

Do profitable banks really make a positive contribution to the economy? A study across ten Asia-Pacific countries

Abstract

This study investigates the relationship between the profitability of the banks and economic growth in ten countries across the Asia-Pacific region over the period from 2004 to 2014. Our findings suggest that a profitable banking sector is a prerequisite for economic growth in the Asia-Pacific region. Perhaps surprisingly we found that bank size has a negative impact on GDP growth with the influence of bank profitability on economic growth reducing when the size of banking sector increases. Furthermore, our results show that the impact of profitability on economic growth is much larger in semi-developed/developed economies compared to small emerging and large emerging economies.

Keywords: Non-performing loans; financial sector development; global financial crisis.

1. Introduction

The banking sector is a very important component of the financial system which attracts funds from depositors and channels these funds to investors who create additional wealth in the economy. Levine and Zervos (1998) suggest that banks foster economic growth by funding productive projects and are a prerequisite for economic growth (Levine, Loayza, and Beck, 2000; Beck, Levine, and Loayza, 2000). Athanasoglou, Brissimis, and Delis (2008) suggest that a profitable banking sector is necessary in order to harness the financing necessary to support economic growth. Bank profitability is also important for financial stability in the country (Klein & Weill, 2017) while an increase in bank profitability reduces the likelihood of bank defaults (Claeys & Schoors, 2007).

Given the importance of the banking sector in economies, it is not surprising that it has been the subject of much academic interest with there still being much disagreement as to the extent of the contribution that it makes. Previous studies have concentrated largely on measures of bank size when trying to explain the contributions of the banking sector to economic growth. However, the view of Athanasoglou et al. (2008) is that it is the profitability of the banks that is more important than the size in explaining their contributions. A related study by Cole, Moshirian, and Wu (2008) found that there is a positive relationship between stock returns of banks and economic growth, thus motivating a comprehensive study to identify the extent to which bank profits affect the economic growth. Our study differs from Cole et al. (2008) in that we use return on bank assets (ROA) as an explanatory variable to investigate the dynamic

relationship between bank profitability and economic growth across ten economies in Asia-Pacific region¹ over the period 2004-2014.

This research will make two significant contributions. First, this is the first study that has conducted a comprehensive study on the impact of bank profitability on economic growth across a range of countries in Asia-Pacific region that are at different stages of economic development although operate within a similar regulatory setting². Second, the study aims to identify the difference between the determinants of economic growth for the countries in our sample that are at different stages of their economic growth: small emerging, large emerging and semi-developed/developed economies. One of the primary goals of policy makers in any country is to foster the economic growth. This study aims to assist policy makers to make important decisions in relation to the structure of the banking sector. Based on the findings of this study, the policy makers may decide whether to expand banking sector through credit creation or to make it more profitable through consolidation.

Our results demonstrate that it is the profitability of banks that drives the economic growth. We found strong evidence to suggest that there is a positive and statistically significant relationship between bank profitability in the period (t-1) and GDP growth in period (t). We also found that an increase in profitability leads to an increase in economic growth while an increase in banking sector size leads to a decrease in economic growth. It indicates that the profitability of banking sector is more important than the growth in banking sector size for the economic growth. In addition, we found evidence that GDP growth trends with there being a positive and statistically significant relationship between GDP growth in the period (t-1) and GDP growth in period (t). Furthermore, our results suggest that the impact of bank profitability on economic growth reduces when the size of banking sector increases. Finally, our findings confirm that that inflation has a negative impact on economic growth but there is a positive impact of government expenditure (education, health, and infrastructure) on economic growth.

The remainder of this paper is structured in the following manner: In Section 2 we provide a brief overview of banking sectors of ten countries in our study. Section 3 discusses the existing literature on the determinants of the economic growth. Section 4 highlights data sources and

¹ The countries are Australia, Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan and Singapore.

² For example, most the central banks in the countries require banks to maintain capital adequacy ratios and all the banks in these countries are required to maintain certain percentage of deposits as cash reserves.

method. In Section 5 we present and discuss our empirical results. Section 6 provides us with an opportunity to provide a summary of our findings.

2. Overview of the Banking Sectors

This study focuses on commercial banks which are the most important part of any financial system, being the key suppliers of credit in the economy (World Bank, 2005). They are also responsible for the exchange of domestic and international payments between various parties; therefore, the economic activities cannot run smoothly without an efficient banking system.

This study focuses on ten countries in Asia-Pacific region which are at different stages of economic development. However, the banking regulations are similar across countries. We have classified these countries in three categories based on the state of their economy, i.e., small emerging economies, large emerging economies and semi-developed/developed economies. In this section, we will briefly discuss some institutional and regulatory characteristics of banking sectors of the regions in our study. Detailed background of banking sector of each country is covered in Appendix-I.

Small Emerging Economies

The small emerging economies included in our study are Bangladesh, Indonesia, Malaysia and Pakistan. In each of these countries, Islamic banks operate in parallel with the conventional banking system.

Table 1 highlights the regulatory and institutional characteristics of the banking system in the four countries. On the basis of total assets, Malaysia has the largest banking sector although Indonesia has the largest number of banks. The table highlights that financial inclusion is very low in these countries ranging from 8 branches per 100,000 adults in Bangladesh to 11 branches per 100,000 adults in Malaysia. The bank assets to GDP ratio is the highest (193%) in Malaysia and the lowest in Indonesia (42%).

Table 1: Regulatory and institutional characteristics of banking system in small emerging economies.

Country Name	Bangladesh	Indonesia	Malaysia	Pakistan
Total assets (USD)	107 billion	440 billion	602 billion	100 billion
Number of conventional banks	48	109	37	28
*Number of Islamic banks	25	34	16	20
Minimum Capital Adequacy Ratio Requirement (%)	10%	8%	8%	10%
Cash Reserve Requirement (%)	5%	6%	4%	5%
Non-Performing Loan (NPL) Criteria	+ 90 days	+ 365 days	+ 90 days	+ 90 days
Financial Inclusion (branches/100,000 adults)	8	9.6	11	9
Bank Assets to GDP ratio	80%	42%	193%	43%

*It includes full-fledged Islamic banks and Islamic windows of conventional banks.

Data related to total assets and number of banks, capital adequacy ratio requirement, cash reserve requirement, and non-performing loan criteria are collected from websites of central banks. Data related to financial inclusion and bank assets to GDP ratio are collected from World Bank database.

Large Emerging Economies

The large emerging economies included in our sample are China and India. The banking sector in both China and India has undergone a series of reforms to improve their performance and to bring their operations more on a par with international standards.

Table 2 highlights the regulatory and institutional characteristics of the banking system in the China and India. Chinese banking sector is larger than India with the total assets of US\$ 24.3 trillion compared to US\$ 1.8 trillion of Indian banking sector. Financial inclusion in both countries is low with 8 branches per 100,000 adults in China and 12 branches per 100,000 adults in India. The bank assets to GDP ratio is higher in China (292%) compared to 95% in India.

Table 2: Regulatory and institutional characteristics of banking system in large emerging economies.

Country Name	China	India
Total assets (USD)	24.5 trillion	1.8 trillion
Number of banks	672	89
Minimum capital adequacy ratio requirement (%)	8.50%	9.00%
Cash reserve requirement (%)	19%	4%
Non-Performing Loan (NPL) criteria	+ 90 days	+ 90 days
Financial Inclusion (branches/100,000 adults)	8	12
Bank assets to GDP ratio	292%	95%

Data related to total assets and number of banks in India are obtained from Reserve Bank of India. Data related to total assets and number of banks in China are obtained from annual report of Chinese Banking Regulation Commission. Information about capital adequacy ratio requirement and cash reserve requirement is collected from websites of central banks of India and China. Data related to financial inclusion and bank assets to GDP ratio are collected from World Bank database.

Semi-developed/developed Economies³

Semi-developed/developed economies in our study include Australia, Hong Kong, Japan and Singapore.

Table 3 highlights the regulatory and institutional characteristics of the banking system in the four countries. Japanese banking sector is largest with total assets of US\$ 8 trillion. Financial inclusion in Japan (34 branches per 100,000 adults) and Australia (30 branches per 100,000 adults) is higher than Hong Kong (23 branches per 100,000 adults) and Singapore (9.5 branches per 100,000 adults). The bank assets to GDP ratio is the highest (700%) in Hong Kong and the lowest in Japan (163%).

Table 3: Regulatory and institutional characteristics of banking system in semi-developed/developed economies.

Country Name	Australia	Hong Kong	Japan	Singapore
Size (USD)	2.8 trillion	2.1 trillion	8 trillion	779 billion
Number of banks	70	56	198	124
Minimum CAR Requirement	8%	8%	8%	10%
Reserve Requirement	0%	0%	0.1% -1.3%*	3%
Non-Performing Loan (NPL) Criteria	+ 90 days	+ 90 days	+ 90 days	+ 90 days
Financial Inclusion (branches/100,000 adults)	30	23	34	9.5
Bank Assets to GDP ratio	179%	700%	163%	261%

*Reserve requirement vary by type of financial institution and by size of deposits.

Data related to total assets and number of banks, capital adequacy ratio requirement, cash reserve requirement, and non-performing loan criteria are collected from websites of central banks. Data related to financial inclusion and bank assets to GDP ratio are collected from World Bank database.

3. Literature Review

The existing empirical studies have investigated the relationship between the development of the financial sector, as measured by size or the extent of lending, and economic growth. Our study differs from these studies in that we introduce new variable bank profitability and investigate both the impact of bank profitability on economic growth and the direction of relationship. Furthermore, we also investigate the impact of bank size on economic growth.

In order to find the relationship between profitable banks and economic growth, we use yearly GDP growth (%) as a measure of economic growth. GDP is one of the most widely used indicators of economic growth in previous studies. King and Levine (1993), Demetriades and Hussein (1996) and Levine, Loayza, and Beck (2000) have used GDP growth to establish a link between financial sector development and economic growth.

³ Australia and Japan are classified as developed economies while Hong and Singapore are classified as semi-developed economies. The reason behind classifying Hong Kong and Singapore as semi-developed economies is that as per World Bank these countries are high income but World Economic Situation and Prospects (WESP) classifies them as developing countries. Given these contradictory classification, we have classified them as semi-developed economies.

We have classified variables into two categories, that is, main variables and control variables. Main variables include the lagged value of GDP growth, profitability and size of banking sector while control variables include macroeconomic variables and one variable related to stock market. The variables are selected from a wider number of variables available in the literature. The following section provides the reasons of using these variables and the rationale behind their expected effect.

Main Variables

Lagged Gross Domestic Product Growth (Lag GDP) (+): We use lagged GDP growth as a potential determinant of economic growth. Lagged GDP growth is used in few research studies. The findings of Cole et al. (2008) suggest that GDP growth in the period (t-1) has a positive and significant effect on GDP growth in the period (t) in developed and emerging markets. On the other hand, the findings of Wijnbergen (1983) show that GDP growth in the period (t-1) has a negative and significant effect on GDP growth in period (t) in Turkey. Given our study focuses on developed and developing countries, therefore, in line with the findings of Cole et al. (2008), we hypothesise that lagged GDP growth will have a positive impact on economic growth.

Return on Assets (ROA) (+): We use Return on Assets (ROA) in period (t) and ROA in the period (t-1) as measures of profitability. Lagged ROA is used because profitability of banks may not immediately translate into better economic growth. For standardisation purpose, we have transformed ROA and lagged ROA into (1+ROA) and lagged (1+ROA). Supporting the view of Athanasoglou et al. (2008) that profitable banking sector is necessary to drive the economic growth, we hypothesise that profitability indicators will have a positive impact on economic growth.

Banking Sector size (SIZE) (+): The most common measure of bank size used in previous studies is credit to private sector, however, some researchers have also used bank loans and deposits as a measure of size. Önder and Özyıldırım (2013) used bank credit as a measure of bank size and found a positive effect of bank credit on economic growth. Masini (1975) used bank loans and bank deposits as measures of size to investigate their impact on the economic growth in China. In both the cases, they found a positive impact of size on economic growth in high-income provinces and a negative impact on the economic growth in low-income provinces. Taking a more novel approach Stern (1989) used an interaction variable (R&D intensity and bank assets) as a proxy for size and concluded that higher growth in the financial sector has a

negative impact on productivity growth. We investigated different measures of size but found that the impact of bank assets on economic growth to be more significant than the other measures of size. On the weight of numbers, previous research has found that SIZE has a positive effect on economic growth, therefore, we also hypothesise that SIZE will have a positive impact on economic growth.

Control Variables

Inflation (INF) (-): We measure inflation as the percentage increase in consumer price index each year. Most of the studies have found that inflation has a negative impact on economic growth. For example, the studies by Koivu (2002), Ndlovu (2013) and Buffie (1984) show a negative and significant impact of inflation on economic growth. Based on these findings, we also hypothesise that inflation will have a negative effect on the economic growth.

Government Expenditure (EXP) (+/-): Government expenditure is also referred to as public expenditure. We use annual percentage change in government expenditure as a potential determinant of economic growth. Wijnbergen (1983) found that an increase in public expenditure leads to an increase in economic growth in Turkey. However, Buffie (1984) that the government expenditure had a negative impact on economic growth in 87 developed and developing countries. Taking account of the existing literature, we are unable to predict the sign of the relationship between EXP and economic growth.

Openness of Economy (TRADE) (+): It is measured as a sum of the exports and imports of goods and services (Andersen & Babula, 2008). A high degree of regulation imposed by a country restricts the degree of openness (Rodriguez & Rodrik, 2001). We use annual percentage change in the sum of exports and imports as a potential determinant of economic growth. Based on the recent study by Buffie (1984) that suggests a positive relationship between trade on economic growth, we also hypothesise that TRADE will have a positive impact on bank profitability.

Stock Market Capitalization (MKTCAP) (+): We use annual percentage change in market capitalization as a potential determinant of economic growth. MKTCAP is used in a number of studies as a control variable. For example, Ndlovu (2013) used stock market capitalization to determine the causal relationship between the financial sector and economic growth and concluded that MKTCAP does not drive economic growth. In contrast, the findings of Goldsmith (1969) suggest that stock market capitalization has a positive and significant impact

on the economic growth in Taiwan and Korea. Based on the findings of Goldsmith (1969), we hypothesise that MKTCAP will have a positive effect on the economic growth.

The existing literature provides evidence on the effect of the significant impact of financial sector development on economic growth. However, the impact of profitability of the banks on economic growth is still not explored, thus motivating a comprehensive study to identify the extent to which bank profits affect the economic growth in Asia-Pacific region.

4. Data and Method

4.1. Description and Sources of Data

This study utilises annual time series data from ten countries in Asia-Pacific region that cover the period 2004-2014. The countries are divided into three groups. The first group consists of small emerging economies that include Bangladesh, Indonesia, Malaysia and Pakistan. The second group comprises of large emerging economies, i.e., China and India. The third group consists of developed/semi developed economies that include Australia, Hong Kong, Japan and Singapore.

In this study, we have used lagged value of GDP growth, profitability and bank size as main variables. In addition to that, we have used three macroeconomic variables, i.e., inflation, government consumption and openness to the economy (trade), and one variable related to stock market. Data is collected from two sources: the Bureau van Dijk's Bankscope⁴ database and the World Bank database. Data of bank related variables such as return on assets and bank size were collected from the Bankscope database. The data of other variables that include GDP growth, inflation, government consumption, trade and market capitalization were gathered from World Bank database.

Our dataset consists of all active commercial banks in ten countries in Asia-Pacific region. In some cases, there was duplicate information on a bank where both consolidated and unconsolidated statements were maintained in the database. In these cases, we included only the consolidated statements to avoid duplication. There were some instances where we found statements covering only part of a year (three months or six months). We excluded all those observations where Bankscope did not provide data for a complete year (12 months). Finally,

⁴ It is a comprehensive database with over 12,000 banks around the world and covers around 90% of the banks in every country.

in line with Beck, Demirgüç-Kunt, and Merrouche (2013) the variables were winsorized to remove the outliers.

4.2. Method

In most of the existing literature, Ordinary Least Squares (OLS) regression is applied on fixed-effects or random-effects to deal with simultaneous causality and unobserved heterogeneity. The fixed-effects model estimates parameters for each unit that not only reduces the power of model but also results in an increase in the standard errors of the coefficient estimates. It creates more problem when the sample size is small because variation in the dependent variable may be caused by these unit effects (Patrick, 1966). Given this problem, we used a random-effects model that lowers the variability within the sample by partially pooling the data⁵.

We run the regression on the combined countries using dummy variables for the three classifications of economies, i.e., small emerging economies, large emerging economies and semi developed/developed economies. In addition, we have also used a dummy variable for Global Financial Crisis (GFC). The dummy variable will take value 1 if the year is 2008 or 2009 and 0 otherwise. We have selected year 2008 and 2009 as GFC period because these are the years when the GFC had an obvious negative impact on the economic growth of our ten countries.

The regression equation that we used is set out below:

$$GDP_{it} = \alpha + \beta_1 GDP_{i(t-1)} + \beta_2(1 + ROA)_{it} + \beta_3(1 + ROA)_{i(t-1)} + \beta_4 SIZE_{it} + \beta_5(1 + ROA)_{i(t-1)} * SIZE_{it} + \beta_6 INF_{it} + \beta_7 MKTCAP_{it} + \beta_8 EXP_{it} + \beta_9 TRADE_{it} + GFCDummy + EconomyDummies \quad (1)$$

Where subscript i refers to the country and t refers to time period. GDP is the GDP growth for a country i , $(1+ROA)$ is the measure of profitability of the banks in country i , SIZE refers to percent change in the size of banking sector in country i , INF refers to inflation of country i , MKTCAP refers to percent change in stock market capitalization of country i , EXP refers to percent change in government expenditure of country i , TRADE refers to percent change in sum of exports and imports of country i , GFCdummy is dummy variable for GFC and EconomyDummies for dummy variables for small emerging economies, large emerging economies and developed/semi-developed economies.

⁵ We also tested our results with pooled regression and fixed-effects model but as the results were largely unchanged, we have only reported results of random-effects model.

In order to investigate a possible nonlinear relationship between bank profitability and economic growth, the banking sectors are divided into large and small based on the 11-year median result (2004-2014) of total assets to population ratio for every country. Based on the median results, the large banking sectors are Australia, Japan, Hong Kong and Singapore; and the small banking sectors are Bangladesh, China, India, Indonesia and Pakistan. The nonlinear relationship is investigated through following equation:

$$GDP_{it} = \alpha + \beta_1 GDP_{i(t-1)} + \sum_j \beta_1 X_{it}^j + \sum_{j=1}^J \beta_2 D_1 X_{it}^j + \sum_{l=1}^L \beta_l X_{it}^l + \epsilon_{it} \quad (2)$$

Where X_{it}^j refers to bank main explanatory variables, X_{it}^l refers to variables related to macroeconomic and stock market capitalization. $D_1.X_{it}$ is the difference between the coefficient values for small banking sectors and large banking sectors. D_1 will take the value of 1 if the banking sectors are large and 0 if the banking sectors are small. The sum of X_{it} and $D_1.X_{it}$ is the coefficient on the explanatory variables for large banking sectors. Wald tests will be performed to check the joint significant of the variables.

In order to investigate the way that the key explanatory variables impact on economic growth vary across the three regions, we use the following equation:

$$GDP_{it} = \alpha + \beta_1 GDP_{i(t-1)} + \sum_j \beta_1 X_{it}^j + \sum_{j=1}^J \beta_2 D_1 X_{it}^j + \sum_{j=1}^J \beta_3 D_2 X_{it}^j + \sum_{l=1}^L \beta_l X_{it}^l + \epsilon_{it} \quad (3)$$

Where X_{it}^j refers to bank main explanatory variables, X_{it}^l refers to variables related to macroeconomic and stock market capitalization. $D_1.X_{it}$ is the difference between the coefficient values for developed/semi-developed and small emerging economies and $D_2.X_{it}$ is the difference between the coefficient values for developed/semi-developed and large emerging economies. D_1 will take the value of 1 if economies are small emerging and 0 otherwise. D_2 will take the value of 1 if economies are large emerging and 0 otherwise. The sum of X_{it} and $D_1.X_{it}$ is the coefficient on the explanatory variables for small emerging economies and the sum of X_{it} and $D_2.X_{it}$ is the coefficient on the explanatory variables for large emerging economies. Wald tests will be performed to check the joint significant of the variables.

In order to determine the causal relationship between the bank profitability and economic growth, we used the Granger causality test. This test was proposed by Clive Granger in 1969.

The following equations will be used to determine the causal relationship:

$$GDP_{it} = \alpha + \beta_1(1 + ROA)_{i(t-K)} + \beta_2GDP_{i(t-K)} + \epsilon_{it} \quad (4)$$

$$(1 + ROA)_{it} = \alpha + \beta_2(1 + ROA)_{i(t-K)} + \beta_4GDP_{i(t-K)} + \epsilon_{it} \quad (5)$$

The null hypothesis is there no causal relationship between bank profitability and economic growth. The Equation 4 and Equation 5 provide following relationships:

- a) There will be a unidirectional causality from bank profitability to economic growth if the coefficient on lagged value of bank profitability is statistically significant from zero and the coefficient on lagged value of GDP is not statistically significant ($\beta_1 \neq 0$ and $\beta_4 = 0$);
- b) There will be a unidirectional causality from economic growth to bank profitability if the coefficient on lagged value of GDP is statistically significant from zero and the coefficient on lagged value of bank profitability is not statistically significant ($\beta_4 \neq 0$ and $\beta_1 = 0$);
- c) There will be a bi-directional causality between bank profitability and economic growth if the coefficient on lagged value of GDP and the coefficient on lagged value of bank profitability are statistically significant from zero ($\beta_1 \neq 0$ and $\beta_4 \neq 0$); and
- d) There will be a no causal relationship between bank profitability and economic growth if the coefficient on lagged value of GDP and the coefficient on lagged value of bank profitability are not statistically significant from zero ($\beta_1 = 0$ and $\beta_4 = 0$).

Table 4 provides a summary of the dependent and independent variables that includes notation, measurement and expected effect. We also measured the correlation between explanatory variables and conducted VIF tests. The results, provided in Appendix II, indicate that multicollinearity is not a problem.

Table 4: Definition, notation and expected effect of the variables.

Variables	Notation	Measure	Expected Sign
<i>Dependent Variable</i>			
Gross Domestic Product	GDP	Annual GDP growth rate (%)	
<i>Independent Variables</i>			
<i>Main Variables</i>			
Lagged Gross Domestic Product	Lag GDP	Lagged value of annual GDP growth rate (%)	+
Return on Assets	ROA	(1+Profit before tax/Total assets)	+
Lagged (1+ Return on Assets)	Lag ROA	Lagged value of (1+Profit before tax/Total assets)	+
Banking Sector Size	SIZE	Annual percentage change in total bank assets (%)	+
<i>Control Variables</i>			
Inflation	INF	Annual percentage change in CPI (%)	-
Government Consumption	EXP	Annual percentage change in government consumption (%)	+/-
Openness to Economy	TRADE	Annual percentage change in Sum of exports and imports (%)	+
Stock Market Capitalization	MKTCAP	Annual percentage change in market capitalization (%)	+

“+” sign shows that we expect a positive relationship between dependent variable and independent variable. “-” sign shows that we expect a negative relationship between dependent variable and independent variable. “+/-” sign shows that there is a reason to believe that the relationship could go in either direction.

Table 5 reports summary statistics of the variables that are used in regressions. The results show that over the period 2004-2014, the average GDP growth of the countries in our study is 5.25% which is higher than many other regions/countries such as European Union (1.12%), OECD members (1.55%) and United States (1.72%) over the same period. The actual growth rates range from -5.53% to 12.69%. The negative growth is associated with Japan in 2009 while the highest GDP growth is associated with Singapore in 2010. Given the drastic changes in GDP growth, the standard deviation is high 3.14%. The mean value of profitability measured with (1+ ROA) and lagged (1+ ROA) is 1.11 and 1.12, respectively. We have used percent change in banking sector size as a potential determinant of the economic growth. The mean value shows that on average the banking sector has grown by 5.3% during the sample period, however, the values range from negative 15.82% to positive 22.16% with a standard deviation of 10.1%.

Turning to macroeconomic variables, the mean value of INF is 4.72% which is higher than many other regions/countries such as European Union (2.22%), OECD members (2.19%) and United States (2.33%). It indicates that inflation has risen significantly in some of the countries in the sample during the period of study. The values range from -0.7% to 13.65%. Japan witnessed a negative inflation rate (0.7%) in 2010 while Pakistan witnessed the highest inflation rate in 2008. The percent change in government expenditure EXP shows that the average growth in government expenditure is 10.51% in the sampled countries. It is higher than the European Union (3.6%), OECD members (3.7%) and United States (3.2%). The mean value of the percent change in TRADE is -1.98% which indicates that value of trade has declined

over the period under study. However, the trade has also declined in the European Union (-4.48%), OECD members (-4.8%) and United States (-4.6%) during the same period. We have also used percent change in stock market capitalization as an explanatory variable. The results show that average growth in market capitalization is 8.93% over the period 2004-2014. The growth in stock market capitalization is more than the European Union (6.6%), OECD members (-0.3%) and United States (-2%) during the same period.

Table 5: Descriptive statistics of variables over the period 2004-2014.

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	100	5.25	3.141	-1.51	12.69
Lag GDP	90	5.2	3.20	-1.51	12.69
(1 + ROA)	100	1.10	0.37	0.31	1.83
Lag (1 + ROA)	90	1.12	0.38	0.31	1.83
SIZE (Change in total assets)	100	5.30	10.99	-15.82	22.16
INF	100	4.72	3.68	-0.7	13.65
EXP	100	10.51	9.18	-7.77	31.43
TRADE	100	-1.97	11.31	-37.48	16.47
MKTCAP	100	8.93	40.47	-64	110.01

These variables are selected from a number of available variables. We measured correlation between explanatory variables and conducted VIF tests for individual countries and for aggregate data, the explanatory variables with correlation of more than 0.8 or VIF value greater than 10 were omitted from the regressions.

5. Empirical Results

5.1. Regression Results and Discussion

Table 6 reports regression results for the combination of all countries. For Columns 1 to 5, the results are obtained through a regression as set out in equation 1 while for Column 6, results are obtained through a regression as set out in equation 2. In Columns 1 to 3, we show results for regressions that include all of the main variables and dummies but which differ with respect to the specification of the profitability variable. In Column 4, we introduce the macroeconomic and stock market variables while in Column 5 and 6 we introduce a cross-product terms for bank profitability and size.

The coefficient of the lagged value of GDP growth is positive and statistically significant in all the models. These findings are as expected and consistent with the results of Cole et al. (2008).

In Model 1, the coefficient of profitability is positive and statistically significant suggesting a contemporaneous relationship between bank profitability and GDP growth. In Model 2, we substitute a lagged value of profitability and now find a positive and significant relationship

between the lagged value of profitability and GDP growth. However, when both contemporaneous and lagged profitability measures are used simultaneously in the regression in Model 3, we find that only the lagged value of profitability remains significant. Hence when we introduce the macroeconomic and market variables in Model 4, we only include the lagged profitability variable whose sign remains positive and highly significant. Our results confirm the positive impact that bank profitability has on economic growth is slow in its transition. These findings provide support for the proposition by Athanasoglou et al. (2008) that a well-functioning and profitable banking sector is necessary to drive economic growth.

Somewhat unexpectedly, the coefficient on our size variable has been negative and weakly significant in our first four models. However, there are some studies that have found bank size to have a negative impact on economic growth. For example, McKinnon (1973) and Masini (1975) suggest the effect of financial sector size on economic growth varies across regions and provinces. We next introduced a cross-product term with profitability and size in order to examine the joint impact that these variables have on economic growth (Model 5). We find that this cross-product term has a negative sign and is significant indicating the positive impact that lagged profitability has on economic growth is weaker for the faster-growing banks. In Model 6 we divided the ten banking sectors into large and small and found that the positive impact that bank profitability has on economic growth is much larger in the case of a smaller banking sector. For both the large and small banking sectors, the coefficient on the cross-product term is negative and significant with this negative impact being much larger in the case of the smaller banking sectors

We have used a dummy variable for GFC which is designated as applying in 2008 and 2009. The coefficient is negative and statistically significant which shows that economic growth was hampered during global financial crisis. Furthermore, negative and significant coefficients of dummy variables for small emerging economies and developed/semi-developed economies suggest that the GDP growth rate in these economies was slower than large emerging economies (China and India) in the sample period.

In terms of macroeconomic variables, it proves that the coefficient on inflation is negative and statistically significant which is consistent with our expectations and the findings in previous studies. We also found that an increase in government expenditure leads to an increase in economic growth. This finding is consistent with those of Wijnbergen (1983) who also found that government expenditure leads to an increase in economic growth. We further found that

growth in stock market capitalization leads to growth in economic growth which is consistent with the findings of Goldsmith (1969). We found trade to be the only macroeconomic variable that we included which was not found to impact on economic growth

Table 6: Regression results

Dependent variable: GDP Growth (%)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Explanatory Variables</i>						
<i>Main variables</i>						
Lag GDP	0.300*** (3.15)	0.276*** (2.93)	0.276*** (2.91)	0.242*** (2.76)	0.187** (2.07)	0.192** (2.30)
(1 + ROA)	1.947*** (2.80)		-0.0542 (-0.04)			
Lag (1 + ROA)		2.302*** (3.43)	2.346* (1.89)	1.957*** (3.08)	8.816*** (2.69)	
Lag (1 + ROA) - Small banking sectors						9.780***
Lag (1 + ROA) - Large banking sectors						4.397***
SIZE (Change in total assets)	-0.0336* (-1.65)	-0.0331* (-1.65)	-0.0330 (-1.64)	-0.0122* (-1.86)	-0.0216 (-1.09)	-0.0277 (-1.51)
Lag (1+ROA)*SIZE					-0.479** (-2.08)	
Lag (1+ROA)*SIZE - Small banking sectors						-0.581**
Lag (1+ROA)*SIZ - Large banking sectors						-0.092**
<i>Dummies</i>						
During GFC	-2.080*** (-3.80)	-2.263*** (-4.23)	-2.267*** (-4.14)	-2.254*** (-4.46)	-2.353*** (-4.66)	-2.377*** (-5.17)
Small Emerging Economies	-2.024*** (-2.85)	-2.114*** (-3.04)	-2.116*** (-3.02)	-1.968*** (-3.05)	-3.876*** (-3.40)	-4.618*** (-4.18)
Semi-developed /Developed Economies	-2.497*** (-3.06)	-2.563*** (-3.23)	-2.567*** (-3.19)	-2.468*** (-3.14)	-3.994*** (-3.67)	-5.651*** (-4.33)
<i>Macroeconomic and stock market variables</i>						
INF				-0.0988 (-1.37)	-0.235** (-2.43)	-0.212** (-2.33)
EXP				0.0923*** (3.88)	0.0866*** (3.50)	0.0830*** (3.68)
TRADE				-0.00276 (-0.14)	-0.00384 (-0.19)	-0.00680 (-0.37)
MKTCAP				0.0110** (2.16)	0.00759 (1.39)	0.00867* (1.74)
Constant	3.883*** (3.30)	3.681*** (3.28)	3.693*** (3.17)	3.438*** (3.11)	5.451*** (3.62)	6.096*** (4.32)
Number of countries	10	10	10	10	10	10
Number of banks	654	654	654	654	654	654
Number of observations	90	90	90	90	90	90

The table reports the result for the regression equation 1. Our dependent variable is economic growth. *t*-Values are in parenthesis. * Significant at 10% level, **Significant at 5% level, ***Significant at 1% level.

Effect of variables across developed/semi-developed, small emerging and large emerging economies

Table 7 reports how the impact of the lagged value of profitability measure (1+ROA) and an interaction variable (lagged value of ROA*SIZE) differs across developed/semi-developed, small emerging and large emerging economies.

Our results highlight that there is some variation between the impact that our profitability measure (1+ROA) and interaction variable (lagged value of ROA*SIZE) have on the economic growth across the three types of economies.

The lagged profitability has a positive and significant impact on the economic growth of all three types of economies. However, our findings support that this impact is larger for developed/semi-developed economies compared to emerging economies. These results are consistent with our pooled regression results reflected in Table 6.

Our findings for the interaction term (lagged value of ROA*SIZE) indicate that this term has a negative and statistically significant impact on the economic growth in the emerging economies which is slightly larger for the smaller emerging economies. This confirms that the increased economic growth attributable to higher profitability is slightly tempered for banking systems enjoying high growth in the case of the emerging economies. In the case of developed/semi-developed economies, the coefficient of the cross-product term is also negative but statistically insignificant.

Table 7: Effect of lagged profitability and interaction term (lagged profitability*bank size) on economic growth across economies.

Subsamples	Lag (1 + ROA)	Lag (1 + ROA)*SIZE
Semi-Dev/Developed (b0.Xit)	9.626***	-0.257
b1.D1.Xit	-3.710***	-0.309***
b2.D2.Xit	-4.720	-0.236
Small Emerging (b0+b1)	5.916***	-0.566***
Large Emerging (b0+b2)	4.906***	-0.493**

The table reports the results for the regression equation 2. Our dependent variable is economic growth. * Significant at 10% level, **Significant at 5% level, and ***Significant at 1% level. X_{it} is the coefficient on the explanatory variables for developed/semi-developed economies, $D_1.X_{it}$ is the difference between the coefficient values for developed/semi-developed and small emerging economies and $D_2.X_{it}$ is the difference between the coefficient values for developed/semi-developed and large emerging economies. $D_1 = 1$ if small emerging, 0 otherwise and $D_2 = 1$ if large emerging and 0 otherwise. The sum of X_{it} and $D_1.X_{it}$ is the coefficient on the explanatory variables for small emerging economies and the sum of X_{it} and $D_2.X_{it}$ is the coefficient on the explanatory variables for large emerging economies.

Bank Profitability and Economic Growth - A Causality Analysis

Table 8 reports the results of granger causality tests to investigate the causal relationship between bank profitability and economic growth. The results are obtained through regressions as set out in equation 4 and 5. We have used the lag order of 1 and lag of order 2 to determine the causal relationship.

The results suggest that unidirectional causality runs from bank profitability (1+ROA) to GDP growth at lag order one while at lag order two, our results suggest a bi-directional causal relationship between bank profitability and GDP growth. It indicates that the impact of the bank profitability on GDP growth is immediate while GDP growth has some delayed feedback on the bank profitability. Overall, the causality results suggest that it is the bank profitability that influences the economic growth to a large extent in Asia-Pacific region. This is also consistent with results of contemporaneous relationship between bank profitability and GDP growth in Table 6.

Table 8: Granger Causality results

Null Hypothesis	Lag Order: 1 p-value	Lag Order: 2 p-value
H_0 : Bank profitability does not Granger-cause GDP Growth.	0.000***	0.000***
H_0 : GDP Growth does not Granger-cause Bank profitability.	0.702	0.000***

The table reports the results for the equation 3 and 4. * Significant at 10% level, **Significant at 5% level, and ***Significant at 1% level.

6. Conclusion

This study investigates the relationship between the profitability of the banks and economic growth in ten countries across Asia-Pacific region over the period 2004 to 2014.

We started with the proposition that economy cannot run smoothly without a well-functioning and profitable banking sector. We find a positive and statistically significant relationship between profitable of the banks and economic growth, however, the impact that bank profitability has on economic growth is slow in its transition. The findings suggest that economic growth in period (t) is largely dependent upon the banking sector profitability in the period (t-1). In relation to bank size, the findings are interesting in that bank size has a negative impact on the economic growth which is a contrast to our expectations. Overall it suggests that an increase in profitability leads to an increase in economic growth while an increase in the size of the banking sector leads to a decrease in economic growth. The causality results suggest that bank profitability fosters economic growth with GDP growth having some delayed feedback on the bank profitability. Furthermore, we find the impact of bank profitability on economic growth reduces when the size of banking sector increases. Other factors that proved to have a positive impact on economic growth included past growth and the level of government expenditure while inflation had a negative impact.

One other question of interest is the extent to which the impact of the explanatory variables differ impact differently on different types of economies? Our results show that the impact of lagged value of profitability is larger for semi-developed/developed economies compared to small emerging and large emerging economies. In addition our results of the interaction term (lagged value of ROA*SIZE) suggest that an increase in profitability leads to an increase in economic growth while increase in banking sector size leads to a decrease in economic growth in small emerging and large emerging economies. In the case of semi-developed/developed economies, the coefficient is also negative but statistically insignificant.

Overall our results support the view of Athanasoglou et al. (2008) that bank profitability is a prerequisite for the economic growth. The results indicate that policy makers should focus on improving bank profitability to achieve the objectives related to economic growth.

References

- Andersen, L., & Babula, R. (2008). The link between openness and long-run economic growth. *Journal of International Commerce and Economics*, 2, 31-50.
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136.
doi:<http://dx.doi.org/10.1016/j.intfin.2006.07.001>
- Bangladesh Bank. (2014). *Central Bank of Bangladesh*. Retrieved from <http://www.bangladesh-bank.org/>
- Bank Indonesia. (2014). *Central Bank of Indonesia*. Retrieved from <http://www.bi.go.id/en/Default.aspx>
- Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance*, 37(2), 433-447.
- Buffie, E. F. (1984). Financial repression, the new structuralists, and stabilization policy in semi-industrialized economies. *Journal of Development Economics*, 14(3), 305-322.
doi:10.1016/0304-3878(84)90061-0
- China Banking Regulation Commission. (2013). *Annual Report*. China: China CITIC Press.
- Cole, R. A., Moshirian, F., & Wu, Q. (2008). Bank stock returns and economic growth. *Journal of Banking & Finance*, 32(6), 995-1007.
- Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of development Economics*, 51(2), 387-411.
- Elliott, D. J., & Yan, K. (2013). *The Chinese financial system: An introduction and overview*: Brookings Institution.
- Global Business Indonesia Guide. (2014). *Indonesian Banking Sector Outlook*. Retrieved from http://www.gbgingonesia.com/en/finance/article/2014/indonesian_banking_sectoroutlook_in_need_of_a_new_growth_strategy.php
- Goldsmith, R. W. (1969). *Financial structure and development* (Vol. 9). New Haven U6 - ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rft_id=info%3Aid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&rft.title=Financial+structure+and+development&rft.au=Goldsmith%2C+Raymond+William&rft.series=Studies+in+comparative+economics&rft.date=1969-01-01&rft.pub=Yale+University+Press&rft.volume=9&rft.externalDocID=35052¶mdict=en-US U7 - Book: Yale University Press.
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The quarterly journal of economics*, 717-737.
- Koivu, T. (2002). Do efficient banking sectors accelerate economic growth in transition countries.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of monetary Economics*, 46(1), 31-77.
- Lucas, R. E., Jr. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22(1), 3.
- Masini, M. (1975). *Finafrica Bulletin*, 2(3), 112-114.
- McKinnon, R. I. (1973). *Money and capital in economic development*. Washington: Brookings Institution.
- Ndlovu, G. (2013). Financial sector development and economic growth: evidence from Zimbabwe. *International Journal of Economics and Financial Issues*, 3(2), 435.
- Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic development and Cultural change*, 14(2), 174-189.
- Reserve Bank of India. (2013). *A Profile of Banks*. Retrieved from <https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/APB30091213F.pdf>

- Reuters. (2014). *Home Page*. Retrieved from <http://www.reuters.com>
- Rodriguez, F., & Rodrik, D. (2001). Trade policy and economic growth: a skeptic's guide to the cross-national evidence *NBER Macroeconomics Annual 2000, Volume 15* (pp. 261-338): MIT Press.
- State Bank of Pakistan. (2006). *Banking Sector Review*: Banking Surveillance Department.
- State Bank of Pakistan. (2014). *Publications*. Retrieved from <http://sbp.org.pk/publications/index2.asp>
- Stern, N. (1989). The Economics of Development: A Survey. *The Economic Journal*, 99(397), 597-685.
- Wijnbergen, S. V. (1983). Interest Rate Management in LDCs. *Journal of Monetary Economics*, 12(3), 433.
- World Bank. (2005). *Financial sector assessment*. Washington, United States of America: World Bank Publications.
- World Islamic Banking. (2014). *World Islamic Banking Competitive Report*. Dubai, UAE: Mega Brands

Appendix-I

Overview of the Banking Sectors

Bangladesh

The banking industry of Bangladesh was comprised of only eight banks at the time of independence in 1971. The number of banks reached to 56 in 2013 with total assets of US\$ 107 billion. Total assets of the banking industry are equivalent to 80% of the total GDP of Bangladesh. The commercial banks in Bangladesh are divided into four categories, that is: state owned commercial banks (SOCBs), specialized banks (SBs), private commercial banks (PCBs) and foreign commercial banks (Bangladesh Bank, 2014). Islamic banking in Bangladesh was started in 1983. In 2013, the assets of Islamic banks stood at US\$ 16.3 billion held by eight full-fledged Islamic banks and Islamic windows or branches of 17 conventional banks.

Indonesia

The banking sector in Indonesia was comprised of a central bank and several state-owned banks until 1982. Currently, the banking industry of Indonesia consists of 120 state-owned and private banks (Bank Indonesia, 2014) but four state-owned banks control about one third of the total assets of the industry (Global Business Indonesia Guide, 2014). In 2013, total assets of the industry stood at US\$ 440 billion which is equivalent to 46% of the total GDP of Indonesia. Indonesia is the largest Islamic country with over 200 million people practicing Islam. Islamic banking in Indonesia has witnessed an average growth of over 65% during the last five years which is three times faster than the growth enjoyed by the conventional banks (Reuters, 2014). Currently, Islamic banking industry of Indonesia is comprised of 11 full-fledged Islamic banks and Islamic windows of 23 conventional banks with total assets US\$ 22.5 billion.

Malaysia

In Malaysia, banking started with the establishment of the chartered bank in 1875. Currently, the Malaysian banking sector is comprised of 43 banks with total assets of US\$ 602 billion which is equivalent to 193% of the GDP of Malaysia. When Islamic banking in Malaysia commenced in the 1970s it became the first country to introduce a dual banking system. The Islamic banking industry in Malaysia is comprised of 6 full Islamic banks and Islamic windows of 10 conventional banks with total assets US\$ 125 billion. Malaysia has the second largest

market share of Islamic banking, i.e., 20% in the total assets of the Islamic banking industry of the world with Qatar being the largest⁶ (World Islamic Banking, 2014).

Pakistan

Over the last four decades, the banking industry in Pakistan has witnessed a dramatic transition with the dominance of government banks moving to the private banks. Private banks were nationalized in 1970s which resulted in an increase in government ownership. In 1990, government shareholding in the banking sector was 93%. However, due to reforms in 1990s, the government ownership declined to 22% in 2004 (State Bank of Pakistan, 2006). Despite inconsistent policies, the banking industry is one of the fastest growing sectors of the economy. The total assets of the banks reached to US\$ 100 billion mark in 2013 with 38 commercial banks. Total assets are equivalent to 43% of the total GDP of the country. The central bank of Pakistan made several attempts to launch Islamic banking in the country in the 1980s, however, attempts were unsuccessful due to absence of a Sharia compliance framework. Islamic banking was re-launched successfully in 2001 and since then has been experiencing an average annual growth rate of 30% (State Bank of Pakistan, 2014). The assets of Islamic banks reached US\$ 9.6 billion in 2013 with 5 full Islamic banks and Islamic windows of 15 commercial banks.

China

China is the second largest economy of the world after the United States and the GDP growth rate of China has remained over 7.5% during the last five years (World Bank, 2014). At the end of 2013, the banking sector of China comprised of 672 commercial banks⁷ with total assets of US\$ 24.5 trillion (China Banking Regulation Commission, 2013) which equals to 292% of China's GDP. The commercial banks in China are broadly divided into large commercial banks, joint-stock commercial banks, city commercial banks, rural commercial banks and foreign banks (Beck et al., 2013). Chinese banking system is highly concentrated with the five largest state-owned banks holding more than 50% of total bank assets (Elliott & Yan, 2013). The banking industry in China is also highly regulated with both capital requirements (8.5%) and stringent cash reserves requirements (19%). Financial inclusion in China is lower than India with 8 branches per 100,000 adults.

⁶ Qatar holds 24% of the assets of Islamic banking industry of the world.

⁷ Five large commercial banks, 12 joint-stock commercial banks, 145 city commercial banks, 468 rural commercial banks and 42 foreign banks.

India

India is one of the fastest growing economies in the world with an average growth of 7.2% over the last five years. At the end of 2013, Indian banking sector comprised of 89 banks with total assets of US\$ 1.8 trillion (Reserve Bank of India, 2013) which is equivalent to 95% of total GDP of India. The commercial banks in India are broadly divided into public sector banks, private banks and foreign banks. Banking industry in India is highly regulated with stringent capital requirements (9%) and cash reserves requirements (4%). Financial inclusion is low with 12 branches per 100,000 adults.

Australia

The banking sector of Australia is well developed with 56 banks which include domestic banks, foreign subsidiary banks and foreign branch banks. In 2013, total assets of Australian banking industry were US\$ 2.8 trillion which is equivalent to 179% of the GDP of Australia. House loans constitutes the largest share of 1.17 trillion that is 38% in total bank assets (Bankers, 2014). Furthermore, Banks in Australia reported profitability of US\$ 23.7 billion in 2013 (ABA, 2014). Four major banks dominate the banking industry in Australia with over 70% of industry assets. Financial inclusion in Australia is better than the other sampled countries in this study, that is, 99.1% population of Australia (age 15+) has a bank account and 79.1% has a debit card (World Bank, 2014).

Hong Kong

Banking industry of Hong Kong is comprised of 57 banks which are classified into three tiers, that is, licensed banks, restricted licenced banks and deposit-taking companies. All these banks are jointly referred as authorized institutions. In 2013, banking industry in Hong Kong reported healthy growth in assets and in net profit. Compared to 2012, total assets increased by 19% and net profit increased 39% in 2013 (HKMA, 2014). Furthermore, strength of the banking sector in Hong Kong can be depicted from the bank assets to GDP ratio which is over 700% of total GDP of the country (He, 2013). Financial inclusion of the banking sector in Hong Kong is better than the other emerging markets in the region. In Hong Kong, 88.7% population (age 15+) have a bank account and 75.8% of the population have a debit card (World Bank, 2014).

Japan

Japanese banking sector is comprised of 198 banks which include Regional Banks, City Banks, Trust Banks, Second Association Regional Banks, Shinkin Banks and Credit Cooperatives. In

2013, the total banking assets were US\$ 8 trillion which is equivalent to 163% of the GDP of the country. Moreover, the deposit of the banking industry was US\$ 1.4 trillion in 2013 (BOJ, 2014). Japan is the third largest economy in the world. Furthermore, 96.4% of the population of Japan have a bank account. However, the economy of Japan has remained stagnant for the last 20 years as a result of deflation faced by the country during the last 15 years⁸.

Singapore

Singapore is the largest foreign exchange trading centre of Asia (FT, 2014). In 2013, the banking sector of Singapore was comprised of 124 banks which include domestic and foreign banks. Foreign banks are further classified in the four categories, that is: full banks, wholesale banks, offshore banks and Merchant banks. The total assets of commercial banks in 2013 were US\$ 779 billion which is equivalent to 261% of the total GDP of Singapore. In addition, banking sector reported a net profit of US\$ 12.7 billion in 2013.

Appendix-II

Table A-1: Correlation matrix for variables.

Correlation Matrix	GDP	Lag GDP	(1 + ROA)	Lag (1 + ROA)	SIZE	INF	EXP	TRADE	MKTCAP
GDP	1								
Lag GDP	0.58	1							
(1 + ROA)	0.49	0.45	1						
Lag (1 + ROA)	0.49	0.45	0.87	1					
SIZE	-0.19	-0.01	-0.04	-0.04	1				
INF	0.15	0.19	0.33	0.36	-0.23	1			
EXP	0.48	0.31	0.35	0.32	-0.33	0.21	1		
TRADE	0.02	-0.11	-0.02	-0.04	-0.13	-0.03	-0.07	1	
MKTCAP	0.18	-0.01	0.03	0.00	0.17	-0.09	-0.08	-0.09	1

Table A-2: Vector Inflation Factor.

Variable	VIF	1/VIF
(1 + ROA)	4.81	0.20
Lag (1 + ROA)	4.69	0.21
INF	1.95	0.51
SIZE	1.84	0.54
Lag GDP	1.52	0.66
EXP	1.24	0.81
PSC	1.2	0.83
NPLS	1.14	0.88
TRADE	1.11	0.90
MKTCAP	1.09	0.92
Mean VIF	2.06	

⁸ The Bank of Japan has targeted to achieve inflation of 2% in the next two years to promote growth in the country.

