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 significant impact on the banking industry at the global level. Therefore, this study examines 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 the Philippines. The research method used is panel regression estimated using fixed and random effect models. The results showed that COVID-19 had a significant positive effect on net income after taxes, while non-performing loans also significantly and negatively affected banking performance. However, there is no significant role in non-interest income in banking in ASEAN-5.

Keywords: ASEAN-5, Bank Performance, Banking, COVID-19, Non-Interest Income, Non-Performing Loan.

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 significantly impacted 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 increased 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. Internet banking usage has significantly increased, such as a 90% increase in 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 (Nikmehr *et al.*, 2021; Stalmachova et al., 2022; and Del Giudice *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.

The above discussion raises the concern that the COVID-19 pandemic has caused severe negative consequences on the Bank's performance. This study focuses on examining the effect of COVID-19 on Bank Performance related to Non-performing Loans, and Non-Interest Income in ASEAN-5's Banking Industry.

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 (Barua, 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 et al., 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; and Supari and Anton, 2022).

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 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 feels 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 re-structuring 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 significantly negatively impacts 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).

H_{1a}: COVID-19 negatively impacts 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 ana-lysis: return ratio calculation and profitability relative to revenue generated (Staikouras, 2004). NIAT has three main functions: re-investment, 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.

H_{1b}: COVID-19 significantly negatively impacts NIAT in the ASEAN-5 banking sector.

H_{2b}: NPL significantly negatively impacts NIAT in the ASEAN-5 banking sector.

H_{3b}: 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 in-formation 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, moni-toring, and screening, supports the statement that NPL and ROA have a significant and negative relationship (Ekinci & Poyraz, 2019).

H_{2a}: NPL significantly negatively impacts 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 pay-ments, 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 in-crease 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 et al., 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 banks' total income (Naili & Lahrichi, 2022). The appropriate implementation of credit relaxation policies can lower non-performing loans (NPL) as many borrowers still have 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); Haryanto (2018); and Regehr & Sengupta (2016) suggests that economies of scale have a high correlation with efficiency, implying that larger companies tend to experience higher effi-ciency 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 and 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 et al., 2021). Therefore, it can be said that GDP has a significant and positive relationship with ROA (Aqel, 2022).

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 whe-ther independent variables impact the banking industry profitability level 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:

$$ROA_{ijt} = \beta_0 + \beta_1 COVID19_{jt} + \beta_\& NPL_{ijt} + \beta_3 NII_{ijt} + \beta_4 Relaksasi_{jt} + \beta_5 Size_{ijt} + \beta_6 GDP_{jt} + \gamma_i + et_{it}$$

$$NIAT_{ijt} = \beta_0 + \beta_1 COVID19_{jt} + \beta_2 NPL_{ijt} + \beta_3 NII_{ijt} + \beta_4 Relaksasi_{jt} + \beta_5 Size_{ijt} + \beta_6 GDP_{jt} + \gamma_i + et_{it}$$

ROA_{ijt} represents the Return on Assets of bank i in country j at time t; $NIAT_{ijt}$ represents the net profit of bank i in country j at time t; $\beta_1 COVID19_{jt}$ represents the level of newly confirmed COVID-19 cases in country j at time t; $\beta_2 NPL_{it}$ $2NPLijt$ represents the level of non-performing loans in bank i in country j at time t; $\beta_3 NII_{it}$ represents the level of non-interest income of bank i in country j at time t; $\beta_4 Relaksasi_{it}$ represents the policy relaxation dummy in country j at time t; $\beta_5 Size_{it}$ represents the size of bank i in country

j at time t; $\beta_6 GDP_{it}$ represents the real Gross Domestic Product of country j at time t; γ_i represents the specific and unobserved effect; et_{it} represents the 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. The average bank ROA is positive, although there are some banks that have negative ROA. A negative ROA indicates that the bank is experiencing losses. This condition is linear with some banks that have negative NII. Credit risk as indicated by NPL indicates a low average of 0.046.

Table 1. Data sources per variable

Variable	Sources of Data Collection
Dependent Variable	
Return On Assets	Bank Financial Statements (Quarterly) for 2020-2021 and Thompson Reuters Eikon
Net Income After Taxes	Bank Financial Statements (Quarterly) for 2020-2021 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 2020-2021 and Thompson Reuters Eikon
Non-Interest Income	Bank Financial Statements (Quarterly) for 2020-2021 and Thompson Reuters Eikon
Control Variable	
Credit Re-laxation	Official website of each ASEAN-5 country financial institution (Financial et al. Malaysia, Bank of Thailand, Monetary Authority of Singapore Bangko Sentral NG Pilipinas)
Size	Bank Financial Statements (Quarterly) for 2020-2021 and Thompson Reuters Eikon
GDP	Official website of each ASEAN-5 country (Indonesian Central Bureau of Statistics, National Economic and Social Development Council, Singapore Department of Statistics, Department of Statistics Malaysia, Philippine Statistics Authority) for 2020-2021 (Quarter)

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max.
ROA	688	0.005	0.085	-0.090	2.220
lnNIAT	562	16.664	2.400	9.15	20.525
lnCOVID	688	13.680	3.239	7.332	19.361
NPL	485	0.046	0.073	0.000	1.277
NII	664	0.218	0.148	-0.262	1.096
RELAK-SASI	688	0.906	0.293	0.000	1.000
SIZE	660	32.305	1.972	27.707	36.537
lnGDP	688	25.853	0.596	25.034	26.473

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. Several tests were conducted to determine the best method, 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). In contrast, 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 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 squares 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

Variable	Indicator	Model 1	Model 2
		ROA	NIAT
lnCOVID	Coefficient	0.00014	0.02289*
	Standard Error	0.00019	0.01267
NPL	Coefficient	-0.01827***	-2.87241*
	Standard Error	0.00218	1.72685
NII	Coefficient	-0.00506	-0.17234
	Standard Error	0.00421	0.95085
RELAK-SASI	Coefficient	-0.00075	-0.23180
	Standard Error	0.00185	0.20562
SIZE	Coefficient	0.01256***	1.15108***
	Standard Error	0.00366	0.06158
lnGDP	Coefficient	-0.01948*	0.12209
	Standard Error	0.01074	0.21887
Konstanta	Coefficient	0.10347	-23.97849***
	Standard Error	0.20990	6.03094
	Prob > F / Prob > Chi^2	0.00000	0.00000
	N	482	409
	R^2	0.18570	0.87540

Note: * $p < 0.10$; ** $p < 0.05$; ***$p < 0.01$

Based on Table 3, the regression test results in Model 2 indicate that the growth rate of COVID-19 cases also significantly and positively influences Net Income After Taxes (NIAT). This result contradicts Xie et al.'s (2021) research, which stated that COVID-19 negatively and significantly impacts bank performance in emerging Asian economies. This may be due to the stability and strength of the funda mental 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 it 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). 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 from the first quarter of 2020 to the fourth quarter of 2021. This regression result is consistent with research conducted in Turkey, where NPLs significantly negatively impact 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 significantly impacts bank performance by causing a decrease in bank performance (Katusiime, 2021). The research con-ducted 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, the Philippines, Singapore, and Thailand within the ASEAN region have demonstrated remarkable resilience. These countries' banks have weathered the storm and maintained their profitability, proving their ability to adapt and navigate 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 ear-nings and stable asset quality. Measures such as loan restructuring programs, government assistance, and the repayment moratorium supported businesses and in-dividuals, mitigating potential credit risks. The im-plementation of digital banking services and the rise of e-commerce contributed to sustained profitability (BNM Annual Report, 2021; and Hakizimana, Wairimu and Stephen, 2023)

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 mea-sures (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 sche-mes 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 et al., 2021). Despite challenges in loan growth, the BSP's regulatory relief mea-sures, including loan moratoriums and financial assistance programs, supported the sector's resilience (BSP et al., 2021). The BSP's commitment to maintaining a sound and stable banking system was pivotal in sustaining profitability.

Singapore's banking sector demonstrated resilien-ce 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 et al., 2021). The government's economic support measures, including loan moratoriums and liquidity provisions, bolstered the sector's stability (Ministry of Finance Singapore, 2021).

Lastly, Thailand's banking sector exhibited resilience during the COVID-19 pandemic, with profitability remaining intact. The Bank of Thailand's (BOT) Financial Stability Report (2021) emphasized that the banking system maintained strong capital positions, adequate provisions, and sufficient liquidity to weather the crisis (BOT Annual Report, 2021). The government's fiscal stimulus measures and loan guarantee programs supported businesses and individuals, contributing to the sector's stability and profitability (Wardhani *et al.*, 2020; BOT Press Release, 2021; and Girón and Correa, 2021).

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

6. Conclusions

As declared in the Introduction section, the objective of this study is to investigate the effect of the COVID-19 pandemic on Bank performance through non-performing loans, and non-interest income. The conclusion of this study is withdrawn as follows. COVID-19 has a positive relationship with both the ROA and NIAT of banks in ASEAN-5. When CO-VID-19 cases increase, ROA and NIAT of banks in ASEAN-5 also increase. COVID-19 does not significantly affect ROA, while COVID-19 significantly impacts the 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, significantly negatively impact the ROA and NIAT of banks in ASEAN-5. This indicates that in the banking sector in ASEAN-5 when the value of a bank's non-performing loans increases, the bank's performance decreases. Meanwhile, as described by the ratio of total non-operating income to operating income, non-interest 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 positively impact 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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