The effect of COVID-19, Non-performing Loans, and Non-Interest Income on Bank Performance: Case Study in ASEAN-5's Banking Industry

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Abstract

The COVID-19 pandemic that has hit the entire world has also had a major impact on the banking industry at the global level. Therefore, this study aims to examine the effects of the COVID-19 pandemic, non-performing loans, and non-interest income in ASEAN-5 countries from the first quarter of 2020 to the fourth quarter of 2021. The sample consists of 86 banks listed in the capital markets of Indonesia, Malaysia, Thailand, Singapore, and Philippines. The research method used is panel regression estimated using fixed effect model and random effect model. The results showed that COVID-19 had a significant positive effect on net income after taxes, while non-performing loans also had a significant and negative effect on banking performance. However, there is no significant role in non-interest income in banking in ASEAN-5.

Keywords: Bank Performance; COVID-19; Non-performing Loan; Non-Interest Income; Banking; ASEAN-5.

1. Introduction

During the COVID-19 pandemic, the World Health Organization declared a global health crisis in March 2020 (Gao et al., 2021; WHO, 2020). This pandemic has had a significant impact on the economies of all countries worldwide (Junaedi & Salistia, 2020). According to the World Economic Outlook (WEO) in 2020, there was a significant decline in global economic growth and financial stability, with a recorded global GDP decrease of 3% (Park et al., 2020). Additionally, the Asian Development Bank stated that the economic downturn caused by COVID-19 amounted to $5.8 - $8.8 trillion, equivalent to 6.4% - 7.9% of the Gross Domestic Product (GDP). These figures indicate a significant economic decline and one of the largest financial downturns ever recorded (Park et al., 2020).

Total remittances to Asia were estimated to decrease by $31.4 billion, accounting for 11.5% of the total remittances during the COVID-19. This exceeded the decline during the global financial crisis in 2007-2008, where remittances to the Asia-Pacific region decreased by 2.7%. Based on this data, the Asian Development Bank stated that there was a significant and unprecedented financial decline during the pandemic (Kikkawa Takenaka et al., 2020).

Given that loan placements represent the largest component of banks’ financial balance sheets, the crisis during the pandemic has led to an increase in credit risk. The pandemic has proven to be a more challenging year than the global financial crisis of 2007-2008, as evidenced by the significant positive relationship between non-performing loans and the country’s economic conditions (Amila Žunić et al., 2021). Based on the research conducted by Rousseau & Wachtel in 2011, it can be concluded that the relationship between financial phenomena and economic growth is closely related to financial crises. In this context, a significant increase in credit provision can have negative consequences, such as increased inflation, weakened banking systems, and hindered economic development (Rousseau & Wachtel, 2011). The lockdown policies implemented by ASEAN-5 governments have directly impacted businesses and the entire economy (Fauzi & Paiman, 2021). Banks have been particularly affected as they are vulnerable to risks related to interest rate fluctuations, cash flows, and credit (Xie et al., 2021). The consequences of pandemic policies have led clients to deplete their savings for daily needs, and there has been a drastic decline in demand for new investments (Lagoarde-Segot & Leoni, 2013).

In response to these rare circumstances, banks have begun improving their internet banking features to facilitate customer transactions. The usage of internet banking has significantly increased, such as a 90% increase in the usage of internet banking at Habib Bank Limited in Pakistan in 2020 (Naeem & Ozuem, 2021). The increased usage of internet banking has become a contributing factor to the growth of fee-based income, and many banks have relied on fee-based income as a profit driver. Notably, there has been an 11.5% increase in Net Interest Income (NII), reaching Rp 14.68 trillion in 2022 (Hutauruk, 2022). The COVID-19 pandemic has spurred a substantial digital transformation in business models, involving the adoption of digital technologies in day-to-day operations. It is crucial for companies considering digitalization to ensure long-term...
sustainability in the banking industry (Stalmachova et al., 2022).

Economic growth during the pandemic depends on the health conditions implemented in several ASEAN countries. Long-term policies in the banking sector are needed to optimize procedures for economic growth (Hodijah & Hastuti, 2022). The severity of the economic crisis during the COVID-19 pandemic, along with the increased risk of loans and the rapid digitalization of banking, becomes crucial for analysis and research.

2. Literature Review

2.1. The Impact of COVID-19 on the Banking Sector

The consequences of COVID-19 for the banking industry in developing countries could be severe as there will be a massive increase in defaults, loan underwriting will become more difficult and stringent, clients will deplete their savings to fund their daily needs, accessibility to loan reserves will diminish, and new investment demands will also be suppressed (Lagoarde-Segot & Leoni, 2013). According to Ito (2020), the COVID-19 crisis will bring several challenges to the banking sector, such as revenue pressures and low profitability due to low-interest rates and higher capital levels, stricter regulations compared to the previous financial crisis, and increased competition from shadow banks and new digital entrants. The role and influence of banks are significant, especially in countries where financial regulation is not mature due to weak or non-operating security markets, the lack of effective and tolerable legal regulation, the absence of essential and contemporary financial instruments, and inadequate knowledge and innovation (Baruta, 2020). One case illustrating the impact of COVID-19 on the banking sector can be seen in PT Bank Artos Indonesia Tbk, where the bank had total assets of IDR 1.78 trillion and total liabilities of IDR 492 billion. As of April 2020, the bank had an operating profit (loss) of IDR 27.7 billion (Bank Jago Tbk, 2020). From this case, it can be seen that the COVID-19 pandemic has negative effects on banks that are unable to innovate and survive (Dicuonzo et al., 2021).

2.2. Bank Profitability Return On Assets

Return on assets (ROA) is one of the most popular and useful financial ratios for calculating a bank's profitability (Jewell & Mankin, 2011). ROA indicates a bank's ability to generate profit from its assets (Hassan et al., 2022). Thus, a company or bank's efficiency can be measured by the use of assets to generate profit (Dietrich & Wanzenried, 2011). A company can be said to be more efficient and productive in managing its balance sheet to generate profit when its ROA value is higher. Williams Jr (2018) states that ROA is considered the most effective and can evaluate a company's performance broadly because it considers the holistic basis of business performance, namely, the performance of the income statement and assets. In previous research, the COVID-19 pandemic caused banks to issue financing restructuring policies such as deferred loan payments and interest payment relief for borrowers affected by the pandemic, resulting in a decline in bank profits and a consequent decrease in ROA (Sohibien et al., 2022). The research also states that COVID-19 has a significant negative impact on ROA of 0.26. Reference studies also state that the COVID-19 pandemic has a negative correlation with ROA in the banking sector (Xie et al., 2021).

H1A: COVID-19 has a significant negative impact on ROA in the ASEAN-5 banking sector.

2.3. Net Income After Taxes

Net income after taxes (NIAT) is profit measured by the amount of money left after a company pays all expenses, including salaries and wages, cost of goods sold or raw materials, and taxes (Porter, 2021). Net income after taxes is considered a company's net profit. There are two ways to use NIAT in profitability analysis, namely, through return ratio calculation and profitability relative to revenue generated (Staikouras, 2004). NIAT has three main functions, namely, reinvestment, dividends, and share repurchase (Molly & Michiels, 2022). The COVID-19 pandemic has had economic and financial impacts on various types of businesses, making it difficult for entrepreneurs to generate profit in the long run (Stephan et al., 2020). Therefore, banks, as one of the financial institutions whose main business is to channel funds through loans and funding, will also feel the impact and consequences of the pandemic through difficulties in maintaining profits (Afkar et al., 2020). Research conducted by Afkar et al. (2020) also mentions that COVID-19 has caused the banking sector to experience a decline in profits.

H1B: COVID-19 significantly negatively impacts NIAT in the ASEAN-5 banking sector.

H2B: NPL significantly negatively impacts NIAT in the ASEAN-5 banking sector.

H3B: NII has a significant positive impact on NIAT in the ASEAN-5 banking sector.

2.4. Non-performing Loan

Non-performing Loan (NPL) refers to some loans in which the borrower fails to make payments on
schedule within a certain period of time (Khairi et al., 2021; Anshori et al., 2020). A high level of problematic loans is a statistical predictor of bankruptcy (Berger & DeYoung, 1997). Problematic credit is positively influenced by the relevance and quality of credit information issued by public and private bureaus (Boudriga et al., 2010). Better corruption control, good quality regulations, law enforcement, freedom of speech, and accountability play an important role in efforts to reduce NPL (Khairi et al., 2021).

The COVID-19 pandemic has caused a sudden surge in borrower credit risk. Therefore, it is expected that the COVID-19 crisis will also increase the level of non-performing loans (Bacchiocchi et al., 2022). A high level or near-default level of credit is a common feature of many banking crises, where a deep recession due to COVID-19 will lead to a high level of non-performing loans and weaken bank balance sheets (Ari et al., 2021).

Research conducted by Ari et al. (2021) on 92 banking crises since 1990 found that most banks tend to increase the number of non-performing loans during a pandemic. This research also mentions that many countries have failed to resolve these non-performing loans in a timely manner, hindering post-crisis recovery. An increase in the number of loans disbursed by banks, coupled with weak bank management, monitoring, and screening, supports the statement that NPL and ROA have a significant and negative relationship (Ekinci & Poyraz, 2019).

\( H_{2A} \): NPL has a significant negative impact on ROA in the ASEAN-5 banking sector.

2.5. Non-Interest Income (NII)

Non-Interest Income (NII) is one of the sources of banking income outside of interest from lending or banking investments (Lee et al., 2014b). In other words, non-interest income is also known as fee-based income (FBI), where fee-based income consists of transfers, collections, clearances, safe deposit boxes, bank cards, banknotes, bank guarantees, bank references, bank drafts, letters of credit, payment deposits such as taxes, telephone, water, electricity, tuition fees, salary payments, dividends, coupons, bonus/gifts, foreign exchange transactions, and other businesses related to banking services (Kasmir, 2012).

The banking sector benefits from non-interest activities in terms of obtaining a source of income that can function as a buffer to reduce the possibility of risks and losses or increase profitability (Lee et al., 2014). The diversification of income by banks serves to increase the bank's profitability. An increase in non-interest income will help banks minimize risks and maximize profits (Markowitz, 1952). Other research also indicates a positive and significant impact of fee-based income on bank profitability (ROA), meaning that an increase in FBI can support the level of return on assets (Cetin, 2018).

\( H_{3A} \): NII has a significant positive impact on ROA in the ASEAN-5 banking sector.

2.6. Determinants of Bank Performance Credit Relaxation

Credit relaxation is a measure undertaken by national institutions to improve lending activities to debtors who may face difficulties in meeting their obligations (Anggraeni, 2021). This restructuring alleviates debtors in making loan payments to banks/leasing companies (Financial Services Authority, 2020). This relief is directed toward those affected by COVID-19, particularly small business owners who are considered to be in dire need (Anggraeni, 2021). Through credit relaxation, banks attempt to maintain their company profits which are continuously eroded by decreasing interest rates. Delayed loan repayments also affect profits by reducing the total income of banks (Naili & Lahrichi, 2022). The appropriate implementation of credit relaxation policies can lower non-performing loans (NPL) as many borrowers are still considered to have a good loan status in their repayments (Rasbin, 2020; NaNshori et al., 2020).

2.7. Bank Size

The size of a business refers to the capacity, production ability, quantity, and diversity of services or businesses that can be offered simultaneously to customers (Tharu & Shrestha, 2019). According to IGI Global, the larger a bank’s assets, the greater the financial services it can offer at a low cost. Research conducted by Al-Harbi (2019) and (Regehr & Sengupta, 2016) suggests that economies of scale have a high correlation with efficiency, implying that larger companies tend to experience higher efficiency and profitability.

2.8. Gross Domestic Product

Gross Domestic Product (GDP) is an economic measure used to gauge a country’s or group of countries’ ability to produce goods and services (Coscieme et al., 2020). Through various studies, such as the research conducted by Twum et al. (2021), GDP is considered to have an influence on bank profitability. Other studies, such as that by Staikouras & Wood (2011), suggest that when a country’s GDP increases, bank profitability and the amount of savings collected by banks also increase. Previous research has also indicated that return on assets (ROA) increases in response to GDP growth (Xie
3. Methods

The data used in this study is secondary data obtained from the Thomson Reuters Eikon data portal, the official website of various official institutions in ASEAN-5 countries, and world institutions related to the scope of this research, namely the financial and banking industry. All data collected was processed using Microsoft Excel and STATA 14 software. This study uses panel data and is processed using the Fixed Effect Model (FEM) and Random Effect Model (REM) methods. This research aims to determine whether independent variables have an impact on the level of banking industry profitability in ASEAN-5 countries.

The sample used in this study includes financial report data released by all publicly listed banks in the Philippines, Malaysia, Singapore, Thailand, and Indonesia. Access to the financial reports of each bank was obtained through Thomson Reuters' bank scope database. The data sources per variable can be seen in Table 1.

This study employed variables based on research conducted by Xie et al. (2021) entitled "COVID-19 Post Implications for Sustainable Banking Sector Performance: Evidence from Emerging Asian Economies". The following is the model used in this study:

\[
ROA_{ijt} = \beta_0 + \beta_1 COVID19_{ijt} + \beta_2 NPL_{ijt} + \beta_3 NII_{ijt} + \\
\beta_4 \text{Relaksasi}_{ij} + \beta_5 \text{Size}_{ij} + \beta_6 GDP_{jt} + \gamma_t + e_{it}
\]

\[
NIAT_{ijt} = \beta_0 + \beta_1 COVID19_{ijt} + \beta_2 NPL_{ijt} + \beta_3 NII_{ijt} + \\
\beta_4 \text{Relaksasi}_{ij} + \beta_5 \text{Size}_{ij} + \beta_6 GDP_{jt} + \gamma_t + e_{it}
\]

\[ROA_{ij} = \text{Return on Assets of bank } i \text{ in country } j \text{ at time } t; \]
\[NIAT_{ij} = \text{Net profit of bank } i \text{ in country } j \text{ at time } t; \]
\[COVID19_{ijt} = \text{level of new confirmed COVID-19 cases in country } j \text{ at time } t; \]
\[NPL_{ijt} = \text{level of non-performing loans in bank } i \text{ in country } j \text{ at time } t; \]
\[NII_{ijt} = \text{level of non-interest income of bank } i \text{ in country } j \text{ at time } t; \]
\[\text{Relaksasi}_{ij} = \text{policy relaxation dummy in country } j \text{ at time } t; \]
\[\text{Size}_{ij} = \text{size of bank } i \text{ in country } j \text{ at time } t; \]
\[\text{GDP}_{jt} = \text{GDP of country } j \text{ at time } t; \]
\[\gamma_t = \text{specific and unobserved effect}; \]
\[e_{it} = \text{error term in the model}. \]

4. Results

Table 2 presents the descriptive statistics of each variable used in this study, which were analyzed using STATA 14 software.

Table 1. Data sources per variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sources of Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Return On Assets | Bank Financial Statements (Quarterly) for 2020-
| Net Income | After Taxes 2021 and Thompson Reuters Eikon |
| **Independent Variable** | |
| COVID-19 | The official website of the World Health Organization for the 2020-2021 period |
| Non-performing Loans | Bank Financial Statements (Quarterly) for 2020-
| Non-Interest | Income 2021 and Thompson Reuters Eikon |
| **Control Variable** | |
| Credit Relaxation | Official website of each ASEAN-5 country financial institution (Financial Services Authority, Bank Negara Malaysia, Bank of Thailand, Monetary Authority of Singapore Bangko Sentral NG Filipinas) |
| Size | Bank Financial Statements (Quarterly) for 2020-
| GDP | Bank of Thailand, Monetary Authority of Singapore Bangko Sentral NG Filipinas, National Economic and Social Development Council, Singapore Department of Statistics, Department of Statistics Malaysia, Philippine Statistics Authority) for 2020-2021 (Quarter) |

We employed a panel regression model in the study on the impact of COVID-19, non-performing loans, and non-interest income on banking performance and selected the best-performing model. To determine the best method, several tests were conducted, namely the Chow test, the Breusch-Pagan Lagrange Multiplier test, and the Hausman test. After going through these three testing processes, the first model was deemed more appropriate when using the Fixed Effect Model (FEM), while the second model was better suited using the Random Effect Model (REM). Classic assumption tests were conducted in this study to determine whether the variables in this study meet the criteria of Best Linear Unbiased Estimator (BLUE). After several tests, it was found that this model had heteroscedasticity and autocorrelation problems. Therefore, both models used...
generalized least square to address the existing problems. Table 3 are the results of the regression tests for both models in this study.

Table 3. Regression output results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnCOVID</td>
<td>Coefficient</td>
<td>0.0001352</td>
<td>0.0228916***</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0001902</td>
<td>0.0126667</td>
</tr>
<tr>
<td>NPL</td>
<td>Coefficient</td>
<td>-0.0182730***</td>
<td>-2.8724110***</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0021780</td>
<td>1.7268530</td>
</tr>
<tr>
<td>NII</td>
<td>Coefficient</td>
<td>-0.0050628</td>
<td>-0.1723892</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0042068</td>
<td>0.9508544</td>
</tr>
<tr>
<td>RELAK</td>
<td>Coefficient</td>
<td>0.0007488</td>
<td>-0.2318035</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0018506</td>
<td>0.2056207</td>
</tr>
<tr>
<td>SASI</td>
<td>Coefficient</td>
<td>0.0125606***</td>
<td>1.1510830***</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0036551</td>
<td>0.0615778</td>
</tr>
<tr>
<td>lnGDP</td>
<td>Coefficient</td>
<td>-0.0194750*</td>
<td>0.1220869</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.0107371</td>
<td>0.2188703</td>
</tr>
<tr>
<td>Konstanta</td>
<td>Coefficient</td>
<td>0.1034662***</td>
<td>-23.9784900***</td>
</tr>
<tr>
<td></td>
<td>Standard Error</td>
<td>0.2099024</td>
<td>6.0309390</td>
</tr>
<tr>
<td>Prob &gt; F / Prob &gt; Chi²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>482</td>
<td>409</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td>0.1857000</td>
<td>0.8754000</td>
</tr>
</tbody>
</table>

* p < 0.1 ; ** p < 0.05 ; *** p < 0.01

Based on Table 3, the regression test results in Model 2 indicate that the growth rate of COVID-19 cases also has a significant and positive influence on Net Income After Taxes (NIAT). This result contradicts Xie et al.’s (2021) research, which stated that COVID-19 has a negative and significant impact on bank performance in emerging Asian economies. This may be due to the stability and strength of the fundamental of banking in the ASEAN-5 (Kabir & Salim, 2014). ASEAN is the world's fourth-largest trading area, so the banking industry in ASEAN is highly competitive (Astuti, 2018). During the COVID-19 pandemic, the banking industry experienced a shock, but they continued to improve (Banks et al., 2020). As one of the research samples, the Indonesian banking sector recorded third-party fund growth that resulted in a 9.5% increase in profit (Alfi, 2021). Additionally, the news also mentions that credit growth in Malaysia tends to be constant, while in Thailand, it is increasing (Alfi, 2021). Therefore, it can be concluded that overall, the banking sector in the ASEAN-5 can withstand the pandemic and not be too shaken by COVID-19.

Table 3 also shows that the regression test results for models 1 and 2 have a significant negative impact between non-performing loans (NPLs) and bank performance measured by ROA and NIAT in ASEAN-5 in the period from the first quarter of 2020 to the fourth quarter of 2021. This regression result is consistent with research conducted in Turkey, where NPLs have a significant negative impact on bank performance (Ekinci & Poyraz, 2019). This research is also supported by research conducted in Uganda, which states that an increase in the number of NPLs has a significant impact on bank performance by causing a decrease in bank performance (Katusiime, 2021). The research conducted by Ekinci & Poyraz (2019) also states that NPLs and ROA have a significant negative relationship.

5. Discussion

Despite the significant challenges posed by the COVID-19 pandemic, the banking sectors of Malaysia, Indonesia, Philippines, Singapore, and Thailand within the ASEAN region have demonstrated remarkable resilience. These countries' banks have weathered the storm and maintained the profitability, proving their ability to adapt and navigate through uncertain times.

Malaysia’s banking sector proved to be robust during the COVID-19 crisis, with limited impact on profitability. According to the Bank Negara Malaysia’s (BNM) Financial Stability Review (2021), banks in Malaysia demonstrated resilience, reporting strong earnings and stable asset quality. Measures such as loan restructuring programs, government assistance, and the moratorium on loan repayments supported businesses and individuals, mitigating potential credit risks. The implementation of digital banking services and the rise of e-commerce contributed to sustained profitability (BNM Annual Report, 2021).

Similarly, Indonesia’s banking sector exhibited resilience in the face of the pandemic, with profitability remaining largely intact. The Financial Services Authority (OJK) reported that banks maintained a healthy level of profitability in 2020, supported by prudent risk management practices and government support measures (OJK Annual Report, 2021). Despite challenges, Indonesian banks remained well-capitalized, ensuring their ability to absorb potential shocks. The OJK’s guidance on loan restructuring and liquidity support schemes helped manage credit risks and maintain profitability (OJK Press Release, 2021).

The banking sector in the Philippines weathered the storm of the COVID-19 pandemic, with profitability remaining stable. The Bangko Sentral ng Pilipinas (BSP) reported that banks exhibited strong capital adequacy ratios, robust liquidity positions, and improved asset quality in 2020 (BSP Annual Report, 2021). Despite challenges in loan growth, the BSP's regulatory relief measures, including loan moratoriums and financial assistance programs, supported the sector's resilience (BSP Press Release, 2021). The BSP's
commitment to maintaining a sound and stable banking system played a pivotal role in sustaining profitability.

Singapore's banking sector demonstrated resilience during the pandemic, maintaining profitability amid challenging conditions. The Monetary Authority of Singapore (MAS) highlighted in its Financial Stability Review (2021) that local banks remained profitable, driven by a diversified business model that includes wealth management, strong risk management practices, and digitalization efforts (MAS Annual Report, 2021). The government's economic support measures, including loan moratoriums and liquidity provisions, bolstered the sector's stability (Ministry of Finance Singapore, 2021).


Collectively, the banks in Malaysia, Indonesia, the Philippines, Singapore, and Thailand have demonstrated their resilience and ability to withstand the financial impact of the COVID-19 pandemic. Through prudent risk management, proactive measures, and innovative strategies, these ASEAN countries' banking sectors have remained profitable, ensuring continued stability and confidence in their respective economies.

6. Conclusions

The conclusion of this study refers to the analysis results of both research models, where the focus of this research is COVID-19, non-performing loans, and non-interest income on bank performance in the ASEAN-5 in the period from the first quarter of 2020 to the fourth quarter of 2021. COVID-19 has a positive relationship with both ROA and NIAT of banks in ASEAN-5. When COVID-19 cases increase, ROA and NIAT of banks in ASEAN-5 also increase. COVID-19 does not significantly affect ROA, while COVID-19 has a significant impact on NIAT of banks. It can be assumed that even though COVID-19 cases are increasing, banks in ASEAN-5 are becoming more active in innovating to survive and have good performance.

Non-performing loans, as measured by the ratio of NPLs to total loans, have a significant negative impact on the ROA and NIAT of banks in ASEAN-5. This indicates that in the banking sector in ASEAN-5 when the value of non-performing loans of a bank increases, the bank's performance decreases. Meanwhile, non-interest income, as described by the ratio of total non-operating income to operating income, has a negative relationship with the ROA and NIAT of banks in ASEAN-5. When the non-interest income of banks in ASEAN-5 increases, it does not have a positive impact on bank performance because banks in ASEAN-5 still cannot rely on service-based income and still rely on traditional systems, namely interest-based income.

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