Research Article

# Determinants of Bank Profitability in the Lao PDR

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## ABSTRACT

The financial sector serves as a cornerstone in sculpting the economic terrain of nations. Effective performance within the banking sector can catalyze economic growth. This study delves into the determinants of bank profitability in the Lao PDR, scrutinizing both bank-specific attributes and macroeconomic variables. Drawing from unbalanced panel data spanning ten years (2012–2021) from 35 banks in Laos, the analysis employs a random effects approach to estimate the relationship. Findings indicate that certain macroeconomic factors such as the policy rate, alongside bank-specific variables including size and organizational structure (CEO), positively impact the profitability of Lao banks. Conversely, factors such as capital adequacy, credit risk, liquidity, operating expenses, and technological aspects significantly negatively influence bank profitability. This study represents one of the earliest investigations into the determinants of bank profitability in Laos, contributing valuable insights to both theoretical literature and practical industry applications. By shedding light on these critical factors, policymakers and stakeholders are empowered to enhance the performance of Lao commercial banks, thereby fostering economic growth and stability.

**Keywords:** Bank Profitability, Commercial Bank, Lao PDR

# INTRODUCTION

Commercial banks are pivotal in driving economic growth by providing capital to businesses and individuals. As they generate profit, they can extend more loans, thereby stimulating economic expansion. Effective regulatory policies are crucial for ensuring the continued support of economic growth by commercial banks. Moreover, commercial banks themselves must understand the factors driving profitability and formulate strategies to enhance revenues and sustain growth.

In the context of Laos, the banking system follows a two-tier structure with the Bank of the Lao PDR (BOL) acting as the central bank and commercial banks providing financial services to individuals and businesses. The commercial banking sector itself is relatively diverse, comprising state-owned commercial banks, specialized banks, joint venture banks, private banks, foreign subsidiary banks, and foreign bank branches. These banks have played a significant role in the economy, as seen by the ratio of commercial banks' deposits to gross domestic product (GDP), which has steadily increased from 44.86% in 2012 to 69.27% in 2021, indicating their significant role in capital accumulation and economic growth. Similarly, the ratio of loans to GDP has shown a consistent upward trend during the same period, rising from 36.18% to 47.19%, underscoring the vital contribution of commercial banks to stimulating economic activity.

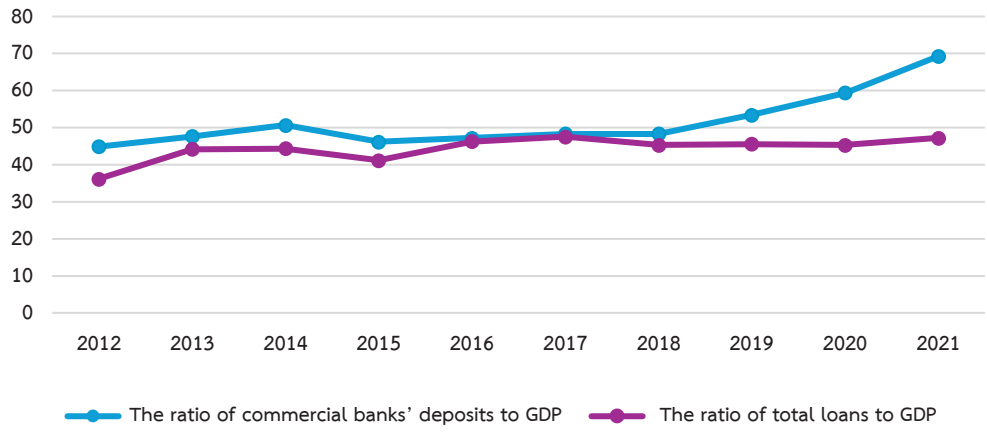


**Figure 1**: The Role of Commercial Banks in Lao Economic form 2012–2021.

**Source**: Bank of The Lao PDR

Regulators play a vital role in promoting a healthy banking sector by formulating policies that ensure adequate capital buffers and effective management practices. Commercial banks must also take proactive measures to improve profitability by understanding the determinants of bank profitability and implementing strategies to boost revenues.

Numerous studies have investigated the determinants of commercial bank profitability globally (Molyneux & Thornton, 1992; Sufian & Habibullah, 2009; Dietrich & Wanzenried, 2011; Saona, 2011;

Roman & Danuletiu, 2013; Lu & Yin, 2013; Thota, 2013; Petria *et al*, 2015 and Li, 2017), none of them analyze the profitability of banking sector in Lao PDR. This presents intriguing questions for the Laos context, such as the influence of bank-specific characteristics and macroeconomic factors on commercial bank profitability, as well as the impact of central bank policies.

Therefore, the objectives of this study are to analyze the factors determining bank profitability in Laos, addressing questions such as the influence of bank-specific characteristics, macroeconomic determinants, and the implementation of central bank policy on commercial bank profitability.

## LITERATURE REVIEWS

Determinants of profitability of commercial banks in Lao PDR can be explained by two components: One component concerns the macroeconomic factors which are, as external factors, not under the control of bank management, but reflect the economy of the country that influence the performance of financial institutions, which consist of growth rate of gross domestic product, inflation rate, central bank policy, and government policy. The other component concerns specific characteristics of banks, which are internal factors reflecting the Bank's performance, including Bank size, management efficiency, capital adequacy, credit risk, and liquidity.

The GDP significantly influences the operations of commercial banks, as it reflects the overall economic activity within a country. A surge in GDP can indirectly spur the demand for loans from the public, prompting banks to extend more credit. Consequently, banks can augment their income through increased interest charges. Sufian and Habibullah (2009) examined factors affecting the profitability of financial institutions in Bangladesh, highlighting how robust economic growth incentivizes banks to expand lending, elevate interest rates, and amplify asset volumes, thereby impacting profitability positively. Similarly, Roman and Danuletiu (2013) scrutinized bank profitability in Romania spanning 2003 to 2011, affirming the significant influence of economic growth rates on bank profitability. Based on this backdrop, this study posits the following hypothesis:

H1: GDP exhibits a positive correlation with commercial bank profitability in Laos.

The inflation rate significantly influences interest rates, thereby exerting a notable impact on bank profitability. Elevated inflation rates tend to coincide with higher loan interest rates, consequently bolstering bank profitability. Studies by Wallich (1980) and Tan and Floros (2012) underscore how heightened inflation rates correlate with enhanced bank profitability. Moreover, Ramadan *et al*., (2011) delve into the interplay between Jordanian bank profitability and various internal and external factors, revealing a positive association between inflation and return on assets and return on equity. Drawing from these insights, the following hypothesis is posited:

H2: The inflation rate exhibits a positive correlation with commercial bank profitability in Laos.

Central Bank Policy measures introduced by the Bank of Lao PDR in 2015 serve as reference interest rates for commercial banks, influencing the determination of interest rates for loans. Theoretically, these policy rate measures may exert a negative impact on commercial bank lending. Studies such as those by Cargill and Mayer (2006), examining the effect of central bank policy on bank lending in the U.S., indicate that banks tend to reduce their earning assets in response. Similarly, Lathaporn and Ananchotikul (2018) investigated the effects of central bank policy on bank profitability in Thailand from 2004 to 2017, noting that lower interest rates tend to diminish profitability, particularly for smaller banks. This effect primarily operates through the influence of interest rates on bank net interest income. Building on these findings, the following hypothesis is formulated:

H3: Central bank policy exhibits a negative correlation with commercial bank profitability in Laos.

The COVID-19 pandemic, with its associated lockdown measures announced by the Lao government in 2020, disrupted normal business operations and led to decreased incomes, impacting loan repayments to banks. Previous studies such as that by Gazi *et al*., (2022) focusing on the impact of COVID-19 on the financial performance and profitability of private commercial banks in Bangladesh, found an increase in non-performing loans during the pandemic outbreak, which consequently decreased bank profitability. Similarly, Elnahass and Li (2021) examined the effects of COVID-19 on financial performance and stability across 1090 banks from 116 countries, spanning the first quarter of 2019 to the second quarter of 2020. Their findings revealed a significant reduction in bank profitability, cost efficiency, financial stability, and stock market valuations during the COVID-19 crisis. These results align with Haider and Mohammad (2022) investigation into the effect of COVID-19 on bank profitability determinants in developed and developing economies. Based on this body of research, the following hypothesis is proposed:

H4: The government policy during the COVID-19 pandemic exhibits a negative correlation with commercial bank profitability in Laos.

Bank size, measured by the natural logarithm of total assets, serves as a proxy for examining the factors influencing commercial bank profitability. Several authors including (Lu & Yin, 2013; Gremi, 2013; Ul Mustafa & Younis, 2012; Li, 2017) have found a positive relationship between bank size and profitability. Larger banks, they argue, benefit from greater product and loan variety, reducing risk and capitalizing on economies of scale, thereby enhancing operational efficiency and profitability. Conversely, Syafri (2012) suggests a negative impact of bank size on profitability, attributing it to diseconomies of scale as banks grow larger, leading to increased management challenges and bureaucratic hurdles that undermine profitability. Theoretically, sizable banks may achieve economies of scale, reducing average costs and boosting profits. Thus, this study posits the following hypothesis:

H5: Bank size exhibits a positive/negative correlation with commercial bank profitability in Laos.

Capital adequacy, a crucial measure for assessing a bank's overall soundness, can significantly impact a commercial bank's earnings. High levels of capitalization, as recognized by international prudential regulations, may lead to lower funding costs for banks, thereby increasing profitability. Dhouibi (2016) found in their investigation of bank transparency and capital adequacy ratio in Tunisia that maintaining high levels of capital adequacy positively influences a bank's profitability and operating efficiency, while low capital levels may have negative effects. Similarly, Masood and Ashraf (2012) concluded that capital sufficiency, loans to assets, and asset management outcomes are positively associated with return on assets and return on equity, crucial for the profitability of Islamic banks, based on data analysis from 25 banks across 12 countries. However, conflicting findings exist, as evidenced by studies such as those by Saona (2011) and Qin and Pastory (2012), which suggest a negative relationship between capital and bank profitability. Thus, this study proposes the following hypothesis:

H6: Capital adequacy exhibits a positive/negative correlation with commercial bank profitability in Laos.

Operating cost efficiency, represented by the operating costs to income ratio, encompasses administrative expenses, employee wages, and property expenditures, excluding losses from bad and non-performing loans over total generated revenues Dietrich and Wanzenried (2009). Scholars often employ operating cost ratios as proxies to gauge the profitability of commercial banks, as efficient expense management is vital for enhancing profitability. Bansal *et al*., (2018) found that a higher costs-to-income ratio reduced the profitability of private banks in India. Similarly, Kosmidou (2008) examined Greek banks' profitability during the period of EU financial regulations from 1990 to 2002, concluding that expense management ratios had a significant negative impact on profitability. Ali *et al*., (2011) supported this finding in the context of Pakistani commercial banks, while Weerasinghe and Perera (2013) and Sufian and Habibullah (2009) observed a negative impact of operational costs on the profitability of commercial banks in Sri Lanka.

Swarnapali (2014) also noted a negative relationship between operating expenses and bank profitability in Sri Lanka from 2009 to 2012. However, Tan and Floros (2012) discovered a positive relationship between bank profitability and cost-effectiveness for city commercial and joint banks in China from 2003 to 2009. Similarly, AL-Omar and AL-Mutairi (2008), analyzing the operational costs to total assets ratio of Kuwaiti commercial banks from 1993 to 2005, suggested that operating expenses substantially influenced profitability. Theoretically, a higher cost-to-income ratio may reduce bank profitability. Thus, this study posits the following hypothesis:

H7: Operating cost efficiency exhibits a negative correlation with commercial bank profitability in Laos.

Credit risk, measured by the proportion of non-performing loans (NPLs), represents a significant factor impacting a bank's profitability. Non-performing loans occur when planned loan repayments are more than 90 days late, ceasing to generate interest income for the bank Rose and Hudgins (2013). Loan loss provisions act as buffers to safeguard a bank's capital, protecting against potential losses from poor loans Golin and Delhaise (2013). However, excessive loan loss provisions can diminish a bank's profit-making capacity by reducing revenue.

Previous studies, such as those by (Molyneux & Thornton, 1992; Athanasoglou *et al*., 2005; Gremi, 2013), have revealed a negative impact of credit risk on bank profitability. They found that larger loan loss provisions are required for riskier loans, limiting profit generation. Kosmidou *et al*., (2007) demonstrated similar detrimental effects on United Kingdom commercial banks, while Sufian and Noor Mohamad (2012) and Petria *et al*., (2015) identified negative impacts of non-performing loans on the profitability of the Korean banking sector and other contexts. However, Ali *et al*., (2011) found a positive impact on the profitability of commercial banks in Pakistan, presenting a conflicting viewpoint. Considering these findings, this study hypothesizes the following:

H8: Credit risk exhibits a positive/negative correlation with commercial bank profitability in Laos.

Liquidity, measured by the ratio of liquid assets to short-term liabilities, is a critical factor in assessing the impact of liquidity risk on bank profitability. Low liquidity ratios, as evidenced during financial crises, can precipitate bankruptcies, while higher liquidity ratios often yield lower rates of return. Bansal *et al*., (2018) utilized the quick ratio as a measure of profitability and found that it enhanced the profitability of 39 public and private banks, indicating a negative relationship between liquid assets and bank profitability. Similarly, Petria *et al*., (2015) concluded that liquidity risk negatively affects EU banks. Contrastingly, Thota (2013) and Sufian and Mohamad (2012) revealed a positive impact of liquidity on the profitability of Sri Lankan and Pakistani commercial banks during the periods of 1997 to 2008, respectively, attributing it to performance liquidity ratios. This diverse literature has led to the development of the following hypothesis:

H9: Liquidity exhibits a positive/negative correlation with commercial bank profitability in Laos.

Organizational structure, particularly the presence of executives with international experience, plays a vital role in enhancing a company's global competitiveness. CEOs with diverse backgrounds, especially in terms of nationality, bring valuable insights and skills that can help organizations navigate international markets effectively (Bass *et al*., 1999; Sanders & Carpenter 1998; Oxelheim *et al*., 2013; Sanda *et al*., 2008). As globalization progresses, companies are increasingly diversifying their management teams by including more foreign executives in top positions, which can lead to broader market insights and improved international expansion strategies (Carter, 2003; Hillman & Dalziel, 2003; Pfeffer, 2015; Abu *et al*., 2016; Scheppink, 2018).

Previous research has shown a positive correlation between the presence of foreign executives and organizations' financial performance in various countries (Masulis, 2012; Rose, 2016; Ware, 2016; Rahman, 2018; Overveld, 2012; Abu *et al*., 2016; Choi J. J., Park & Yoo, 2007; Karani, 2015; Rosenstein & Wyatt, 1997; Carter, 2003; Oxelheim *et al*., 2013). However, foreign executives may face challenges such as minimal engagement, weak monitoring functions, linguistic barriers, and limited familiarity with local culture, markets, and economies, particularly in developing countries like Laos. In such contexts, the influence of foreign executives on bank performance may not be as pronounced. Therefore, this study aims to explore the relationship between organizational structure, including the presence of foreign executives, and commercial bank profitability in Laos.

H10: Organization structure exhibits a positive correlation with commercial bank profitability in Laos.

Technology, as measured by commercial banks has its application. In the Lao context, there are a total of 11 commercial banks that have their applications that provide payment for goods and services, including Banque Pour Le Commerce Exterieur Lao Public, BIC Bank Lao Co., ltd, Joint Development Bank, Lao-Viet Bank CO., ltd, Indochina Bank ltd, MARUHAN Japan Bank Lao Co.,ltd, Military Commercial Joint Stock Bank - Lao Branch, Kasikornthai Bank Sole Limited, Acleda Bank Lao.,ltd, Phongsavanh Bank Ltd, and VietinBank Lao Limited. Technological-based products provide significant advantages to the banks Zhang and Zhu (2018). Previous studies found that (Zengin & Yuksel, 2016; Tunay & Akhusar, 2015) the bank may see cost benefits, higher profitability, and reduced risks compared to traditional banking products due to when there are enough consumers to support the demand for technology-based goods, the return times on bank investments in this sector are significantly quicker. The results of applied research conducted in several nations show that banks function better when using electronic banking services. However, it is also observed that the anticipated outcomes are not accessible due to the propensity of clients to conventional branch-based banking, since several poor and developing nations are unable to invest in necessary infrastructure (Long & Tuyen, 2017; Yukel & Emir, 2017). Based on the above literature has led the authors to develop the following hypothesis:

H11: Technology has a positive relationship with commercial bank profitability in Laos.

Profitability in commercial banking can be assessed through three key variables: return on assets (ROA), return on equity (ROE), and net interest margin over total assets (NIM). ROA measures the efficiency with which a bank utilizes its assets to generate income, calculated as the ratio of net income to total assets. It provides insight into the effectiveness of asset management in generating earnings (Jahan, 2012; Golin & Delhaise, 2013). ROE, on the other hand, represents the return on equity capital, indicating the profitability of shareholders' investments. While commonly used, some studies suggest that ROE may not always accurately reflect a bank's profitability due to its reliance on equity capital Dietrich and Wanzenried (2009). Lastly, NIM measures the difference between interest received and

interest paid by a bank relative to its total assets. This ratio, also known as net interest margin over total assets, illustrates the revenue generated from interest-related activities, providing insight into a bank's interest rate spread Dietrich and Wanzenried (2009).

Understanding these measures of profitability is essential for assessing a bank's financial performance and operational efficiency. Each metric offers unique insights into different aspects of a bank's profitability, enabling stakeholders to make informed decisions regarding investment and management strategies.

# METHODOLOGY AND DATA

This study employs unbalanced panel data from 2012 to 2021 from 35 commercial banks in Laos to investigate the determinants of commercial bank profitability. Analyzing a comprehensive range of banks provides a more holistic view of the banking sector in Laos. This inclusive approach allows us to capture the diverse characteristics and operational scopes of the different types of banks, leading to a more robust and generalizable analysis. The annual financial data of all commercial banks were extracted from the respective bank's income statement and balance sheets which were downloaded from the commercial bank's official website. Moreover, The World Bank website and the Bank of Lao PDR website were used to gather the macroeconomic data, which includes Lao's GDP, central bank policy, and covid-19.

## Regression Model

A baseline regression model is developed to investigate the determinants of commercial bank profitability in Laos.

$$\text{Bank Profitability}_{it} = \beta_0 + \beta_1 \text{Log(TA)}_{it} + \beta_2 \text{OPR}_{it} + \beta_3 \text{CAR}_{it} + \beta_4 \text{NPL}_{it} + \beta_5 \text{LIQ}_{it} + \beta_6 \text{TECH}_{it} + \beta_7 \text{CEO}_{it} + \beta_8 \text{GDP}_t + \beta_9 \text{INF}_t + \beta_{10} \text{PR}_t + \beta_{11} \text{COVID-19}_t + \varepsilon_t$$

$\text{Bank Profitability}_{it}$ : Return on asset (ROA), return on equity (ROE) and Net Interest Margin (NIM) of bank i at time t.

$\text{Log(TA}_{it})$ : The logarithm of total assets of bank i at time t.

$\text{OPR}_{it}$ : Operating cost of bank i at time t.

$\text{CAR}_{it}$ : Capital of bank i at time t.

$\text{NPL}_{it}$ : Non-performing loan of bank i at time t.

$\text{LIQ}_{it}$ : Total liquid assets of bank i at time t.

$\text{TECH}_{it}$ : Dummy for bank has application at year t, where 1 and 0 for bank do not any application.

$CEO_{it}$ : Dummy for foreigner CEO at year t, where 1 and 0 Lao CEO

$GDP_t$ : Annual growth rate of Lao Gross Domestic Product at time t.

$INF_t$ : The annual average inflation rate at time t.

$PR_t$ : Dummy for policy rate measures 2015 at year t, where 1 for the period of 2015–2021 and 0 for the period of 2012–2014

$COVID\text{-}19_t$ : Dummy for government policy announced to lockdown in 2021, where 1 in 2021 and 0 for the period of 2012–2020

$\varepsilon_t$ : The error term of regression.

**Table 1**: Summary of Variables

| Variables | Symbol | Measurement of Variables | Expected sign |
|---|---|---|---|
| **Dependent Variable** | | | |
| Profitability | ROA | Net profit after tax divided by total assets | |
| | ROE | Net profit after tax divided by shareholders' equity | |
| | NIM | Difference between interest earned and interest expended by a bank divided by its total assets | |
| **Independent Variable** | | | |
| Bank Specific Characteristic | | | |
| Bank Size | TA | Natural logarithm of total assets | +/– |
| Operating cost efficiency | OPR | Operating cost of bank divined by total income | – |
| Capital Adequacy | CAR | Shareholders' equity divided by total assets | +/– |
| Credit Risk | NPL | Ratio of non-performing loans to total loans | +/– |
| Liquidity | LIQ | Ratio of Liquidity to total assets | +/– |
| Technology | TECH | Dummy for bank has application, where 1 and 0 for bank do not any application | + |
| Organization structure | CEO | Dummy foreign CEO at year t, where 1 and 0 Lao CEO | + |
| Macroeconomic factors | | | |
| Gross Domestic Product | GDP | The annual growth of Lao gross domestic products | + |
| Inflation | INF | The annual average inflation rate | + |

**Table 1**: Summary of Variables (Cont.)

| Variables | Symbol | Measurement of Variables | Expected sign |
|---|---|---|---|
| Central bank policy | PR | Dummy for policy rate measures 2015, where 1 for the period of 2015–2021 and 0 for the period of 2012–2014 | – |
| Covid-19 | COVID-19 | Dummy for government policy announced to lockdown in 2021, where 1 in 2021 and 0 for the period of 2012–2020 | – |

## Technique of Analysis

The Random Effect Model is employed in this study to examine the relationship between bank specific characteristics and macroeconomic variables with the commercial bank profitability in Laos from 2012 to 2021. This is because the Random Effect Model enables the study to efficiently account for any remaining serial correlation which arises from unobserved time-constant factor Wooldridge (2002). Furthermore, the Random Effect Model also infers that the entity of the error term does not correlate with the predictors. There are some benefits to using the Random Effect Model to analyze the data of this study. First off, according to Torres-Reyna (2007), the Random Effect Model allows time-invariant variables to function as the model's explanatory variable. As it is not necessary for the study to determine the N cross-sectional intercepts, the Random Effect Model also offers inexpensive degrees of freedom Gujarati & Porter (2009). The Random Effects model also imposes many more assumptions than those needed for pooled OLS, which the Random Effect Model are strict homogeneity in addition to orthogonally between the error term and the explanatory variables Wooldridge (2002).

## Empirical Results

Table 2 presents the descriptive statistics for the variables in this study. The data includes 350 observations, and there are no significant outliers. Table 3 reports the correlation coefficient matrix for the independent variables used in this study. The correlations between the independent variables are all less than 0.8, which meets the 0.8 rule of thumb for multicollinearity. Therefore, there are no problems with multicollinearity between the independent variables.

**Table 2**: Descriptive Statistics

| Variables | Obs | Mean | Std. Dev | Min | Max |
|---|---|---|---|---|---|
| ROA | 350 | .006 | .034 | –.542 | .0545 |
| ROE | 350 | .046 | .023 | –.859 | .522 |
| NIM | 350 | .023 | .018 | 0 | .077 |
| TA | 350 | 4.971 | 2.455 | 0 | 7.834 |
| CAR | 350 | .261 | .271 | 0 | .852 |
| OPR | 350 | 0.327 | .676 | 0 | .795 |
| LIQ | 350 | .160 | .156 | 0 | .703 |
| NPL | 350 | .027 | .145 | 0 | .627 |
| TECH | 350 | .314 | .464 | 0 | 1 |
| CEO | 350 | .874 | .332 | 0 | 1 |
| GDP | 350 | .031 | .0251 | –.0179 | .0602 |
| INF | 350 | .032 | .017 | .008 | .0637 |
| PR | 350 | .7 | .458 | 0 | 1 |
| COVID-19 | 350 | .1 | .400 | 0 | 1 |

**Source:** Test by Stata

**Table 3**: Descriptive Statistics

| | ROA | ROE | NIM | TA | CAR | OPR | LIQ | NPL | TECH | CEO | GDP | INF | PR | COVID-19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROA | 1.000 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ROE | 0.1154 | 1.000 | – | – | – | – | – | – | – | – | – | – | – | – |
| NIM | 0.1826 | 0.007 | 1.000 | – | – | – | – | – | – | – | – | – | – | – |
| TA | 0.100 | 0.284 | 0.531 | 1.000 | – | – | – | – | – | – | – | – | – | – |
| CAR | −0.007 | −0.185 | 0.549 | 0.320 | 1.000 | – | – | – | – | – | – | – | – | – |
| OPR | −0.143 | −0.129 | −0.015 | 0.226 | 0.297 | 1.000 | – | – | – | – | – | – | – | – |
| LIQ | 0.128 | 0.139 | 0.315 | 0.465 | 0.337 | 0.088 | 1.000 | – | – | – | – | – | – | – |
| NPL | 0.101 | −0.060 | 0.124 | 0.063 | 0.167 | 0.027 | 0.105 | 1.000 | – | – | – | – | – | – |
| TECH | −0.055 | −0.004 | −0.020 | 0.247 | −0.238 | 0.090 | −0.00 | −0.045 | 1.000 | – | – | – | – | – |
| CEO | −0.046 | 0.035 | −0.010 | −0.229 | 0.181 | −0.123 | −0.103 | 0.019 | −0.560 | 1.000 | – | – | – | – |
| GDP | 0.052 | 0.074 | 0.038 | −0.051 | 0.020 | 0.071 | −0.135 | −0.038 | 0.000 | −0.00 | 1.000 | – | – | – |
| INF | −0.026 | 0.022 | −0.139 | −0.219 | −0.121 | −0.114 | −0.076 | 0.056 | −0.000 | −0.01 | −0.01 | 1.000 | – | – |
| PR | −0.013 | 0.063 | 0.069 | 0.392 | 0.154 | 0.093 | 0.238 | −0.016 | −0.000 | 0.033 | 0.058 | 0.636 | 1.000 | – |
| COVID-19 | −0.059 | −0.007 | 0.187 | 0.151 | 0.042 | −0.026 | 0.225 | 0.006 | −0.000 | 0.017 | 0.081 | 0.336 | 0.327 | 1.000 |

**Source:** Test by Stata

**Random Effect Regression**

Table 4 presents the regression results from the random effect estimation by using commercial bank profitability (ROA, ROE, and NIM) as the dependent variable to analyze the determinants of commercial bank profitability in Laos. As a result, Table 4, bank size (TA) has a positive relationship with ROA, ROE, and NIM and is statistically significant at 5%, 1%, and 5% levels, respectively. Implies that bank size induces economies of scale by making larger banks more profitable and economies of scale will reduce the cost of gathering and processing information. This result is consistent with previous research by authors (Ul Mustafa *et al*., 2012; Lu & Yin, 2013; Gremi, 2013; Li, 2017)

Capital Adequacy (CAR) has a negative and significant relationship with return on equity (ROE). The coefficient of CAR shows that the 1% increment of CAR will cause the return on equity to decline by 10.19%. The finding implies that this is inconsistent with the hypothesis set. This is because the ratio of capital adequacy is high from the policy of commercial banks and the regulations of the central bank, especially in 2018, commercial banks must increase their registered capital from 300 billion LAK to 500 billion LAK, foreign branch banks must have their registered capital from 100 billion LAK to 300 billion LAK, so banks must maintain increased capital in order to have capital adequacy and the increase in capital is not able to generate additional income as well as liquidity because banks must maintain more liquidity, resulting in low capital in lending (the main income of the bank) to the people. This result is consistent with previous research by (Saona, 2013; Qin & Pastory, 2012)

Operating cost efficiency (OPR) has a negative and significant relationship with ROA, ROE and NIM and statistically significant at 1% levels. This is because operating cost-to-income ratio increases, it will affect the bank's ability to make a profit which was consistent with previous research by (Kosmidou, 2008; Sufian & Habibullah, 2009; Ali *et al*., 2011; Weerasingh & Perera, 2013; Bansal *et al*., 2018)

Liquidity (LIQ) has a negative and significant relationship with NIM. According to the result, 1% increment of the commercial bank’s liquidity will cause the profit by commercial banks will decline to 0.92%. The finding implies that the more liquid assets held by the commercial banks, the lower the loans that will be granted to the customers which will affect the bank's income which was consistent with previous research by (Petria *et al*., 2015; Bansal *et al*., 2018)

Credit risk (NPL) has a negative and significant relationship with NIM and statistically significant at 5% levels. increment of the commercial bank’s non-performing loan will cause the return on asset by commercial banks to decline to 3%. It should be clear that an increase in bad debts would require banks to increase reserve spending and deal with an increase in credit risk, which would reduce bank earnings. Additionally, the overall amount of bad loans has a direct impact on the net interest revenue of commercial banks. This result is consistent with the studies of (Molyneux & Thornton, 1992; Athanasoglou *et al*., 2005; Kosmidou, 2007; Sufian & Mohamad 2012; Gremi, 2013)

Technology (TECH) has a negative and significant relationship with ROE and statistically significant at 10% level. The finding implies that which is inconsistent with the hypothesis set. Because commercial banks have applications to facilitate financial transactions which will have high administrative costs If created, it is not popular with customers. At the same time, it still in the early stages where the banks established their own applications, causing expenses to be greater than revenues, thus affecting commercial banks' performance in a negatively.

Organization structure (CEO) has a positive and significant relationship with ROE, ROE and NIM and statistically significant at 10% levels. This is because the foreign CEO has experience in managing banks in order to maximize the benefits of existing assets. In addition, foreign CEO less assets management and low cost. For example, there are no service units, no branches, and no complex financial products. This result is consistent with the studies of (Masulis, 2012; Rose, 2016; Ware, 2016; Rahman, 2018; Overveld, 2012; Abu *et al*., 2016; Choi & Yoo, 2007; Karani, 2015; Rosenstein & Wyatt, 1997; Carter, 2003; Oxelheim *et al*., 2013)

Central bank policy (PR) has a negative and significant relationship with NIM and statistically significant at 5% level. Central bank began to set reference rate for commercial banks in 2015, as a result loan interest rates has decreased significant which affects commercial bank profitability due to credit is the main income of commercial banks. This result is consistent with the studies of (Cargill & Mayer, 2006; Lathaporn & Ananchotikul, 2018)

**Table 4**: Regression Results

| Variables | ROA | ROE | NIM |
|---|---|---|---|
| | Coefficient | Coefficient | Coefficient |
| TA | 0.0019** | 0.0175*** | 0.0040** |
| CAR | –0.0017 | –0.1019*** | –0.0249 |
| OPR | –0.0098*** | –0.0239*** | –0.0068*** |
| LIQ | 0.0228 | 0.0422 | –0.0092** |
| NPL | –0.0305 | –0.0251 | –0.0324** |
| TECH | –0.0053 | –0.0344* | –0.0046 |
| CEO | 0.0090* | 0.0468* | 0.0072* |
| GDP | 0.1944 | 0.5243 | 0.1487 |
| INF | –0.2565 | –1.2320 | 0.1696 |
| PR | 0.0049 | –0.0227 | –0.0053** |
| COVID-19 | –0.0017 | –0.0428 | –0.0001 |

**Table 4**: Regression Results (Cont.)

| Variables | ROA | ROE | NIM |
|---|---|---|---|
| | Coefficient | Coefficient | Coefficient |
| Constant | 0.2365 | 0.17617 | 0.0300 |
| R-squared | 0.1944 | 0.2541 | 0.4871 |
| Prob > chi2 | 0.0011 | 0.0000 | 0.0000 |
| No. Obs | 350 | | |

**Notes:** ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively

# CONCLUSION AND RECOMMENDATIONS

This study investigates the determinants of commercial bank profitability in Laos covering the period from year 2012 to year 2021. The findings of this study conclude that on the one hand, bank specific characteristics like bank size and organization structure have a positive and significant effect on profitability. Bank size has more credibility to raise large amounts of deposits and distribute those funds to maximize returns. While foreign CEO have business management experience from foreign banks, such as how to manage existing assets for maximum profit. On the other hand, capital adequacy and liquidity have a negative relationship to bank profitability as these ratios increase, so that banks have to make more capital reserves resulting in less capital to lending (main income). Similarly operating cost and non-performing loans have a negative relationship to profitability. The higher this ratio, the higher the cost that affects the bank profits. Meanwhile banks introduced technology measures by using their own applications which have a negative impact on bank performance, causing expenses to be greater than revenues, thus affecting commercial banks' performance.

In the aspect of macroeconomic determinants, the results that the central bank's reference interest rate determination policy has started since 2015 affected the net interest margin of commercial banks in a negative direction. This is because the central bank has adjusted the deposit and loan interest rates to suit economic conditions, especially for businesses and individuals to access low-cost financing. Therefore, commercial banks cannot adjust loan interest rates as in the past. As a result, loan interest rates have decreased significant which affects commercial bank profitability due to lending is the main income of commercial banks. For other macroeconomic factors the results were not significant for the profitability of commercial banks in Lao PDR.

This study suggests that central bank policy, which was introduced in 2015, had the opposite direction with regard to bank's performance, especially the net interest margin. In fact, this is a successful central bank policy because it allows businesses to borrow at low cost to produce goods and services. However, it might impact on small and medium-sized enterprises (SMEs) cannot be able to access funding sources as banks consider more rick, so policy makers may need to develop policies to support

this matter, such as designation of agencies to consider underwriting risks of small and medium-sized enterprises in accessing capital. Consideration should be given for the establishment of a specialized bank or agency to promote funding sources for SME businesses. Meanwhile central banks may use this financial instrument to solve current economic problems, especially inflation meaning when there is too much money circulating in the economy. The central bank may increase loan interest rates, which results in a decrease in demand for money. On the contrary, if the economy is in recession, the central bank may lower its policy rate to encourage more access to funding. As a result, the economy has good liquidity and circulation.

Creating a good economic environment, especially to promote investment, leads to convenience in doing business. When the business goes well, it must expand the business to generate more income and profits. Ability to pay back loans to banks, these banks will reduce the problem of following-up and resolving bad debts and deducting reserves of bad debts. This will make the bank more profitable, and the government will earn revenue from various economic activities, especially taxation.

Most commercial banks using their own applications to perform financial transactions in real-time; require many users in order to achieve economic of scale which can make a profit. However, this is still in the early stages where the banks established their own applications. As a result, there will be a sunk cost. Therefore, this study suggests that the bank should consider adding more services that are core businesses, such as digital lending service, because many banks already have their customer information, which are available to be used to create benefits and increase business profits.

Commercial bank managers should control expenses more efficiently, especially expenses that have been invested but without benefits for banks, such as branch expansion or service units that people use less often, which are not worth the cost. In addition, the managers should also increase investment in technology instead of supporting consumers' behavior that has changed according to the era, which will result in long-term profits.

Commercial bank managers have to focus on a credit quality policy emphasizing that credit quality must be more important than credit growth. If banks focus too much on lending volume without quality, it will lead to non-performing loans (NPL), which requires deduction of provisions for bad loans, resulting in lower bank earnings.

Chief Executives Officer (CEOs) of state-owned or private banks to increase the importance of formulating management strategies to be more internationalized, professionally connected and sharing international lessons.

Commercial banks have to focus on maintaining liquidity at an appropriate level or as already determined by the central bank's rules, investing money to create other higher returns.

The study found that the size of the bank has a positive relationship with the profitability of commercial banks in Lao PDR or banks with large assets will result in the profitability of the bank's main assets which come from deposits. Therefore, commercial banks should use effective strategies to attract more customers making more deposits, such as the development of deposit products using strategies for raising deposits and deposit management to facilitate lending which is the main income of the bank.

## LIMITATIONS OF THE STUDY, AND RECOMMENDATIONS FOR FUTURE RESEARCH

The limitations of this study include the challenge of accessing long-term data (more than 10 years) from commercial banks and the relatively limited availability of research evidence within the context of Laos, necessitating reliance on studies from other countries for references.

Suggestions for future studies could include adding more variables that are expected to impact the operations of commercial banks in Laos, such as government policies, regional economic factors, and bank-specific characteristics. Additionally, an analysis could be conducted on foreign bank branches and local commercial banks.

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