Bank Profitability Determinants: Firm-Level Observations in the ASEAN-5 Markets

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Abstract

This paper aims to investigate the bank-specific characteristics and macroeconomic factors affecting the profitability performance of the Southeast Asian banking sector. The sample markets cover the five original members of ASEAN, i.e. Indonesia, Malaysia, Philippines, Singapore, and Thailand, whereas the sample period encompasses the years between 2010 and 2017. While a healthy financial system is important for the economic sustainability and growth, there are still limited studies to understand how banks generally perform in this region. Our findings largely support the existing hypotheses about the importance of certain micro- and macro variables while contributing new empirical evidence to the current literature. The bank size, loan to assets, loan loss provision, non-interest incomes and expenses, and capital adequacy remain relevant in influencing bank profitability in the ASEAN-5 region. Macroeconomic variables of inflation, interest rate, market concentration and GDP per capita play considerable roles in profitability when they are assessed separately from the bank-specific factors. It is worth noting that the bank-level factors remain important and outplay the macroeconomic factors when they are considered at the same time. The result robustness is of a certain level of satisfaction because comparisons have been performed across individual countries and across different regression models of pooled ordinary least squares model, random effect model, and fixed effect model for all the tentative tests. Both the return on assets and return on equity are examined. Combining both micro- and macroeconomic variables in the regressions also indicates an overall improvement in the r-squared under the same models.

Keywords: bank profitability, ASEAN, panel data, firm-level, macroeconomic factors

1. Introduction

The banking sector is the section of economy devoted to the holding of financial assets for others, investing those financial assets as leverage and the regulation of those activities by government agencies. The sector plays a crucial role in financial resource allocation. A well-established financial system is known to be an important factor for economic growth (Xu, Li, & Ahmad, 2018). The Association of Southeast Asian Nations (ASEAN) was established in 1967 to encourage active collaborations and mutual assistance on matters of common interests such as economic, social, cultural, technical and scientific fields. The banking system continues to be the most important financial sector in many ASEAN member states, serving as major financial intermediaries in the economy and thus deserves careful study. A healthy banking system with good profitability would support the economic growth and stability of the nation. Profitability is an important tool to evaluate internal performance and helps to determine whether the business has succeeded in achieving its ultimate objectives (Jumono & Mala, 2019). Therefore, it is important to understand the fundamental profitability factors for a sustainable finance landscape in the region.

The main objective of this study is to identify the internal bank-level determinants and the potential influence of macroeconomics on the profitability performance of the banking sector in the ASEAN-5 region covering Indonesia, Malaysia, Philippines, Singapore, and Thailand. Existing studies, including those focusing on a single market and multi markets, have suggested some common bank-specific characteristics such as bank size, asset structure and capital adequacy as determinants of profitability performance in the banking sector. This paper attempts to contribute further empirical evidence in the ASEAN region by considering the importance of external environment factors, including the GDP performance, inflation, interest rates, and market structure, in addition to the commonly used firm-level factors. We expect to observe some significant relationships between these variables and the profitability

performance of banks. We opine that further research is still much needed in terms of its updated empirical evidence as well as the regional coverage. While international research efforts have been found in understanding bank's performance, there is still relatively low coverage of such a study in the ASEAN region. This paper also aims to contribute to the literature gaps by incorporating both the micro- and macroeconomic variables in comparing the bank performance across the five countries using recent years of data post the sub-prime crisis period.

The next section entails the literature review of relevant theoretical and empirical studies. Section three discusses the model specification and the description of variables and data sources. Section four provides the results and discussion while the final section concludes with a summary of findings, policy implications and potential future research.

2. Literature Review

The concept of economy of scale relates the firm size to the cost of production. Thus, large banks could earn higher profits from low-cost outputs production. Nevertheless, the study by Sahul Hamid (2017) on the ASEAN-5 markets indicates that bank size has a negative and significant relationship with profitability. Large banks are likely to have lower profitability. A study by Caporole, Lodh and Nandy (2017) in the MENA countries also find the similar. Such a negative and significant relationship is consistent with the observations by Sufian and Habibullah (2009) in Malaysia and Thailand. However, Menicucci and Paolucci (2016) find a positive relationship in the 35 top European banks during the years 2009-2013. Ali and Puah (2019) suggest that the positive relationship in the Pakistan banks implies that these banks are efficient to attain economies of scale. The findings by Masood and Ashraf (2012) from 25 Islamic banks in 12 countries also indicate a positive relationship. Sufian (2009) suggests that bank size and profitability could have a positive association during an unstable macroeconomic environment. In some studies, bank size does not seem to exhibit an important role (see, for example, Petria, Capraru & Ihnatov, 2015; Sun, Shamsher & Ariff, 2017; Javaid & Alalawi, 2018; Ercegovac, Klinac & Zdrilic, 2020; Phan, Hoang, Dinh & Hoang, 2020).

Loans-to-total assets ratios, which indicate how much value of the assets is tied up in loans in a year, can be used as a measure of liquidity. The higher this ratio indicates the liquidity is lower and the bank may face higher default risks. Between the years 1995 and 1999, this ratio shows a positive and significant relationship with banks' efficiency in Malaysia (Sufian, 2009). The findings imply that banks with a higher ratio tend to have higher efficiency scores. Ali and Puah (2019) explain such a positive impact from the risk-return perspective. In contrast, another study by Sufian and Habibullah (2009) indicates that the ratio has a negative and significant impact on profitability when the data from both Malaysia and Thailand are regressed together. When the analysis is performed separately, the ratio is only negatively related to Thailand banks' profitability but not to the Malaysian banks. In the MENA region, a study by Caporale et al. (2017) finds that this ratio has a negative relationship with banks' profitability probably because higher uncertainty results in higher liquidity holding.

Loan loss provision is a reserve account to cover unexpected defaults on loans by borrowers. Higher provisions for loan losses consequently reduce net income. In Malaysia, a negative relationship between the ratio of loan loss provision to total loans and the bank's technical efficiency can be observed (Sufian, 2009). The result implies that banks should focus more on credit risk management which could be problematic. A study on Vietnam by Nguyen and Nguyen (2018) finds that this ratio is significant and negatively correlated to return on assets and suggests that banks with higher credit risks tend to exhibit lower efficiency levels. In Portugal and Korea, the similar significant and negative relationships with return on assets are found, reflecting the importance of quality of credit risk towards bank profitability (Sufian, 2011; Garcia & Guerreiro, 2016; Ercegovac et al., 2020). A study by Sahul Hamid (2017) instead indicates that the loan loss provision-to-total loans do not have any significant influence on bank profitability in ASEAN. The author also suggests that foreign banks earn significantly lower profits because these ASEAN countries are emerging economies. The insignificant role of this ratio is also found in the Thailand banking sector (Sufian & Habibullah, 2009).

Non-interest income is another source of funds of banks in addition to the conventional interest income. Non-interest income has a significantly positive relationship with the bank's technical efficiency (Sufian, 2009). This implies that banks tend to become more managerially efficient as they increase the incomes from non-interest sources. Income diversification makes a significant contribution to bank profitability (Sufian & Habibullah, 2009). In Turkey, commercial banks also enjoy high profits when they manage to generate income from non-interest activities (Anbar & Alper, 2011). Nguyen and Nguyen (2018) also find that non-interest income is significantly positive in all models containing globalisations variables for the Vietnam banks. This indicates that a higher proportion of banks' income was derived from non-interest sources and more income can be generated when banks are engaged in any kind of business activity. Meanwhile, the study by Sun et al. (2017) on commercial and Islamic banks in the Organisation of

Islamic Countries further suggests that there is an increasing importance of non-interest incomes as a way of diversification in improving overall bank performance. Next, the cost to income ratio largely exhibits a consistent negative relationship with profitability in the past studies (see, for example, Masood & Ashraf, 2012; Javaid & Alalawi, 2018; Ercegovac et al., 2020). Sufian and Habibullah (2009) investigate the non-interest expenses ratio and find a negative and significant impact. Nguyen and Nguyen (2018) believe that banks in Vietnam have a low efficiency level based on the negative relationship between such expenses with profitability. Sufian (2011) also suggests the same impact on the return on assets and return on equity in the Korean banking sector.

Javaid and Alalawi (2018) measure capital adequacy by using the equity to total assets ratio. The capital ratio indicates the robustness of financial institutions to withstand shocks. A bank with a sound capital position is able to pursue business opportunities more effectively and manage to deal with problems regarding unexpected losses, thus achieving increased profitability (Menicucci & Paolucci, 2016; Hasanov, Bayramli & Al-Musehel, 2018; Javaid & Alalawi, 2018). Xu et al. (2018) find that in China, the capital adequacy ratio has a positive relationship with both the return on assets and return on equity. In the EU-27 banking sector, Petria et al. (2015) suggest that the capital adequacy ratio has a positive relationship and statistically significant only with return on assets and not with return on equity.

Macroeconomic environment wise, there is an expected significant relationship between interest rates and banks' performance given the business nature of banks. Bank profits could increase when interest rates increase. The study by Anbar and Alper (2011) implies that when real interest rates are higher, the return on equity of banks rises. Garcia and Guerreiro (2016) find that the term structure of interest rates has some moderate negative impact on bank profitability in terms of return on equity and net interest margins in Portugal during the years 2002-2011. While the interest rates can be reflected through inflation expectation, finding in Malaysia and Thailand suggests that the impact of inflation is positively related to the profitability of both countries and is statistically significant during and post the Asian financial crisis (Sufian & Habibullah, 2009). A similar positive finding is proposed by Phan et al. (2020) for the Vietnam market. However, inflation exhibits a negative impact on the profitability of Malaysian banks during a crisis period. Abel and Le Roux (2016) also find that inflation gives a negative impact on the return on assets, by increasing bank costs which erodes profits. However, Hasanov et al. (2018) find that inflation has a positive impact on profitability and suggest that banks in Azerbaijan are able to manage inflation and improve profitability. Similar observations are found by Robin, Salim and Bloch (2018) in the Bangladesh banking sector. On Islamic banks, the inflation rate impacts positively on return on assets but the coefficient founds to be insignificant (Masood & Ashraf, 2012). A similar insignificant result is found in the investigation of return on equity.

In the EU 27, GDP exhibits a strong positive impact on the return on assets and return on equity (Petria et al., 2015). This is consistent with the observations found for the banks in the MENA region when both the foreign and domestic banks are regressed together (Caporale et al. 2017). The country-level analysis by Le and Ngo (2020) on 21 countries supports such a positive impact in relation to the increase in demand for financial products and services. In Vietnam, while Phan et al. (2020) find a positive relationship, Nguyen and Nguyen (2018) discover a significantly negative relationship with profitability, suggesting the result of severe competition between banks for more market share during the recession. Javaid and Alalawi (2018) also find that the Islamic banks in Saudi Arabia exhibit a significant negative relationship between growth and profitability. They believe that the negative association was interpreted as reflecting increased ease of entry and consequent competition that reduced profitability. Nevertheless, an insignificant relationship is found in the banks of Turkey and Korea (Anbar & Alper, 2011; Sufian, 2011). Masood and Ashraf (2012) also do not observe a significant role of GDP on profitability in 25 Islamic banks across 12 countries. The study by Sufian and Habibullah (2009) in Malaysia and Thailand indicates that GDP is positively related to return on assets though not significant.

Market structure refers to components such as the number of firms that compete in a market. The structure conduct performance (SCP) and relative market power (RMP) hypotheses are usually referred to in the analysis of bank performance. SCP theory suggests that firms are able to earn a monopolistic profit in a highly concentrated market. RMP suggests that firms with large market shares and well-differentiated products are more efficient and able to earn high profits. Herfindahl-Hirschman Index (HHI) can be used to measure market concentration. Sahul Hamid (2017) states that HHI shows a positive and significant impact thus manages to support the RMP hypothesis. In Saudi Arabia, Javaid and Alalawi (2018) find that HHI is significant and positive indicating that Islamic financial products dominate the market. A study by Robin et al. (2018) also suggests that market concentration has a positive and significant relationship with return on equity on the commercial banks in Bangladesh. Khan, Ahmad and Chan (2018) suggest that the positive relationship could be due to the anti-competitive conduct of banks, and thus proper regulations are needed to ensure financial stability. On the other hand, Petria et al. (2015) state that competition has a

positive impact on bank profitability. A significantly negative HHI coefficient on return on assets and return on equity suggests that market concentration diminishes bank profitability. Le and Ngo (2020) suggest that this is possibly related to non-price competition, expense preference and risk aversion behaviour of the bank managers in more concentrated markets.

3. Methodology

This study aims to investigate the explanatory variables affecting the profitability performance in the banking sector of ASEAN-5 markets. The profitability performance is the dependent variables presumed to vary systematically with the interested independent variables, including total assets as the proxy of bank size (TA), total loan-to-total assets (TLTA), loan loss provisions-to-total loans (LLPTL), non-interest income-to-net sales (NII), capital adequacy ratio (CAR), non-interest expenses-to-net sales (NIE), inflation (INFL), real interest rate (REAL), market concentration (HHI) and gross domestic product per capita (GDPPC). The general models used in this study can be expressed as in the equations (1) - (4) below. In the equations below, return on assets (ROA) and return on equity (ROE) are the main dependent variables of interest. All the variables on the right-hand side of the equations are the explanatory variables. Equations (1) and (2) serve as the base models to capture the bank-specific determinants. Equations (3) and (4) aims to provide further empirical support if the macroeconomic factors play important roles in affecting the outcomes of the analysis.

$$ROA_{it} = \beta_0 + \beta_1 lnTA_{it} + \beta_2 TLTA_{it} + \beta_3 LLPTL_{it} + \beta_4 NII_{it} + \beta_5 CAR_{it} + \beta_6 NIE_{it} + \varepsilon_{it} \tag{1}$$

$$ROE_{it} = \beta_0 + \beta_1 lnTA_{it} + \beta_2 TLTA_{it} + \beta_3 LLPTL_{it} + \beta_4 NII_{it} + \beta_5 CAR_{it} + \beta_6 NIE_{it} + \varepsilon_{it} \tag{2}$$

$$ROA_{it} = \beta_0 + \beta_1 lnTA_{it} + \beta_2 TLTA_{it} + \beta_3 LLPTL_{it} + \beta_4 NII_{it} + \beta_5 CAR_{it} + \beta_6 NIE_{it} + \beta_7 INFL_{it} + \beta_8 REAL_{it} + \beta_9 lnHHI_{it} + \beta_{10} lnGDPPC_{it} + \varepsilon_{it} \tag{3}$$

$$ROE_{it} = \beta_0 + \beta_1 lnTA_{it} + \beta_2 TLTA_{it} + \beta_3 LLPTL_{it} + \beta_4 NII_{it} + \beta_5 CAR_{it} + \beta_6 NIE_{it} + \beta_7 INFL_{it} + \beta_8 REAL_{it} + \beta_9 lnHHI_{it} + \beta_{10} lnGDPPC_{it} + \varepsilon_{it} \tag{4}$$

Where:

$\beta_0 \beta_0$ = Intercept or constant term;

$lnTA_{it}$ $lnTA_{jt}$ = logarithm of total assets;

$TLTA_{it}$ $TLTA_{jt}$ = ratio of total loan-to-total assets;

$LLPTL_{it}$ $LLPTL_{jt}$ = ratio of loan loss provisions-to-total loan;

NII_{it} NII_{jt} = ratio of non-interest income-to-net sales;

CAR_{it} CAR_{jt} = capital adequacy ratio;

NIE_{it} NIE_{jt} = ratio of non-interest expenses-to-net sales;

$INFL_{it}$ $INFL_t$ = inflation rate;

$REAL_{it}$ $REAL_t$ = real interest rate;

$lnHHI_{it}$ $lnHHI_t$ = logarithm of Herfindahl-Hirschman Index;

$lnGDPPC_{it}$ $lnGDPPC_t$ = logarithm of GDP per capita;

i refers to an individual bank, t refers to year, and ε_{it} ε_{it} is a normally distributed random variable disturbance term. Table 1 exhibits the variable computations with the respective expected relationships with profitability.

Table 1. Variables used in the regression analysis

Variable	Description	Hypothesized relationship
Response Variable		
ROA	Net profit divided by total assets, expressed in percentage	NA
ROE	Net profit divided by equity, expressed in percentage	NA
Internal Determinants		
lnTA	Logarithm of total assets	+

TLTA	Total loan divided by total assets, expressed in percentage	+/-
LLPTL	Total loan loss provisions divided by total assets, expressed in percentage	-
NII	Non-interest income divided by net sales, expressed in percentage	+
CAR	Tier-1 capital divided by total risk-weighted assets, expressed in percentage	+/-
NIE	Non-interest expenses divided by net sales, expressed in percentage	-
External Determinants		
INFL	Annual changes in CPI, expressed in percentage	+
REAL	Real interest rate is the lending interest rate adjusted for inflations as measured by the gross domestic product deflator.	+/-
lnHHI	Logarithm of 10000 Σw_i^2 , where w is sales of the firm divided by total sales of all firms in the industry	+/-
lnGDPPC	Logarithm of gross domestic product divided by population	+

This paper applies secondary data covering the period from years 2010 to 2017 in examining the internal and external determinants of bank profitability performance in the ASEAN-5 markets. The data is sourced from the Asian Development Bank, International Monetary Fund, World Bank Data, and Thomson Reuters Datastream. The sample includes all listed banks in Indonesia, Malaysia, Philippines, Singapore, and Thailand. Table 2 displays the descriptive statistics of all variables used for the analysis of the region. Panel data analysis consists of three model estimations, i.e. pooled OLS (POLS) model, random effect (RE) model, and fixed effect (FE) model. In determining which model to be used in each dataset, the Breusch-Pagan Lagrange multiplier test is used to know whether the POLS or RE model is more proper, whereas the Hausman test is used to test between the RE model and FE model. The relevant diagnostic checks include multicollinearity, serial correlation and heteroskedasticity.

Table 2. Descriptive statistics

Variables	Minimum	Maximum	Mean	Standard Deviation
ROA	-5.950	5.660	1.555	1.177
ROE	-132.53	41.84	10.801	11.743
LNTA	16.905	27.747	21.723	2.700
TLTA	25.39	97.90	69.928	12.674
LLPTL	-1.500	16.72	0.9363	1.429
NII	-66.07	68.24	18.755	13.321
CAR	0.680	86.27	16.030	8.205
NIE	2.116	99.131	32.358	15.97
INFL	-0.902	6.410	3.710	1.883
REAL	-2.113	9.224	4.397	2.985
LNHHI	66.945	8.245	7.185	0.264
LNGDPPC	7.661	10.946	8.431	0.666

4. Results and Discussions

This section highlights the empirical findings of the study about the impacts of internal determinants with and without the controls of external factors on profitability performance. The result of bank-specific analysis suggests that the factors of interest may play different roles in the respective markets. Nevertheless, it is worth noting that the findings exhibit a considerable level of consistency despite the adoption of different models. As indicated in Table 3, bank size generally shows a negative and significant relationship in determining the ROA, except in Malaysia. This implies that the bigger size of the bank does not warrant better profitability due to the economy of scale. The ASEAN-5 panel shows that TLTA has a negative but insignificant relationship with ROA. The relationship between

LLPTL and ROA in panel ASEAN-5 is within expectation as provisions would adversely impact the profitability. The relationship between non-interest income and the bank's profitability is positive and statistically significant for the ASEAN-5 panel, implying the encouraging consequence of income diversification. Though insignificant, CAR shows a positive relationship with ROA for the regional panel. Masood and Ashraf (2012) suggest that the negative coefficient sign given by CAR may be due to the economic situation that the market is facing. As expected, NIE exhibits a negative and significant relationship with ROA in the ASEAN-5 panel.

Table 3. Result for Equation (1)

Independent Variables	ASEAN-5 (FE)	Indonesia (FE)	Malaysia (POLS)	Philippines (POLS)	Singapore (POLS)	Thailand (RE)
Constant	10.95***	9.735***	-0.851	8.066***	-1.966	7.409***
	(1.759)	(2.895)	(0.861)	(1.127)	(3.098)	(2.832)
LNTA	-0.3830***	-0.0296***	0.0840**	-0.264***	0.1980	-0.2900**
	(0.0758)	(0.1070)	(0.0329)	(0.0467)	(0.1700)	(0.121)
TLTA	-0.000544	0.01140**	0.01350*	0.0135	-0.00538	0.00164
	(0.00378)	(0.00548)	(0.00716)	(0.00799)	(0.00582)	(0.01410)
LLPTL	-0.485***	-0.499***	-0.109	-0.174*	-0.431	-0.523***
	(0.0466)	(0.0426)	(0.0837)	(0.0884)	(0.3100)	(0.0433)
NII	0.0409***	0.0674***	0.0122*	0.0515***	0.0144	0.0374***
	(0.00872)	(0.01850)	(0.00603)	(0.00948)	(0.00896)	(0.01260)
CAR	0.00055	0.00554	-0.0394**	-0.0352***	-0.00033	0.0126
	(0.00362)	(0.00487)	(0.0137)	(0.00606)	(0.03740)	(0.01470)
NIE	-0.0491***	-0.0563***	-0.00632	-0.0562**	-0.0212**	-0.1600*
	(0.00825)	(0.01340)	(0.00639)	(0.02010)	(0.00963)	(0.08830)
Observations	430	163	68	104	23	72
R^2	0.808	0.904	0.520	0.656	0.466	0.473

Notes: Figures in the parentheses are robust standard error. *, ** and *** indicate the 10%, 5% and 1% significance levels, respectively.

When the profitability of ROE is examined (refer to Table 4), the results largely show consistency especially when the same panel regression model is used like being observed in Indonesia, Philippines and Singapore. The chosen models reported in the result tables are based on the Breusch-Pagan Lagrange multiplier and Hausman tests. Bank size exhibits a positive and significant relationship with ROE when the RE model is referred to. Despite comparing different regression models, all the coefficients of TLTA, LLPTL, NII, CAR and NIE in the ASEAN panel indicate consistency in terms of sign and significance as compared with the analysis with ROA. TLTA indicates a negative but insignificant relationship with ROE. The coefficient of LLPTL is consistently showing a negative and significant relationship with ROE. NII shows a positive and significant relationship with profitability while CAR still has no power in explaining profitability. The impact of NIE is still negative and significant at a 1% level.

Table 4. Result for Equation (2)

Independent Variables	ASEAN-5 (RE)	Indonesia (FE)	Malaysia (FE)	Philippines (POLS)	Singapore (POLS)	Thailand (FE)
Constant	6.600	150.2***	157.1***	57.53***	-7.903	56.71**
	(9.824)	(38.84)	(41.92)	(16.87)	(34.18)	(24.99)
LNTA	0.663**	-5.122***	-7.217***	-0.1768**	1.730	-1.889
	(0.326)	(1.555)	(2.139)	(0.698)	(1.876)	(1.106)

TLTA	-0.0424	0.0750	0.0610	0.0995	-0.0552	0.00795
	(0.0613)	(0.0733)	(0.0606)	(0.0664)	(0.0642)	(0.1410)
LLPTL	-5.120***	-5.211***	-4.367***	-1.293	-7.226*	-4.634***
	(1.276)	(1.239)	(1.172)	(0.865)	(3.416)	(0.394)
NII	0.296***	0.593***	-0.054	0.356***	0.266**	0.288**
	(0.0680)	(0.2640)	(0.0819)	(0.0770)	(0.0988)	(0.0977)
CAR	0.0120	0.0884	-0.3550	-0.3200***	-0.3360	-0.0664
	(0.0656)	(0.0611)	(0.2610)	(0.1020)	(0.4130)	(0.1010)
NIE	-0.255***	-0.684***	-0.147*	-0.414***	-0.337***	-2.075**
	(0.0543)	(0.1740)	(0.0695)	(0.0680)	(0.1060)	(0.7870)
Observations	444	173	69	104	23	75
R^2	0.407	0.782	0.496	0.501	0.623	0.653

Notes: Figures in the parentheses are robust standard error. *, ** and *** indicate the 10%, 5% and 1% significance levels, respectively.

The estimations of Equation (3) and (4) are mainly to examine if the impact of macroeconomic factors may affect the importance of bank-specific determinants. Generally, when being regressed together (refer to Table 5 and Table 6), the bank-specific variables are more important than the macroeconomic factors in examining bank profitability. Also, combining both factors in the analysis is better than considering just one, with improvements in the r squares. Bank size is still significant in determining ROA. TLTA and CAR of the ASEAN-5 panel still show an insignificant relationship with ROA. LLPTL, NII and NIE remain significant in determining the ROA. However, the external economic factors are found to be not significant in determining the ROA of banks. When being regressed together, the bank size loses power in explaining ROE for the ASEAN-5 panel. While the other variables are still consistent based on the significance level and sign of coefficients. However, INFL and lnGDPPC become more important in explaining ROE, as compared with ROA, at a 5% significance level. The negative coefficient of lnGDPPC is consistent with the findings by Javaid and Alalawi (2018), and Nguyen and Nguyen (2018). Overall comparisons across Table 3 to Table 6 suggest that despite the additional controls of macroeconomic factors, the importance of bank-level characteristics remains robust.

Table 5. Result for Equation (3)

Independent Variables	ASEAN-5 (FE)	Indonesia (RE)	Malaysia (POLS)	Philippines (FE)	Singapore (POLS)	Thailand (POLS)
Constant	5.833	-2.983	7.662	6.895	-16.80	3.276
	(5.376)	(11.54)	(5.775)	(52.60)	(15.18)	(26.38)
LNTA	-0.355***	0.138	0.114***	-0.700	-0.012	-0.342***
	(0.114)	(0.0982)	(0.0408)	(0.821)	(0.251)	(0.0595)
TLTA	-0.0005	0.0191***	0.0124	-0.0109	-0.0150	0.0158*
	(0.00406)	(0.00496)	(0.00837)	(0.00934)	(0.01020)	(0.00932)
LLPTL	-0.487***	-0.499***	-0.178	-0.291*	-0.371	-0.364***
	(0.0481)	(0.0459)	(0.1500)	(0.1490)	(0.3490)	(0.0941)
NII	0.0403***	0.0630***	0.0112	0.0377***	0.0090	0.0542***
	(0.00869)	(0.01810)	(0.00734)	(0.00700)	(0.01100)	(0.00756)
CAR	0.0006	0.0103*	-0.0267	-0.0043	-0.0180	0.0727***
	(0.00394)	(0.00552)	(0.01600)	(0.01220)	(0.04450)	(0.02060)
NIE	-0.0481***	-0.0399***	-0.00611	-0.0601**	-0.0181	-0.3020***
	(0.0085)	(0.0127)	(0.0074)	(0.0218)	(0.0112)	(0.1030)

INFL	0.00453	-0.00813	0.0509	-0.0503	-0.00210	0.0867
	(0.0150)	(0.0230)	(0.0468)	(0.0906)	(0.0267)	(0.0673)
REAL	0.0100	0.0124	0.0102	-0.0624	0.0155	-0.0005
	(0.0149)	(0.0248)	(0.0202)	(0.0703)	(0.0344)	(0.0613)
LNHHI	1.103	2.826	0.242	0.285	-0.355	5.021
	(0.710)	(2.260)	(0.865)	(8.580)	(2.033)	(5.253)
LNGDPPC	-0.417	-2.304*	-1.197	1.209	2.090	-3.907*
	(0.331)	(1.189)	(0.693)	(1.507)	(2.006)	(2.247)
Observations	430	163	68	104	23	72
R^2	0.809	0.410	0.569	0.726	0.527	0.654

Notes: Figures in the parentheses are robust standard error. *, ** and *** indicate the 10%, 5% and 1% significance levels, respectively.

Table 6. Result for Equation (4)

Independent Variables	ASEAN-5 (FE)	Indonesia (FE)	Malaysia (POLS)	Philippines (POLS)	Singapore (POLS)	Thailand (POLS)
Constant	172.4*	223.6	234.6**	-499.0	-125.1	112.7
	(87.42)	(242.7)	(111.8)	(553.8)	(172.7)	(167.6)
LNTA	-1.577	-2.198	1.467***	-1.601**	0.358	-1.103***
	(1.758)	(2.474)	(0.517)	(0.753)	(2.856)	(0.366)
TLTA	0.0143	0.0769	0.0074	0.1180*	-0.1110	0.2570***
	(0.0500)	(0.0630)	(0.0596)	(0.0642)	(0.1160)	(0.0573)
LLPTL	-5.121***	-5.242***	-2.836*	-1.343	-6.415	-3.446***
	(1.271)	(1.355)	(1.427)	(0.888)	(3.972)	(0.602)
NII	0.269***	0.537*	-0.082	0.338***	0.228*	0.435***
	(0.0858)	(0.2790)	(0.0544)	(0.0833)	(0.1250)	(0.0465)
CAR	0.052	0.088	-0.478	-0.296***	-0.419	-0.176
	(0.0532)	(0.0684)	(0.2790)	(0.1040)	(0.5060)	(0.1320)
NIE	-0.431***	-0.623***	-0.025	-0.400***	-0.307**	-2.100***
	(0.0986)	(0.1870)	(0.0589)	(0.0624)	(0.1270)	(0.6400)
INFL	-0.463**	-0.619*	0.824	-0.667	0.085	-0.0004
	(0.187)	(0.307)	(0.742)	(0.955)	(0.304)	(0.428)
REAL	-0.062	0.004	0.229	-0.635	0.159	0.081
	(0.167)	(0.371)	(0.268)	(0.769)	(0.392)	(0.386)
LNHHI	3.772	5.447	1.498	104.3	-6.118	-0.927
	(11.45)	(41.25)	(12.32)	(95.43)	(23.14)	(33.68)
LNGDPPC	-16.69**	-22.05	-27.43***	-25.24	18.26	-10.40
	(6.560)	(19.34)	(7.261)	(17.36)	(22.83)	(14.29)
Observations	444	173	69	104	23	75
R^2	0.719	0.789	0.408	0.517	0.645	0.767

Notes: Figures in the parentheses are robust standard error. *, ** and *** indicate the 10%, 5% and 1% significance levels, respectively.

Besides that, this study also emphasizes the importance of market-specific analysis, by comparing the results across individual markets (as presented from Table 3 to Table 6). For instance, panels of Malaysia and Thailand show opposite observations pertaining to the relationship between size and ROA (by comparing Table 3 and Table 5). The result suggests that Malaysia is in the economies of scale while panel Thailand is in diseconomies of scale. For TLTA, the only panel that shows a consistent result is Indonesia. Panels of Indonesia, Philippines and Thailand show consistent results with a negative coefficient LLPTL on ROA. The same panels also show consistent results as the NII and ROA have a positive and significant relationship. All panels show consistency in the relationship of CAR with ROA in terms of the sign. Whereas for NIE, only the panel of Singapore displays inconsistency in terms of the significance level. All panels exhibit a negative relationship. In comparing Table 4 and Table 6, only the Philippines show a consistent result with a negative and significant coefficient of bank size, suggesting that a huge asset size does not improve ROE. LLPTL examinations in the panels of Indonesia, Malaysia and Thailand show consistent results that recommend a lower level LLPTL to improve their ROE. Banks in Indonesia, Philippines, Singapore and Thailand show that product diversification helps to increase profit based on the consistent observations between NII and ROE. A higher CAR only lowers the ROE in the Philippines, probably suggesting that the country faces difficulty in coping with the economic situation. Lastly, the NIE coefficient of Indonesia, Philippines, Singapore and Thailand again exhibits consistent results, recommending the banks in these markets to further manage the related expenses carefully.

The additional check using Table 7 supports the previous argument that while some macroeconomic variables are important especially when being considered alone, they do not impact the significance of bank-specific factors (as indicated in Table 5 and Table 6). Table 7 indicates that inflation and interest rate exhibit a significantly positive relationship with the banks' ROA for the overall ASEAN-5 panel. Market concentration becomes moderately negative to the ROA, implying that competition may encourage banks to be more efficient. Comparing the result in Table 7 with Table 5, lnGDPPC is now significant in determining the ROA while the impact is still negative. A similar robustness test is also done on ROE (not tabulated to save space). Comparing the results in Table 6 with the results from regressing ROE with only the external determinants, REAL and ROE now have a positive relationship and still do not show a significance of at least a 10% level. Market concentration now has a negative relationship with ROE and significant at a 10% level. Lastly, lnGDPPC still shows a negative relationship with ROE but significant at a 1% level. Additionally, this study attempts to regress ROA and ROE on the lagged terms of external determinants (not tabulated), to see if the effect on profitability would remain. Most variables lose the power in explaining the ROA and ROE except lnGDPPC, suggesting that the current terms of the macroeconomic variables in this study are properly selected.

Table 7. Regression with only macroeconomic determinants

Independent Variables	ASEAN-5 (FE)	Indonesia (FE)	Malaysia (RE)	Philippines (FE)	Singapore (POLS)	Thailand (RE)
Constant	44.72***	79.78***	14.17**	193.2***	2.205	-8.672
	(11.21)	(27.16)	(5.709)	(62.91)	(11.52)	(20.34)
INFL	0.0542**	0.0503	0.0901***	0.2944*	0.0056	0.1200***
	(0.0259)	(0.0852)	(0.0268)	(0.1817)	(0.0301)	(0.0281)
REAL	0.0376*	0.0215	0.0259**	0.1296	0.0146	0.0323
	(0.0224)	(0.0780)	(0.0109)	(0.1445)	(0.0341)	(0.0621)
LNHHI	-2.648*	-8.116	0.0127	-28.67***	-1.905	3.012
	(1.517)	(6.293)	(0.540)	(11.190)	(2.203)	(2.157)
LNGDPPC	-2.892***	-2.677	-1.441**	1.8370	1.323	-1.404
	(0.582)	(3.010)	(0.692)	(2.4682)	(1.617)	(1.017)
Observations	496	215	73	107	23	78
R^2	0.148	0.138	0.083	0.437	0.073	0.082

Notes: Figures in the parentheses are robust standard error. *, ** and *** indicate the 10%, 5% and 1% significance levels, respectively.

5. Conclusion

This paper proposes that both the firm-level and the external determinants need to be considered to properly study the bank performance. Our overall study has provided considerable robust findings from several perspectives. First, the analysis covers the use of different panel regression models (POLS, FE and RE models). While the relationships are mostly consistent under the same model, the results are reported based on the recommended models chosen using Breusch-Pagan Lagrange multiplier and Hausman tests. Even so, the consistency of the results is still largely supported. Second, the importance of bank-level factors remains robust with or without the controls of macroeconomic determinants. This is despite the fact that overall r-squared terms have been improved with the inclusion of such macroeconomic controls under the same models. Moreover, regressions using solely macroeconomic variables suggest that they are relevant in explaining bank profitability. Their roles tend to be overshadowed by the bank-specific variables. Last but not least, the profitability has been assessed by using both the ROA and ROE, as well as compared across different markets using the country-specific samples. Our cross-country comparisons suggest that not all factors play consistent roles in different markets.

The findings of this study have some important implications. The study suggests that a large asset size may not be advantageous to the banks of ASEAN-5 countries in making better profits. All banks in the region need to carefully manage their loan collectability given that the provision expenses exhibit a considerable association with lower profits. In addition, banks are encouraged to consider product variety as diversification to non-interest incomes empirically suggests improving profitability. Similar to the provisions, banks should prudently manage their non-interest expenses which indicate a strong association to lower profits. While the external economic factors may not necessarily disturb the roles of the internal determinants, it is wise to consider these external factors in decision making given their high relevance to the bank performance as supported by the robustness tests. Lastly, the bank managers in different countries shall make decisions in consideration of the market where they operate. For example, non-interest income diversification may be more important in Thailand, as compared with Malaysia, in improving the overall bank profitability. Such a study can be further extended in the future by considering more variables and comparisons. Performance across sub-periods with and without the existence of financial crisis or recession would be helpful for decision-making purposes. The inclusion of other markets like Europe, the U.S., or the other parts of Asia for regional comparisons would also be sensible to better understand the performance of the banking sector.

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