

# Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis

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## ABSTRACT

*This study, "Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis," examines how key financial metrics influence the performance of commercial banks in Cambodia. Utilizing annual data from 2023 provided by the National Bank of Cambodia, the study analyzes 59 commercial banks through multiple regression analysis. The findings reveal that an increase in Non-Performing Loans (NPLs) significantly decreases Net Income, while Total Assets (TA) shows a marginally negative impact. Conversely, Total Equity (TE) and Deposits (DP) positively and significantly affect Net Income. Total Loans demonstrate a marginally positive effect on profitability. These results emphasize the importance of effective NPL management, careful control of asset growth, maintaining robust capital reserves, fostering a strong deposit base, and implementing prudent loan risk management practices to enhance the financial performance of commercial banks in Cambodia.*

**Keyword:** Commercial Bank Performance, Financial Metrics Analysis, Non-Performing Loans (NPLs), Total Assets (TA), Total Equity (TE), Deposits (DP), Total Loans, Net Income

## 1. INTRODUCTION

The financial performance of commercial banks is a critical factor in the stability and growth of a nation's economy. In Cambodia, the banking sector has experienced significant growth over recent years, yet it faces numerous challenges that affect its overall performance. Understanding the key financial metrics that influence bank performance is essential for policymakers, regulators, and bank management to make informed decisions that promote financial stability and growth (Alvarez & Marsal, 2020).

The Cambodian economy is projected to grow by 5.5%, largely due to significant expansion in the tourism and non-garment manufacturing sectors (NBC, 2023). The tourism sector experienced impressive growth, increasing by 19.8% and attracting 5.5 million international visitors (NBC, 2023). The manufacturing sector also saw substantial growth, expanding by 7.4%. Notably, the production of non-garment products for export, such as electronics and vehicle accessories, increased by 1.3 times and 3.2 times, respectively. Conversely, the production of goods for the domestic market fell by 7% (NBC, 2023). The agriculture sector showed modest growth of 1.1%, driven by gains in the rice, rubber, and fisheries sub-sectors. The construction and real estate sectors experienced slower growth rates of 1.1% and 0.5%, respectively (World Bank, 2023).

In this dynamic economic environment, the Cambodian banking system has shown remarkable resilience and progress, ensuring the sustainability of financing and the provision of essential financial services to support economic activities. The total assets of banks and financial institutions rose by 8.6%, reaching KHR 346.7 trillion (USD 84.3 billion), with the banking sector accounting for 91.8% of this growth. Additionally, total credit extended to other sectors increased by 4.8%, amounting to KHR 237.2 trillion (USD 57.6 billion), while customer deposits grew by 13.1%, totaling KHR 197.2 trillion (USD 47.9 billion) (NBC, 2023). The economic expansion has led to increased lending activities, with the total loan portfolio of commercial banks reaching approximately USD 45 billion by the end of 2023 (NBC, 2023). Within this context, the outstanding balance of the KHR loan portfolio in

the banking sector is approximately USD 6.1 billion in 2023, marking an 18.4 percent increase from USD 5.2 billion in 2022 (Association of Banks in Cambodia [ABC], 2023).

The banking system's capital position remained strong, with the capital adequacy ratio standing at a high 22.7%, well above the regulatory minimum of 15%. Furthermore, the capital conservation buffer has been reinstated at 1.25% of risk-weighted assets. Liquidity levels were also robust, with commercial banks maintaining a liquidity coverage ratio of 167.6%, surpassing the regulatory requirement of 100% (NBC, 2023). Despite these positive indicators, the non-performing loan (NPL) ratio has risen to 5.4% for the banking sector. This increase is primarily due to the completion of loan restructuring measures and a slowdown in credit growth (NBC, 2023).

The Cambodian banking sector plays a pivotal role in the nation's economic stability and growth. Despite the sector's notable resilience and progress in recent years, it faces various challenges that require strategic intervention and informed decision-making. This study has underscored the importance of key financial metrics—Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits—in influencing the performance of commercial banks. The economic backdrop, characterized by a projected 5.5% growth driven by robust tourism and non-garment manufacturing sectors, presents both opportunities and challenges for the banking sector. While total assets, credit extension, and customer deposits have shown impressive growth, the rising NPL ratios indicate underlying risks that need to be managed to ensure long-term financial stability.

By focusing on these critical financial metrics, policymakers, regulators, and bank management can develop targeted strategies to mitigate risks, enhance financial stability, and support the sector's contribution to economic growth. Continuous monitoring and analysis of these financial indicators will be crucial in navigating the dynamic economic environment and ensuring the sustainable development of Cambodia's banking sector.

### 1.1 Object of study

The objective of the study "Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis" is to identify and analyze the key financial metrics that impact the performance of commercial banks in Cambodia. By examining financial indicators such as Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits, the study aims to provide a comprehensive understanding of how these factors affect the financial performance of commercial banks, as indicated by Net Income. The insights gained from this analysis can help policymakers, bank management, and stakeholders make informed decisions to enhance the stability and growth of the banking sector in Cambodia.

### 1.2 Hypothesis development

Given the research aim to identify and analyze the key financial metrics that impact the performance of commercial banks in Cambodia, which includes examining indicators such as Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits, the hypotheses can be formulated as follows:

Hypothesis 1: There is a statistically significant impact of Non-Performing Loans (NPLs) on the Net Income of commercial banks in Cambodia.

Hypothesis 2: There is a statistically significant impact of Total Assets on the Net Income of commercial banks in Cambodia.

Hypothesis 3: There is a statistically significant impact of Total Equity on the Net Income of commercial banks in Cambodia.

Hypothesis 4: There is a statistically significant impact of Loans on the Net Income of commercial banks in Cambodia.

Hypothesis 5: There is a statistically significant impact of Deposits on the Net Income of commercial banks in Cambodia.

## 2. LITERATURE REVIEW

The literature review aims to provide a comprehensive overview of existing research on the determinants of commercial bank performance, with a specific focus on financial metrics. It explores the theoretical foundations and empirical evidence on how various financial indicators, such as Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits, impact the performance of commercial banks. This literature review is divided into two main sections: the Theoretical Review and the Empirical Review. The Theoretical Review examines traditional theories of bank performance, while the Empirical Review delves into the findings of previous studies that have

analyzed the impact of specific financial metrics on bank performance, providing evidence on how indicators such as NPLs, Total Assets, Total Equity, Loans, and Deposits influence the financial performance of commercial banks.

## 2.1 Theoretical review

The performance of commercial banks is influenced by various financial metrics, which can be understood through different theoretical lenses. This review focuses on the impact of Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits on bank performance.

Asset quality, particularly the level of NPLs, is a crucial determinant of bank performance. High levels of NPLs indicate poor asset quality and are associated with increased credit risk, which can lead to financial distress and reduced profitability. For example, Louzis, Vouldis, and Metaxas (2012) found that high NPLs negatively impact bank profitability and increase the risk of insolvency. This finding aligns with traditional theories emphasizing the importance of maintaining good asset quality to ensure financial stability.

Total assets are a measure of a bank's size and capacity to generate income. Larger banks often benefit from economies of scale, which can enhance their efficiency and profitability. However, they may also face challenges related to managing more complex operations. Pasiouras and Kosmidou (2007) found that bank size positively influences performance, as larger banks are better able to diversify risks and exploit new market opportunities.

Capital adequacy, represented by total equity, is essential for absorbing losses and protecting depositors. Adequate capital levels are crucial for maintaining solvency and stability. Berger and Bouwman (2013) argue that well-capitalized banks are more resilient during financial crises and tend to be more profitable. This aligns with the view that higher equity levels provide a buffer against potential losses and support sustainable growth.

The volume of loans extended by a bank is a primary source of income, as interest from loans constitutes a significant portion of a bank's earnings. However, an excessive focus on loan growth can lead to higher credit risk if not managed properly. Abreu and Mendes (2002) highlight that while loan growth can enhance profitability, it must be balanced with prudent risk management practices to avoid adverse outcomes such as increased NPLs.

Deposits are a critical source of funding for banks, providing the liquidity needed to support lending activities. High levels of deposits indicate strong customer confidence and can enhance a bank's ability to generate income through interest rate spreads. According to the Basel Committee on Banking Supervision (2014), liquidity management, supported by stable deposit bases, is vital for maintaining operational stability and preventing bank runs.

## 2.2 Empirical review

Numerous studies have shown that Non-Performing Loans (NPLs) significantly impact the financial performance of banks. High levels of NPLs often indicate poor asset quality, which can negatively affect net income. Research by Ghosh (2015) in the context of Indian banks found a significant negative relationship between NPLs and bank performance, indicating that higher NPL ratios are associated with lower profitability. Similarly, a study on European banks by Makri, Tsagkanos, and Bellas (2014) corroborated this finding, showing that NPLs negatively affect net income (Ghosh, 2015; Makri, Tsagkanos, & Bellas, 2014).

The size of a bank, often measured by total assets, is another crucial determinant of bank performance. Larger banks benefit from economies of scale, which can lead to higher efficiency and profitability. Staikouras and Wood (2011) found that total assets positively influence bank profitability in European banks. Furthermore, Athanoglou, Brissimis, and Delis (2008) demonstrated that Greek banks with larger asset bases performed better financially, indicating a positive correlation between total assets and profitability (Staikouras & Wood, 2011; Athanoglou, Brissimis, & Delis, 2008).

Total equity represents the bank's net worth and serves as a buffer against potential losses, thus influencing performance. Berger and Bouwman (2013) highlighted that banks with higher equity levels are more resilient during financial crises and perform better overall. This is supported by Dietrich and Wanzenried (2011), who found that higher equity levels positively impact the profitability of Swiss banks. The relationship between equity and

performance is also evident in studies focusing on emerging markets, where well-capitalized banks tend to show superior financial performance (Berger & Bouwman, 2013; Dietrich & Wanzenried, 2011).

The loan portfolio is a primary source of income for banks, and its quality and volume directly affect performance. Kosmidou (2008) found that a higher loan-to-asset ratio is positively associated with profitability in Greek banks. Additionally, Tan and Floros (2012) in their study on Chinese banks reported that loan growth positively impacts bank profitability, emphasizing the importance of an effective lending strategy for financial success (Kosmidou, 2008; Tan & Floros, 2012).

Deposits are a critical funding source for banks and influence their ability to extend loans. Banks with a higher deposit base can reduce their reliance on expensive external funding, thus improving profitability. Sufian and Habibullah (2010) observed a positive relationship between deposits and bank performance in Malaysia, where banks with a larger deposit base achieved better financial outcomes. Similarly, Molyneux and Thornton (1992) found that deposit growth is positively correlated with bank profitability in European banks (Sufian & Habibullah, 2010; Molyneux & Thornton, 1992).

### 3. METHODOLOGY

This section outlines the research design, data collection methods, and analytical techniques employed in the study. By utilizing annual data from 2023, sourced from the National Bank of Cambodia, the study examines the financial performance of 59 commercial banks. Multiple regression analysis is conducted using STATA 15.0 software to explore the relationship between financial metrics and the net income of these banks. Various diagnostic tests, including tests for heteroskedasticity, multicollinearity, and model specification, are performed to ensure the accuracy and reliability of the regression models.

#### 3.1 Research design

The study "Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis" aims to identify and analyze the key financial metrics that impact the performance of commercial banks in Cambodia. By examining indicators such as Non-Performing Loans (NPLs), Total Assets, Total Equity, Loans, and Deposits, the research seeks to understand how these factors influence the financial performance of commercial banks, as measured by Net Income. To achieve this, an explanatory approach using cross-sectional data analysis is employed. Cross-sectional data offers several advantages. It provides a snapshot of financial metrics at a single point in time, allowing for an immediate understanding of the relationships between variables (Levin, 2006). This method is efficient, as data is collected once and analyzed to grasp the current state of variables (Kumar, 2019). Additionally, cross-sectional data facilitates the comparison of different entities, such as various commercial banks, at the same time, helping to identify patterns and differences (Kumar, 2019). Moreover, it is particularly useful for testing hypotheses and examining potential causal relationships between variables due to the comprehensive nature of the data available at one point in time (Bhattacharjee, 2012).

#### 3.2 Data

This study utilizes annual data from 2023, sourced from the National Bank of Cambodia, which collected data from 59 commercial banks. Financial performance is measured by Net Income (NI) as the dependent variable. The key financial metrics that influence the performance of commercial banks in Cambodia are examined, including indicators such as Non-Performing Loans (NPLs), Total Assets (TA), Total Equity (TE), Loans (LN), and Deposits (DP), all measured as dollar amounts and considered as independent variables. Non-Performing Loans (NPLs) reflect the quality of the bank's loan portfolio and its risk management effectiveness (Alvarez & Marsal, 2020). Total Assets (TA) indicate the overall resources owned by the bank, demonstrating its size and capacity to generate income (Baker & Powell, 2012). Total Equity (TE) represents the bank's net worth and its ability to absorb losses, showcasing financial stability (Fabozzi, 2020). Loans (LN) measure the total amount of money lent out by the bank, highlighting its lending activity and growth potential (Hubbard, 2018). Deposits (DP) signify the total value of customer deposits held by the bank, indicating its liquidity and funding capacity (Koch & MacDonald, 2014). Together, these variables are analyzed to understand their influence on the financial performance of commercial banks, as measured by their Net Income (NI). The assumption of normality for the regression analysis is justified by the Central Limit Theory, which states that the sampling distribution of the sample mean will be approximately

normal if the sample size is sufficiently large ( $n \geq 30$ ). Given that this study involves data from 58 commercial banks, the sample size is considered adequate to satisfy the normality assumption (Gravetter & Wallnau, 2016).

### 3.3 Model specification

The study "Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis" aims to identify and analyze the key financial metrics—Non-Performing Loans (NPLs), Total Assets (TA), Total Equity (TE), Loans (LN), and Deposits (DP)—that impact the Net Income (NI) of commercial banks in Cambodia. This study employs a multiple regression model in cross-sectional data analysis. This approach provides several methodological advantages. It captures a snapshot of financial metrics at a specific point in time, allowing for a clear understanding of the relationships between variables (Bryman & Bell, 2015). The efficiency of collecting and analyzing data once offers a comprehensive view of the current state of variables (Creswell, 2014). Additionally, cross-sectional data enables comparisons among different entities, such as various commercial banks, simultaneously, helping to identify patterns and differences (Saunders, Lewis, & Thornhill, 2019). Moreover, it is particularly effective for testing hypotheses and exploring potential causal relationships between variables due to the detailed nature of the data collected at one point in time (Sekaran & Bougie, 2016). Equation (1) represents the impact of financial metrics on the performance of commercial banks in Cambodia. The model for this work is as follows:

$$NI_i = \beta_0 + \beta_1 NPLS_i + \beta_2 TA_i + \beta_3 TE_i + \beta_4 LN_i + \beta_5 DP_i + \epsilon_i \quad (1)$$

In the model,  $NI_i$  represents the Net Income of bank  $i$ , while  $\beta_0$  is the intercept. The coefficients for the respective financial metrics are  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ . Specifically,  $NPLS_i$  denotes the Non-Performing Loans of bank  $i$ ,  $TA_i$  signifies the Total Assets of bank  $i$ ,  $TE_i$  stands for the Total Equity of bank  $i$ ,  $LN_i$  indicates the Loans of bank  $i$ , and  $DP_i$  represents the Deposits of bank  $i$ . The error term for bank  $i$  is denoted by  $\epsilon_i$ . To validate the accuracy of the cross-sectional data regression models used in this study, several diagnostic tests are conducted. These include tests for heteroskedasticity, such as the Breusch-Pagan test, to detect unequal error variances (Gleason, 2020). Multicollinearity is examined using variance inflation factors (VIF) (Field, 2018), while specification tests like the RESET test verify the model's functional form (Wooldridge, 2016). These diagnostics ensure the reliability and integrity of the regression models' results in analyzing how financial metrics affect the performance of commercial banks in Cambodia. STATA 15.0 software is used for these analyses (StataCorp, 2017).

## 4. RESULT AND DISCUSSION

This section presents the findings from the analysis of determinants affecting commercial bank performance in Cambodia, focusing on several critical areas. The discussion begins with descriptive statistics, providing an overview of key financial metrics such as mean, median, standard deviation, maximum, and minimum values to highlight central tendencies and variability within the data. This is followed by the results of multicollinearity tests, which are essential for verifying the reliability of the regression models used. Next, the model estimation process is detailed, demonstrating how these financial metrics are applied to assess their impact on bank performance. The section concludes with an evaluation of model diagnostic tests, which assess the robustness and validity of the analysis. This comprehensive approach offers a thorough understanding of the factors influencing commercial bank performance and the overall financial health of Cambodia's banking sector.

### 4.1 Descriptive statistics

Descriptive statistics provide a summary of the dataset's key features, including central tendencies and variability. This section presents measures such as the mean, median, standard deviation, maximum, and minimum values in billion USD to offer a clear overview of the financial metrics related to commercial bank performance in Cambodia.

**Table 1-** Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NI	59	8.30	35.50	-83.56	186.44

LN	59	875.91	1510.46	0	7738.62
NPLs	59	46.62	81.09	0	393.26
DP	59	780.325	1620.31	0	9026.31
TA	59	1304.067	2179.53	0	11498.15
TE	59	242.67	327.90	0	1688.79

#### 4.2 Multicollinearity test

In regression analysis, multicollinearity refers to the situation where independent variables are highly correlated with each other, leading to unreliable estimates of regression coefficients (Hair et al., 2014). To address this issue, the Variance Inflation Factor (VIF) is used as a diagnostic tool. VIF quantifies how much the variance of a regression coefficient is inflated due to multicollinearity. A high VIF value indicates a high degree of multicollinearity, suggesting that the corresponding independent variable may be redundant (Kennedy, 2008). This section details the application of VIF to assess and mitigate multicollinearity, ensuring the reliability and accuracy of the regression model.

The threshold values for interpreting Variance Inflation Factor (VIF) are commonly used as follows: a VIF of 1 indicates no correlation among the predictor variable and the other variables; a VIF between 1 and 10 indicates moderate correlation but may not be problematic; and a VIF greater than 10 signals high correlation, indicating significant multicollinearity (Hair et al., 2010).

Based on the results in Table 2, the VIF values indicate substantial multicollinearity issues. Total Assets (TA) has a VIF of 220.68, Loans has a VIF of 65.87, Deposits (DP) has a VIF of 62.81, and Total Equity (TE) has a VIF of

Variable	VIF	1/VIF
LN	65.87	0.015182
NPLs	7.74	0.129127
DP	62.81	0.015921
TA	220.68	0.004531
TE	22.85	0.043759
Mean VIF	75.99	

22.85, all of which are significantly above the threshold of 10, indicating extreme multicollinearity. Non-Performing Loans (NPLs) has a VIF of 7.74, which is below the threshold of 10 but still suggests problematic multicollinearity. This situation underscores the need for regularization techniques, such as Ridge Regression or Lasso Regression, to manage multicollinearity and enhance the stability and reliability of the regression model (Lantz, 2019).

**Table 2-**Multicollinearity Test

#### 4.3 Model estimation

Robust regression is a technique used to estimate regression models, particularly when dealing with multicollinearity issues among predictor variables. This approach ensures that the model remains stable and accurate by mitigating the influence of collinear variables, thereby enhancing the overall robustness of the analysis.

**Table 3-**Model Estimation using Robust Regression

Variable	Coef.	Std. Err.	P-value	90% Conf. Interval
NPLs	-0.40	0.049	0.000*	-0.49 to -0.32
TA	-0.02	0.009	0.093***	-0.03 to -0.01
TE	0.07	0.019	0.000*	0.04 to 0.11
DP	0.02	0.007	0.001*	0.01 to 0.04
LN	0.02	0.009	0.053***	0.01 to 0.04
Constant	-5.47	1.974	0.008*	-8.77 to -2.16

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

Based on the results in Table 3, the regression coefficients indicate several important relationships. A one-dollar increase in Non-Performing Loans (NPLs) is associated with a decrease in Net Income by approximately \$0.40, holding other factors constant. This relationship is statistically significant ( $p < 0.001$ ), with a 90% confidence interval of  $-\$0.49$  to  $-\$0.32$ . Therefore, Hypothesis 1: There is a statistically significant impact of Non-Performing Loans (NPLs) on the Net Income of commercial banks in Cambodia is confirmed.

An increase of one dollar in Total Assets (TA) is associated with a decrease in Net Income by about \$0.02, with other factors held constant. This effect is marginally significant ( $p = 0.093$ ) and is reflected in a 90% confidence interval of  $-\$0.03$  to  $-\$0.01$ . Thus, Hypothesis 2: There is a statistically significant impact of Total Assets on the Net Income of commercial banks in Cambodia is marginally verified.

In the case of Total Equity (TE), a one-dollar increase is associated with an increase in Net Income by approximately \$0.07, with other factors held constant. This relationship is statistically significant ( $p < 0.001$ ), with a 90% confidence interval of  $\$0.04$  to  $\$0.11$ . This confirms Hypothesis 3: There is a statistically significant impact of Total Equity on the Net Income of commercial banks in Cambodia.

Furthermore, an increase of one dollar in Deposits (DP) is linked to an increase in Net Income by around \$0.02, while other factors remain constant. This finding is statistically significant ( $p = 0.001$ ) and is accompanied by a 90% confidence interval of  $\$0.01$  to  $\$0.04$ . This confirms Hypothesis 5: There is a statistically significant impact of Deposits on the Net Income of commercial banks in Cambodia.

Lastly, an increase of one dollar in Loans results in an increase in Net Income by roughly \$0.02, when other variables are controlled. This effect is marginally significant ( $p = 0.053$ ) and falls within a 90% confidence interval of less than  $\$0.01$  to  $\$0.04$ . Thus, Hypothesis 4: There is a statistically significant impact of Loans on the Net Income of commercial banks in Cambodia is marginally confirmed.

The constant term is statistically significant ( $p = 0.008$ ), with a 90% confidence interval of  $-\$8.77$  to  $-\$2.16$ , indicating that when all predictors are zero, the Net Income would be  $-\$5.47$ . Overall, these results substantiate the significant impacts of Non-Performing Loans, Total Equity, and Deposits on Net Income, while the effects of Total Assets and Loans are marginally significant, providing partial support for the stated hypotheses. These interpretations provide insights into the impact of each financial metric on the performance of commercial banks in Cambodia, highlighting both the magnitude and direction of their effects.

#### 4.4 Model diagnostic test

Model diagnostic tests are essential for validating the assumptions of regression models and ensuring the robustness of the results. Testing for heteroskedasticity is crucial because it identifies if the variance of residuals varies with the independent variables, which can affect the efficiency of the estimates. The Breusch-Pagan test (Breusch & Pagan, 1979) is commonly used for this purpose; it involves regressing the squared residuals on the independent variables to detect any systematic variance.

Additionally, the Ramsey RESET test (Ramsey, 1969) is employed to check for model specification errors, such as omitted variables or incorrect functional forms. This test involves adding powers of the fitted values to the model and assessing whether these additions significantly improve the model, helping to verify the model's validity and correctness.

**Tabel 4**-Diagnostic Tests in Regression Analysis

Type of Diagnostic	Null Hypothesis	P-Value
Heteroskedasticity Test: Breusch-Pagan-Godfrey	H0: Constant variance	0.1203
Ramsey RESET Test	H0: Model has no omitted variables	0.3505

## 5. CONCLUSION AND RECOMMENDATIONS

The study "Determinants of Commercial Bank Performance in Cambodia: A Financial Metrics Analysis" successfully identifies and analyzes key financial metrics affecting the performance of commercial banks in Cambodia. The findings reveal that a one-dollar increase in Non-Performing Loans (NPLs) results in a decrease in Net Income by approximately \$0.40, a statistically significant relationship ( $p < 0.001$ ) with a 90% confidence interval of  $-\$0.49$  to  $-\$0.32$ . This negative impact of NPLs on profitability is consistent with previous literature, which highlights the detrimental effects of high NPL levels on asset quality and financial stability (Louzis, Vouldis, & Metaxas, 2012; Ghosh, 2015; Makri, Tsagkanos, & Bellas, 2014). Effective management of NPLs is crucial for improving the financial health of banks in Cambodia.

Conversely, an increase of one dollar in Total Assets (TA) is associated with a decrease in Net Income by about \$0.02, with marginal significance ( $p = 0.093$ ) and a 90% confidence interval of  $-\$0.03$  to  $-\$0.01$ . While larger banks often benefit from economies of scale, as noted by Pasiouras and Kosmidou (2007), the negative impact observed in this study suggests that the complexity associated with larger asset bases may offset potential profitability gains (Staikouras & Wood, 2011; Athanasoglou, Brissimis, & Delis, 2008). Banks should focus on managing asset growth carefully to avoid inefficiencies.

The study also finds that a one-dollar increase in Total Equity (TE) leads to a \$0.07 increase in Net Income, with statistical significance ( $p < 0.001$ ) and a 90% confidence interval of \$0.04 to \$0.11. This positive relationship underscores the importance of capital adequacy in enhancing bank performance, aligning with Berger and Bouwman (2013) and Dietrich and Wanzenried (2011). Maintaining robust capital levels is essential for banks to absorb losses and support sustainable growth.

Additionally, a one-dollar increase in Deposits (DP) results in an increase in Net Income by approximately \$0.02, with statistical significance ( $p = 0.001$ ) and a 90% confidence interval of \$0.01 to \$0.04. This finding highlights the critical role of deposits in enhancing bank profitability, supported by the Basel Committee on Banking Supervision (2014), Sufian and Habibullah (2010), and Molyneux and Thornton (1992). A strong deposit base is vital for operational stability and income generation.

Finally, an increase of one dollar in Loans results in an increase in Net Income by about \$0.02, with marginal significance ( $p = 0.053$ ) and a 90% confidence interval of less than \$0.01 to \$0.04. This suggests that while loan growth can positively impact profitability, the effect is on the threshold of statistical significance. Effective risk management is crucial, as noted by Abreu and Mendes (2002) and Tan and Floros (2012), to balance loan growth with profitability.

Based on the study's findings, several recommendations can be made to improve the financial performance of commercial banks in Cambodia. First, it is crucial to enhance the management of Non-Performing Loans (NPLs) to mitigate their negative impact on profitability. Implementing effective strategies to reduce NPL levels will improve asset quality and reduce financial distress. Second, banks should carefully manage their asset growth to avoid inefficiencies that may offset potential profitability gains. Balancing asset expansion with operational effectiveness is essential to maintain financial stability. Third, maintaining robust capital reserves is critical for enhancing bank performance. Strengthening capital adequacy will provide a crucial buffer against potential losses and support sustainable growth. Fourth, banks should focus on building and maintaining a strong deposit base, as deposits play a vital role in improving liquidity and profitability. Finally, effective risk management practices are necessary to ensure that loan growth contributes positively to profitability. By managing loan risks carefully, banks can enhance their financial performance while avoiding adverse outcomes associated with excessive credit risk. Implementing these recommendations will help commercial banks in Cambodia achieve better financial health and performance.

## 6. REFERENCES

- [1]. Abreu, M., & Mendes, V. (2002). Commercial bank interest margins and profitability: Evidence for some EU countries. Paper presented at the Proceedings of the Pan-European Conference Jointly organized by the IEFs-UK & University of Macedonia Economic & Social Sciences, Thessaloniki, Greece.



- [2]. Association of Banks in Cambodia. (2023). Annual report 2023. Retrieved from [www.abc.org.kh](http://www.abc.org.kh)
- [3]. Alvarez, P., & Marsal, R. (2020). Bank performance and risk management. Palgrave Macmillan.
- [4]. Alvarez & Marsal. (2020). The impact of non-performing loans on bank performance. Financial Times.
- [5]. Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136.
- [6]. Baker, H. K., & Powell, G. E. (2012). *Understanding financial management: A practical guide*. Wiley.
- [7]. Basel Committee on Banking Supervision. (2014). Basel III: The net stable funding ratio. Bank for International Settlements. <https://www.bis.org/bcbs/publ/d295.pdf>
- [8]. Berger, A. N., & Udell, M. (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, 109(1), 146-176. <https://doi.org/10.1016/j.jfineco.2013.02.008>
- [9]. Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices* (2nd ed.). Textbooks Collection. Book 3.
- [10]. Bryman, A., & Burgess, P. (2015). *Business research methods* (4th ed.). Oxford University Press.
- [11]. Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approach* (4th ed.). SAGE Publications.
- [12]. Breusch, T. S., & Pagan, A. R. (1979). A simple test for heteroskedasticity and random coefficient variation. *Econometrica: Journal of the Econometric Society*, 47(5), 1287-1294. <https://doi.org/10.2307/1911963>
- [13]. Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, 21(3), 307-327.
- [14]. Fabozzi, F. J. (2020). *Handbook of financial instruments*. Wiley.
- [15]. Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). Sage Publications.
- [16]. Ghosh, A. (2015). Banking-industry specific and regional economic determinants of non-performing loans: Evidence from US states. *Journal of Financial Stability*, 20, 93-104.
- [17]. Gleason, C. A. (2020). Practical considerations in conducting heteroskedasticity tests. *Journal of Empirical Finance*, 58, 123-138.
- [18]. Gravetter, F. J., & Wallnau, L. B. (2016). *Statistics for the Behavioral Sciences* (10th ed.). Cengage Learning.
- [19]. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
- [20]. Hubbard, R. G. (2018). *Money, the financial system, and the economy* (8th ed.). Pearson.
- [21]. Kennedy, P. (2008). *A guide to econometrics* (6th ed.). Wiley.
- [22]. Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance*, 34(3), 146-159.
- [23]. Koch, T. W., & MacDonald, S. S. (2014). *Bank management* (8th ed.). Cengage Learning.
- [24]. Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (5th ed.). SAGE Publications.
- [25]. Lantz, B. (2019). *Machine Learning with R: Expert techniques for predictive modeling* (3rd ed.). Packt Publishing.
- [26]. Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-Based Dentistry*, 7(1), 24-25. doi:10.1038/sj.ebd.6400375
- [27]. Louzis, D. P., Vouldis, A. T., & Metaxas, V. L. (2012). Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance*, 36(4), 1012-1027. <https://doi.org/10.1016/j.jbankfin.2011.10.012>
- [28]. Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus*, 61(2), 193-206.
- [29]. Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal of Banking & Finance*, 16(6), 1173-1178.
- [30]. National Bank of Cambodia. (2023). annual report 2023. Retrieved from <https://www.nbc.org.kh>
- [31]. Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21(2), 222-237. <https://doi.org/10.1016/j.ribaf.2006.03.007>
- [32]. Ramsey, J. B. (1969). Tests for specification errors in classical linear least squares regression analysis. *Journal of the Royal Statistical Society: Series B (Methodological)*, 31(2), 350-371. <https://doi.org/10.1111/j.2517-6161.1969.tb00727.x>
- [33]. Staikouras, C., & Wood, G. (2011). The determinants of European bank profitability. *International Business & Economics Research Journal*, 3(6), 57-68.

- [32]. Sufian, F., & Habibullah, M. S. (2010). Assessing the impact of financial crisis on bank performance: Empirical evidence from Indonesia. *ASEAN Economic Bulletin*, 27(3), 245-262.
- Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.
- [33]. Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley.
- [34]. StataCorp. (2017). *Stata Statistical Software: Release 15*. College Station, TX: StataCorp LLC.
- [35]. Tan, Y., & Floros, C. (2012). Bank profitability and GDP growth in China: A note. *Journal of Chinese Economic and Business Studies*, 10(3), 267-273.
- [36]. Wooldridge, J. M. (2016). *Introductory Econometrics: A Modern Approach* (6th ed.). Cengage Learning.
- [37]. World Bank. (2023). *Cambodia economic update: Growth, prospects, and challenges*. Retrieved from <https://www.worldbank.org/en/country/cambodia/publication/economic-update>

