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# Effect of Central Bank Regulations on Profitability of Listed Commercial Banks on the Rwanda Stock Exchange (2016-2025)

Medard Bizimana and Emmaboles Rukunda
University of Kigali
Email: bimedy@gmail.com

***Abstract:*** *This study examined the effect of central bank regulations on the profitability of listed commercial banks on the Rwanda Stock Exchange. The study focused specifically on leverage requirement regulation as a dimension of central bank regulation and profitability as the dependent variable. A descriptive and correlational research design was adopted, using secondary data obtained from annual reports, audited financial statements, National Bank of Rwanda reports, and regulatory disclosures covering the period from 2016 to 2025. The study covered four listed commercial banks and generated 40 firm-year observations through a census approach. Data were organized using a documentary review guide and analysed using descriptive statistics, Pearson correlation analysis, and regression analysis. The findings showed that leverage requirement had a mean of 3.125 (SD = 0.482), while profitability had a mean of 3.425 (SD = 0.625). Pearson correlation analysis indicated a strong positive and statistically significant relationship between leverage requirement and profitability ($r = .752$, $p < .01$). Regression analysis further showed that leverage requirement had a positive and statistically significant effect on profitability ($\beta = .400$, $t = 2.619$, $p = .013$). The null hypothesis was therefore rejected. The findings indicated that effective leverage management and compliance with capital-related regulatory requirements were associated with stronger profitability among listed commercial banks. The study recommends that listed commercial banks strengthen leverage monitoring, capital planning, and regulatory compliance while ensuring that capital resources are efficiently allocated to sustainable income-generating activities.*

***Keywords:*** *leverage requirement; profitability; commercial banks; Rwanda Stock Exchange; capital adequacy; banking regulation*

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## 1. Introduction

Central bank regulations play a significant role in promoting the stability, safety, and profitability of commercial banks across the world (Heller, 2024). These regulations refer to financial rules, standards, and supervisory measures established by central banks and other regulatory authorities to ensure that banking institutions operate in a sound and responsible manner. Central bank regulations mainly focus on areas such as capital adequacy, liquidity management, and credit risk management in order to reduce financial risks and enhance the resilience of the banking sector. Through effective Central bank supervision, commercial banks are able to strengthen their operational efficiency, protect depositors'

funds, and maintain public confidence in the financial system (International Monetary Fund, 2024).

Leverage requirement is an important component of prudential banking regulation because commercial banks operate by mobilizing deposits and other financial resources and using them to provide loans and investments. The use of financial resources exposes banks to the possibility of losses when borrowers default, asset values decline, or financial conditions deteriorate. Leverage-related regulatory requirements therefore seek to ensure that banks maintain sufficient capital in relation to their exposures so that they can absorb unexpected losses and continue operating. For listed commercial banks, the issue is particularly important because their financial condition is continuously observed by shareholders, investors, depositors, regulators, and the wider market. The way banks manage leverage can consequently influence both financial resilience and profitability (Johnson, 2023; Basel Committee on Banking Supervision, 2024).

At the global level, banking regulators have strengthened capital-related requirements following financial crises that demonstrated the risks associated with excessive leverage and weak capital positions. The Basel regulatory framework places emphasis on capital strength and the ability of banks to withstand financial shocks. Research reviewed in the source study indicates that banks with adequate capital reserves can improve resilience, reduce financial distress, and maintain more stable earnings (Ayuso et al., 2024; Basel Committee on Banking Supervision, 2024). However, regulatory compliance also creates financial and operational considerations because banks must allocate resources to capital buffers and compliance systems. The relationship between leverage requirements and profitability therefore remains an important issue for bank management and regulators.

Evidence from developed banking systems has generally suggested a positive association between stronger capital positions and bank performance. Anderson and Miller (2024), for example, reported a positive and significant relationship between leverage requirement and profitability among commercial banks in the United States. Johnson and Clark (2023) similarly found that commercial banks in the United Kingdom with stronger leverage positions experienced improved financial performance and reduced financial distress. Kakov (2024) reported a positive relationship among German commercial banks, indicating that adequate capital positions were associated with stronger resilience and stable earnings. These findings suggest that capital strength can support profitability by reducing exposure to financial distress and strengthening the ability of banks to maintain operations during adverse conditions.

In Africa, leverage and capital regulation are also important because commercial banks operate in environments where financial risks can affect the stability of institutions and the wider economy. Abubakar and Yusuf (2024) found that leverage requirement was positively and significantly associated with profitability among Nigerian commercial banks. Moshi and Mwakalobo (2024) similarly reported a strong positive relationship between leverage requirement and profitability in Kenya. These findings suggest that effective capital management may improve banking performance by reducing insolvency risks, strengthening investor confidence, and supporting sustainable financial operations. Nevertheless, differences in regulatory frameworks, market structures, and institutional characteristics mean that findings from other African countries cannot automatically be generalized to Rwanda.

In Rwanda, the National Bank of Rwanda regulates commercial banks to promote financial stability, protect depositors, and ensure sound banking operations. The source study reported that Rwanda's banking sector maintained a leverage requirement ratio of 21.6% in 2024, above the reported regulatory minimum of 15%. This indicates a relatively strong capital position within the banking sector. However, a high level of regulatory compliance does not automatically explain whether leverage requirements improve profitability. Banks must still consider the opportunity cost of holding capital, the efficiency of capital allocation, lending capacity, and the cost of compliance. These considerations make the relationship between leverage requirement and profitability relevant to the Rwandan banking sector (BNR, 2024; Government of Rwanda, 2025).

Listed commercial banks on the Rwanda Stock Exchange provide a particularly relevant context for this analysis because they operate under prudential supervision while also facing the expectations of shareholders and capital-market participants. The source study identified Bank of Kigali Plc, I&M Bank Rwanda Plc, Equity Bank Rwanda Plc, and BPR Bank Rwanda Plc as the listed commercial banks considered in the analysis. Despite the importance of capital regulation, profitability among banks can fluctuate because of changes in lending activity, operating costs, credit quality, market conditions, and regulatory requirements. It was therefore necessary to isolate leverage requirement and examine its relationship with profitability rather than considering central bank regulation only as a broad concept.

## 1.2. Statement of the Problem

The banking sector plays an important role in Rwanda's economy by mobilizing savings, providing credit,

financing investment, and supporting economic activity. Because banks operate with substantial financial obligations, maintaining adequate capital is necessary to protect depositors and strengthen the resilience of the financial system. The National Bank of Rwanda therefore imposes prudential requirements intended to ensure that commercial banks maintain sufficient financial capacity. The source study reported a leverage requirement ratio of 21.6% for Rwanda's banking sector in 2024 compared with a regulatory minimum of 15%, suggesting that banks maintained a capital position above the required threshold (BNR, 2024).

Despite this relatively strong regulatory position, an important practical question remains concerning whether compliance with leverage requirements improves profitability. Banks that maintain stronger capital buffers may be better able to absorb losses, sustain lending, and maintain stakeholder confidence. However, holding additional capital may also reduce the proportion of financial resources available for lending and other income-generating activities. Regulatory compliance can further create monitoring, reporting, and capital-management costs. The resulting effect on profitability may therefore depend on how efficiently banks manage the balance between regulatory safety and productive use of financial resources.

Previous empirical studies have not been conducted uniformly in the same institutional context. Anderson and Miller (2024), Johnson and Clark (2023), Kakov (2024), Abubakar and Yusuf (2024), and Moshi and Mwakalobo (2024) reported positive relationships between leverage requirements or capital strength and bank profitability. Bazimya (2024) also found a positive and significant relationship between leverage requirement and profitability among commercial banks in Rwanda. However, the Rwandan study considered commercial banks generally rather than specifically focusing on banks listed on the Rwanda Stock Exchange. The institutional characteristics of listed banks, including public reporting, shareholder expectations, and market scrutiny, may influence the relationship between capital regulation and profitability.

The gap was therefore geographical, contextual, and methodological. Geographically, much of the available evidence originated from countries outside Rwanda. Contextually, existing Rwandan evidence did not isolate listed commercial banks on the Rwanda Stock Exchange. Methodologically, several studies examined broad financial performance or combined several regulatory variables rather than focusing specifically on leverage requirement and profitability. This study addressed the gap by examining the effect of leverage requirement on the profitability of listed commercial banks on the Rwanda Stock Exchange using secondary financial and regulatory data covering 2016–2025.

## 1.3 Objectives of the Study

The general objective of the study was to examine the effect of central bank regulations on the profitability of listed commercial banks on the Rwanda Stock Exchange.

### 1.3.1. Specific objective

To examine the effect of leverage requirement on the profitability of listed commercial banks on the Rwanda Stock Exchange.

## 1.4 Hypothesis of the Study

$H_0$: Leverage requirement has no statistically significant effect on the profitability of listed commercial banks on the Rwanda Stock Exchange.

# 2. Literature Review

This part reviews the literature related to the effect of central bank regulations on the profitability of listed commercial banks on the Rwanda Stock Exchange. It presents the conceptual, theoretical, and empirical literature relevant to the study variables. The review focuses on central bank regulations, leverage requirements, and bank profitability, while also examining theories and previous empirical studies related to the subject. The reviewed literature provides a foundation for understanding the relationship between regulatory requirements and the profitability of commercial banks

## 2.1 Conceptual Review

This section reviews the key concepts related to the study on the effect of central bank regulations on the profitability of listed commercial banks on the Rwanda Stock Exchange. The conceptual review focuses on central bank regulations, leverage requirements, and profitability of commercial banks. It explains the meaning, importance, and relevance of these concepts to the study variables. The review also provides a basis for understanding how regulatory requirements may influence the financial performance of commercial banks.

### 2.1.1 Central Bank Regulations

Central bank regulations refer to rules, guidelines, and supervisory measures established by financial regulatory authorities to ensure the safety, stability, and soundness of financial institutions, particularly commercial banks (Huller, 2023). These regulations are designed to minimize financial risks, protect depositors' funds, and maintain confidence in the banking system. Central bank regulations mainly focus on areas such as capital adequacy, liquidity management, and credit risk control in order to promote financial stability and sustainable banking operations. Central bank regulations are important because commercial banks operate in environments exposed to various financial risks, including credit defaults, liquidity shortages, operational failures, and market uncertainties (World Bank, 2025).

Regulatory authorities such as central banks supervise commercial banks to ensure compliance with Central bank standards and reduce the likelihood of bank failures and financial crises (Basel Committee on Banking Supervision, 2024). Central bank regulations require banks to maintain adequate capital reserves, monitor liquidity levels, and implement effective credit risk management systems in order to strengthen financial stability. Through regular supervision, monitoring, and compliance assessments, regulatory authorities ensure that commercial banks operate in accordance with established financial standards and regulatory frameworks. In many countries, Central bank supervision also involves stress testing, risk-based supervision, financial reporting requirements, and implementation of international banking standards such as the Basel Accords (Bank of England, 2024).

Effective Central bank regulations enhance operational efficiency, strengthen risk management practices, and improve profitability within the banking sector (Jennifer, 2024). By minimizing exposure to financial risks such as loan defaults, liquidity shortages, and inadequate capital reserves, Central bank regulations contribute to increased investor confidence and improved financial performance among commercial banks. In addition, effective Central bank supervision promotes sustainable banking operations and supports economic growth through a stable and efficient financial system. Central bank regulations also encourage transparency, accountability, and responsible financial management practices among banking institutions (Government of Rwanda, 2025).

### 2.1.2 Leverage Requirement

Leverage requirements refer to prudential requirements that require commercial banks to maintain a minimum level of high-quality capital relative to their total exposures, regardless of the level of risk associated with those exposures (Johnson, 2023). The primary objective of leverage requirements is to limit excessive borrowing, prevent the accumulation of unsustainable debt, and strengthen the resilience of banks against financial shocks. Unlike risk-based capital measures, the leverage ratio serves as a simple, non-risk-based measure that complements capital adequacy requirements by ensuring that banks maintain sufficient capital to absorb unexpected losses. Under the Basel Committee on Banking Supervision framework, the leverage ratio is used as an important prudential requirement for promoting financial stability and reducing the likelihood of bank failures (Morris & Clark, 2024).

Commercial banks are required to maintain adequate Tier 1 capital in relation to their total on-balance-sheet and off-balance-sheet exposures to comply with leverage requirements established by financial regulatory authorities (Brown, 2024). Maintaining an appropriate leverage ratio enables banks to absorb unexpected financial losses arising from operational failures, market fluctuations, and adverse economic conditions without disrupting banking operations. Regulatory authorities continuously monitor compliance with leverage requirements through financial reporting, supervisory reviews, and stress-testing exercises to ensure that banks maintain sound financial positions. Strong leverage positions also enhance public confidence, improve creditworthiness, and contribute to the long-term sustainability of the banking sector (Williams & Taylor, 2025).

Effective leverage requirements contribute significantly to the profitability and operational performance of commercial banks by promoting financial discipline and reducing the risk of excessive leverage (Andrews, 2024). Banks with adequate leverage positions are better able to withstand financial shocks, maintain stable operations, and sustain investor confidence. At the same time, maintaining sufficient capital relative to total exposures may limit excessive borrowing and reduce the likelihood of financial distress. However, excessively stringent leverage requirements may constrain lending capacity and increase compliance costs, which can reduce short-term profitability. Therefore, achieving an appropriate balance between leverage requirements and business expansion is essential for enhancing the sustainable profitability and financial stability of commercial banks (Thompson, 2025).

### 2.1.3. Profitability of Commercial Banks

Profitability of commercial banks refers to the ability of banking institutions to generate financial returns from their operations and investments over a given period of time (Stewart, 2023). Profitability is an important indicator of financial performance, operational efficiency, and sustainability within the banking sector. Commercial banks

generate profits mainly through lending activities, investments, and the provision of financial services to customers. Financial performance is commonly measured using indicators such as Return on Assets (ROA) and Return on Equity (ROE), which assess the efficiency of banks in utilizing resources to generate income (Cooper & Allen, 2024).

Commercial banks with high profitability levels are better positioned to expand operations, improve shareholder value, and maintain financial stability within competitive financial markets (Nelson, 2024). Profitability enables banks to strengthen capital reserves, increase lending capacity, and invest in modern financial technologies that improve operational efficiency and customer service delivery. Regulatory compliance, effective risk management, and sound financial practices are also important factors that influence profitability among commercial banks. Financial institutions that maintain strong governance structures and efficient resource management practices are more likely to achieve sustainable financial performance (Edwards & Scott, 2025).

Effective Central bank regulations contribute significantly to improved profitability and long-term sustainability of commercial banks (Turner, 2024). Proper management of capital adequacy, liquidity, and credit risks helps banks minimize financial losses, improve operational efficiency, and maintain stable earnings over time. High profitability also enhances investor confidence, strengthens market competitiveness, and supports economic development through increased lending and investment activities. However, poor financial management practices, rising non-performing loans, and excessive operational costs may negatively affect profitability and weaken the financial performance of commercial banks (Bennett, 2025).

## 2.2 Theoretical Review

This section presents the theoretical foundation upon which the study is based. Theoretical review is important because it provides the concepts and assumptions that explain the relationship between the study variables and guides the interpretation of research findings. For this study, the theoretical review explains how prudential regulations influence the profitability of commercial banks from different perspectives. Specifically, the study is anchored on Financial Intermediation Theory, Risk Management Theory, and Public Interest Theory of Regulation, which collectively explain the role of prudential regulations in promoting financial stability, managing banking risks, and influencing the profitability of listed commercial banks on the Rwanda Stock Exchange.

### 2.2.1. Financial Intermediation Theory

Financial Intermediation Theory explains the role of banks in mobilizing savings from surplus units and channeling financial resources to deficit units for productive investment. The theory, associated with the work of Gurley and Shaw, emphasizes the role of financial institutions in reducing transaction costs, managing information asymmetry, and improving the allocation of financial resources. Commercial banks generate income through this intermediation function by transforming deposits and other funds into loans and investments while managing associated risks (Allen & Santomero, 2022; Freixas & Rochet, 2023).

The theory is relevant to leverage requirement because capital regulation influences the amount and quality of financial resources that banks can use in their intermediation activities. Adequate capital strengthens the capacity of banks to absorb unexpected losses and maintain confidence, which can support continued lending and income generation. However, excessive capital retention can reduce the funds available for income-generating activities. Financial Intermediation Theory therefore provides a useful explanation for why the relationship between leverage requirement and profitability may depend on the balance between financial safety and efficient resource allocation.

For this study, the theory suggests that effective leverage management can improve profitability when stronger capital positions reduce financial distress and allow banks to perform their intermediary role more sustainably. It also recognizes that regulatory requirements should be balanced with the need to allocate resources to productive assets. The positive and significant finding reported in the study is therefore consistent with the view that appropriate capital strength can support effective financial intermediation and sustainable returns.

### 2.2.2. Risk Management Theory

Risk Management Theory explains how organizations identify, assess, monitor, and control risks in order to reduce potential losses and achieve sustainable performance. In banking, risk management is particularly important because banks face credit, liquidity, market, operational, and solvency risks. Adequate capital provides an important protection mechanism because it enables banks to absorb losses without immediately threatening their operations. Prudential capital requirements therefore form part of the broader risk-management framework of commercial banks (Hull, 2023; Saunders & Cornett, 2024).

The theory is relevant to leverage requirement because excessive leverage can increase the vulnerability of a bank to losses and financial distress. Maintaining adequate

capital can reduce the probability that unexpected losses will threaten solvency. A more resilient bank may also maintain stakeholder confidence, preserve access to funding, and continue providing financial services during difficult periods. These conditions can contribute indirectly to stable profitability. The significant positive relationship found in the study therefore supports the risk-management argument that stronger capital protection can improve financial resilience and financial performance.

### 2.2.3 Public Interest Theory of Regulation

The Public Interest Theory of Regulation was developed by Arthur Cecil Pigou (1932). The theory argues that government regulation is established to protect the public interest by correcting market failures, promoting efficiency, ensuring fair competition, and safeguarding consumers. Within the banking sector, prudential regulations are introduced to maintain financial stability, protect depositors' funds, reduce systemic risks, and promote confidence in the financial system (Viscusi, Vernon & Harrington, 2023). The theory assumes that regulatory authorities act in the best interests of society by establishing policies that enhance the stability and sound functioning of financial institutions.

According to the theory, prudential regulations relating to capital adequacy, liquidity management, and credit risk management are essential because they reduce the likelihood of bank failures and financial crises. By requiring banks to maintain adequate capital reserves, sufficient liquidity, and prudent lending practices, regulators strengthen the resilience of the banking sector and protect depositors against financial losses. Although compliance with these regulations may increase operational costs and reduce short-term profitability, the long-term benefits include improved financial stability, increased public confidence, and sustainable banking operations (Barth, Caprio & Levine, 2022).

The Public Interest Theory of Regulation is relevant to this study because it explains why the National Bank of Rwanda imposes prudential regulations on commercial banks despite the compliance costs involved. The theory provides a basis for understanding how Leverage requirement regulations, liquidity regulations, and credit risk regulations promote financial system stability while influencing the profitability of commercial banks. It therefore offers an appropriate theoretical framework for examining the effect of prudential regulations on the profitability of listed commercial banks on the Rwanda Stock Exchange.

## 2.3 Empirical Review

In the United States, Anderson and Miller (2024) conducted a study to examine the effect of Leverage requirement on profitability of commercial banks. The study adopted a descriptive research design and used secondary data collected from annual financial reports of commercial banks for the period 2019–2023. Data were analyzed using correlation and regression analysis. The findings revealed a positive and significant relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.681$ and $p < 0.05$. The study established that banks maintaining adequate capital reserves recorded improved Return on Assets (ROA) and Return on Equity (ROE). The study concluded that effective Leverage requirement enhanced financial stability and operational performance among commercial banks. The researchers recommended that commercial banks should strengthen capital reserve management and maintain compliance with Central bank capital requirements. However, the study focused on developed economies and did not examine the situation within developing countries such as Rwanda, thereby creating a contextual gap for the current study (Anderson & Miller, 2024).

In the United Kingdom, Johnson and Clark (2023) conducted a study to assess the influence of Leverage requirement on financial performance of commercial banks. The study employed a quantitative research design and collected secondary data from selected commercial banks over a ten-year period. Regression and correlation techniques were used to analyze the data. The findings indicated a positive relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.654$ and $p < 0.05$. The study revealed that commercial banks with strong Leverage requirement ratios experienced improved operational efficiency and reduced financial distress. The researchers concluded that adequate capital reserves enhanced investor confidence and strengthened banking sector sustainability. The study recommended that regulatory authorities should continue strengthening Central bank supervision frameworks to ensure effective compliance among commercial banks. However, the study concentrated mainly on European commercial banks and failed to address listed commercial banks within the African context, thereby leaving a geographical research gap (Johnson & Clark, 2023).

In Germany, Kakov (2024) carried out a study to investigate the relationship between Leverage requirement and profitability of commercial banks. The study used a correlational research design and relied on panel data obtained from financial statements of commercial banks between 2020 and 2024. Data analysis was conducted using regression analysis and Pearson correlation techniques. The findings established a significant positive relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.702$ and $p < 0.01$. The study found that banks maintaining higher

Leverage requirement ratios were more resilient to financial shocks and maintained stable earnings during periods of economic uncertainty. The study concluded that strong Leverage requirement frameworks improved financial sustainability and reduced operational risks among commercial banks. The researchers recommended that banks should continuously monitor Leverage requirement positions in order to improve long-term profitability. However, the study focused mainly on advanced financial systems and did not examine emerging financial markets such as Rwanda, thereby creating a contextual research gap (Kakov, 2024).

In Nigeria, Abubakar and Yusuf (2024) conducted a study to examine the effect of Leverage requirement on financial performance of commercial banks. The study adopted a descriptive survey design and used secondary financial data collected from commercial banks for the period 2018–2023. Data were analyzed using correlation and multiple regression analysis. The findings showed a positive and significant relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.618$ and $p < 0.05$. The study established that adequate capital reserves improved financial stability and minimized insolvency risks among commercial banks. The researchers concluded that compliance with Central bank capital requirements enhanced operational efficiency and profitability within the banking sector. The study recommended that commercial banks should improve capital management strategies and strengthen compliance with regulatory standards. However, the study focused on Nigerian commercial banks generally and did not specifically examine listed commercial banks, thereby leaving a methodological gap for the current study (Abubakar & Yusuf, 2024).

In Kenya, Moshi and Mwakalobo (2024) conducted a study to assess the relationship between Leverage requirement and profitability of commercial banks. The study used explanatory research design and collected secondary data from annual reports of commercial banks between 2019 and 2024. Correlation and regression analysis techniques were applied in data analysis. The findings revealed a strong positive relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.689$ and $p < 0.05$. The study established that banks with adequate capital reserves recorded higher Return on Assets (ROA) and improved financial sustainability. The study concluded that Leverage requirement enhanced risk management practices and strengthened investor confidence within the banking sector. The researchers recommended that financial regulatory authorities should strengthen Leverage requirement supervision and encourage compliance among commercial banks. However, the study focused on Kenyan commercial banks generally and did not examine commercial banks listed on stock exchanges, thereby creating a contextual gap for the current study (Moshi & Mwakalobo, 2024).

In Rwanda, Bazimya (2024) conducted a study to examine the influence of Central bank regulations on profitability of commercial banks. The study adopted a correlational research design and used secondary data collected from financial reports of commercial banks operating in Rwanda from 2020 to 2024. Data were analyzed using regression and correlation analysis techniques. The findings revealed a positive and significant relationship between Leverage requirement and profitability, with a correlation coefficient of $r = 0.731$ and $p < 0.05$. The study established that commercial banks maintaining strong Leverage requirement positions experienced improved profitability, operational efficiency, and financial stability. The study concluded that effective compliance with Leverage requirement strengthened banking sector sustainability and improved financial performance. The researcher recommended that commercial banks should continue strengthening capital reserve management practices and compliance with Central bank regulations. However, the study focused on commercial banks generally and did not specifically examine listed commercial banks on the Rwanda Stock Exchange, thereby creating a research gap that the current study intends to fill (Bazimya, 2024).

# 3. Methodology

The methodology describes the procedures that were used to examine the effect of leverage requirements on the profitability of listed commercial banks on the Rwanda Stock Exchange. The study adopted a descriptive and correlational research design to analyse the relationship between leverage requirements and profitability. The study relied entirely on secondary data obtained from documented financial and regulatory sources. The population consisted of listed commercial banks on the Rwanda Stock Exchange during the period from 2016 to 2025. Data were collected through documentary review and analysed using descriptive statistics, Pearson correlation analysis, and regression analysis. The methodology was designed to ensure that the data obtained from official financial records were systematically organized, analysed, and interpreted in accordance with the research objective and hypothesis.

The study used a descriptive and correlational research design. The descriptive component was used to summarize the observed levels of leverage requirements and profitability among the selected listed commercial banks. The correlational component was used to determine the direction and strength of the relationship between leverage requirements and profitability. The design was appropriate because the study relied on historical financial and

regulatory information that had already been recorded and did not involve manipulation of the study variables. It enabled the researcher to examine whether changes in leverage requirements were associated with changes in the profitability of listed commercial banks during the period from 2016 to 2025. The design was also suitable because the study sought to establish an empirical relationship between the independent and dependent variables using quantitative secondary data.

The study population comprised commercial banks listed on the Rwanda Stock Exchange during the study period. The banks considered in the study were Bank of Kigali Plc, I&M Bank Rwanda Plc, Equity Bank Rwanda Plc, and BPR Bank Rwanda Plc. These institutions were selected because they represented the listed commercial banks considered in the study and provided publicly reported financial information required for the analysis. Since the number of listed commercial banks included in the study was relatively small, a census approach was adopted rather than selecting a sample from the identified institutions. The census approach enabled the researcher to include all the identified listed commercial banks in the analysis and thereby minimize the possibility of sampling bias. Ten years of observations were considered for each bank from 2016 to 2025, resulting in 40 firm-year observations.

The study relied exclusively on secondary data collected from existing financial and regulatory documents. The main sources of data included annual reports, audited financial statements, National Bank of Rwanda reports, and relevant regulatory disclosures relating to the selected listed commercial banks. These sources were considered appropriate because they contained the financial and regulatory information required to measure leverage requirements and profitability. The use of secondary data also enabled the researcher to examine financial information consistently across different banks and years without relying on respondents' perceptions or opinions. Officially reported financial information provided a basis for comparing the selected indicators across the ten-year study period. The use of documented sources further supported the reliability and objectivity of the data because the information had been prepared and reported within established financial and regulatory reporting systems.

A documentary review guide was used as the main instrument for collecting and organizing the secondary data. The guide was designed to capture the information required to measure leverage requirements and profitability for each selected commercial bank and each year from 2016 to 2025. The researcher reviewed the relevant annual reports, audited financial statements, National Bank of Rwanda publications, and regulatory documents to identify the required financial and regulatory figures. The extracted information was recorded according to the name of the bank, financial year, study variable, indicator, and reported value. After extraction, the researcher compared the recorded information with the original documents to identify possible omissions, inconsistencies, or recording errors. The verified data were then organized into a structured dataset for statistical analysis.

The independent variable in the study was leverage requirement, while the dependent variable was profitability of listed commercial banks. Leverage requirement was assessed using relevant capital-related regulatory measures, including the leverage requirement ratio, Tier One capital ratio, and applicable capital buffer requirements. These indicators were selected because they provide information about the capital strength of commercial banks in relation to their financial exposures and regulatory obligations. Profitability was measured using Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), which are commonly used indicators for assessing the financial performance of commercial banks. ROA measures the ability of a bank to generate income from its assets, while ROE assesses the returns generated from shareholders' equity. NIM measures the effectiveness of a bank in generating net interest income from its interest-earning assets. The selected indicators therefore provided a basis for assessing the relationship between capital-related regulatory requirements and the financial performance of the selected listed commercial banks.

**Table 1. Operationalization and Measurement of Study Variables**

| Variable | Role | Indicators | Measurement |
|---|---|---|---|
| Leverage requirement | Independent | Leverage requirement ratio; Tier One capital ratio; Capital buffer requirements | Capital-related regulatory measures |
| Profitability | Dependent | ROA; ROE; NIM | Financial return indicators |

*Source: Researcher's conceptualization, 2026*

The collected data were analysed using descriptive statistics, Pearson product-moment correlation analysis, and regression analysis. Descriptive statistics were used to summarize the characteristics of the data and to determine

the mean and standard deviation of the study variables. Pearson correlation analysis was used to establish the direction and strength of the relationship between leverage requirements and profitability. Regression analysis was used to determine whether leverage requirements had a statistically significant effect on the profitability of the listed commercial banks. The regression results were interpreted using the regression coefficient, test statistic, and significance level. Statistical significance was assessed at the 5% level, whereby a p-value below .05 was considered sufficient evidence for rejecting the null hypothesis. The statistical analysis therefore provided a basis for determining whether the observed relationship between leverage requirements and profitability was statistically significant.

Diagnostic procedures were conducted before the regression results were interpreted in order to assess the suitability and reliability of the statistical analysis. The diagnostic assessment considered issues such as normality, multicollinearity, heteroscedasticity, stationarity, homogeneity, and the suitability of the panel data structure. The normality assessment was intended to determine whether the distribution of the relevant variables was appropriate for the planned statistical procedures. Multicollinearity assessment was relevant for determining whether closely related explanatory indicators could create instability in the estimated regression coefficients. Heteroscedasticity assessment was used to determine whether the variability of the regression errors remained reasonably consistent across observations. Stationarity and homogeneity procedures were considered because the study involved financial observations across several banks and years. The diagnostic procedures therefore provided additional assurance that the statistical results could be interpreted appropriately and that major violations of regression assumptions were identified before drawing conclusions.

The study observed ethical principles applicable to the use of secondary financial and regulatory information. Since the study relied exclusively on publicly available financial reports, audited statements, regulatory publications, and other documented sources, no human respondents were directly involved in the data collection process. The researcher maintained accurate attribution to the original sources from which the financial and regulatory information was obtained. The extracted data were recorded and analysed without deliberate alteration, fabrication, or manipulation of reported values. Confidential information that was not publicly available was not used in the analysis. The researcher also presented the findings according to the evidence contained in the reviewed documents and avoided making conclusions beyond the scope of the study. The study period, selected institutions, variables, and analytical procedures were maintained consistently throughout the research process.

# 4. Results and Discussion

This section presents the results and findings of the study on the effect of leverage requirements on the profitability of listed commercial banks on the Rwanda Stock Exchange during the period 2016–2025. The results are based on secondary data obtained from the selected banks' financial reports and relevant regulatory documents. The findings are presented using descriptive statistics, Pearson correlation analysis, and regression analysis. It also presents the results of hypothesis testing to determine whether leverage requirements had a statistically significant effect on profitability.

## 4.1 Results

#### 4..1.1 Descriptive Statistics

Descriptive statistics were used to summarize the observed levels of leverage requirement and profitability among listed commercial banks on the Rwanda Stock Exchange during 2016–2025. The analysis was based on 40 firm-year observations obtained from four listed commercial banks over ten years. The mean provides an indication of the general level of each variable, while the standard deviation indicates the degree of variation across the observations.

**Table 2. Descriptive Statistics of Leverage Requirement and Profitability**

| Variable | N | Mean | SD |
|---|---|---|---|
| Leverage requirement regulation | 40 | 3.125 | 0.482 |
| Profitability of listed commercial banks | 40 | 3.425 | 0.625 |

**Source:** Secondary data from the, 2016–2025.

The results show that leverage requirement recorded a mean of 3.125 with a standard deviation of 0.482. This indicates a relatively satisfactory and consistent level of compliance with leverage-related regulatory requirements during the study period. Profitability recorded a higher mean of 3.425 with a standard deviation of 0.625, suggesting that the listed commercial banks generally maintained a relatively favourable level of profitability, although profitability varied somewhat more than leverage requirement. The relatively moderate standard deviations

indicate that the observations were not highly dispersed. Overall, the descriptive results provide an initial indication that leverage requirement and profitability remained relatively stable over the period considered.

### 4.1.2 Pearson Correlation

Pearson correlation analysis was conducted to establish the direction and strength of the relationship between leverage requirement and profitability. The analysis is important because it provides an initial indication of whether higher levels of leverage requirement are associated with higher or lower levels of profitability before considering the regression coefficient.

**Table 3. Pearson Correlation between Leverage Requirement and Profitability**

| Variables | Leverage requirement | Profitability |
|---|---|---|
| Leverage requirement | 1 | .752** |
| Profitability | .752** | 1 |

*Note. N = 40. ** p < .01, two-tailed. Source: Secondary data, 2026*

The correlation coefficient between leverage requirement and profitability was r = .752 and was statistically significant at the 1% level. This represents a strong positive relationship, meaning that higher levels of leverage requirement were associated with higher levels of profitability among the listed commercial banks during the study period. The significance level below .01 indicates that the observed relationship was statistically significant. The correlation result therefore provides initial evidence supporting the expectation that leverage requirement is positively associated with profitability.

### 4.1.3 Regression Effect of Leverage Requirement

The regression analysis was used to assess the effect of leverage requirement on profitability. The coefficient reported for leverage requirement in the original regression model was positive and statistically significant. Because the original thesis included other central bank regulatory variables, the coefficient represents the contribution of leverage requirement while the other variables in the original model were controlled. In this study, only the leverage requirement coefficient is interpreted because the analysis is restricted to the selected objective.

**Table 4. Regression Coefficients for the Effect of Leverage Requirement on Profitability**

| Predictor | B | SE | β | t | p |
|---|---|---|---|---|---|
| Leverage requirement | .268 | .102 | .400 | 2.619 | .013 |

*a. Dependent variable = Profitability of listed commercial banks.*

The regression results show that leverage requirement had a positive and statistically significant effect on profitability (β = .400, t = 2.619, p = .013). Since the p-value was below .05, the effect was statistically significant. The standardized coefficient indicates a positive contribution of leverage requirement to profitability. The unstandardized coefficient of B = .268 indicates that a one-unit increase in leverage requirement was associated with an estimated .268-unit increase in profitability, holding the other conditions included in the original regression model constant. The result therefore indicates that stronger leverage-related regulatory compliance was associated with improved profitability among listed commercial banks.

### 4.1.4 Hypothesis Testing

This section presents the results of the hypothesis test on the effect of leverage requirements on the profitability of listed commercial banks on the Rwanda Stock Exchange. The hypothesis was tested using the regression results obtained from the analysis. The decision was based on the 5% significance level. A p-value below .05 led to rejection of the null hypothesis

**Table 5. Hypothesis Testing for the Effect of Leverage Requirement on Profitability**

| Hypothesis | p-value | Decision |
|---|---|---|
| $H_0$: Leverage requirement has no statistically significant effect on profitability. | .013 | Rejected |

*Note. Decision rule: reject $H_0$ when $p < .05$.*

The null hypothesis stated that leverage requirement has no statistically significant effect on the profitability of listed commercial banks on the Rwanda Stock Exchange. The regression results produced a significance value of .013, which is below the 5% significance level. The null hypothesis was therefore rejected. The study concludes that

leverage requirement had a statistically significant positive effect on the profitability of listed commercial banks during the 2016–2025 study period.

## 4.2 Discussion of Findings

The study established that leverage requirement had a positive and statistically significant effect on the profitability of listed commercial banks on the Rwanda Stock Exchange. The regression results showed that leverage requirement was positively associated with profitability, with a standardized coefficient of $\beta = .400$ and a significance level of $p = .013$. This finding indicates that commercial banks with stronger leverage positions were more likely to achieve better profitability during the 2016–2025 study period. The result suggests that maintaining adequate capital in relation to total financial exposures can strengthen the financial capacity of banks and enable them to withstand financial pressures. Therefore, effective management of leverage requirements appears to be an important factor in supporting the financial performance and sustainability of listed commercial banks in Rwanda.

The positive relationship can be explained by the role of capital in protecting commercial banks against financial shocks and unexpected losses. Adequate capital provides a financial cushion that enables banks to absorb losses without significantly disrupting their normal operations. Strong capital positions can also increase the confidence of depositors, shareholders, investors, regulators, and other stakeholders in the financial condition of banking institutions. In addition, well-capitalized banks may be better positioned to continue lending and investing in income-generating activities during periods of economic uncertainty. Consequently, effective management of leverage requirements can contribute to financial stability, operational continuity, and sustainable profitability among listed commercial banks.

The finding is consistent with Financial Intermediation Theory, which emphasizes the role of financial institutions in mobilizing savings and channeling financial resources toward productive economic activities. Commercial banks require adequate financial capacity to perform their intermediary functions while managing the risks associated with lending and investment activities. Appropriate leverage requirements can provide a financial foundation that enables banks to continue their intermediation activities while maintaining sufficient protection against potential losses. When banks maintain adequate capital, they may be better positioned to sustain lending, investment, and other income-generating activities without exposing themselves to excessive financial vulnerability. The positive relationship identified in this study therefore supports the theoretical view that appropriate capital strength can enhance the sustainability and effectiveness of financial intermediation.

The finding also supports Risk Management Theory, which emphasizes the identification, assessment, monitoring, and control of risks to reduce potential losses and improve organizational performance. Commercial banks are exposed to credit, market, liquidity, operational, and solvency risks, which can negatively affect their financial performance if they are not effectively managed. Adequate capital serves as an important buffer against unexpected losses and reduces the likelihood that adverse financial conditions will immediately threaten the solvency of a bank. Banks with stronger capital positions may therefore be better equipped to absorb financial shocks while continuing their normal operations. The significant positive relationship found in this study consequently supports the argument that effective leverage requirement management can strengthen financial resilience and contribute to improved profitability.

The finding further agrees with the Public Interest Theory of Regulation, which views financial regulation as a mechanism for protecting depositors, correcting market weaknesses, maintaining confidence, and promoting stability within the financial system. Leverage requirements are established to ensure that commercial banks maintain sufficient financial strength to meet their obligations and absorb unexpected losses. Although compliance with capital requirements may impose costs on banks and potentially limit the amount of funds available for certain activities, the benefits of financial stability can outweigh these costs when capital is managed efficiently. Strong regulatory compliance can reduce the likelihood of financial distress, protect stakeholders, and strengthen confidence in banking institutions. The finding therefore suggests that prudential regulation can contribute not only to financial stability but also to profitability when banks efficiently manage their regulatory capital requirements.

The finding is also consistent with previous empirical studies reviewed in the study. Anderson and Miller (2024) found a positive relationship between leverage requirement and profitability among commercial banks in the United States, indicating that stronger capital positions were associated with improved financial performance. Similarly, Johnson and Clark (2023) reported that stronger leverage positions were associated with improved financial performance and reduced financial distress among commercial banks in the United Kingdom. Kakov (2024) also found a positive and significant relationship between leverage requirement and profitability among German commercial banks. In Africa, Abubakar and Yusuf (2024) reported a positive relationship between leverage requirement and profitability among commercial banks in

Nigeria, while Moshi and Mwakalobo (2024) found similar evidence among commercial banks in Kenya. The finding also agrees with Bazimya (2024), who established a positive and significant relationship between leverage requirement and profitability among commercial banks in Rwanda. The consistency of these findings across different banking environments suggests that appropriate capital strength can play an important role in supporting the financial performance of commercial banks.

The present study extends the existing empirical evidence by focusing specifically on listed commercial banks on the Rwanda Stock Exchange. Unlike studies that examined commercial banks generally, this study considered banks operating within the listed banking environment, where institutions are subject to prudential supervision, public financial reporting, shareholder expectations, and capital-market scrutiny. The finding provides localized evidence that effective management of leverage requirements can be compatible with profitability among listed commercial banks in Rwanda. It also suggests that capital regulation should not necessarily be regarded only as a constraint on banking activities because appropriate capital strength can improve financial resilience and support continued income-generating operations. Therefore, the study provides evidence that maintaining adequate leverage positions can contribute to stronger profitability while simultaneously supporting the stability and sustainability of Rwanda's listed banking sector.

# 5. Conclusion and Recommendations

This section presents the conclusion of the study and provides recommendations based on the findings regarding the effect of leverage requirements on the profitability of listed commercial banks on the Rwanda Stock Exchange

## 5.1 Conclusion

The study concludes that **leverage requirement has a positive and statistically significant effect on the profitability of listed commercial banks on the Rwanda Stock Exchange**. The findings indicate that appropriate leverage management and compliance with capital-related regulatory requirements can strengthen the financial resilience and profitability of listed commercial banks. Adequate capital provides banks with a buffer against unexpected losses, strengthens the confidence of stakeholders, and enables banks to continue their financial intermediation activities under changing financial conditions. The study therefore concludes that leverage requirement is an important regulatory and financial management factor associated with the profitability of listed commercial banks in Rwanda, and the null hypothesis stating that leverage requirement has no significant effect on profitability was rejected

## 5.2 Recommendations

The recommendations are based on the study findings and are directed toward strengthening leverage management and improving the profitability of listed commercial banks on the Rwanda Stock Exchange:

1) Listed commercial banks should strengthen their internal monitoring of leverage positions. Bank management should regularly assess capital levels, total exposures, Tier One capital, and capital buffers to ensure continued compliance with regulatory requirements. Monitoring should be integrated into routine financial planning so that management can identify potential capital pressures before they affect banking operations or profitability.
2) Listed commercial banks should integrate leverage requirement management into broader profitability and financial planning decisions. Regulatory compliance should not be treated as a separate administrative responsibility. Instead, management should consider the effect of capital allocation on lending capacity, investment decisions, risk absorption, and shareholder returns. This approach can help banks maintain an appropriate balance between financial resilience and productive use of capital.
3) The National Bank of Rwanda should continue strengthening supervision of leverage-related requirements while considering the operational realities of listed commercial banks. Supervisory monitoring should encourage adequate capital protection while also supporting sound and sustainable banking activities. Regulatory communication and reporting requirements should remain clear so that banks can plan their capital positions effectively.

4) Investors and shareholders should consider leverage positions alongside profitability indicators when evaluating listed commercial banks. A bank's profitability should not be assessed independently of its capacity to absorb financial losses and maintain regulatory compliance. Understanding the relationship between capital strength and profitability can support more informed investment decisions.

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