An in-depth analysis of financial metrics and their interrelations in shaping the performance of commercial banks in Cambodia

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Abstract

This study aims to systematically identify and analyze key financial metrics that influence the performance of commercial banks in Cambodia. Utilizing 2023 data from the National Bank of Cambodia across 59 banks, the research adopts an explanatory framework based on cross-sectional data analysis. The findings reveal that Loan Growth (LG) exhibits no statistical significance in relation to Return on Equity (ROE), suggesting that increases in lending do not necessarily enhance bank profitability in the Cambodian context. Conversely, Non-Performing Loans (NPL) demonstrate a marginally significant positive relationship with ROE, indicating that effective management of these loans can still yield profitability. Additionally, the Loan to Deposit Ratio (LDR) shows a significant negative impact on ROE, suggesting that higher liquidity risks associated with elevated LDR levels may hinder profitability. The study further confirms that Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Net Interest Margin (NIM) significantly influence ROE. These results underscore the importance of effective risk management, operational efficiency, and strategic financial planning in enhancing bank profitability. Recommendations for Cambodian commercial banks include improving risk management practices, focusing on loan portfolio quality, optimizing LDR, implementing cost efficiency measures, and enhancing tax management strategies.

Keywords: Commercial Banks; Financial Metrics; Return on Equity (ROE) ; Non-Performing Loans (NPLs) ; Loan to Deposit Ratio (LDR) ; Cost to Income Ratio (CIR) ; Effective Tax Rate (ETR) ; Net Interest Margin (NIM) ; Loan Growth (LG) ; Market Share (MS)

1. Introduction

The financial performance of commercial banks is pivotal in determining the stability and growth trajectory of a nation's economy. In Cambodia, despite significant expansion in the banking sector, various structural and operational challenges continue to hinder its full potential. A comprehensive analysis of the critical financial metrics driving bank performance is imperative for policymakers, regulators, and banking executives. Such insights will enable the formulation of data-driven strategies aimed at enhancing financial resilience and fostering long-term, sustainable economic growth (Laeven and Tong, 2016).

Over the past three decades, Cambodia has sustained an impressive macroeconomic growth trajectory, averaging approximately 6.74% annually. This growth has enabled the nation to successfully achieve its target of lower-middle-income status by 2015. Looking ahead, Cambodia has set ambitious milestones, aiming for upper-middle-income status by 2030 and high-income status by 2050. The fourth phase of the Rectangular Strategy (2018–2023) seeks to consolidate previous achievements while driving sustainable economic growth, with an average annual target of 7%. Central to this strategy is the enhancement of economic resilience through the strategic diversification of key competitive sectors, positioning the country to better navigate global uncertainties.

The strategy places a strong emphasis on maintaining macroeconomic stability through key measures such as controlling inflation, stabilizing the exchange rate, increasing foreign reserves, and managing public debt prudently. However, as depicted in Figure 1, Cambodia's economic growth trajectory faced a severe disruption during the COVID-19 pandemic, with the economy contracting by 3.1% in 2020. This downturn was further compounded by global uncertainties, including escalating trade tensions between China and the United States, as well as geopolitical disruptions such as the Russia-Ukraine conflict. Despite these formidable challenges, Cambodia's economy has demonstrated resilience, exhibiting a modest recovery with an annual growth rate of 1.27% in the medium term.

Between 1994 and 2023, Cambodia's industrial sector exhibited an impressive average annual growth rate of 10.73%, with particularly robust expansion of 17.22% from 1995 to 2007, prior to the global financial crisis. However, over the past decade (2013–2022), growth within the industrial sector has decelerated, averaging 7.98% annually. Similarly, over the span of nearly three decades, the service sector has demonstrated steady growth, achieving an average annual increase of 6.6% (National Institute of Statistics [NIS], 2023).

In 2023, Cambodia's economy is forecasted to expand by 5.5%, primarily fueled by robust growth in the tourism and non-garment manufacturing sectors (NBC, 2023). The tourism industry has shown remarkable growth, with international visitors increasing by 19.8% to reach approximately 5.5 million (NBC, 2023). Similarly, the manufacturing sector has seen a 7.4% growth, driven by substantial gains in non-garment exports, particularly in electronics and vehicle accessories, which have surged by 1.3 and 3.2 times, respectively. In contrast, domestic production has struggled, recording a 7% decline (NBC, 2023).

The financial sector in Cambodia, encompassing both deposit-taking and non-deposit-taking institutions, is instrumental in stabilizing and facilitating national economic activity. Over the past three decades, this sector has achieved an impressive average annual growth rate of approximately 13.5%. In the last decade, since 2010, growth has moderated to an average annual rate of 7.07%. The financial sector experienced significant growth rates of 13.5% in 2010, 11% in 2011, and 14% in 2012. However, the onset of the COVID-19 pandemic in 2020 resulted in a notable decline of -1.2%, highlighting the sector's vulnerability to external shocks (NIS, 2023).

In the context of a rapidly evolving economic landscape, the Cambodian banking system has showcased exceptional resilience and growth, effectively facilitated sustainable financing and delivered crucial financial services that underpin economic activities. The banking sector's total assets have surged by 17.1%, now totaling KHR 316.9 trillion (approximately USD 77.6 billion). The key sources of these funds encompass customer deposits, which amount to KHR 188.1 trillion (around USD 46.0 billion), shareholder equity at KHR 59.5 trillion (approximately USD 14.6 billion), and borrowed funds totaling KHR 12.8 trillion (around USD 3.1 billion) (National Bank of Cambodia [NBC], 2023). For a detailed analysis of these financial metrics, please consult Table 1.

Table 1: Banking Sector's Development (as percentage)

Indicators	2019	2020	2021	2022	2023
Asset Growth	21.5	14.7	17.5	10.4	17.1
Customer's Credit Growth	23.9	16.1	22.0	19.5	14.8
Customer's Deposit Growth	15.1	14.5	16.6	7.3	22.3
Asset to GDP	155.1	186.1	232.0	256.1	262.1
Customer's Credit to GDP	92.0	114.8	149.3	174.6	176.5
Customer's Deposit to GDP	93.3	110.9	135.6	174.6	155.5

The Cambodian banking sector has seen a significant rise in the total volume of credit extended, which has reached KHR 221.2 trillion (approximately USD 54.2 billion). Customer credit, in particular, has increased by 14.8%, totaling KHR 213.4 trillion (around USD 52.2 billion). This credit is crucial for financing economic activities and has been strategically allocated across various key industries. The distribution of credit is as follows: Retail Trade (16.8%), Owner-Occupied Housing (12.9%), Real Estate Activities (10.0%), Construction (9.4%), Personal Consumption (9.3%), Agriculture, Forestry, and Fishing (8.7%), Wholesale Trade (8.7%), Other Non-Financial Services (5.0%), Manufacturing (4.2%), Hotels and Restaurants (3.8%), and Other Sectors (11.2%) (National Bank of Cambodia [NBC], 2023).

The Cambodian banking sector plays a crucial role in the nation's economic stability and growth trajectory. Despite demonstrating remarkable resilience and progress in recent years, the sector faces a myriad of challenges that necessitate strategic interventions and informed

decision-making. This study highlights the critical importance of key financial metrics—Loan Growth (LG), Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Net Interest Margin (NIM)—in assessing the performance of commercial banks.

Despite a projected growth rate of 5.5%, driven primarily by strong performance in the tourism and non-garment manufacturing sectors, the economic outlook presents both opportunities and challenges for the commercial banking sector in Cambodia. While total assets, credit extension, and deposits have witnessed significant growth, the rising ratios of non-performing loans (NPLs) underscore emerging risks that must be proactively addressed to ensure long-term financial stability. By focusing on these essential financial metrics, policymakers, regulators, and bank management can devise targeted strategies to mitigate risks, enhance financial stability, and bolster the sector's contribution to economic growth. Continuous monitoring and analysis of these financial indicators will be critical for navigating the dynamic economic landscape and ensuring the sustainable development of Cambodia's banking sector. The primary objective of this study is to systematically identify and critically analyze the key financial metrics that significantly influence the performance of commercial banks within the Cambodian context. Through a rigorous examination of essential financial indicators—including Loan Growth (LG), Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Net Interest Margin (NIM)—this research aims to provide an in-depth understanding of the intricate relationships among these factors and their collective impact on the financial performance of commercial banks, as measured by Return on Assets (ROE). The insights derived from this comprehensive analysis are expected to empower policymakers, bank executives, and stakeholders with the knowledge necessary to make informed decisions, ultimately fostering enhanced stability and sustainable growth within Cambodia's banking sector. This study not only contributes to the existing body of knowledge but also serves as a crucial resource for strategic planning and regulatory frameworks in the evolving financial landscape of the region.

In pursuit of a comprehensive investigation into the pivotal financial metrics influencing the performance of commercial banks in Cambodia, this analysis encompasses a diverse array of critical indicators, including Loan Growth (LG), Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Interest Margin (IM). To rigorously frame this exploration, the following hypotheses have been articulated:

H1: There is a statistically significant impact of Loan Growth (LG) on Return on Equity (ROE) of commercial banks in Cambodia.

H2: There is a statistically significant impact of Non-Performing Loans (NPL) on Return on Equity (ROE) of commercial banks in Cambodia.

H3: There is a statistically significant impact of Loan to Deposit Ratio (LDR) on Return on

Equity (ROE) of commercial banks in Cambodia.

H4: There is a statistically significant impact of Market Share (MS) on Return on Equity (ROE) of commercial banks in Cambodia.

H5: There is a statistically significant impact of Loan Loss Provision (LLP) on Return on Equity (ROE) of commercial banks in Cambodia.

H6: There is a statistically significant impact of Cost to Income Ratio (CIR) on Return on Equity (ROE) of commercial banks in Cambodia.

H7: There is a statistically significant impact of Effective Tax Rate (ETR) on Return on Equity (ROE) of commercial banks in Cambodia.

H8: There is a statistically significant impact of Net Interest Margin (NIM) on Return on Equity (ROE) of commercial banks in Cambodia.

2. Literature Review

2.1 Theoretical Review

The theoretical framework for this study is built upon a variety of foundational theories. The analysis of Loan Growth (LG) is based on the Risk-Return Tradeoff Theory and Modern Portfolio Theory. Non-Performing Loans (NPL) are examined through the lens of Adverse Selection Theory and Credit Risk Theory. The Loan to Deposit Ratio (LDR) is anchored in Liquidity Preference Theory and Financial Intermediation Theory. For Market Share (MS), the Structure-Conduct-Performance (SCP) Paradigm and Market Power Theory provide the theoretical basis. Loan Loss Provision (LLP) is explored using Prudential Regulation Theory and Loan Loss Accounting Theory. The Cost to Income Ratio (CIR) is supported by the Efficiency Hypothesis and X-Efficiency Theory. The analysis of the Effective Tax Rate (ETR) relies on Taxation Theory and the Laffer Curve Theory. Finally, the study of Net Interest Margin (NIM) is framed by Interest Rate Spread Theory and Financial Intermediation Theory. These theoretical perspectives offer a comprehensive foundation for investigating the key financial metrics that influence the performance of commercial banks in Cambodia.

Adverse Selection Theory and Credit Risk Theory play pivotal roles in elucidating the challenges that banks face in loan management. Adverse Selection Theory underscores the problem of information asymmetry, where borrowers possess greater knowledge of their own creditworthiness than lenders do. This discrepancy can lead banks to inadvertently extend credit to higher-risk borrowers, ultimately increasing the likelihood of defaults (Serwadda, 2018). Consequently, this phenomenon can elevate the ratio of Non-Performing Loans (NPLs) within a bank's portfolio, posing significant threats to its financial stability (Le & Nguyen, 2018). To counteract these risks, banks adopt various strategies, including the implementation of credit scoring systems and collateral-based lending practices (Tunay et al., 2019).

Simultaneously, Credit Risk Theory centers on the probability of borrower default, evaluating critical components such as the Probability of Default (PD), Exposure at Default (EAD), and

Loss Given Default (LGD) (Okeyo, 2023). To manage credit risk effectively, banks employ strategies like risk-based pricing and diversification, which help mitigate potential losses. An increase in Non-Performing Loans (NPLs) frequently signals deficiencies in credit risk management, underscoring the necessity for robust strategies to safeguard financial health. Collectively, these theories offer a comprehensive framework for understanding and addressing lending risks within the banking sector.

Liquidity Preference Theory suggests that individuals have a preference for holding liquid assets, such as cash, driven by uncertainty about future needs and potential speculative opportunities. Originally introduced by John Maynard Keynes, this theory underscores the trade-off between maintaining liquidity and earning interest on less liquid investments. In contemporary banking, institutions must adeptly manage the Loan to Deposit Ratio (LDR) to ensure they can meet withdrawal demands while simultaneously extending loans for profit (Keynes, 1936; Diamond & Rajan, 2001). Complementing this, Financial Intermediation Theory elucidates how financial institutions, especially banks, mitigate transaction costs and manage risks by serving as intermediaries between savers and borrowers. Recent expansions of this theory have highlighted the role of financial intermediaries in smoothing economic shocks and efficiently allocating capital, particularly during financial crises (Allen & Santomero, 1997; Gorton & Winton, 2003). The function of banks as intermediaries is critical for maintaining liquidity and stability, especially in times of economic downturn.

The Structure-Conduct-Performance (SCP) Paradigm and Market Power Theory are essential frameworks for understanding industrial organization and the interplay between market structure, firm behavior, and overall performance. Developed initially by Edward S. Mason and later expanded by Joe S. Bain, the SCP paradigm asserts that the characteristics of a market, including the number of competitors and the level of market concentration, significantly influence how firms operate. This, in turn, affects market performance. In markets with high concentration, firms may resort to anti-competitive practices, such as price-fixing, which can diminish consumer welfare and create inefficiencies (Lipczynski et al., 2017; Perloff et al., 2010). Market Power Theory complements the SCP framework by examining firms' ability to set prices above marginal costs, particularly in monopolistic or oligopolistic settings. Companies with substantial market power can manipulate prices and limit competition, resulting in inefficiencies and a decline in consumer surplus. Together, these theories underscore the critical role that market structure plays in shaping competitive behaviors and its subsequent impact on industry performance as a whole (Lipczynski et al., 2017; Perloff et al., 2010).

Prudential Regulation Theory underscores the importance of regulatory frameworks designed to ensure the stability and soundness of financial institutions. It emphasizes the necessity for banks to maintain adequate capital reserves and adopt effective risk management practices to mitigate systemic risks, particularly during times of financial crises. Regulatory bodies, such as the Basel Committee on Banking Supervision, implement standards like Basel III, which aim to enhance capital requirements and improve risk management practices within the

banking sector (BIS, 2017; OECD, 2020). In contrast, Loan Loss Accounting Theory focuses on how banks recognize and account for potential losses arising from non-performing loans (NPLs). This theory elaborates on the estimation methods that banks employ, taking into account various factors such as historical data, current economic conditions, and future expectations. The advent of International Financial Reporting Standards (IFRS) 9 has significantly transformed how banks account for expected credit losses, shifting the paradigm from an incurred loss model to an expected loss model. This change promotes greater transparency and enables a timelier recognition of losses, thereby enhancing the financial health of banks (Beatty & Liao, 2014; IFRS, 2014). Recent studies have highlighted the interaction between prudential regulation and loan loss provisioning, demonstrating how these factors influence banks' lending behavior and overall risk profiles. These findings underscore the critical need for robust regulatory frameworks to sustain financial stability in the banking sector (Bai & Ramesh, 2021; Hakenes & Schnabel, 2011).

The Efficiency Hypothesis suggests that competition can enhance a firm's operational efficiency, resulting in improved resource allocation and reduced costs. In the banking sector, this theory implies that banks operating with greater efficiency can offer more attractive interest rates and services, ultimately leading to increased market share and profitability. Research has shown that banks can bolster their efficiency through technological innovations and process optimizations, which in turn positively influence their overall performance (Sathye, 2001; Berger & Mester, 1997). On the other hand, X-Efficiency Theory, introduced by Harvey Leibenstein, addresses the internal inefficiencies that can exist within an organization. This theory posits that even in competitive environments, firms may not achieve maximum efficiency due to factors such as managerial slack, lack of motivation, or suboptimal resource utilization. Within the banking context, X-Efficiency Theory underscores that some banks possess the potential for higher efficiency but may fall short due to organizational inertia or other inefficiencies. Recent studies highlight the importance of implementing effective management practices and organizational changes to attain X-efficiency, which can have a significant impact on both profitability and competitive standing in the market (Bader et al., 2010; Chortareas et al., 2012).

Taxation Theory encompasses a range of principles that explain the impact of taxes on economic activity. It posits that taxes can significantly influence individual behavior, investment choices, and overall economic growth. A key element of this theory is the trade-off between equity and efficiency; while higher tax rates may be necessary to fund public goods and services, they can also disincentivize work and investment, potentially leading to decreased economic productivity (Musgrave & Musgrave, 1984; Diamond & Saez, 2011). Complementing this, the Laffer Curve Theory, introduced by economist Arthur Laffer, illustrates the relationship between tax rates and tax revenue. It asserts that there exists an optimal tax rate that maximizes revenue. If tax rates are set too low, revenue may fall short of public needs; conversely, excessively high rates can deter income generation, ultimately leading to lower overall revenue. This theory indicates that there is a threshold beyond which

increasing tax rates could actually reduce total tax revenue due to diminished incentives for work and investment (Laffer, 2004; Wasylenko, 1997). Recent empirical studies have provided evidence supporting the Laffer Curve concept, suggesting that optimal tax rates fluctuate based on prevailing economic conditions and the structure of the tax system (Feldstein, 1995; Pomerleau, 2016).

Interest Rate Spread Theory investigates the difference between the interest rates that banks charge borrowers and those they pay to depositors. This spread is vital for bank profitability and serves as an indicator of risk and market conditions. A wider spread may suggest higher risks associated with lending, while a narrower spread often reflects heightened competition among banks (Mishkin, 1992; Allen & Gale, 2004). Recent research emphasizes the influence of macroeconomic factors, such as inflation and monetary policy, on interest rate spreads. These factors play a significant role in shaping banking behavior and ensuring financial stability (Huang & Wang, 2020; Büyükkara & Korkmaz, 2021).

2.2 Empirical Review

Empirical studies offer compelling evidence about the substantial influence of financial metrics on the performance of commercial banks. This research aims to systematically identify and critically analyze essential financial indicators—such as Loan Growth (LG), Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Net Interest Margin (NIM). By doing so, the study seeks to provide a comprehensive understanding of the complex relationships among these indicators and their collective impact on the financial performance of commercial banks, specifically as measured by Return on Equity (ROE).

Empirical studies examining Loan Growth (LG) in various countries highlight its pivotal role in the performance of commercial banks. In Ghana, Abor and Biekpe (2007) discovered that effective management of loan portfolios significantly enhances profitability in an increasingly competitive landscape. In Nigeria, Onoja et al. (2017) reported that aggressive loan growth positively impacts bank profitability, though they also cautioned against the risks linked to high Non-Performing Loans (NPLs). Similarly, Sarma (2017) emphasized in India that banks with diversified loan portfolios tend to demonstrate better financial performance, underscoring the importance of strategic lending practices. In South Africa, Nkhata and Akinboade (2015) found that sustained loan growth is vital for profitability but must be approached with caution to manage credit risk effectively. Furthermore, research conducted by Harjito and Susilo (2017) in Indonesia reinforced the idea that well-managed loan growth is positively correlated with profitability, highlighting the critical need for robust risk management. Collectively, these studies demonstrate that while Loan Growth can drive financial performance, the effective management of associated risks is essential for maintaining stability within the banking sector.

Empirical studies indicate that a high ratio of Non-Performing Loans (NPLs) often signals underlying risks in lending practices and prevailing economic conditions. For instance, in Turkey, Yıldırım and Öztürk (2016) found that factors such as economic growth, inflation, and

interest rates have a significant impact on NPL levels. Their findings suggest that banks must adopt effective risk management strategies to mitigate these risks. Similarly, research conducted by Akhigbe and McNulty (2003) in the United States revealed that rising NPLs adversely affect bank profitability, as banks are required to allocate more resources for loan loss provisions, which subsequently constrains their lending capacity. In Africa, a study by Olalekan and Adeyemi (2013) highlighted the detrimental impact of NPLs on bank performance in Nigeria, emphasizing that high NPL levels result in reduced liquidity and profitability. More recently, Kassem and Fayed (2020) conducted a study in Egypt that reinforced these findings, demonstrating that external factors such as political instability and economic volatility exacerbate the NPL problem. They urged banks to strengthen their credit risk assessment frameworks to address these challenges effectively. Overall, these studies underscore the critical importance of managing NPLs to ensure the financial stability and profitability of banks.

Moreover, research in the Asian context by Bhattacharyya and Narayan (2021) identified a strong correlation between macroeconomic indicators and Non-Performing Loan (NPL) levels. Their findings suggest that effective policy measures are essential to address the increasing trend of NPLs in developing economies. Collectively, these studies highlight the necessity for banks to implement comprehensive strategies for managing NPLs effectively, thereby enhancing their financial stability and overall performance. The integration of robust risk management practices, combined with proactive policy interventions, is crucial for banks to navigate the challenges posed by rising NPLs and to maintain a sound financial footing.

Research findings underscore that an optimal Loan to Deposit Ratio (LDR) is critical for sustaining a bank's financial health and overall performance. Molyneux and Thornton (1992) demonstrated that banks with higher LDRs are more adept at generating interest income, as they leverage deposits more effectively for lending activities. This dynamic highlight the pivotal role of efficient fund management in enhancing profitability. In the context of developing economies, Sufian (2012) illustrated a positive correlation between a balanced LDR and bank profitability, signifying effective allocation of funds to generate income. Conversely, an excessively elevated LDR may indicate liquidity risks, potentially precipitating financial instability. Furthermore, Khamis (2018) in the Malaysian banking sector emphasized the necessity of maintaining an appropriate LDR to manage risks associated with loan defaults while ensuring adequate liquidity to meet withdrawal demands. The influence of macroeconomic factors on LDR has also been a subject of inquiry. Akinlo and Emmanuel (2021) revealed that variables such as economic growth, inflation rates, and regulatory policies substantially affect the LDR in Nigeria. Their findings imply that banks must adeptly navigate these external influences to optimize their LDR, thereby minimizing the risks inherent in lending practices.

Research consistently underscores the positive correlation between market share and the financial performance of commercial banks. For instance, Ghosh (2015) identified that a higher market share is linked to increased profitability, as larger banks can leverage economies of

scale to reduce costs and enhance their pricing power. This relationship is particularly pronounced in competitive banking environments, where larger institutions can attract more customers and offer superior services. Moreover, Altunbas et al. (2019) emphasized that banks commanding substantial market shares tend to exhibit lower risk profiles. This advantage allows them to diversify their portfolios more effectively, enabling greater resilience in the face of economic downturns. The study posited that such banks often demonstrate enhanced performance metrics during financial crises. Similarly, Sufian and Habibullah (2010) found that banks with significant market shares benefit from increased customer loyalty, resulting in stable funding sources and improved interest income. However, the dynamics surrounding market share can be influenced by a myriad of external factors, including regulatory changes and economic conditions. For instance, Kaur and Sharma (2021) conducted a study within the Indian banking sector, revealing that market share is significantly impacted by regulatory policies, economic growth, and competitive pressures. Their analysis highlighted the necessity for banks to adopt adaptive strategies to maintain or enhance their market share while effectively navigating these external challenges.

Extensive research has established a significant relationship between Loan Loss Provisions (LLP) and the overall financial performance of commercial banks. Evidence suggests that effectively managed LLP can bolster a bank's financial stability by mitigating risks associated with non-performing loans. For instance, Büyükkara and Korkmaz (2021) highlight that banks with higher levels of LLP often exhibit superior risk management practices, resulting in improved profitability and reduced default rates. Their findings indicate that strategic LLP approaches enable banks to absorb potential losses, thereby sustaining investor confidence and contributing to market stability. Similarly, Alhassan et al. (2019) emphasize that banks employing proactive LLP practices are better positioned to navigate economic downturns, enhancing their resilience during periods of financial stress. Furthermore, the influence of macroeconomic factors on LLP has been extensively examined. Adeyemi and Adebayo (2019) found that LLP is significantly affected by economic indicators such as GDP growth and unemployment rates. Their research reveals that during economic downturns, banks typically increase their LLP as a precautionary measure against escalating default risks. However, it is crucial to recognize that excessive provisioning can adversely impact a bank's profitability. Beck et al. (2019) demonstrate that overly conservative LLP practices may lead to diminished net income, thereby constraining a bank's growth prospects. Consequently, striking a balance between sufficient provisioning and maintaining profitability is essential for effective financial management.

Extensive research has consistently underscored the importance of the Cost-to-Income Ratio (CIR) in evaluating the financial performance of commercial banks. Ayyagari et al. (2019) found that banks with lower CIR values typically demonstrate superior profitability, underscoring the critical role of efficient cost management in maximizing returns. Their analysis emphasizes that operational efficiency is pivotal for enhancing financial stability, especially in emerging markets. In a similar vein, Kwan (2021) established that a lower CIR

correlates with improved Return on Assets (ROA) and Return on Equity (ROE), indicating that effective cost control is essential for sustaining robust financial performance. Furthermore, the interaction between CIR and macroeconomic factors has also been investigated. Wu et al. (2020) indicated that economic downturns often lead to heightened operating costs for banks, adversely affecting their CIR. This finding highlights the necessity for banks to implement strategic cost management practices during challenging economic conditions to maintain their performance levels. Additionally, recent research by Büyükkara et al. (2021) revealed that digital transformation and technological investments can substantially reduce CIR, enabling banks to enhance their efficiency and competitiveness. Their findings suggest that banks that effectively leverage technology can achieve a more favorable CIR, resulting in improved financial outcomes.

Research has established the significant impact of Effective Tax Rate (ETR) on the financial performance and decision-making processes of firms, including commercial banks. Minnick and Noga (2010) found that firms with lower ETRs often engage in more aggressive tax planning, which can bolster profitability by minimizing tax expenses. This finding is particularly pertinent in the banking sector, where tax strategies play a crucial role in determining financial outcomes and enhancing shareholder value. Similarly, Gupta and Newberry (1997) argue that a firm's ETR serves as a reflection of its capacity to manage tax obligations efficiently while navigating complex tax policies. Recent studies have further examined the connection between ETR and bank profitability. For example, Barros et al. (2021) discovered that banks with lower ETRs tend to exhibit higher profitability, as reduced tax burdens free up more resources for investment and expansion. This relationship is especially pronounced in jurisdictions with intricate tax regulations, where effective tax management can significantly influence overall financial performance. Furthermore, Karkinsky and Riedel (2012) emphasized that multinational banks encounter a range of tax environments, resulting in varying Effective Tax Rates (ETRs) across different countries. Their research indicates that banks operating in multiple jurisdictions can optimize their ETR by employing strategic cross-border tax planning methods. This ability to navigate diverse tax regulations allows multinational banks to enhance their financial performance while effectively managing their tax liabilities.

Empirical research underscores the multifaceted factors influencing Net Interest Margin (NIM) and their implications for the financial performance of commercial banks. Ameer et al. (2020) illustrate those macroeconomic variables, including interest rates and inflation, play a significant role in shaping NIM. Their findings indicate that rising interest rates can positively impact NIM by boosting interest income, while elevated inflation may compress margins due to increasing operational costs. Similarly, Kargar and Zand (2018) highlight that operational efficiency and diligent cost management are critical determinants of NIM, asserting that banks that optimize their cost structures tend to realize higher margins. Additionally, competitive dynamics within the banking sector significantly affect NIM. Lestari and Suharto (2022) reveal that intensified competition among banks often leads to a reduction in NIM, as institutions may

lower interest rates to attract a greater volume of borrowers. This observation underscores the influence of market conditions on the interest margin landscape. Moreover, internal banking practices are pivotal in determining NIM. Athanasoglou et al. (2006) emphasize the importance of effective asset-liability management, indicating that banks aligning their interest-earning assets with interest-bearing liabilities can enhance their profitability.

3. Methodology

3.1 Research Design

This study conducts a comprehensive examination of key financial variables influencing the operational and financial outcomes of commercial banks in Cambodia, with Return on Equity (ROE) designated as the primary performance indicator. To achieve its objectives, the research employs a robust design utilizing annual data from 2023, focusing on the financial performance metrics of 59 commercial banks. A thorough multiple regression analysis is carried out using STATA 15.0 software to investigate the intricate relationships between essential financial metrics and Return on Equity (ROE). The study adopts an explanatory framework based on cross-sectional data analysis, capturing financial metrics at a singular point in time. This methodology facilitates a focused investigation of the interrelationships among variables (Levin, 2006) and simplifies data collection for a streamlined cross-sectional analysis of the current financial landscape, while also enabling meaningful comparisons among different commercial banks to reveal patterns and variations within the same timeframe (Kumar, 2019). The strengths of this approach include the ability to test hypotheses and explore potential causal relationships using detailed data from a single temporal snapshot (Bhattacherjee, 2012). To ensure the accuracy and reliability of the regression models, a series of diagnostic tests are performed, including assessments for heteroskedasticity, multicollinearity, model specification, and normality of distribution. This meticulous approach reinforces the validity of the findings and enhances the understanding of financial dynamics within the Cambodian banking sector.

3.2 Data

This advanced study offers a comprehensive analysis of the financial dynamics influencing the performance of commercial banks in Cambodia, utilizing 2023 data from the National Bank of Cambodia, encompassing a total of 59 banks. Emphasizing Return on Equity (ROE) as the primary indicator of financial health, the research scrutinizes key metrics expressed as percentage values for effective comparison. These metrics include ROE, which reflects the efficiency of profit generation from assets (Hassan & Bashir, 2003), and Loan Growth (LG), indicating the percentage increase in the loan portfolio (Olson & Zoubi, 2008). Additionally, Non-Performing Loans (NPLs) assess loan portfolio quality (Choudhry, 2007), while the Loan to Deposit Ratio (LDR) evaluates liquidity risk (Koch & MacDonald, 2014). Market Share (MS) measures the bank's size relative to the sector (Berger et al., 2009), and Loan Loss Provision (LLP) is presented as a percentage of total loans (Fabozzi, 2020). The Cost to Income Ratio (CIR) reflects operational efficiency (Baker & Powell, 2012), while the Effective Tax Rate (ETR) illustrates the fiscal burden on the institution (Peterson, 2019). Lastly, the Net

Interest Margin (NIM) signifies core profitability derived from lending activities (Fabozzi, 2020). The subsequent Table 2 summarizes these key financial metrics alongside their corresponding formulas utilized in the analysis:

Table 2: Key Financial Metrics and Formulas

Financial Metric	Formula
Return on Equity	$ROE = \left(\dfrac{\text{Net Income}}{\text{Total Equity}}\right) \times 100$
Loan Growth	$LG = \left(\dfrac{\text{Current Period Loans } - \text{ Previous Period Loans}}{\text{Previous Period Loans}}\right) \times 100$
Non-Performing Loans	$NPL = \left(\dfrac{\text{Non} - \text{Performing Loans}}{\text{Total Loans}}\right) \times 100$
Loan to Deposit Ratio	$LDR = \left(\dfrac{\text{Total Loans}}{\text{Total Deposits}}\right) \times 100$
Market Share	$MS = \left(\dfrac{\text{Bank's Total Asset}}{\text{Total Asset of All Banks}}\right) \times 100$
Loan Loss Provision	$LLP = \left(\dfrac{\text{Loan Loss Provisions}}{\text{Total Loans}}\right) \times 100$
Cost to Income Ratio	$CIR = \left(\dfrac{\text{Operating Expenses}}{\text{Operating Incomes}}\right) \times 100$
Effective Tax Rate	$ETR = \left(\dfrac{\text{Income Tax}}{\text{Pre} - \text{Tax Earnings}}\right) \times 100$
Net Interest Margin	$NIM = \left(\dfrac{\text{Net Interest Income}}{\text{Average Interest} - \text{Earning Assets}}\right) \times 100$

The study employs a multidimensional econometric model to elucidate the complex interactions among these variables, unveiling intricate patterns of causality and interdependence that significantly influence bank profitability and stability. To bolster the reliability of the findings, a series of diagnostic tests are conducted to evaluate the models, ensuring they are properly specified and resilient against potential issues. This comprehensive framework fosters a nuanced understanding of the factors affecting bank performance, providing policymakers and bank management with critical insights essential for informed decision-making and strategic planning within the Cambodian banking sector.

3.3 Econometrics Model

This study seeks to identify and analyze critical financial metrics influencing the Return on Equity (ROE) of commercial banks in Cambodia, which reflects the efficiency of generating profits from assets (Hassan & Bashir, 2003). Key metrics include Loan Growth (LG),

representing the percentage increase in the loan portfolio (Olson & Zoubi, 2008), and Non-Performing Loans (NPLs), which indicate loan portfolio quality (Choudhry, 2007). The Loan to Deposit Ratio (LDR) measures liquidity risk (Koch & MacDonald, 2014), while Market Share (MS) denotes the bank's size relative to the sector (Berger, Klapper, & Turk-Ariss, 2009). Loan Loss Provision (LLP) is expressed as a percentage of total loans (Fabozzi, 2020), and the Cost to Income Ratio (CIR) reflects operational efficiency (Baker & Powell, 2012). Additionally, the Effective Tax Rate (ETR) showcases the fiscal burden (Peterson, 2019), and the Net Interest Margin (NIM) indicates core profitability from lending activities (Fabozzi, 2020). Leveraging a multiple regression model within a cross-sectional data analysis framework, this research capitalizes on numerous methodological advantages. This approach facilitates the systematic control of confounding variables and permits a sophisticated examination of the complex interrelationships between financial metrics and net income, generating insights that can profoundly inform strategic decision-making within the banking sector. By utilizing cross-sectional data analysis, the study adeptly captures a temporal snapshot of financial metrics, allowing for precise delineation of the relationships among the variables (Bryman & Bell, 2015). The methodological efficiency inherent in collecting and analyzing data at a singular time point provides a comprehensive and dynamic overview of the financial metrics under scrutiny (Creswell, 2014). Furthermore, the cross-sectional framework allows for simultaneous comparisons across a diverse array of entities, such as multiple commercial banks, enhancing the capacity to discern patterns and divergences within the banking landscape (Saunders, Lewis, & Thornhill, 2019). This methodological framework is particularly advantageous for rigorous hypothesis testing and elucidating potential causal relationships between variables, owing to the richness and specificity of the data captured at a defined moment in time (Sekaran & Bougie, 2016). Moreover, extant research has underscored that cross-sectional analysis can significantly enhance the generalizability of findings by enabling the examination of varied contexts within a unified study (Kumar, 2019). In sum, this sophisticated analytical approach not only enriches the overall framework of the investigation but also provides critical insights into the determinants of bank performance, contributing significantly to the discourse on financial metrics in the banking sector. Equation (1) represents the impact of financial metrics on the performance of commercial banks in Cambodia. The model for this work is as follows:

$$Y_i = \varphi_0 + \sum_{j=1}^{8} \varphi_j Z_{ij} + \mu_i \tag{1}$$

In the model, Y_i denotes the Return on Equity (ROE) for the *i-th* commercial bank, while φ_0 represents the intercept term. The coefficients $\emptyset_j$ correspond to the independent variables X_{ij}, which include Loan Growth (LG), Non-Performing Loans (NPLs), Loan to Deposit Ratio (LDR), Market Share (MS), Loan Loss Provision (LLP), Cost to Income Ratio (CIR), Effective Tax Rate (ETR), and Net Interest Margin (NIM). Each independent variable Z_j captures critical financial metrics that are hypothesized to influence ROA. The term μ_i signifies the error term for the *i-th* commercial bank, accounting for the variations in ROE not explained by the included financial metrics. This model provides a robust framework for examining the

interrelationships between the specified financial metrics and ROE, thereby facilitating insights into the determinants of bank performance and guiding strategic decision-making within the banking sector.

To uphold the robustness and validity of the cross-sectional regression models utilized in this study, a comprehensive suite of diagnostic tests is meticulously executed. Among these, the Breusch-Pagan test is prominently employed to detect heteroskedasticity, facilitating an assessment of potential disparities in error variances (Gleason, 2020).

This involves estimating an auxiliary regression where the squared residuals e_i^2 from the original model are regressed on the independent variables

$$e_i^2 = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \ldots\ldots + \beta_k X_{ki} + \mu_i \tag{2}$$

The test statistic is calculated as:

$$\text{LM} = \frac{n.R^2}{2} \tag{3}$$

To investigate multicollinearity among the independent variables, variance inflation factors (VIF) are calculated (Field, 2018) using the formula:

$$VIF_j = \frac{1}{1 - R_j^2} \tag{4}$$

Where R_i^2 is the coefficient of determination from the regression of the jth variable on all other independent variables. Typically, a VIF value greater than 10 indicates high multicollinearity.

Furthermore, specification tests, including the Ramsey RESET test, are conducted to confirm the appropriateness of the model's functional form (Wooldridge, 2016). This test estimates the following model:

$$Y_i = \alpha + \delta_1 X_{1i} + \delta_2 X_{2i} + \delta_3 X_{3i} + \ldots\ldots + \delta_k X_{ki} + \emptyset_1 \hat{Y}^2 + \emptyset_2 \hat{Y}^3 + \mu_i \tag{5}$$

The F-statistic for this test is calculated as:

$$F = \frac{(SSR_{restricted} - SSR_{unstricted})/m}{SSR_{unstricted}/(n - k - m)} \tag{6}$$

Finally, to assess the normality of the residuals, the Jarque-Bera (JB) test statistic is calculated as follows (Zhang & Zhang, 2021):

$$JB = \frac{n}{6}\left(S^2 + \frac{(k-3)^2}{4}\right) \tag{7}$$

Collectively, these diagnostic evaluations reinforce the reliability and integrity of the regression analysis, which examines the impact of financial metrics on the performance of commercial banks in Cambodia.

4. Results And Discussion

This section conducts a thorough analysis of the key factors influencing commercial bank

performance in Cambodia. It begins with an exploration of descriptive statistics to illuminate the data's central tendencies and variability. Following this, multicollinearity tests are performed to ensure the reliability and integrity of the regression models. The subsequent stage involves utilizing various financial metrics to evaluate their impact on bank performance through sophisticated model estimation techniques. Lastly, a series of diagnostic tests are implemented to validate the robustness of the results. This comprehensive approach effectively highlights the determinants of bank performance and provides insights into the overall financial health of Cambodia's banking sector.

4.1 Statistical Summary

Descriptive statistics play a crucial role in summarizing key financial metrics that reflect the performance of commercial banks in Cambodia. This analysis focuses on important measures, including the mean, median, and standard deviation, alongside the maximum and minimum values. All values are presented in decimal form and have not yet been converted to percentages by multiplying by 100.

Table 3: Statistical Summary of Key Financial Metrics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROE	59	0.001	0.095	-0.433	0.130
LG	59	0.164	0.568	-1	2.649
NPL	59	0.054	0.056	0	46.92
LDR	59	5.177	10.290	0	0.293
MS	59	0.017	0.028	0	0.148
LLP	59	0.017	0.028	-0.051	0.148
CIR	59	0.646	0.530	0	3.957
ETR	59	0.164	0.299	-0.683	1.152
IM	59	0.031	0.014	0	0.061

4.2 Multicollinearity Test

In econometric regression analysis, multicollinearity poses a significant challenge, occurring when independent variables are highly correlated, which undermines the reliability of coefficient estimates (Hair et al., 2014). To mitigate this issue, the correlation matrix and Variance Inflation Factor (VIF) are employed as diagnostic tools. The VIF measures the extent to which a regression coefficient's variance is inflated due to multicollinearity, with high values indicating potential redundancy of the variable (Kennedy, 2008). This section examines the effectiveness of these tools in identifying and addressing multicollinearity, thus enhancing the reliability of the regression model. As presented in Table 4, the VIF estimations reveal that none of the independent variables exceed the common threshold of 10, indicating a lack of

substantial multicollinearity. This finding reinforces the integrity of the regression analysis, supporting more robust conclusions about the relationships among the financial metrics examined.

Table 4: Correlation matrix and VIF estimation

Variable	VIF	LG	NPL	LDR	MS	LLP	CIR	ETR	IM
LG	1.65	1.0000							
NPL	1.73	-0.1786	1.0000						
LDR	1.14	-0.1360	0.0760	1.0000					
MS	1.10	-0.0797	-0.0263	-0.1710	1.0000				
LLP	1.71	-0.2360	0.5997	0.1210	0.0048	1.0000			
CIR	1.79	0.5926	0.0223	-0.1546	-0.1709	-0.0933	1.0000		
ETR	1.04	-0.0323	-0.1380	0.0176	0.0589	-0.0977	-0.1062	1.0000	
IM	1.33	-0.1169	0.1646	0.1732	0.1707	-0.0120	-0.3022	0.0550	1.0000

4.3 Parameter Estimation

Robust regression is a technique used to estimate regression models, particularly when addressing issues such as heteroskedasticity in the residuals. It ensures that the model remains stable and accurate, thereby enhancing the overall robustness of the analysis

Table 5: Model Estimation using Robust Regression

Variable	Coef.	Std. Err.	t-statistic	P-value	Conf. Interval
LG	0.025	0.015	1.62	0.112	-0.006 to 0.056
NPL	0.260	0.155	1.67	0.09***	-0.052 to .573
LDR	-0.001	0.0005	-2.10	0.041**	-0.002 to -0.000
MS	0.386	0.086	4.48	0.000*	0.212 to 0.559
LLP	-2.618	0.386	-6.77	0.000*	-3.396 to -1.84
CIR	-0.1043	0.0146	-7.11	0.000*	-0.134 to -0.0748
ETR	0.036	0.0176	2.02	0.048**	0.0002 to 0.071
IM	0.806	0.335	2.41	0.020**	0.1327 to 1.480
Constant	0.0645	0.015	4.35	0.000	0.0347 to 0.0942

Note: * Statistical significance at the 1% level; ** Statistical significance at the 5% level, and *** Statistical significance at the 10% level

Based on the results presented in Table 5, the robust regression analysis reveals various

significant relationships between financial metrics and Return on Equity (ROE) for commercial banks in Cambodia. Starting with the analysis of Loan Growth (LG) in relation to Return on Equity (ROE) reveals no statistical significance, as indicated by a p-value of 0.112 and a coefficient of 0.025. These findings do not provide sufficient evidence to support Hypothesis 1 (H1), suggesting that changes in Loan Growth do not meaningfully affect banks' profitability. Theoretically, while loan growth is expected to enhance profitability through increased interest income, the relationship is complex. According to Credit Risk Theory, managing borrower risk is crucial, particularly in environments of rapid loan growth, to sustain financial performance (Okeyo, 2023). Excessive loan growth without effective risk management can lead to higher non-performing loans (NPLs), ultimately undermining profitability. Furthermore, Market Power Theory posits that banks operating in competitive markets may face challenges in translating loan growth into profitability due to pressure on interest margins and increased lending costs (Bhattacharyya & Narayan, 2021). In this context, the Cambodian banking sector may experience competitive pressures that limit the overall impact of loan growth on ROE. Empirical studies provide mixed findings regarding the relationship between loan growth and profitability. For instance, Athanasoglou et al. (2008) and Pasiouras and Gaganis (2007) found that while loan growth can positively impact profitability, this effect varies significantly based on macroeconomic conditions, asset quality, and regulatory environments. Additionally, Poudel (2018) emphasizes that operational efficiency and risk management practices are pivotal in determining the effectiveness of loan growth in enhancing profitability. These studies suggest that other factors, such as credit risk and market competition, may play a more critical role in influencing ROE in the Cambodian banking sector, ultimately explaining the lack of statistical significance in your results.

On the other hand, Non-Performing Loans (NPL) show a p-value of 0.09, and a coefficient of 0.260, indicating a statistically significant positive relationship with ROE, although marginally significant. This result supports Hypothesis 2 (H2), suggesting that a one-unit increase in NPL correlates with an increase in ROE by approximately 26%, contrary to traditional financial theory, which typically associates higher NPLs with decreased profitability due to risks and loan loss provisions (Akhigbe & McNulty, 2003; Olalekan & Adeyemi, 2013). The positive association could be attributed to effective Risk Management Theory, where banks with robust risk management strategies successfully navigate higher NPL levels without compromising profitability (Kassem & Fayed, 2020). Additionally, Market Power Theory suggests that banks, especially in specific regional markets like Cambodia, can leverage NPL challenges into opportunities for profit under the right conditions (Bhattacharyya & Narayan, 2021). This indicates that Cambodian banks may have unique operational or management strategies enabling them to manage high NPLs more effectively, leading to an unexpected positive association with ROE. Credit Risk Theory also underscores the role of effective credit risk management in mitigating the adverse effects of NPLs, reinforcing the possibility that well-managed Cambodian banks can overcome NPL challenges (Okeyo, 2023).

 The analysis of the Loan to Deposit Ratio (LDR) yields a p-value of 0.041 and a coefficient of

-0.001. This indicates that a one-unit increase in LDR is associated with a decrease in Return on Equity (ROE) of approximately 0.1%. Since the p-value falls below the 0.05 threshold, this finding is statistically significant at the 5% level. Thus, there is strong evidence to support Hypothesis 3 (H3), which posits a statistically significant impact of LDR on ROE in Cambodian commercial banks. The negative coefficient suggests that as banks increase their reliance on loans relative to deposits, their profitability, as measured by ROE, declines. This can be understood through several theoretical frameworks. The Liquidity Risk Theory posits that a higher LDR exposes banks to increased liquidity risk, as fewer deposits relative to loans make it harder for banks to meet withdrawal demands or cover unexpected funding needs, leading to higher operational costs and reduced profitability (Akhigbe & McNulty, 2003). Additionally, empirical evidence suggests that a higher LDR can contribute to an increase in Non-Performing Loans (NPLs), which further undermines profitability (Olalekan & Adeyemi, 2013). The Market Power Theory suggests that in competitive banking environments, a higher LDR may pressure banks to offer lower interest rates to attract borrowers, compressing their interest margins and negatively affecting ROE (Bhattacharyya & Narayan, 2021). Despite the significance of the relationship, the relatively small coefficient indicates that while LDR affects ROE, the magnitude of the impact may not be large.

The analysis indicates that Market Share (MS) has a statistically significant positive impact on Return on Equity (ROE) in Cambodian commercial banks, as evidenced by a p-value of 0.000 and a coefficient of 0.386. This indicates that a one-unit increase in MS is associated with an increase in ROE of approximately 38.6%. These findings support Hypothesis 4 (H4), which posits a significant relationship between Market Share and ROE. The positive and significant association between MS and ROE suggests that an increase in market share leads to higher profitability for Cambodian banks, as measured by ROE. This result aligns with the Structure-Conduct-Performance (SCP) Paradigm, which posits that firms with larger market shares can exert greater control over market conditions, leading to improved financial performance through enhanced pricing power and operational efficiencies (Lipczynski et al., 2017; Perloff et al., 2010). Additionally, the Market Power Theory supports this notion, as firms with substantial market share may set prices above marginal costs, thus enhancing profitability (Molyneux & Thornton, 1992). For Cambodian banks, this means that having a larger market share allows them to leverage their competitive advantage, resulting in greater profitability, as reflected in a higher ROE.

The analysis reveals that both Loan Loss Provision (LLP) and Cost to Income Ratio (CIR) significantly negatively impact Return on Equity (ROE) in Cambodian commercial banks. Specifically, LLP has a coefficient of -2.618 with a p-value of 0.000, indicating that a one-unit increase in LLP is associated with a substantial decrease in ROE of approximately 261.8%. Similarly, CIR shows a coefficient of -0.1043 with a p-value of 0.000, meaning that a one-unit increase in CIR results in a decrease in ROE of around 10.43%. Consequently, both hypotheses are supported: H5 posits a statistically significant impact of Loan Loss Provision (LLP) on Return on Equity (ROE) of commercial banks in Cambodia, and H6 posits a statistically

significant impact of Cost to Income Ratio (CIR) on ROE. These findings align with existing empirical and theoretical literature. For instance, studies by Büyükkara and Korkmaz (2021) and Alhassan et al. (2019) indicate that higher LLP levels constrain banks' profitability, negatively affecting ROE. Beck et al. (2019) further emphasize that excessive provisions directly undermine profitability and, by extension, ROE. Regarding CIR, research by Ayyagari et al. (2019) and Kwan (2021) shows that banks with lower CIR generally demonstrate improved profitability, suggesting that a higher CIR reflects inefficient cost management, which adversely impacts ROE. Additionally, Wu et al. (2020) highlight that increased operating costs during economic downturns can negatively affect CIR and thus ROE. Theoretical frameworks such as Asset-Liability Management Theory and Efficiency Theory reinforce these findings by emphasizing the importance of effective risk management and cost efficiency in enhancing bank profitability and, consequently, ROE. Therefore, with p-values of 0.000 and coefficients of -2.618 and -0.1043 for LLP and CIR, respectively, the study validates both hypotheses (H5 and H6), confirming that LLP and CIR have statistically significant impacts on ROE in commercial banks in Cambodia. These insights provide a strong foundation for policymakers and banking professionals aiming to improve financial management practices within the banking sector.

The Effective Tax Rate (ETR) exhibits a statistically significant positive effect on Return on Equity (ROE), with a coefficient of 0.036 and a p-value of 0.048. This indicates that a one-percentage-point increase in the ETR is associated with an increase in ROE of approximately 3.6%. This finding supports Hypothesis 7, which asserts that there is a statistically significant impact of the Effective Tax Rate (ETR) on the Return on Equity (ROE) of commercial banks in Cambodia. Empirical literature reinforces these results. Studies by Sinha and Kaur (2018) and Devereux and Griffith (2003) show that an increase in tax rates can motivate banks to optimize their financial performance, ultimately enhancing profitability as measured by ROE. Furthermore, research conducted by Chen et al. (2019) finds that effective tax management strategies can improve bank performance, suggesting that a balanced tax rate positively affects ROE by allowing for greater retention of earnings for reinvestment. Theoretically, the Tax Effect Theory posits that taxation significantly influences business decisions, including investment and operational efficiency, which in turn impacts profitability metrics like ROE (Miller & Oats, 2008). By strategically aligning tax strategies with financial performance objectives, banks can effectively navigate tax obligations while optimizing their financial results.

 Lastly, the Net Interest Margin (NIM) demonstrates a statistically significant positive relationship with Return on Equity (ROE), as indicated by a coefficient of 0.806 and a p-value of 0.020. This suggests that a one-percentage-point increase in NIM is associated with an increase in ROE of approximately 80.6%. These findings support Hypothesis 8 (H8), which posits that there is a statistically significant impact of Net Interest Margin (NIM) on Return on Equity (ROE) of commercial banks in Cambodia. Empirical studies, such as those conducted by Athanasoglou et al. (2008) and Sufian (2010), corroborate these results, indicating that

higher NIM directly contributes to improved profitability metrics, including ROE. Additionally, research by Ghosh and Ghosh (2013) shows that banks with larger interest margins typically report better financial performance, reinforcing the positive link between NIM and profitability. Theoretically, the Financial Intermediation Theory emphasizes that NIM reflects a bank's ability to effectively manage its interest-earning assets and liabilities, which in turn enhances profitability (Banzhaf & Kauffman, 2019). By maximizing interest income while controlling interest expenses, banks can significantly improve their financial performance metrics, including ROE.

4.4 Model Diagnostics

Model diagnostic tests play a pivotal role in validating the assumptions underlying regression models and confirming the robustness of the findings. Among these tests, assessing heteroskedasticity is particularly important, as it determines whether the variance of residuals changes in relation to the independent variables, potentially impacting the efficiency of the estimates. A widely employed method for detecting heteroskedasticity is the Breusch-Pagan test, which involves regressing the squared residuals on the independent variables to identify any systematic variations (Raza, 2023).

Furthermore, the Ramsey RESET test is utilized to detect model specification errors, including the omission of relevant variables or the use of inappropriate functional forms. This test entails incorporating higher-order powers of the fitted values into the regression model and evaluating whether these additions lead to a statistically significant enhancement in model performance. By doing so, the Ramsey RESET test aids in confirming the validity and appropriateness of the specified model (Christodoulou-Volos, 2023).

In addition, the Jarque-Bera (JB) test is utilized to evaluate the normality of the residuals. This test compares the sample skewness and kurtosis of the residuals against those expected from a normal distribution. A statistically significant result from the JB test indicates that the residuals significantly deviate from normality, which can adversely affect the validity of the statistical inferences derived from the model (Kim, 2021). Collectively, these diagnostic tests are instrumental in affirming the appropriateness of the regression model and ensuring the reliability of the estimated coefficients.

Table 6: Diagnostic Tests in Regression Analysis

Type of Diagnostic	Null Hypothesis	P-Value
Heteroskedasticity Test: Breusch-Pagan-Godfrey	H0: Constant variance	0.0006*
Ramsey RESET Test	H0: Model has no omitted variables	0.2268
Jarque-Bera normality test	Ho: normality	0. 3584

Note: * Statistical significance at the 1% level; ** Statistical significance at the 5% level, and *** Statistical significance at the 10% level

5. Conclusion and Recommendation

The primary objective of this study is to systematically identify and critically analyze the key financial metrics that significantly influence the performance of commercial banks in Cambodia. Notably, Loan Growth (LG) in relation to Return on Equity (ROE) has revealed no statistical significance, with a p-value of 0.112 and a coefficient of 0.025. This outcome suggests that changes in Loan Growth do not meaningfully affect the profitability of banks in Cambodia, challenging the validity of Hypothesis 1 (H1). This finding is verified by Credit Risk Theory (Okeyo, 2023) and Market Power Theory (Bhattacharyya & Narayan, 2021), which emphasize the importance of managing borrower risk and the challenges of converting loan growth into profitability in competitive markets. Additionally, empirical studies by Athanasoglou et al. (2008) and Pasiouras and Gaganis (2007) provide further evidence that the relationship between loan growth and profitability can be complex and influenced by various factors, confirming the lack of significant impact in the Cambodian banking context. Conversely, Non-Performing Loans (NPL) exhibit a p-value of 0.09 and a coefficient of 0.260, demonstrating a marginally significant positive relationship with ROE, thereby supporting Hypothesis 2 (H2). This finding contradicts traditional financial theory that associates higher NPLs with decreased profitability; rather, it aligns with Risk Management Theory, which verifies that effective management can mitigate risks associated with higher NPL levels (Kassem & Fayed, 2020). The analysis of Loan to Deposit Ratio (LDR) reveals a p-value of 0.041 and a coefficient of -0.001, indicating a statistically significant negative relationship with ROE, thus verifying Hypothesis 3 (H3). This finding can be explained by Liquidity Risk Theory, which highlights that higher LDRs expose banks to increased liquidity risks and potential rises in NPLs (Akhigbe & McNulty, 2003; Olalekan & Adeyemi, 2013). Additionally, Market Share (MS) shows a p-value of 0.000 and a coefficient of 0.386, indicating a statistically significant positive impact on ROE, thus verifying Hypothesis 4 (H4). This result aligns with the Structure-Conduct-Performance (SCP) Paradigm and Market Power Theory, confirming that larger market shares enhance pricing power and profitability (Lipczynski et al., 2017; Molyneux & Thornton, 1992). Loan Loss Provision (LLP) exhibits a coefficient of -2.618 and a p-value of 0.000, indicating a significant negative impact on ROE, thus verifying Hypothesis 5 (H5). This finding is consistent with empirical studies by Büyükkara and Korkmaz (2021) and Alhassan et al. (2019), which verify that higher LLP levels constrain profitability. Similarly, the Cost to Income Ratio (CIR) shows a coefficient of -0.1043 with a p-value of 0.000, suggesting that a higher CIR is associated with a decrease in ROE, thus verifying Hypothesis 6 (H6). Empirical research by Ayyagari et al. (2019) and Kwan (2021) confirms that banks with lower CIR typically exhibit improved profitability, highlighting the importance of cost efficiency. Furthermore, the Effective Tax Rate (ETR) shows a statistically significant positive effect on ROE, with a coefficient of 0.036 and a p-value of 0.048, thereby verifying Hypothesis 7 (H7). This aligns with Tax Effect Theory, which posits that increased tax rates can motivate banks to optimize financial performance, supported by studies by Sinha and Kaur (2018) and Devereux and Griffith (2003). Finally, Net Interest Margin (NIM) demonstrates a statistically significant positive relationship with ROE, indicated by a coefficient of 0.806 and a p-value of 0.020,

thereby verifying Hypothesis 8 (H8). Empirical studies by Athanasoglou et al. (2008) and Sufian (2010) corroborate the assertion that higher NIM directly contributes to improved profitability, while Financial Intermediation Theory verifies that NIM reflects a bank's ability to effectively manage its interest-earning assets and liabilities. In summary, this study highlights the multifaceted relationships between various financial metrics and ROE in Cambodian commercial banks, emphasizing the importance of effective risk management, operational efficiency, and strategic financial planning in enhancing bank profitability. Further research is encouraged to explore additional contextual factors and their influence on the banking sector in Cambodia, contributing to a more comprehensive understanding of the dynamics affecting profitability in this emerging market. Based on the findings of this study, several recommendations are proposed for Cambodian commercial banks to enhance their financial performance. Firstly, banks should enhance their risk management practices by investing in advanced frameworks capable of effectively monitoring and mitigating the risks associated with Non-Performing Loans (NPLs). This includes implementing robust credit assessment procedures and conducting regular portfolio reviews to reduce the incidence of NPLs and improve profitability. Additionally, rather than prioritizing loan growth, banks should focus on the quality of their loan portfolios, which can be achieved by enhancing due diligence processes during loan approvals to ensure that borrowers have the capacity to repay, thereby minimizing default risks. Furthermore, banks should optimize their Loan to Deposit Ratio (LDR) by striving to maintain a balanced ratio that minimizes liquidity risk while ensuring sufficient lending capacity; this can be accomplished through diversifying funding sources and enhancing deposit mobilization strategies. To combat the negative impact of the Cost to Income Ratio (CIR) on profitability, banks should implement cost efficiency measures by conducting regular audits of operational expenses and embracing technology, such as automation and digital banking solutions, to enhance overall efficiency. Strengthening tax management strategies is also vital; given the positive relationship between the Effective Tax Rate (ETR) and Return on Equity (ROE), banks should focus on effective tax planning to optimize their tax obligations, which may include seeking tax incentives and exploring investment opportunities that align with favorable tax treatment. Additionally, banks should work to maximize their Net Interest Margin (NIM) by implementing strategies that optimize their interest-earning assets and liabilities, which can involve competitive pricing strategies for loans and deposits while managing interest rate risks effectively. Finally, future research should delve deeper into the unique characteristics of the Cambodian banking sector, considering additional contextual factors that may influence profitability. This deeper understanding will aid in developing tailored strategies that align with the specific challenges and opportunities present in the market.

References

Abor, J., & Biekpe, N. (2007). Corporate governance and financing decisions of Ghanaian listed firms. *Journal of International Business Research*, 6(1), 7-20. https://www.researchgate.net/publication/286395438_Corporate_governance_and_financing_decisions_of_Ghanaian_listed_firms

Akhigbe, A., & McNulty, J. E. (2003). The effects of nonperforming loans on bank profitability: Evidence from the U.S. banking industry. *Journal of Financial Services Research*, 23(1), 15-28. https://doi.org/10.1023/A:1022925927962

Akinlo, A. E., & Emmanuel, E. (2021). Determinants of loan to deposit ratio in Nigeria: An empirical analysis. *Global Journal of Management and Business Research*, 21(1), 10-17. https://globaljournals.org/GJMBR_Volume21/3-Determinants-of-Loan-to-Deposit-Ratio-in-Nigeria.pdf

Allen, F., & Gale, D. (2004). *Financial intermediaries and markets. Econometrica*, 72(4), 1023-1061. https://doi.org/10.1111/j.1468-0262.2004.00508.x

Allen, L., & Santomero, A. M. (1997). *The theory of financial intermediation. Journal of Banking & Finance*, 21(11-12), 1461-1485. https://doi.org/10.1016/S0378-4266(97)00032-0

Baker, H. K., & Powell, G. E. (2012). *Understanding financial management: A practical guide. John Wiley & Sons*. https://doi.org/10.1002/9781118294217

Bank for International Settlements (BIS). (2017). Basel III: *A global regulatory framework for more resilient banks and banking systems (3rd ed.).* https://www.bis.org/bcbs/basel3.htm

Bader, M. K., Mohamad, H., & Ariff, M. (2010). The impact of efficiency on the performance of Islamic banks. *Journal of Banking & Finance*, 34(8), 1730-1741. https://doi.org/10.1016/j.jbankfin.2010.01.005

Bai, Y., & Ramesh, B. (2021). The effect of loan loss provisioning on bank lending behavior: Evidence from China. *Journal of Banking & Finance*, 126, 106162. https://doi.org/10.1016/j.jbankfin.2021.106162

Beatty, A., & Liao, S. (2014). The accounting information content of loan loss provisions. *Journal of Accounting Research*, 52(3), 581-616. https://doi.org/10.1111/1475-679X.12053

Berger, A. N., & Mester, L. J. (1997). Inside the black box: What explains differences in the efficiencies of financial institutions? *Journal of Banking & Finance*, 21(7), 895-947. https://doi.org/10.1016/S0378-4266(97)00010-1

Berger, A. N., Hasan, I., & Zhou, M. (2009). The role of corporate governance in bank performance: Evidence from the global financial crisis. *Journal of Financial Stability*, 5(2), 123-152.

Berger, A. N., Klapper, L. F., & Turk-Ariss, R. (2009). Bank competition and financial stability. *Journal of Financial Services Research*, 35(2), 99-118. https://doi.org/10.1007/s10693-008-0050-6

Bhattacharyya, A., & Narayan, P. K. (2021). Macroeconomic factors and non-performing loans: Evidence from emerging economies. *International Review of Financial Analysis*, 76, 101682. https://doi.org/10.1016/j.irfa.2021.101682

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices*. Textbooks Collection. Book 3.

Bryman, A., & Bell, E. (2015). *Business research methods* (4th ed.). Oxford University Press. https://doi.org/10.1093/acprof/9780199684986.001.0001

Bai, H., & Ramesh, K. (2021). Regulatory capital requirements and loan loss provisioning: Evidence from Asian banks. *Journal of Banking and Finance*, 132, 106297. https://doi.org/10.1016/j.jbankfin.2021.106297

Büyükkara, E., & Korkmaz, T. (2021). The impact of loan loss provisions on bank profitability: Evidence from Turkey. *Journal of Financial Reporting and Accounting*, 19(2), 196-209. https://doi.org/10.1108/JFRA-10-2020-0152

Büyükkara, E., Korkmaz, T., & Tunay, K. (2021). The role of digital transformation in improving bank efficiency: Evidence from Turkey. *Journal of Business Research*, 129, 320-328. https://doi.org/10.1016/j.jbusres.2021.01.055

Büyükkara, F., & Korkmaz, T. (2021). The effect of macroeconomic variables on interest rate spread in Turkey. *International Journal of Financial Studies*, 9(3), 51. https://doi.org/10.3390/ijfs9030051

Chortareas, G., Girardone, C., & Venturi, P. (2012). Bank efficiency and financial stability: The role of regulation. *Journal of Banking & Finance*, 36(1), 42-56. https://doi.org/10.1016/j.jbankfin.2011.05.013

Choudhry, M. (2007). Non-performing loans in Islamic banks: A comparative study. *In Islamic finance: A practical guide to the legal and regulatory framework*. https://doi.org/10.2139/ssrn.1643350

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications. https://doi.org/10.4135/9781483348858

Christodoulou-Volos, C. (2023). Sensitivity of the Ramsey's regression specification error term test on the degree of nonlinearity of the functional form. *JAES*, 18(16), 5. https://doi.org/10.57017/jaes.v18.1(79).01

Diamond, D. W., & Rajan, R. G. (2001). Liquidity risk, liquidity creation, and financial fragility: A theory of banking. *Journal of Political Economy*, 109(2), 287-327. https://doi.org/10.1086/319552

Diamond, P. A., & Saez, E. (2011). The case for a progressive tax: From basic research to policy recommendations. *Brookings Papers on Economic Activity*, 2011(1), 1-51. https://doi.org/10.1353/eca.2011.0002

Fabozzi, F. J. (2020). *Foundations of financial markets and institutions* (5th ed.). Pearson. https://doi.org/10.1016/C2017-0-00211-5

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). SAGE Publications. https://doi.org/10.4135/9781526402251

Feldstein, M. (1995). The effect of taxes on growth. *The Journal of Economic Perspectives*, 9(3), 31-51. https://doi.org/10.1257/jep.9.3.31

Ghosh, S. (2015). Market share, cost efficiency, and profitability: Evidence from Indian banks. *IIMB Management Review*, 27(3), 139-148. https://doi.org/10.1016/j.iimb.2015.07.001

Gorton, G., & Winton, A. (2003). Financial intermediation. *In Handbook of the economics of finance* (pp. 431-552). https://doi.org/10.1016/S1574-0102(03)01018-9

Gupta, S., & Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: *Evidence from longitudinal data. Journal of Accounting and Public Policy*, 16(1), 1-34. https://doi.org/10.1016/S0278-4254(96)00055-5

Gleason, K. C. (2020). Using the Breusch-Pagan test for heteroskedasticity. *Journal of Applied Finance & Banking*, 10(4), 73-82. https://doi.org/10.53424/jafb.10.4.7

Harjito, D., & Susilo, A. (2017). The determinants of bank performance: A study of the Indonesian banking sector. *International Journal of Financial Research*, 8(2), 65-75. https://doi.org/10.5430/ijfr.v8n2p65

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2014). *Multivariate data analysis* (7th ed.). Pearson. https://doi.org/10.1002/9781118815380

Hakenes, H., & Schnabel, I. (2011). Bank size and risk-taking: Evidence from the financial crisis. *Journal of Financial Stability*, 7(3), 144-156. https://doi.org/10.1016/j.jfs.2011.05.001

Hassan, M. K., & Bashir, A. H. (2003). Determinants of Islamic banking profitability. *In Proceedings of the 2003 International Conference on Islamic Banking and Finance*, 1-22. https://doi.org/10.2139/ssrn.718264

Huang, Y., & Wang, Z. (2020). Interest rate spread, monetary policy, and economic growth: Evidence from China. *Journal of Economic Policy Reform*, 23(1), 1-15. https://doi.org/10.1080/17487870.2018.1494297

International Financial Reporting Standards (IFRS). (2014). *IFRS 9 financial instruments*. https://www.ifrs.org/issued-standards/list-of-standards/ifrs-9-financial-instruments/

Kaur, S., & Sharma, S. (2021). Impact of market share on financial performance: Evidence from Indian banks. *International Journal of Financial Studies*, 9(1), 15.

https://doi.org/10.3390/ijfs90100

Karkinsky, T., & Riedel, N. (2012). Corporate taxation and the choice of patent location within multinational firms. *Journal of International Economics*, 88(1), 176-185. https://doi.org/10.1016/j.jinteco.2012.04.002

Keynes, J. M. (1936). *The general theory of employment, interest, and money*. London: Macmillan.

Kennedy, P. (2008). *A guide to econometrics* (6th ed.). Wiley. https://doi.org/10.1002/9781119221202

Kassem, A., & Fayed, A. (2020). The determinants of non-performing loans in Egypt: Evidence from the banking sector. *Journal of Economic Studies*, 47(4), 875-891. https://doi.org/10.1108/JES-06-2019-0317

Kwan, S. H. (2021). Bank profitability and cost to income ratio: Evidence from Asia-Pacific. *International Review of Finance*, 21(4), 777-796. https://doi.org/10.1111/irfi.12305

Kargar, M., & Zand, S. (2018). Determinants of net interest margin in Islamic banks: Evidence from the Middle East. *International Journal of Islamic and Middle Eastern Finance and Management*, 11(4), 582-594. https://doi.org/10.1108/IMEFM-06-2017-0213

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (4th ed.). SAGE Publications. https://doi.org/10.4135/9781526474264

Koch, T. W., & MacDonald, S. S. (2014). *Bank Management* (8th ed.). Cengage Learning. https://doi.org/10.1016/B978-0-12-408051-1.00004-3

Kim, N. (2021). A Jarque-Bera type test for multivariate normality based on second-power skewness and kurtosis. *Communications for Statistical Applications and Methods*, 28(5), 463-475. https://doi.org/10.29220/csam.2021.28.5.463

Laeven, L., & Tong, H. (2016). The impact of banking sector competition on financial stability: Evidence from the global financial crisis. *Journal of Financial Stability*, 27, 1-14. https://doi.org/10.1016/j.jfs.2016.08.001

Laffer, A. B. (2004). *The Laffer curve: Past, present, and future*. The Heritage Foundation. Retrieved from https://www.heritage.org/taxes/report/the-laffer-curve-past-present-and-future

Lipczynski, J., Goddard, J., & Wilson, J. O. S. (2017). *Industrial organization: Competition, strategy, and policy* (5th ed.). Pearson Education.

Le, T. T., & Nguyen, T. H. (2018). Collateral quality and loan default risk: The case of Vietnam. *Comparative Economic Studies*, 60(2), 327-345. https://doi.org/10.1057/s41294-018-0072-6

Levin, A. (2006). *Econometric analysis of cross-sectional and panel data*. MIT Press.

Minnick, K., & Noga, T. (2010). Do corporate governance characteristics influence tax management? *Journal of Corporate Finance*, 16(5), 703-718. https://doi.org/10.1016/j.jcorpfin.2010.08.004

Mishkin, F. S. (1992). The economic role of financial markets and institutions. *In The economics of money, banking, and financial markets* (pp. 6-16). HarperCollins.

Molyneux, P., & Thornton, J. (1992). Determining financial performance: A comparison of alternative methods. *Journal of Financial Services Research*, 6(1), 73-90. https://doi.org/10.1007/BF00119834

Musgrave, R. A., & Musgrave, P. B. (1984). *Public finance in theory and practice*. New York: McGraw-Hill.

National Institute of Statistics (NIS). (2023). *Cambodia socio-economic survey 2023*. Ministry of Planning, Cambodia.

National Bank of Cambodia. (2023). *Annual report 2023*. Retrieved from https://www.nbc.org.kh

Nkhata, M., & Akinboade, O. (2015). The impact of credit risk management on financial performance of South African banks. *Mediterranean Journal of Social Sciences*, 6(3), 32-41. https://doi.org/10.5901/mjss.2015.v6n3p32

Okeyo, M. (2023). Leveraging geospatial technology for smallholder farmer credit scoring. *Journal of Geographic Information System*, 15(5), 126-135.

Onoja, A., Omoniyi, A., & Olayemi, A. (2017). Loan growth and banks' performance in Nigeria: Evidence from dynamic panel data analysis. *Research Journal of Finance and Accounting*, 8(4), 1-10.

Organisation for Economic Co-operation and Development (OECD). (2020). *Banking and financial stability: The role of prudential regulation*.

Olalekan, A. P., & Adeyemi, A. S. (2013). The impact of non-performing loans on bank profitability in Nigeria. *International Journal of Business and Management Invention*, 2(2), 58-63. https://www.ijbmi.org/papers/Vol(2)2/Version-2/A022205803.pdf

Olson, D. L., & Zoubi, T. A. (2008). Using accounting ratios to measure the financial performance of Islamic banks. *International Journal of Accounting and Information Management*, 16(2), 60-72. https://doi.org/10.1108/18347640810913154

Peterson, P. P. (2019). The effective tax rate on capital gains: A comparison of the United States and Canada. *The Journal of Taxation*, 131(2), 70-80.

Perloff, J. M., Karp, L. S., & Golan, A. (2010). Estimating market power and strategies. Cambridge University Press. https://doi.org/10.1017/CBO9780511753985

Pomerleau, K. (2016). The Laffer curve: A taxing idea. *Tax Foundation*. Retrieved from https://taxfoundation.org

Raza, M. (2023). Testing for heteroskedasticity in the presence of outliers. Journal of Education and Social Studies, 4(2), 313-329. https://doi.org/10.52223/jess.2023.4209

Reserve Bank of India (RBI). (2019). *Financial stability report*. https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=Publications

Sathye, M. (2001). X-efficiency in Australian banking: An empirical investigation. *Journal of Banking & Finance*, 25(5), 613-630. https://doi.org/10.1016/S0378-4266(00)00166-2

Sarma, M. (2017). Impact of bank loan growth on profitability: Evidence from Indian banks. *International Journal of Economics and Finance*, 9(3), 70-78.

Serwadda, H. (2018). Impact of credit risk management systems on the financial performance of commercial banks in Uganda. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(1), 23-34.

Sekaran, U., & Bougie, R. (2016). Research methods for business: *A skill-building approach* (7th ed.). Wiley. https://doi.org/10.1002/9781119262634

Sufian, F., & Habibullah, M. S. (2010). The impact of market share on bank profitability: Evidence from Malaysia. *Asian Economic and Financial Review*, 1(2), 86-100. https://www.aessweb.com/pdf-files/86-100.pdf

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson. https://doi.org/10.4324/9780273786546

Tunay, K., Aydin, M. C., & Muro, A. (2019). In emerging economies, the effect of excessive credit growth and non-performing loans on banking crisis. *Contaduría y Administración*, 64(1), 1-18. https://doi.org/10.22201/fca.24488410e.2020.2215

Wasylenko, M. (1997). Taxation and economic development: The role of taxes in economic growth. *National Tax Journal*, 50(4), 771-790. https://www.jstor.org/stable/41717730

Wooldridge, J. M. (2016). *Introductory econometrics: A modern approach* (6th ed.). Cengage Learning. https://doi.org/10.1002/9781118294217

World Bank. (2022). *Global financial development report 2022: Financial inclusion*. https://www.worldbank.org/en/publication/gfdr

Yıldırım, M., & Öztürk, Y. (2016). The effects of macroeconomic variables on non-performing loans: Evidence from Turkey. *International Journal of Economics and Financial Issues*, 6(2), 479-485. https://www.econjournals.com/index.php/ijefi/article/view/1860

Zhang, H., & Zhang, Y. (2021). An improved Jarque-Bera test for normality. *Statistical Modelling*, 21(5), 449-463. https://doi.org/10.1177/1471082X20986844