results from the interaction of credit monitoring and annual economic growth depicted a positive but statistically insignificant ($\beta = .23456$, $p = .501>.05$). The study therefore failed to reject H_{02c}, and thus, annual economic growth does not moderate significantly on the association between credit monitoring and financial performance of the financial institutions under investigation.

7.2 Conclusions

The coefficient of lending requirements of commercial banks was statistically significant and positive. Thus, a unit increase in the lending requirements by the commercial banks would result in an improvement in the performance of the commercial banks in Kenya. The investigation concluded that lending requirements are a significant determinant of the financial performance of the commercial banks in Kenya. Strict lending requirements reduce default rates and enhance loan quality, supporting long-term profitability of the banks. More lenient lending policies may increase short-term revenue through higher loan volumes but can also elevate credit risk and impair performance over time.

The coefficient of the credit appraisal process of the commercial banks was positive and statistically significant. Thus, a unit improvement in the credit appraisal process leads to improvement in the performance of the Kenyan commercial banks. Hence, the credit appraisal process is a significant determinant of the performance of the commercial banks. An effective and thorough credit appraisal process helps ensure that loans are given to creditworthy borrowers, reducing defaults and enhancing asset quality. This contributes to improved profitability and overall financial stability. On the other hand, a weak or inconsistent credit appraisal process can lead to poor lending decisions, higher default rates, and financial losses.

The value of the coefficient of credit monitoring was positive and significant. Therefore, a one unit change in the credit monitoring brings about better performance of the commercial banks, which will be under analysis. Therefore, credit observation is a key player in determining the performance of the commercial banks in Kenya. An efficient credit appraisal system allows banks to make a proper determination of the creditworthiness of the borrowers, therefore reducing defects on loans and enhancing the quality of the loan portfolio, which also results in a high performance.

The study also established that the annual economic growth would not have much of a moderating impact on the relationship between the lending requirements and performance. In addition to this, annual economic growth is reduced considerably due to the dependence of the credit appraisal process on the performance of Kenyan

commercial institutions. Lastly, annual economic growth fails to soften the connection between credit surveillance and the performance of business banks considerably. Amidst strong economic growth, the usefulness of credit risk management procedures is likely to play a more negative role in financial performance since positive economic conditions favor the repayment potential of borrowers and minimize the risk of default. However, during periods of slow or negative economic growth, even well-structured credit risk management strategies may struggle to fully mitigate rising credit risks, potentially weakening their impact on performance.

7.3 Recommendations

7.3.1 Theoretical Implications

This investigation supports the propositions of the loanable funds theory, which was formulated by Robertson & Ohlin (1930), which states that the interest rate is determined by the supply of and demand for loanable funds. It incorporates monetary factors with the non-monetary factors of savings and investment (Lindner, 2013). The loanable funds theory suggests that the supply of credit is influenced by people's savings and bank credit creation during a specific period. The study was used to explain the importance of the credit appraisal process and credit monitoring before a loan is extended to individuals or organizations.

The study further supports the propositions of Asymmetry Information Theory by Akerlof (1970). Information asymmetry entails situations where some trade agents have information that other trade agents in the same market do not, and arises when there is more information to the borrower is more informed than the lender. The historical reputation of the borrower is critical in evaluating creditworthiness. The availability of credit information is significant to borrowers and lenders in making informed decisions on to whom a loan should be issued and how much. The information is significant in identifying genuine borrowers and hence reducing default rates.

The study further supports the propositions of Rostow's Economic Growth model, advanced by Rostow in 1959. This states that the economic growth of a country follows five distinct stages. The Rostow growth stages comprise stage 1 (Traditional society), stage 2 (precondition to take-off), stage 3 (take off), stage 4 (drive to maturity and stage 5 (high mass consumption). Stage 1 is featured with subsistence farming that employs family labour. There is low production and technological deployments (Rostow, 1959). Rostow's Economic Growth model is important in understanding economic transformation in Kenya and how it affects the performance of business organizations in Kenya. The growth of the country's economy lays the foundation for private and public organizations. The theory stimulates the growth of the financial sector headed by commercial banks.

7.3.2 Practical Implications

The commercial banks in Kenya ought to put in place stringent lending requirements to reduce default rates and improve loan quality to enhance their sustainability and

financial performance in the long run. More lenient lending policies may increase short-term revenue through higher loan volumes, but can also elevate credit risk and impair financial performance over time. Furthermore, the commercial banks ought to scrutinize the credit scores of the borrowers to ensure that the borrowers are lent money according to their ability to repay based on their past borrowing records. This enhances the financial stability of the banks by ensuring low default rates. In addition, the commercial banks under study ought to have measures in place to enhance credit monitoring. This can include the application of technology in monitoring credit, among other measures, to help reduce default rates among borrowers, which can negatively affect the performance of the banks. Finally, the government of Kenya also have to have measures in place that can help stabilize the economic growth of Kenya. A stable economy is a recipe for the performance of the many sectors of the economy, including the financial sector. A more stable economy enhances the performance of the financial sectors.

7.3.3 Policy Implications

The study recommends that the policy makers in the financial sector, specifically the Central Bank of Kenya, ought to put in place adequate measures to mitigate credit risks, including partnering with credit reference bureaus and other stakeholders to curb NPLs and improve the performance of the banks under investigation. Commercial banks should implement robust credit risk assessment frameworks using real-time data to minimize loan defaults and enhance financial stability. The government should promote macroeconomic stability and sustainable GDP growth through supportive fiscal and monetary policies, as economic expansion improves borrowers' repayment capacity and strengthens bank performance.

7.3.4 Suggestion for Future Research

The research proposes that further research should be carried out on online lending conduct and the financial performance of Kenyan business institutions, and the moderating effect of monetary policy. Future research might as well concentrate on the dynamic interaction of the management of credit risk, movement in GDP, and the financial performance of commercial banks in various business cycles. It may also be possible to extend the investigation to cross-border commercial banks, so as to account for country differences. The target population could be expanded to a time scope of over 10 years to enhance the reliability of the results while also considering changes in regimes or policy interventions in the banking sector. Future studies may also integrate both primary data (via structured questionnaires) and secondary data (such as audited financial records). Data analysis techniques could include a combination/comparison of panel data regression, for example, random effects model, fixed effects model and pooled OLS to compare results from different models. A stratified random sampling technique would ensure representation across different bank sizes, regions, and regulatory environments, enhancing the generalizability of the findings.

Conflict of Interest Statement

Dr. Irene Cherono and Irine Chepkirui Kalya do not have any conflict of interest while conducting this research.

About the Author(s)

Irene Chepkirui is a Master's in Business Administration (Finance) Student at Catholic University of Eastern Africa, GABA Campus. She is also a member of the Institute of Certified Public Accountant (Kenya). She has interest in Banking and Financial Institutions.

Dr. Cherono Irene is a Lecturer at Catholic University of Eastern Africa, Department of Accounting & Finance, School of Business and Economics. She has PhD. (Finance), MBA (Finance), Bsc. Business Administation (Accounting), She is a member of the Institute of Certified Public Accountant (Kenya) and a member of Institute of Internal Auditors (Kenya). She has interest in Behavioral Finance, Dividend Policies, Capital Structure, Banking and Financial Institutions, Taxation policies, Auditing and Financial Reporting.

References

Ackon, S. E. (2023). *Evaluation of Financial Performance of Rural Banks in Ghana. A Case Study of Nzema Manle Rural Bank Limited* (Doctoral dissertation, University of Cape Coast). Retrieved from https://ir.ucc.edu.gh/xmlui/handle/123456789/10865

Afjal, M., Salamzadeh, A., & Dana, L. P. (2023). Financial fraud and credit risk: Illicit practices and their impact on banking stability. *Journal of Risk and Financial Management*, *16*(9), 386. http://dx.doi.org/10.3390/jrfm16090386

Ahmed, F., Nizam, K., & Ahsan, N. (2023). Credit risk management and default risk: empirical evidence from the United Kingdom. *Journal for Business Education and Management*, *3*(2), 95-110. http://dx.doi.org/10.56596/jbem.v3i2.52

Aiko, M. K. (2023). *Effect of Constructs of Intra-African Foreign Direct Investment on Economic Growth in East African Countries* (Doctoral dissertation, KCA University). Retrieved from https://repository.kcau.ac.ke/bitstream/handle/123456789/1486/Aiko-Effect%20Of%20Constructs%20of%20Intra-African%20Foreign%20Direct%20Investment%20on%20Economic%20Growth%20in%20East%20African%20Countries.pdf?sequence=1

Akomeah, J., Agumeh, R., & Siaw, F. (2020). Credit risk management and financial performance of listed banks in Ghana. *Research journal of finance and accounting*, *11*(6), 39-48. Retrieved from https://iiste.org/Journals/index.php/RJFA/article/download/52144/53880

Akpa, V. O., Asikhia, O. U., & Nneji, N. E. (2021). Organizational culture and organizational performance: A review of literature. *International Journal of Advances in Engineering and Management*, *3*(1), 361-372. http://dx.doi.org/10.35629/5252-0301361372

Akpoviroro, K. S., & Owotutu, S. O. (2018). Impact of external business environment on organizational performance. *International Journal of Advanced Research and Innovative Ideas in Education*, *4*(3), 498-505. Retrieved from https://www.researchgate.net/publication/336320140_IMPACT_OF_EXTERNAL_BUSINESS_ENVIRONMENT_ON_ORGANIZATIONAL_PERFORMANCE

Aldayel, M., & Fragouli, E. (2018). Risk management and performance: a case study of credit risk management in commercial banks. *The Business & Management Review*, *10*(1), 169-183. Retrieved from https://www.researchgate.net/publication/332138018_'_Risk_management_performance_A_case_study_of_credit_risk_management_in_commercial_banks'

Aliija, R., & Muhangi, B. W. (2017). The effect of loan appraisal process management on credit performance in microfinance institutions (MFIs): A case of MFIs in Uganda. *International Journal of Science and Research (IJSR)*, *6*(4), 2283-2289. http://dx.doi.org/10.21275/ART20172815

Allen, D. E., Powell, R. J., & Singh, A. K. (2015). A Critique of Credit Risk Models with Evidence from Mid-Cap Firms. *Quantitative Financial Risk Management: Theory and Practice*, 296-311. https://doi.org/10.1002/9781119080305.ch11

Allen, D., & Powell, R. (2011). Credit risk measurement methodologies. Retrieved from https://www.mssanz.org.au/modsim2011/D6/allen4.pdf

Antar, A. M. (2024). Evaluating the impact of demographic characteristics on residential mortgage default risk: Evidence from Lebanon. *Nurture*, *18*(4), 847-867. http://dx.doi.org/10.55951/nurture.v18i4.901

Auma, L. A. (2018). *Factors Affecting the Effectiveness of Bank Credit in Enhancing the Performance of Small and Medium Enterprises in Kenya: A Case of Kisumu City* (Doctoral dissertation, JKUAT-COHRED). Retrieved from https://ijecm.co.uk/wp-content/uploads/2017/05/5522.pdf

Ayadi, R., Naceur, S. B., Casu, B., & Quinn, B. (2016). Does Basel compliance matter for bank performance?. *Journal of Financial Stability*, *23*, 15-32. https://doi.org/10.1016/j.jfs.2015.12.007

Aydin, M., Guney, E., Yigit, B., Acikgoz, F., & Cakmak, B. Y. (2024). Regulatory pathways to green energy transition for a sustainable environment: The fostering role of human rights, banking sector development, economic complexity, and economic freedom. *Journal of Environmental Management*, *366*. https://doi.org/10.1016/j.jenvman.2024.121739

Basle Committee on Banking Supervision, & Bank for International Settlements. (2000). *Principles for the management of credit risk*. Bank for International Settlements. Retrieved from https://books.google.ro/books/about/Principles_for_the_Management_of_Credit.html?id=ucwlAQAAMAAJ&redir_esc=y

Bera, A. K., & Jarque, C. M. (1981). Efficient tests for normality, homoscedasticity and serial independence of regression residuals: Monte Carlo evidence. *Economics Letters*, *7*(4), 313-318. https://doi.org/10.1016/0165-1765(81)90035-5

Bhatore, S., Mohan, L., & Reddy, Y. R. (2020). Machine learning techniques for credit risk evaluation: a systematic literature review. *Journal of Banking and Financial Technology*, *4*(1), 111-138. https://doi.org/10.1007/s42786-020-00020-3

Bindseil, U., & Senner, R. (2023). Destabilization of bank deposits across destinations–assessment and policy options. Retrieved from https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2887~845e136b3b.en.pdf

Birken, E. G., & Curry, B. (2021). Return on Assets (ROA) definition. Retrieved from https://www.forbes.com>advisor>investing>ROA-return. Accessed on 25th July 2023.

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The review of economic studies*, *47*(1), 239-253. Retrieved from https://www.jstor.org/stable/2297111

Brown, K., & Moles, P. (2014). Credit risk management. *Credit Risk Management*, *16*. Retrieved from https://ebs.online.hw.ac.uk/EBS/media/EBS/PDFs/Credit-Risk-Management.pdf

Cai, J., Huang, H., & Leung, P. (2019). Understanding and measuring the contribution of aquaculture and fisheries to gross domestic product (GDP). *FAO Fisheries and Aquaculture Technical Paper*, (606), I-69. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/077302f4-9d34-488f-baed-f052dde78194/content

CBK (2020). Bank Supervision Annual Report. Available at https://www.centralbank.go.ke/uploads/banking_sector_annual_reports/197965474_BSDANNUALREPORT2019%20.pdf. Accessed on 15th September 2022.

CBK (2021). Credit Officer Survey. Available at https://www.centralbank.go.ke/uploads/banking_sector_reports/1506362303_Credit%20Survey%20Report%20for%20the%20Quarter%20ended%20March%202021.pdf. Accessed on 24th March 2023.

CBK (2022). Bank Supervision Annual Report 2021. Available at https://www.centralbank.go.ke/uploads/banking_sector_annual_reports/1033515790_2021%20Annual%20Report.pdf. Accessed on 6th March 2023.

Coscieme, L., Mortensen, L. F., Anderson, S., Ward, J., Donohue, I., & Sutton, P. C. (2020). Going beyond Gross Domestic Product as an indicator to bring coherence to the Sustainable Development Goals. *Journal of Cleaner Production*, *248*. https://doi.org/10.1016/j.jclepro.2019.119232

Dănăcică, D. E. (2017). Methodological and Applicative Problems of Using Pearson Correlation Coefficient in the Analysis of Socio-Economic Variables. *Romanian Statistical Review Supplement*, *65*(2), 148-163. Retrieved from https://ideas.repec.org/a/rsr/supplm/v65y2017i2p148-163.html

Donkor, J., Donkor, G. N. A., Kankam-Kwarteng, C., & Aidoo, E. (2018). Innovative capability, strategic goals and financial performance of SMEs in Ghana. *Asia Pacific Journal of Innovation and Entrepreneurship*, *12*(2), 238-254. https://doi.org/10.1108/APJIE-10-2017-0033

Eisenhardt, S. B. (1989). *Analyzing banking risk: A framework for assessing corporate governance and risk management* (2nd ed.). Washington, DC: The World Bank.

Elia, G., Polimeno, G., Solazzo, G., & Passiante, G. (2020). A multi-dimension framework for value creation through big data. *Industrial Marketing Management*, *90*, 617-632. https://doi.org/10.1016/j.indmarman.2019.08.004

Ernst, A. F., & Albers, C. J. (2017). Regression assumptions in clinical psychology research practice—a systematic review of common misconceptions. *PeerJ*, *5*. https://doi.org/10.7717/peerj.3323

Fatihudin, D. (2018). How measuring financial performance. *International Journal of Civil Engineering and Technology (IJCIET)*, *9*(6), 553-557. Retrieved from https://www.researchgate.net/publication/326141100_How_Measuring_Financial_Performance

Figueiredo, M. A. L. N. D. (2023). *How corporate banking institutions manage non-performing loans: Case study on BNP Paribas' approach to credit risk management* (Master's thesis). Retrieved from https://www.iscte-iul.pt/tese/15022

Githama, J. N., & Gachanja, P. (2020). Effects of Credit Appraisal Methods on Non-Performing Loans in Government-Owned Financial Institutions, A Case of Kenya Commercial Bank Limited. *International Journal of Current Aspects*, *4*(2), 1-12. http://dx.doi.org/10.35942/ijcab.v4i2.123

González, C. I., & Núñez, S. (2021). Markets, financial institutions and central banks in the face of climate change: challenges and opportunities. *Banco de España Occasional Paper*, (2126). Retrieved from https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSeriadas/DocumentosOcasionales/21/Files/do2126e.pdf

Gutterman, A. S. (2023). Organizational performance and effectiveness. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4532570

Hada, I. D., & Maria, M. M. (2020). The importance of profitability indicators in assessing the financial performance of economic entities. *The Annals of the University of Oradea*, *29*(2020), 219. Retrieved from https://ideas.repec.org/a/ora/journl/v1y2020i1p219-228.html

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271. https://doi.org/10.2307/1913827

Ibtissem, B., & Bouri, A. (2013). Credit risk management in microfinance: The conceptual framework. *ACRN Journal of Finance and Risk Perspectives*, *2*(1), 9-24. Retrieved from https://www.findevgateway.org/sites/default/files/publications/files/credit_risk_in_microfinance_the_conceptual_framework.pdf

Igan, M. D., & Kang, M. H. (2011). *Do loan-to-value and debt-to-income limits work? Evidence from Korea*. International Monetary Fund. Retrieved from https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Do-Loan-To-Value-and-Debt-To-Income-Limits-Work-Evidence-From-Korea-25441

Iqbal, I. (2020). Political, Economic, Social, Technological, Environmental, and Legal Analysis on Dompet Ummat Pontianak Indonesia. *Journal of Research in Business, Economics and Management, 14*(2), 2638-2644. Retrieved from https://core.ac.uk/download/pdf/304913252.pdf

Jafari, M., & Adibpour, M. (2016). The impact of macro-economic variables on credit risk (Case Study Cooperative Development Bank). *IOSR Journal of Economics and Finance*, *7*(4), 111-114. http://dx.doi.org/10.9790/5933-070401111114

Jean-Paul, F., & Martine, D. (2018). *Beyond GDP measuring what counts for economic and social performance: measuring what counts for economic and social performance*. OECD Publishing. Retrieved from https://seea.un.org/content/beyond-gdp-measuring-what-counts-economic-and-social-performance

Jumbe, G., & Gor, R. (2022). Credit Risk Assessment Using Default Models: A Review. *Vidya-A Journal of Gujarat University*, *1*(2), 1-14. http://dx.doi.org/10.47413/vidya.v1i2.78

Kaimu, A., & Muba, S. (2021). The relationship between credit risk and financial performance: Evidence from commercial banks in Tanzania. *East African Journal of Business and Economics*, *4*(1), 22-33. Retrieved from http://dx.doi.org/10.37284/eajbe.4.1.478

Karanja, J. G. (2019). *Credit risk and lending performance of commercial banks in Kenya* (Doctoral dissertation, KeMU). DOI: https://doi.org/10.21203/rs.3.rs-2038051/v1

Karnataka State Souharda Federal Cooperative (2020). Credit appraisal. https://www.souharda.coop/pdf/2020/New01.pdf

Kingu, P. S., Macha, S., & Gwahula, R. (2018). Impact of non-performing loans on banks' profitability: Empirical evidence from commercial banks in Tanzania. *International Journal of Scientific Research and Management*, *6*(1), 71-79. http://dx.doi.org/10.18535/ijsrm/v6i1.em11

Kinyua, J. W., Kiiru, G., & Njoroge, D. (2022). Effect of Client Appraisal and Loan Monitoring Strategies on the Repayment of Revolving Funds in Kenya. *International Journal of Managerial Studies and Research,* 10(8), 74-84. Retrieved from https://www.arcjournals.org/pdfs/ijmsr/v10-i8/7.pdf

Kithinji, A. M. (2010). Credit risk management and profitability of commercial banks in Kenya. Retrieved from https://erepository.uonbi.ac.ke/bitstream/handle/11295/40437/aibuma2011-submission232.pdf

Klein, T. J., Lambertz, C., & Stahl, K. O. (2016). Market transparency, adverse selection, and moral hazard. *Journal of Political Economy*, *124*(6), 1677-1713. Retrieved from https://www.journals.uchicago.edu/doi/10.1086/688875

Koju, L., Koju, R., & Wang, S. (2020). Macro-economic determinants of credit risks: evidence from high-income countries. *European Journal of Management and Business Economics*, *29*(1), 41-53. https://doi.org/10.1108/EJMBE-02-2018-0032

Lawrence, B., Doorasamy, M., & Sarpong, P. (2020). The Impact of Credit Risk on Performance: A Case of South African Commercial Banks. *Global Business Review*. https://doi.org/10.1177/0972150920969927

Léon, F. (2023). Public bank lending in Africa in times of crisis. *Emerging markets review*, *55*. https://doi.org/10.1016/j.ememar.2023.101032

Lindner, F. (2013). *Banken treiben Eurokrise* (No. 82). IMK Report.

Maina, E. M., & Njeru, A. (2023). Influence of credit risk management practices on loan recovery performance of the registered digital credit providers in Kenya. *The Strategic Journal of Business & Change Management*, *10*(4), 682-695. http://dx.doi.org/10.13140/RG.2.2.26892.28801

Mamo, W. B., Feyisa, H. L., & Yitayaw, M. K. (2021). Financial performance of commercial banks in the emerging markets. *Corp. Gov. Organ. Behav. Rev*, *5*, 244-257. Retrieved from https://virtusinterpress.org/IMG/pdf/cgobrv5i2sip12.pdf

Markov, A., Seleznyova, Z., & Lapshin, V. (2022). Credit scoring methods: Latest trends and points to consider. *The Journal of Finance and Data Science*. 8(11), 180-201. https://doi.org/10.1016/j.jfds.2022.07.002

Mohamed, A. M., & Onyiego, G. (2018). Effect of risk management on financial performance of commercial banks in Kenya: a case study of commercial banks in Mombasa County. *The Strategic Journal of Business & Change Management*, *5*(4), 1605-1630. http://dx.doi.org/10.61426/sjbcm.v5i4.988

Musau, S., Muathe, S., & Mwangi, L. (2018). Financial inclusion, GDP and credit risk of commercial banks in Kenya. *International Journal of Economics and Finance*, *10*(3), 181-195. http://dx.doi.org/10.5539/ijef.v10n3p181

Mweshi, G. K., & Sakyi, K. (2020). Application of sampling methods for the research design. *Archives of Business Review–Vol. 8*(11), 180-193. https://doi.org/10.14738/abr.811.9042

Namkoong, Y. (1999). Dependency Theory: Concepts, Classifications, and Criticisms. *International Area Review*, *2*(1), 121–150. https://doi.org/10.1177/223386599900200106

Ndero, S. W., Wepukhulu, J. M., & Bogonko, J. B. (2019). Relationship between credit appraisal and loan performance by commercial banks in Uasin Gishu County, Kenya. *European Journal of Economic and Financial Research* 3(4), 16-29. https://doi.org/10.5281/zenodo.3241790

Ngiay, S. M., & Hong, D. (2023). Analysis of Credit Risk Management Practices in Commercial Banks in DR Congo: Case of RAWBANK SA. *Open Access Library Journal*, *10*(10), 1-20. https://doi.org/10.4236/oalib.1110796

Obae O., G. (2022). *Credit Management Practices and Loan Performance of Commercial Banks in Kenya* (Dissertation, Kenyatta University). Retrieved from https://iajournals.org/articles/iajef_v3_i7_222_237.pdf

OECD (2015), G20/OECD Principles of Corporate Governance, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264236882-en.

Okero, E. O., & Waweru, F. W. (2023). Credit Risk Assessment and Loan Repayment among Development Financial Institutions. A Case of Kenya Industrial Estates Limited. *International Journal of Finance and Accounting*, *2*(1), 21-29. http://dx.doi.org/10.37284/ijfa.2.1.1197

Oleiwi, A. T., Ali, M., Jassim, S. H., Nadhim, M. H., Gueme, G. M., & Bujang, N. (2019). The relationship between credit risk management practices and profitability in malaysian commercial banks. *International Journal of Engineering and Advanced Technology*, *8*(5), 53-59. http://dx.doi.org/10.35940/ijeat.E1007.0585C19

Omokhoa, H. E., Odionu, C. S., Azubuike, C. H. I. M. A., & Sule, A. K. (2024). Innovative credit management and risk reduction strategies: AI and fintech approaches for microfinance and SMEs. *IRE Journals*, *8*(6), 686.

Ong'era, J., O. & Onditi, L., A. (2016). Influence of Loan Lending Policies on Financial Performance of Commercial Banks in Kenya: A Case of Selected Banks in Kisii Town, Kenya. *International Journal of Economics, Commerce and Management United Kingdom, 6(11),* 239-253. Retrieved from https://ijecm.co.uk/wp-content/uploads/2016/11/41123.pdf

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International journal of economics and financial issues*, *3*(1), 237-252. Retrieved from https://www.researchgate.net/publication/306122535_Determinants_of_Financial_Performance_of_Commercial_Banks_in_Kenya

Orito, M. O. (2021). *Investigating strategic leadership and performance of state corporations and departments in the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works, Kenya* (Doctoral dissertation, University of Nairobi). Retrieved from https://erepository.uonbi.ac.ke/bitstream/handle/11295/155722/Moses%20Omolo%20Orito%20-Projec%20t.pdf?sequence=1

Pfeffer, D. G., & Salancik, A. B. (1978). *Bank management: Text and cases.* John Wiley & Sons, Inc. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1496213

Phina, O. N. (2020). Effects of strategic management on organizational performance in manufacturing firms in South-East Nigeria. *Asian Journal of Economics, Business and Accounting*, *15*(2), 24-31. Retrieved from http://dx.doi.org/10.9734/ajeba/2020/v15i230211

Pochiraju, B., & Kollipara, H. S. S. (2019). Statistical Methods: Regression Analysis. *Essentials of Business Analytics: An Introduction to the Methodology and its Applications*, 179-245. https://doi.org/10.1007/978-3-319-68837-4_7

Porenta, J., & Rant, V. (2025). ESG relevance in the credit risk of development banks. *Research in International Business and Finance*, *76*. https://doi.org/10.1016/j.ribaf.2025.102831

Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instrument development. *International Journal of*

Economics & Management Sciences, *6*(2), 1-5. http://dx.doi.org/10.4172/2162-6359.1000403

Republic of Kenya (2022). Kenya Vision 2030 Flagship Programmes and Projects Progress Report (Fy 2020/2021). Available at https://vision2030.go.ke/wp-content/uploads/2022/09/final-edited-vision-2030-flagship-project-progress-report_170820221-1.pdf. Accessed on 19th May 2023.

Rostow, W. W. (1959). *The stages of economic growth and the problems of peaceful co-existence*. Cambridge, Mass.: Center for International Studies, Massachusetts Institute of Technology, 1959.

Scott, A. O., Amajuoyi, P., & Adeusi, K. B. (2024). Advanced risk management solutions for mitigating credit risk in financial operations. *Magna Scientia Advanced Research and Reviews*, *11*(1), 212-223. http://dx.doi.org/10.30574/msarr.2024.11.1.0085

Scott, A. O., Amajuoyi, P., & Adeusi, K. B. (2024). Effective credit risk mitigation strategies: Solutions for reducing exposure in financial institutions. *Magna Scientia Advanced Research and Reviews*, *11*(1), 198-211.

Serwadda, I. (2018). Impact of credit risk management systems on the financial performance of commercial banks in Uganda. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*. 66(6): 1627 – 1635. http://dx.doi.org/10.11118/actaun201866061627

Shrestha, N. (2020). Detecting multicollinearity in regression analysis. *American Journal of Applied Mathematics and Statistics*, *8*(2), 39-42. http://dx.doi.org/10.12691/ajams-8-2-1

Siddiqi, N. (2017). *Intelligent credit scoring: Building and implementing better credit risk scorecards*. John Wiley & Sons. https://onlinelibrary.wiley.com/doi/book/10.1002/9781119282396

Siddique, A., Khan, M. A., & Khan, Z. (2021). The effect of credit risk management and bank-specific factors on the financial performance of the South Asian commercial banks. *Asian Journal of Accounting Research*, *7*(2), 182-194. https://doi.org/10.1108/AJAR-08-2020-0071

Sile, N. K., Olweny, T., & Sakwa, M. (2019). Asset quality as a determinant of commercial banks financial performance in Kenya. *International Journal of Economics, Commerce and Management*, *7*(2), 413-424. Retrieved from https://ijecm.co.uk/wp-content/uploads/2019/02/7225.pdf

Stiglitz, J., & Greenwald, B. (2003). *Towards a new paradigm in monetary economics*. Cambridge University Press. Retrieved from https://www.filosofiadeldebito.it/wordpress/wp-content/uploads/2017/05/Stiglitz-Greenwald-Towards-a-New-Paradigm-in-Monetary-Economics.pdf

Syadali, M. R. A., Segaf, S., & Parmujianto, P. (2023). Risk management strategy for the problem of borrowing money for Islamic commercial banks. *Enrichment: Journal of Management*, *13*(2), 1227-1236. Retrieved from https://www.enrichment.iocspublisher.org/index.php/enrichment/article/view/1392

Taherdoost, H. (2021). Data collection methods and tools for research: a step-by-step guide to choosing data collection techniques for academic and business research projects. *International Journal of Academic Research in Management (IJARM)*, *10*(1), 10-38. Retrieved from https://hal.science/hal-03741847/document

Taiwo, J. N., Ucheaga, E. G., Achugamonu, B. U., Adetiloye, K., & Okoye, O. (2017). Credit risk management: Implications on bank performance and lending growth. *Saudi Journal of Business and Management Studies*, *2*, 584-590.

Thakor, A. V. (2016). The highs and the lows: A theory of credit risk assessment and pricing through the business cycle. *Journal of Financial Intermediation*, *25*, 1-29. http://dx.doi.org/10.2139/ssrn.2565499

Trueck, S., & Rachev, S. T. (2009). *Rating-based modeling of credit risk: theory and application of migration matrices*. Academic Press. Retrieved from https://books.google.ro/books/about/Rating_Based_Modeling_of_Credit_Risk.html?id=C8mxdgm_K8EC&redir_esc=y

Tsiang, S. C. (1956). Liquidity preference and loanable funds theories, multiplier and velocity analysis: a synthesis. *The American Economic Review*, *46*(4), 539-564. https://www.jstor.org/stable/1814282

Twum, A. K., Agyemang, A. O., & Sare, Y. A. (2022). Revisiting credit risk and banks performance of China's commercial banks before and after the COVID-19 pandemic. *Journal of Corporate Accounting & Finance*, *33*(3), 16-30. https://doi.org/10.1002/jcaf.22539

Ugut, G. S. (2024). *Credit Default Swap: Definition, Structure, Use, and Potential Misuse*. Penerbit NEM. Retrieved from https://www.penerbitnem.com/2024/05/credit-default-swap-definition.html

Vovchenko, O. (2021). Development of the banks' risk management system under conditions of uncertainty. *РОЗВИТКУ*. http://dx.doi.org/10.57111/econ.20(4).2021.8-15

Wairagu, E. G. (2016). *Influence of Credit Policy on the Performance of Loans among Commercial Banks in Kenya* (Master's dissertation, KCA University). Retrieved from http://41.89.49.13:8080/xmlui/bitstream/handle/123456789/1336/Wairagu-Influence%20Of%20Credit%20Policy%20On%20The%20Performance%20Of%20Loans%20Among%20Commercial%20Banks%20In%20Kenya.pdf?sequence=1&isAllowed=y

Wambugu, W. J., & Mungai, N. J. (2019). Asset Quality and Financial Performance of Commercial Banks in Kenya. *The international journal of business & management*, 7(11), 271-277. http://dx.doi.org/10.24940/theijbm/2019/v7/i11/145780-3565

Witzany, J., & Witzany, J. (2017). *Credit risk management* (pp. 5-18). Springer International Publishing. Retrieved from http://ndl.ethernet.edu.et/bitstream/123456789/45389/1/90.pdf

Wójcicka-Wójtowicz, A. (2018). Credit risk management in finance: a review of various approaches. *Operations Research and Decisions*, *28*(4), 99-106. Retrieved from https://ord.pwr.edu.pl/assets/papers_archive/1349%20-%20published.pdf

Woodford, M. (2003). Optimal interest-rate smoothing. *The Review of Economic Studies*, *70*(4), 861-886. Retrieved from https://www.jstor.org/stable/3648627

Wooldridge, J. M. (2002). Econometric analysis of cross-section and panel data, MIT Press. *Cambridge*, *108*(2), 245-254. Retrieved from https://ipcid.org/evaluation/apoio/Wooldridge%20-%20Cross-section%20and%20Panel%20Data.pdf

Yeasin, H. M. (2022). Impact of credit risk management on financial performance: A study of commercial banks in Bangladesh. *Interdisciplinary Journal of Applied and Basics Subjects*, *2*(1), 14-22.

Yhip, T. M., & Alagheband, B. M. (2020). *The Practice of Lending*. Springer International Publishing. Retrieved from https://books.google.ro/books/about/The_Practice_of_Lending.html?id=3c3SDwAAQBAJ&redir_esc=y

Yhip, T. M., Alagheband, B. M., Yhip, T. M., & Alagheband, B. M. (2020). Credit Analysis and Credit Management. The Practice of Lending: A Guide to Credit Analysis and Credit Risk, 3-46. Retrieved from https://ideas.repec.org/h/spr/sprchp/978-3-030-32197-0_1.html

Zhu, H., Sarafidis, V., Silvapulle, M. J., & Gao, J. (2015). Testing for a Structural Break in Dynamic Panel Data Models with Common Factors. Retrieved from https://www.monash.edu/_data/assets/pdf_file/0012/925878/wp20-15.pdf