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Bank Size and Bank Performance During the Covid-19 Pandemic: Evidence from ASEAN

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ABSTRACT

This study examines the impact of COVID-19-related uncertainty on bank performance in ASEAN countries and investigates whether bank size moderates this relationship. While prior studies document the vulnerability of banking sectors during crises, limited empirical evidence explores how bank size shapes resilience in emerging ASEAN markets during the COVID-19 pandemic. This study addresses this gap by employing panel data from commercial banks across ASEAN over the pandemic period. Using panel regression analysis, the results indicate that uncertainty caused by COVID-19 significantly reduces bank performance. However, the negative effect is less pronounced for large banks, suggesting that bank size plays a stabilizing role during systemic shocks. Additional sub-sample analyses across individual countries and between large and small banks confirm the robustness of the findings. This study contributes to the banking and crisis literature by providing empirical evidence on the moderating role of bank size during an unprecedented global disruption. The findings offer important implications for regulators and policymakers in strengthening banking sector resilience against future systemic crises.

Keywords: bank size; bank performance; COVID-19; ASEAN; uncertainty

ABSTRAK

Studi ini meneliti dampak ketidakpastian terkait COVID-19 terhadap kinerja bank di negara-negara ASEAN dan menyelidiki apakah ukuran bank memoderasi hubungan ini. Meskipun studi sebelumnya mendokumentasikan kerentanan sektor perbankan selama krisis, bukti empiris yang terbatas mengeksplorasi bagaimana ukuran bank membentuk ketahanan di pasar negara berkembang ASEAN selama pandemi COVID-19. Studi ini mengatasi kesenjangan ini dengan menggunakan data panel dari bank komersial di seluruh ASEAN selama periode pandemi, dengan menggunakan analisis regresi panel. Hasilnya menunjukkan bahwa ketidakpastian yang disebabkan oleh COVID-19 secara signifi-

-kan mengurangi kinerja bank. Namun, efek negatifnya kurang terasa untuk bank-bank besar, menunjukkan bahwa ukuran bank memainkan peran penstabil selama guncangan sistemik. Analisis sub-sampel tambahan di masing-masing negara dan antara bank besar dan kecil mengkonfirmasi kekokohan temuan tersebut. Studi ini berkontribusi pada literatur perbankan dan krisis dengan memberikan bukti empiris tentang peran moderasi ukuran bank selama gangguan global yang belum pernah terjadi sebelumnya. Temuan ini menawarkan implikasi penting bagi regulator dan pembuat kebijakan dalam memperkuat ketahanan sektor perbankan terhadap krisis sistemik di masa mendatang.

Kata kunci: ASEAN; COVID-19; ketidakpastian; kinerja bank; ukuran bank

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INTRODUCTION

Since early 2020, the COVID-19 pandemic has generated an unprecedented global economic disruption. The shock led to widespread instability in financial markets and significant downgrades of banking and non-bank financial institutions. Global economic activity contracted sharply, with the World Bank projecting a 5.2% decline in 2020, marking the deepest global recession since World War II (World Bank, 2020). As an exogenous shock, the COVID-19 crisis created substantial uncertainty and disrupted economic activity through social distancing and mobility restrictions (Ashraf, 2020). The economic risks arising from the pandemic have significantly affected financial sectors, including banking, stock markets, and insurance (Ashraf, 2020; Goodell, 2020; Ashraf & Goodell, 2022). Due to its unexpected and external nature, COVID-19 provides an opportunity to revisit fundamental questions in financial economics, particularly regarding risk, resilience, and financial stability (Spatt, 2020).

The banking sector is particularly sensitive to crisis-induced uncertainty because banks serve as key financial intermediaries. Increased uncertainty weakens borrowers' repayment capacity, elevates credit risk, and pressures profitability and capital adequacy. Consequently, identifying the structural characteristics that enhance bank resilience during systemic shocks becomes crucial. One structural factor that may explain heterogeneous resilience is bank size. Larger banks are generally expected to benefit from economies of scale, greater diversification, broader funding access, and stronger capital buffers, potentially enhancing their ability to withstand external shocks. At the same time, large banks may face higher complexity and systemic exposure, which can amplify vulnerabilities during crises. Therefore, whether bank size strengthens or weakens performance during pandemic-induced uncertainty remains an empirical question, particularly in emerging markets such as ASEAN, where banking structures differ substantially across countries.

Banks tend to experience the impact of the Covid-19 crisis in the form of withdrawal of liquid assets by risky borrowers, an increase in non-performing loans, and higher credit risk (Acharya & Steffen, 2020); Goodell, 2020). According to Boot et al (2020) the channel through which the corona virus infects the banking sector is social distancing measures that

stop economic activity (production and consumption) and disrupt supply chains which puts companies' cash flows under pressure to pay their employees, their suppliers, and finally to their bank. Furthermore, banks that have relatively higher operating costs will face more difficulties if their doors are closed to customers for an uncertain period of time (Ashraf, 2020b).

Factors such as technological change, globalization and deregulation have also succeeded in fundamentally changing the structure of the banking system over the last three decades. This is indicated by stronger bank competition, an optimistic view of bank liquidity, financial liberalization has led to a large increase in mergers and acquisitions in the banking sector, thereby increasing the number of large banking organizations in many countries (Fraisse et al., 2018; Brealey et al., 2019). This trend has attracted the attention of other researchers and policy makers looking to explore large banks (Avramidis et al., 2018; Fina Kamani, 2019; Jondeau & Khalilzadeh, 2022). Furthermore, there has also been a lot of literature that has investigated whether large banks can perform better than other banks (Biswas et al, 2017).

In this study, we investigate how the impact of Covid-19 on bank performance will be and whether this impact will differ with specific bank sizes in the ASEAN region, thereby addressing a gap in the existing literature that still provides limited empirical evidence on the role of bank size in shaping banks' performance during the Covid-19–induced crisis, particularly in emerging markets with heterogeneous banking structures. According to Ahmad et al., (2022) the Covid-19 pandemic has had significant implications for the process of economic integration in the ASEAN region. Uncertainty has significant negative consequences on bank performance, such as low bank profitability, increasing bank risk (Ghosh, 2016; Ashraf, 2020), reducing access to model markets (Bitar et al., 2018; Alraheb et al., 2019). Although there is more and more research on the impact of uncertainty caused by Covid-19 on bank performance, the impact of bank size has so far not been widely studied. Understanding this is quite important because large banks can have different behaviors and outcomes due to their different commitments to borrowers and lenders.

The remainder of this paper is structured as follows, Section 2 reviews the theoretical framework regarding the impact of Covid-19 in ASEAN on the banking system as well as the impact of bank size, and Section 3 describes the data and methodology. Section 4 reports on estimates. Section 4 concludes.

LITERATURE REVIEW

Banking performance and pandemic Covid-19

The existence of the Covid-19 pandemic case that hit almost the whole world, and ASEAN is no exception, this is certainly very burdensome for the banking sector. Over the past few years, the impact of the Covid-19 pandemic on a country's banking system has attracted the interest of many researchers. There is a rapidly growing literature exploring the potential impact of the Covid-19 pandemic on financial markets (Ashraf, 2020; Al-Awadhi et al., 2020; Zaremba et al., 2021, Szczygielski et al., 2021; Liu et al., 2021). According to (Danisman et al., 2021) banks will still have a bigger impact than most other industries due to the very fast spread of COVID-19. The negative impact on banking is expected to be

higher compared to the previous crisis (Aldasoro et al., 2020) because banks are basically very vulnerable during times of crisis (Goodell, 2020). Wang et al., (2021) found that the number of confirmed cases of Covid-19 led to a significant decline in returns in Canada, France, Germany, Italy, and the United States (US) which further indicated a decline in the company's performance. Baek et al., (2020) documented that COVID-19 causes a substantial increase in stock market volatility, where the occurrence of this volatility can also lead to a decline in company performance.

The Covid-19 pandemic can affect banks in several different ways. For example, banks around the world make large loans in US dollars to finance international trade and financial investments (Aldasoro & Ehlers, 2018). During a financial crisis, this can tighten dollar lending money markets, implying risks to the global banking system. According to (Bahaj & Reis, 2020) banks operating in developing countries will feel the impact of the reduced flow of funds, as the first response to the Covid-19 pandemic, the central bank will expand existing swap lines and create new channels to lower the cost of dollar funding. Prudential bank regulatory measures can be taken, such as softening the treatment of non-performing loans and easing the capital buffer as an effort to reduce the negative impact of the Covid-19 pandemic on the stability of the banking system. According to Danisman et al., (2021) equity markets in countries with stricter capital and liquidity regulatory requirements will tend to be more resilient to the shocks of the Covid- 19 pandemic, due to Basel III capital and liquidity reforms after 2008, banks are in a better position to absorb severe impact of the Covid-19 pandemic. Furthermore, the possibility of an increase in non-performing loans and the possibility of massive withdrawals of deposits by companies and households will have a very bad impact on bank performance (Goodell, 2020). According to Elnahass et al.,(2021) the Covid-19 pandemic has adversely affected the performance and financial stability of banks in 116 countries.

Despite the broad consensus that the Covid-19 pandemic has negatively affected the banking sector, the existing literature presents heterogeneous findings regarding the magnitude and channels of this impact. Market-based studies such as Wang et al., (2021) and Baek et al., (2020) emphasize immediate financial market reactions, documenting sharp declines in returns and heightened volatility following increases in Covid-19 cases. In contrast, banking-focused studies highlight balance-sheet and stability channels, showing that the pandemic exacerbates credit risk, non-performing loans, and liquidity pressures (Goodell, 2020; Elnahass et al.,2021)). Moreover, while Danisman et al., (2021) find that stricter capital and liquidity regulations enhance banks' resilience to Covid-19 shocks, Aldasoro & Ehlers, (2018) argue that the unprecedented scale and persistence of the pandemic may generate more severe effects than previous crises, potentially weakening the effectiveness of existing regulatory buffers. These contrasting findings suggest that the impact of Covid-19–induced environmental uncertainty on bank performance is not uniform and may depend on institutional settings, regulatory frameworks, and regional characteristics.

Building on the above literature, the causal mechanism in this study can be explained as follows. The COVID-19 pandemic increases environmental and economic uncertainty, which weakens macroeconomic conditions, reduces borrowers' repayment capacity,

increases non-performing loans, and heightens liquidity and funding pressures. These channels ultimately deteriorate bank profitability and stability. However, the magnitude of this impact may depend on bank size. Larger banks may mitigate the negative effects through diversification benefits, economies of scale, stronger capital buffers, and implicit government support consistent with the Too Big To Fail argument, whereas smaller banks may be more vulnerable due to limited diversification and resources.

From the above discussion, the impact of environmental uncertainty on the banking sector has been extensively investigated in recent years. However, contributions in this area will remain focused if the environment has a negative impact on bank performance in several countries. Our study considers a sample consisting of banks operating in the ASEAN region. Furthermore, in this study, we try to provide a better understanding of the impact of environmental uncertainty (covid-19 pandemic) on bank performance, so that this argument leads to our first hypothesis:

H1. There is a negative relationship between environmental uncertainty and bank performance.

How does bank size matter when analyzing performance?

As one of the determinants of performance, bank size becomes important in the banking literature (Kouzez, 2021). There are many studies that confirm that the performance of large banks is stronger than other banks (Gandhi & Lustig, 2015). The main reason for explaining this trend is that large banks enjoy more favorable funding conditions than small banks in addition to better diversification of credit risk and liquidity than other credit institutions. When risks can be fully diversified and monitoring costs are well defined, financial intermediation is most efficiently conducted through sufficiently diversified portfolios of borrowers, implying that larger intermediaries tend to operate more efficiently. In addition to diversification, lowering the cost of relative risk, the spread of overhead costs, especially those related to information technology is another form of economies of scale. In addition, Goetz et al (2016) also show that banks that grow larger (geographical expansion) can reduce risk by reducing their exposure to idiosyncratic local risks.

Big banks outperform other banks because they have claims to public resources that other banks do not have (Sakawa et al., 2020). Large banks can profit from expanding their business and are considered 'too big to fail' (Kouzez, 2021). Based on a macroeconomic perspective, failures experienced by large banks must be prevented so as not to cause other banks to run and reduce the money supply significantly (Farhi & Tirole, 2012).

Despite extensive evidence suggesting that larger banks benefit from economies of scale, diversification, and preferential access to funding, the literature does not provide a unanimous conclusion regarding the resilience of large banks during periods of severe uncertainty. While some studies argue that bank size enhances stability through better risk diversification and liquidity management, other research highlights potential vulnerabilities associated with large banks. In particular, the "too-big-to-fail" perception may encourage excessive risk-taking and moral hazard, which could amplify losses during systemic shocks (Farhi & Tirole, 2012). Moreover, much of the existing evidence on bank size and performance is derived from normal economic conditions or financial crises of endogenous origin, leaving uncertainty as to whether the advantages of bank size persist under an

exogenous shock such as the Covid-19 pandemic. These mixed findings suggest that the role of bank size in shaping banks' resilience remains an empirical question, especially in emerging regions like ASEAN with heterogeneous banking structures.

In the context of the Covid-19 pandemic, bank size is expected to play a particularly important role in shaping banks' ability to withstand heightened environmental uncertainty. Unlike conventional financial crises, the Covid-19 shock is exogenous and simultaneously affects both the real economy and the financial system, thereby testing banks' operational flexibility, funding access, and risk absorption capacity. Large banks may be better positioned to absorb such shocks due to their diversified asset portfolios, broader funding bases, and stronger relationships with regulators and policymakers. At the same time, the unprecedented nature of the pandemic raises questions as to whether these structural advantages are sufficient to offset the heightened uncertainty and economic disruption. This makes bank size a critical dimension through which differences in banks' resilience to Covid-19–related uncertainty can be empirically examined.

Based on this explanation, in this analytical framework, large banks have better resilience in dealing with external shocks including shocks due to the Covid-19 pandemic so that large banks can maintain their stability better. Given the importance of bank size and determining its performance, we will examine the impact of environmental uncertainty due to the Covid-19 pandemic on bank performance by size, so the second hypothesis in this paper is structured as follows:

H2. Big banks are more resilient to uncertainty than other banks.

METHODOLOGY

This study uses specific banking and country-level data for the ASEAN region, namely, Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam in the period 2016 – 2021. These data were obtained from Thomson Reuters and the World Bank. Based on the data obtained from the database, the researcher then obtained data on the main dependent variable, namely bank performance as measured by Return on Assets (ROA). The period of uncertainty due to the Covid-19 pandemic will be broken down by year using a variable dummy, where for the year after the pandemic (2020) dummy 1, and 0 otherwise. Then, to see the size effect, this study will separate groups based on bank size, where for the large bank group that has a size value above the median, and a small bank group for banks that have a size value below the median. Furthermore, this research will also control several micro factors (companies) and macro factors. This study examines the relationship between uncertainty (pandemic Covid-19) and banking performance for bank i and time t with the following equation:

$$\underline{ROA_{i,t}} = \alpha_i + \beta_1\ Cov-19_{i,t} + \beta_2 \underline{Equity_{i,t}} + \beta_3 \underline{MKTB_{i,t}} + \beta_4 \underline{GDP_{i,t}} + \beta_5 \underline{INFL_{i,t}} + \beta_6 \underline{IR_{i,t}} + \varepsilon_{it} \ldots\ldots(1)$$

In this study, bank performance (ROA) is measured as net income divided by total assets, reflecting the bank's ability to generate profit from its overall asset base. The main independent variable, Covid-19 uncertainty (Cov-19), is proxied by a dummy variable, which takes the value of 1 for the period after the outbreak of the Covid-19 pandemic (2020 onward) and 0 otherwise. This variable captures the structural shift in economic conditions during the pandemic period.

Several bank-specific control variables are included in the model. Equity is measured as the ratio of total equity to total assets, representing the bank's capitalization level and financial resilience. Bank size (Size) is calculated as the natural logarithm of total assets, which controls for scale effects and potential differences in operational efficiency between large and small banks. Market-to-book ratio (MKTB) is measured as market capitalization divided by total book value, capturing market valuation and growth opportunities.

In addition to micro-level factors, the model incorporates macroeconomic control variables. Gross Domestic Product (GDP) represents the annual growth rate of each country's economy and reflects overall economic conditions. Inflation (INFL) is measured as the annual inflation rate, indicating price stability and purchasing power dynamics. Interest Rate (IR) represents the prevailing national interest rate, which influences lending activities, funding costs, and overall banking sector performance.

The banking data were obtained from the Thomson Reuters database, while macroeconomic indicators were sourced from the World Bank. These variables collectively allow for a comprehensive analysis of how pandemic-related uncertainty and both bank-specific and macroeconomic factors influence banking performance across ASEAN countries.

RESULT AND DISCUSSION

The empirical analysis begins with the descriptive statistics presented in **Table 1**, which reports the number of observations, minimum, maximum, mean, and standard deviation for all variables, both before and after the Covid-19 pandemic period. As shown in Table 1, the average value of bank performance (ROA) before the pandemic was 0.0697, with a standard deviation of 0.0733, indicating relatively moderate variation across banks. In the same period, the uncertainty variable records a mean value of 0.0000, reflecting the absence of pandemic conditions.

After the Covid-19 outbreak, the average ROA slightly decreased to 0.0633, while the uncertainty variable increased to 1.00, as expected due to the dummy measurement of the pandemic period (see **Table 1**). Although the decline in average performance appears modest, the descriptive comparison suggests an initial indication of pressure on banking profitability during the pandemic period.

Furthermore, **Table 1** shows changes in both microeconomic and macroeconomic variables across the two periods. For example, equity ratios slightly increased after the pandemic, suggesting strengthened capitalization among banks. Meanwhile, macroeconomic indicators such as GDP growth display greater dispersion during the pandemic period, reflecting heightened economic volatility across ASEAN countries. Overall, these descriptive results provide preliminary evidence of structural differences between the pre- and post-pandemic periods, which are further examined in the regression analysis section.

Table 1. Descriptive Statistics

Variables	Before pandemic Covid-19					After pandemic Covid-19				
	N	Min	Max	Mean	Std. Dev	N	Min	Max	Mean	Std.Dev
Performance	272	-0.16	0.73	0.06	0.07	136	-0.24	0.85	0.06	0.07
Uncertainty	272	0.00	0.00	0.00	0.00	136	1.00	1.00	1.00	1.00
Equity	272	0.05	1.15	0.46	0.21	136	-0.06	2.21	0.47	0.22
MKTB	272	15.1	20.6	18.3	16.4	136	-25.3	21.88	18.9	16.2
GDP	272	1.10	7.20	4.61	1.36	136	-9.52	7.61	2.15	4.43
INFL	272	-0.36	4.36	1.95	1.31	136	-2.97	6.02	2.08	2.20
IR	272	1.50	5.17	3.06	1.21	136	1.50	5.26	3.21	1.32

Note: please see **Table 1** for the description of variables.

Uncertainty due to the Covid-19 pandemic for the group before the pandemic uses a dummy variable, resulting in a mean value of 0 for before and 1 for after the Covid-19 pandemic. Based on the results of descriptive statistics, it can be seen that the average value of bank performance before pandemic is greater than the average value of bank performance after the Covid-19 pandemic (0.0697 > 0.0633). This shows that the bank's performance before the Covid-19 pandemic was better than the average bank performance after that. This result is consistent with the argument of this study that bank performance will decline due to uncertainty due to the pandemic Covid-19.

Table 2. Correlations

	1	2	3	4	5	6	7
Performance	1						
Uncertainty	-0.102*** (0.000)	1					
Equity	0.306*** (0.000)	0.024 (0.264)	1				
MKTB	0.167*** (0.000)	-0.022 (0.313)	-0.099*** (0.000)	1			
GDP	0.069** (0.002)	-0.635*** (0.000)	-0.011 (0.602)	0.048** (0.028)	1		
INFL	0.028 (0.193)	-0.071*** (0.001)	-0.020 (0.345)	0.101*** (0.000)	.575*** (0.000)	1	
IR	-0.044** (0.041)	0.078*** (0.000)	0.005 (0.820)	0.210*** (0.000)	.015 (0.486)	.064*** (0.003)	1

Note: This table presents regression results, respectively. Please see **Table 1** for the description of variables. Superscripts ***, **, and * denotes statistically significant at the 0.01, 0.05 and 0.10 levels, respectively

Furthermore, this research is strengthened by the findings of the correlation matrix presented in **Table 2**. The results are generally consistent with the descriptive statistics. As shown in **Table 2**, there is a negative and statistically significant correlation between ROA (bank performance) and uncertainty (Covid-19), with a coefficient of –0.102 at the 1 percent significance level. This indicates that the pandemic period is associated with lower bank profitability, providing preliminary evidence that uncertainty adversely affects banking performance.

In addition, bank performance shows a positive and significant correlation with equity (0.306), suggesting that better-capitalized banks tend to exhibit higher profitability. This finding aligns with the argument that stronger capital buffers enhance financial stability and operational resilience. ROA is also positively correlated with the market-to-book ratio (0.167), implying that banks with higher market valuation relative to book value generally demonstrate better performance.

Regarding macroeconomic variables, GDP growth is positively and significantly correlated with ROA (0.069), indicating that favorable economic conditions support banking profitability. Meanwhile, inflation and interest rates show weaker relationships with bank performance, although the correlation between ROA and interest rates is negative and statistically significant (–0.044), suggesting that higher interest rates may exert pressure on profitability.

Importantly, the correlation coefficients among the independent variables remain below commonly accepted multicollinearity thresholds, indicating that multicollinearity is unlikely to pose serious concerns in the regression analysis. Overall, the correlation matrix provides initial empirical support for the hypothesized relationships and justifies proceeding with multivariate regression estimation.

Table 3. Bank performance and uncertainty (Covid-19)

Variables	Dependent variable: performance			
	1	2	3	4
Uncertainty	-0.016***	-0.016***	-0.017***	-0.017***
	(0.000)	(0.000)	(0.001)	(0.000)
Equity		0.109***		0.109***
		(0.000)		(0.000)
MKTB		9.270***		1.004***
		(0.000)		(0.000)
GDP			0.000	0.000
			(0.611)	(0.645)
INFL			0.001	0.001
			(0.252)	(0.453)
IR			-0.002*	-0.005***
			(0.084)	(0.000)
Observation	408	408	408	408
R-Squared	0.010	0.144	0.012	0.148
F-Statistic	22.323***	117.869***	6.658***	62.174***
Sig	0.000	0.000	0.000	0.000

Note: This table presents regression results, respectively. Please see **Table 1** for the description of variables. Superscripts ***, **, and * denotes statistically significant at the 0.01, 0.05 and 0.10 levels, respectively

Furthermore, the regression analysis for all research samples is shown in **Table 3**. The results show that the Cov-19 variable has a negative and significant effect on bank performance in all models (models 1-4). These results indicate that when entering the period after the Covid-19 pandemic (dummy 1), bank performance will decline due to the uncertainty caused by the pandemic. These results are consistent with our first hypothesis, so the first hypothesis in this study is accepted. This study is consistent with the findings of several other researchers, namely Mohammad & States (2020) who found that the number of confirmed cases of Covid-19 led to a significant decline in returns in Canada, France, Germany, Italy, and the United States (US) which further decreased. the return indicates a decline in the company's performance. According to Baek et al., (2020) and Zaremba et al., (2020) documented that COVID-19 causes a substantial increase in stock market volatility, where the occurrence of this volatility can also lead to a decline in company performance. According to Elnahass et al., (2021) the Covid-19 pandemic had a negative impact on the performance and financial stability of banks in 116 countries.

A closer examination of Table 3 further confirms the robustness of this finding across different model specifications. In Model 1, which includes only the uncertainty variable, the

coefficient of Cov-19 is –0.016 and statistically significant at the 1 percent level. This negative effect remains stable in Model 2 after controlling for bank-specific variables (Equity and MKTB), where the coefficient remains –0.016 and highly significant. Similarly, in Model 3, which incorporates macroeconomic variables (GDP, inflation, and interest rates), the coefficient of uncertainty slightly increases in magnitude to –0.017 and remains statistically significant. The full specification in Model 4, which includes both bank-level and macroeconomic controls, continues to show a negative and significant coefficient (–0.017), indicating that the adverse impact of the pandemic on bank performance is consistent and not sensitive to model adjustments.

Regarding the control variables, equity exhibits a positive and statistically significant coefficient in Models 2 and 4, suggesting that better-capitalized banks tend to achieve higher profitability. This finding supports the argument that stronger capital buffers enhance banks' resilience during periods of economic distress. The market-to-book ratio (MKTB) also shows a positive and significant relationship with performance, indicating that banks with stronger market valuation and growth prospects tend to perform better.

Among the macroeconomic variables, GDP growth and inflation do not show statistically significant effects in the full model, implying that the direct impact of macroeconomic fluctuations on profitability may be less pronounced once bank-specific characteristics are controlled for. However, the interest rate variable becomes negative and statistically significant in Model 4, suggesting that higher interest rates may exert downward pressure on bank profitability, possibly through increased funding costs or reduced credit demand.

The R-squared values increase substantially when control variables are included, from 0.010 in Model 1 to 0.148 in Model 4, indicating improved explanatory power. Moreover, the F-statistics in all models are statistically significant at the 1 percent level, confirming the overall goodness-of-fit of the regression models. Overall, **Table 3** provides strong empirical evidence that pandemic-related uncertainty significantly reduced bank performance across ASEAN countries, even after controlling for both microeconomic and macroeconomic factors.

Table 4. Bank performance, uncertainty (Covid-19), and size

Variables	Dependent variable: performance							
	Big size				Small size			
	1	2	3	4	1	2	3	4
Uncertainty	-0.011*** (0.003)	-0.012*** (0.000)	-0.017*** (0.001)	-0.018*** (0.000)	-3.586*** (0.003)	-3.634*** (0.003)	-5.094** (0.014)	-4.821** (0.021)
Equity		0.090*** (0.000)		0.093*** (0.000)		5.601* (0.076)		6.034* (0.057)
MKTB		9.557*** (0.000)		1.001*** (0.000)		2.870 (0.654)		6.006 (0.360)
GDP			-0.001* (0.085)	-0.001* (0.068)			-0.327 (0.322)	-0.280 (0.397)
INFL			0.002* (0.067)	0.001 ((0.176)			0.007 (0.989)	-0.031 (0.946)
IR			0.001 (0.518)	-0.004*** (0.005)			-0.849 (0.103)	-1.059** (0.049)
Observation	204	204	204	204	204	204	204	204
R-Squared	0.007	0.167	0.010	0.174	0.011	0.015	0.017	0.022
F-Statistic	8.697***	86.710***	3.222***	45.655***	8.613***	3.973***	3.468***	3.025***

Sig	(0.003)	(0.000)	(0.012)	(0.000)	(0.003)	(0.000)	(0.000)	(0.006)

Note: This table presents regression results, respectively. Please see **Table 1** for the description of variables. Superscripts ***, **, and * denotes statistically significant at the 0.01, 0.05 and 0.10 levels, respectively.

This study also divides groups based on size to see how the impact of bank size on stability by looking at the bank's performance are presented in **Table 4**. We divided the sample into two groups, where the first group is big size for banks that have a size above the median value, and the second group is small size for banks that have a size below the median value. The results of the regression analysis in separating the sample into two groups. In the big size group, both models 1 to 4, the results show a significant negative relationship between uncertainty due to the Covid-19 pandemic and bank performance with coefficient values of -0.011, -0.012, respectively., -0.017, and -0.018. In the small size group, it is known that in models 1 to model 4 the results also show a negative relationship between uncertainty due to the Covid-19 pandemic and bank performance as indicated by the coefficient values of -3,586, -3,634, -5,094, and -4,821, respectively. Based on the coefficient values of the two groups, it can be seen that the coefficients produced by the small size group have a greater negative impact than the big size group, meaning that the negative impact of uncertainty due to the Covid-19 pandemic on bank performance is felt worse when banks have a larger size. small size, so the big size is considered more stable than the small size.

This is consistent with the second hypothesis in our study, where the second hypothesis reveals that large banks are more resilient to uncertainty (the Covid-19 pandemic) than other banks. Based on this explanation, it can be concluded that the second hypothesis in this study is also accepted.

The results of this study are consistent with several other studies, namely (Goetz et al., 2016) which also shows that banks that grow larger (geographical expansion) can reduce risk by reducing their exposure to idiosyncratic local risks. The performance of large banks is stronger than other banks (Sakawa et al (2020) large banks outperform other banks because they have claims to public resources that other banks do not have.

Table 5. Bank performance, uncertainty, and countries

Variables	Dependent variable : performance					
	Indonesia	**Malaysia**	**Singapore**	**Thailand**	**Philippines**	**Vietnam**
Uncertainty	-1.609*	-0.540*	-0.606***	-0.021*	-0.046***	-0.250***
	(0.095)	(0.086)	(0.002)	(0.069)	(0.000)	(0.000)
Equity	-0.525	0.165	0.392	0.153***	0.114***	0.219***
	(0.418)	(0.250)	(0.376)	(0.000)	(0.000)	(0.002)
MKTB	-4.747	1.997	-9.173	5.443***	-2.373	3.436
	(0.911)	(0.279)	(0.944)	(0.000)	(0.557)	(1.00)
GDP	-0.378	-0.199***	0.087	0.001	-0.002***	0.035***
	(0.167)	(0.000)	(0.168)	(0.654)	(0.008)	(0.004)
INFL	0.158	0.143***	0.002	-0.006	-0.002	-0.007
	(0.490)	(0.002)	(0.982)	(0.308)	(0.594)	(0.726)
IR	0.923	-1.084***	-7.460***	0.018	-0.001	0.099**
	(0.117)	(0.002)	(0.009)	(0.302)	(0.915)	(0.021)
Observation	150	60	18	66	84	30
R-Squared	0.056	0.205	0.295	0.288	0.233	0.296
F-Statistic	6.391***	27.592***	30.628***	36.824***	27.451***	37.917***
Sig	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: This table presents regression results, respectively. Please see **Table 1** for the description of variables. Superscripts ***, **, and * denotes statistically significant at the 0.01, 0.05 and 0.10 levels, respectively.

Overall, the findings can be interpreted from an economic perspective as evidence that pandemic-induced uncertainty weakens the intermediation function of banks by increasing credit risk, compressing profitability, and limiting risk-taking capacity. Although the negative effect is observed across all ASEAN countries, the magnitude and resilience patterns reflect structural differences in national banking systems, including market concentration, regulatory frameworks, and capitalization levels. In relatively more developed banking systems such as Singapore and Malaysia, large banks appear better positioned to absorb shocks, whereas in other ASEAN countries with more fragmented banking structures, smaller banks experience stronger performance deterioration. These results are consistent with prior international evidence documenting the adverse impact of COVID-19 on financial institutions (Baek et al., 2020; Zaremba et al., 2020; Elnahass et al., 2021), while also reinforcing the argument that larger banks benefit from diversification and structural advantages (Goetz et al., 2016; Rhoades, 1998; Allen & Liu, 2007; Gandhi & Lustig, 2015; Sakawa et al., 2020). However, unlike some studies focusing primarily on developed markets, this study highlights how bank size plays a particularly important stabilizing role within emerging ASEAN banking structures, where institutional and structural heterogeneity shapes crisis transmission mechanisms.

Table 6. Bank performance, uncertainty, size, and countries

Variables	Dependent variable: performance					
	Indonesia		Malaysia		Singapore	
	Big Size	Small Size	Big Size	Small Size	Big Size	Small Size
Uncertainty	-0.333**	-1.079**	-0.973	-2.167*	-0.010***	-1.093***
	(0.033)	(0.021)	(0.120)	(0.057)	(0.007)	(0.003)
Equity	0.280**	-0.093	0.246	0.716	0.032***	1.842
	(0.045)	(0.786)	(0.382)	(0.266)	(0.000)	(0.102)
MKTB	-9.842	5.334***	2.218	1.769	1.296***	4.010
	(0.156)	(0.010)	(0.464)	(0.513)	(0.000)	(0.258)
GDP	-0.064	-0.259**	-0.361***	-0.853***	0.000	0.165
	(0.181)	(0.043)	(0.000)	(0.000)	(0.749)	(0.147)
INFL	0.022	0.107	0.244***	0.674***	-0.002	0.027
	(0.596)	(0.309)	(0.008)	(0.000)	(0.400)	(0.878)
IR	0.231**	0.625**	-1.758**	-5.039***	0.054	-14.84***
	(0.030)	(0.023)	(0.011)	(0.000)	(0.306)	(0.004)
Observation	75	75	30	30	9	9
R-Squared	0.266	0.182	0.224	0.144	0.399	0.262
F-Statistic	6.780***	7.274***	21.182***	12.065***	48.389***	25.836***
Sig	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Thailand		Philippines		Vietnam	
	Big Size	Small Size	Big Size	Small Size	Big Size	Small Size
Uncertainty	-0.025**	-2.658***	-0.062***	-0.068*	-0.150***	-0.203***
	(0.018)	(0.008)	(0.000)	(0.095)	(0.000)	(0.000)
Equity	0.148***	-0.185	0.119***	0.232***	0.218***	0.214***
	(0.000)	(0.854)	(0.000)	(0.000)	(0.000)	(0.000)
MKTB	3.313***	0.431	-1.614	-3.059	1.815***	8.058
	(0.003)	(0.667)	(0.644)	(0.793)	(0.003)	(0.426)
GDP	0.001	-0.425	-0.004***	0.030***	0.012***	0.021***
	(0.626)	(0.671)	(0.001)	(0.000)	(0.010)	(0.003)
INFL	-0.006	1.683*	-0.002	-0.021**	-0.003	-0.003
	(0.237)	(0.093)	(0.598)	(0.027)	(0.633)	(0.751)
IR	-0.020	-3.587***	0.000	-0.103***	0.036**	0.045*
	(0.169)	(0.000)	(0.981)	(0.000)	(0.019)	(0.055)
Observation	33	33	42	42	15	15
R-Squared	0.332	0.269	0.256	0.310	0.299	0.327
F-Statistic	44.903***	33.392***	30.824***	40.006***	38.558***	43.209***

Sig	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: This table presents regression results, respectively. Please see Table 1 for the description of variables. Superscripts ***, **, and * denotes statistically significant at the 0.01, 0.05 and 0.10 levels, respectively

Then to strengthen the results of the study, we conducted a robustness test by dividing the research sample by country. First, we divide the groups by country to find out whether the results of this study (hypothesis 1) remain consistent in each country, which indicates that the uncertainty due to the Covid-19 pandemic does have a negative impact on bank performance for each country. Second, we subdivide each country group based on the size of the company, namely big size and small size. This is done to see the strength of the results of our second hypothesis, which is expected to remain consistent that the negative effect of small size will be greater than big size, which means big size is more stable than small size.

Based on **Table 5**, each country, namely Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam has a negative and significant coefficient where the coefficient values are -1.609, -0.540, -0.606, -0.021, -0.046, and -0.250 respectively. These results indicate that in each of our sample countries, our research shows that uncertainty due to the Covid-19 pandemic has a negative effect on bank performance. This is consistent with the results of our first hypothesis research, so it can be concluded that our first model is robust.

The uncertainty of the surrounding conditions that hinder all bank operational activities is a form of uncertainty for the bank (Taghizadeh-Hesary, Phoumin, and Rasoulinezhad 2022). As a result, it is not known whether the decisions taken at this time will succeed or fail in the future. This makes the bank have poor performance if the decision is not right. In addition, future planning and its control will be slightly constrained by the uncertainty that occurs (Ardiyono 2022; Ventouri 2018). Banks that are successful in dealing with uncertainty will adapt quickly to changes in their environment. Banks are organizations that are very close to uncertainty. This can be seen when banks operate as intermediaries for parties who need and have excess funds. Bank life depends on these two things. Especially in the Covid-19 situation (Ong et al. 2023; Suripto 2022). This condition is a condition that comes suddenly which threatens a country's economy to deteriorate. One example is a party that lacks funds could be more but to return the funds becomes difficult. As a result, there is a default that can affect the bank. In the conditions of Covid-19, banks must have a strategy to avoid a decrease in income that should be earned. Thus, low uncertainty makes bank performance high.

Based on **Table 6** in our study, where we divided the sample of each country into two groups, namely big size and small size. The results show that for each country, namely Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam in the big size group, the values obtained are -0.333 (sig. 0.033), -0.973 (sig. 0.120), -0.010 (sig. 0.120), -0.010 (sig. 0.120). 0.007), -0.025 (sig. 0.018), -0.062 (sig. 0.000), and -0.150 (sig. 0.000). These results show that for each country except Malaysia, there is a negative correlation between the uncertainty of the Covid-19 pandemic and bank performance. In Malaysia, the results show a negative relationship between uncertainty due to the Covid-19 pandemic and bank performance, but the results are not significant for big size, meaning that the large size bank group in Malaysia is more stable than the big size group in other ASEAN countries

because of the negative influence. from the pandemic did not significantly reduce bank performance.

Furthermore, in the small size group, for each country, namely Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam, the coefficient values are -1.079 (sig. 0.021), -2.167 (sig. 0.057), -1.093 (sig. 0.057). 0.003), -2.658 (sig. 0.008), -0.068 (sig. 0.095), and -0.203 (sig. 0.000). These results show that for each country, there is a negative and significant correlation between uncertainty due to the Covid-19 pandemic and bank performance. Based on the results of the two groups for each country, it can be seen that the coefficient results in the small size group have a larger negative value. This means that in all ASEAN countries, the small size group has a negative impact between the uncertainty due to the Covid-19 pandemic and the performance of banks that are greater than the big size group. These results are consistent with our research on the second hypothesis, which shows that large banks are more resilient to uncertainty (the Covid-19 pandemic) than other banks. Based on the results of the study in Table 6, it can be concluded that the second model in our study is also robust.

The handling of Covid-19 in Malaysia can be said to be better compared to other countries in this study. The quality of handling the covid pandemic can be seen from the existence of infrastructure and professional staff (Davis, Karim, and Noel 2020; Trinugroho, Risfandy, and Ariefianto 2018). However, related to banking and the economy, the challenges that occur with the arrival of the covid pandemic cannot be solved individually. This is a global financial crisis that must be resolved together. It doesn't stop there; inflationary conditions also greatly affect banking performance. High inflation is a benchmark for a country in terms of increasing money circulation and relatively high prices for goods. People expect lower prices of goods compared to high prices of goods (Elsayed, Naifar, and Nasreen 2022; Tan 2016). If people are faced with inflationary conditions, then people tend to prefer to save their funds in banks compared to buying goods that are relatively high. This is due to interest rates that increase deposit interest in banks. The more people who save in the bank, the higher the income in the form of interest received by the bank. As a result, bank performance will increase. This is in line with the GDP in a country (Wu and Turvey 2020). If people's income increases, the bank can carry out a strategy to increase interest rates in the hope that people will save more. This strategy is used to improve bank performance. These conditions will differ in terms of bank size. Larger banks will be able to improve their performance more quickly in the face of Covid-19 conditions.

CONCLUSION AND RECOMMENDATION

This study examines the effect of uncertainty caused by the COVID-19 pandemic on bank performance and investigates whether bank size moderates this relationship. Using a sample of commercial banks in ASEAN countries—Indonesia, Malaysia, Singapore, the Philippines, Thailand, and Vietnam—over the period 2016–2021, the findings indicate that pandemic-related uncertainty significantly reduces bank performance. This result confirms that heightened environmental uncertainty during systemic crises weakens banking sector profitability in emerging markets.

Furthermore, the results reveal that the negative impact of COVID-19 uncertainty is more pronounced for small banks than for large banks. This finding suggests that larger banks demonstrate greater resilience during periods of systemic shocks, consistent with the arguments of diversification benefits, economies of scale, and the Too Big To Fail hypothesis. Sub-sample analyses across individual countries confirm the robustness of the model, as the negative effect remains significant in all ASEAN countries. Additional size-based sub-sample tests show that large banks experience a smaller decline in performance compared to small banks. In Malaysia, although large banks experienced a decline during the pandemic period, the effect was not statistically significant. Overall, the findings support the robustness of both empirical models employed in this study.

The findings provide several important implications. First, for regulators, the results highlight the need to strengthen supervisory frameworks and crisis mitigation policies, particularly for smaller banks that are more vulnerable to systemic uncertainty. Targeted capital buffer policies, liquidity support mechanisms, and risk monitoring systems may help reduce asymmetric vulnerabilities across bank sizes.

Second, for small banks, the results suggest the importance of enhancing risk management practices, diversifying loan portfolios, strengthening capital positions, and improving operational efficiency to increase resilience against future systemic shocks. Third, in terms of financial system stability, the study underscores that heterogeneous bank resilience can amplify systemic risk during crises. A banking structure dominated by vulnerable small institutions may increase overall financial fragility. Therefore, maintaining balanced regulatory policies that support both competitiveness and stability is crucial for sustaining long-term financial system resilience.

This study has several limitations. First, the analysis focuses on ASEAN countries, which may limit the generalizability of the findings to other regions. Second, the measurement of uncertainty is primarily linked to the COVID-19 period and may not fully capture other dimensions of macroeconomic or geopolitical uncertainty. Third, the study mainly emphasizes bank size as a moderating factor, without incorporating other structural characteristics such as ownership structure, digitalization level, or governance quality.

Future research may extend this study by including a broader cross-country sample, examining post-pandemic recovery dynamics, or exploring additional moderating variables such as capitalization, liquidity, or institutional quality. Further investigation into long-term structural changes in banking performance following systemic health crises would also provide valuable insights.

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