



## CAMEL VARIABLES AND MALAYSIAN BANKS PERFORMANCE

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### ABSTRACT

One of the main driver to good economy is Banking system. Without an efficient banking system, there is a risk for whole failure in the economy with the resultant consequences of high cost of living, unemployment, inflation, falling value of currencies etc. Many studies in past examines factors that effects the bank's profitability, using both internal and external factors that affect the banks performance. However, the findings in these studies indicates a different result at different times within the same jurisdictions. This paper will close this gap by finding out the result of the internal factors that affect Malaysian Islamic and conventional banks performance during the period between 2008-2016. The study used secondary data from (Fitch connect databases) to evaluate the internal variable (CAMEL) and the return on equity (ROE) as dependent variables, Stata Econometrics software through panel data was used for analysis. The findings of the study show contrary result from the anticipated, it shows that the newly introduced long-term liquidity measured (NSFR) did not significantly affect the Malaysian Banks performance as measured by ROE. Thus, the future study should focus to find whether NSFR has effect of banks profitability through other internal of external factors (i.e. mediating/interactions effects of NSFR and banks performance). The implication of the study is twofold; first it serves as avenue for policy makers to find out more issues that leads to the 2008 financial crisis, second, researchers in the banking sectors will use it as a gap for further research in this area.

### 1. Introduction

The downturn in the United States in the late part of 2008 led to a dramatic downturn in businesses and financial institutions, not only in the United States but other countries as well (Lau, 2008). It affected the world stock markets and made large financial institution to either go bankrupt or sell off their shares to the public (Anup, 2009). The banking sector was one of the sectors most affected by the finance turnover, where 80% of the banking sector struggled with the sub-prime crisis and most financial instruments were affected. Loans were not able to be paid on time due to the stunted growth by early 2009 (Anup, 2009).

However, it was predicted that Islamic banks would not be affected as much as commercial banks due to the fact that Islamic banks follow different fundamentals, laws and have a different approach in their business. Due to the concept of profit-sharing where both parties are subjected to potential losses and returns, Islamic banking has become envy and is now being applied in various countries (Mokhtar et al, 2008).

According to Lahem (2009), the financial crisis is indeed a golden opportunity for Islamic banking to emerge to other parts of the world. In their article on 24 August 2009, RNCOS Research Analysts point out that "The recent financial turmoil witnessed by the world unveiled the vulnerabilities in the traditional banking system and displayed that Islamic banks are far much safer as they do not include risky product offerings." This is backed by Cihak and Hesse (2008) in their study on bank stability through bank performance between Islamic and commercial banks, where they showed that Islamic banks were more stable than commercial banks. Hassan and Ahmad (2007) found no difference in the asset quality of both types of banks in Bangladesh but found that Islamic banks were better capitalized than conventional or public banks. However, conventional banks were operationally more efficient than Islamic banks.

Malaysia was one of the countries least affected by the crisis. Several reasons were given by economic analysts and one of them was the development of Malaysia as the hub for Islamic finance. The Islamic banking concept was first implemented in Malaysia in 1983 with the first Islamic bank called Bank Islam. The growth of Islamic banking in Malaysia was more rapid when the government opened the opportunity for foreign Islamic banks in Malaysia in 1996. By early 2000, most of the local commercial banks had implemented the Syariah law as a window of their Islamic banking products. Statistically, the market share of Malaysia's Islamic banks boomed from 3.37 per cent in 1998 to 22.8 per cent in 2007 with Islamic banking assets reaching USD65.6 billion (Bank Negara Malaysia, 2008). The findings of Mokhtar et al (2008) showed that the performance of the Islamic banking industry in Malaysia had improved during the period of his study. With Malaysia's aim of becoming the most significant Islamic finance hub in the world, it is therefore very important to study the performance of the participants in the Islamic finance industry and what drives this performance. Since the early 1990s, studies on Islamic banking were focused more on the efficiency and were largely theoretical studies of how Islamic banking affected the banking industry (Berger and Humprey, 1997). Also, other studies underlined the comparison of Islamic banking instruments with that of commercial banking, the regulatory aspects, and challenges faced by countries that were initiating Islamic principles into their banking sectors (Sundarajan and Erico, 2002; Ainley et al, 2007; Sole, 2007; Jobst, 2007; Dhar and Hoque, 2015; Rahouma et al., 2018; Saeed et al., 2018).

Although there have been a significant number of studies done on the efficiency of Islamic banking globally, there is still little quantitative analysis done on the profitability of Islamic banks as compared to that done for conventional banks. Many studies have been conducted to determine what affects the profitability of conventional commercial banks and most of the studies done used different methods and approaches in evaluating a bank's performance. Among these studies, includes the studies conducted by (Athanasoglou et al, 2005; Anna and Hoi, 2009; Chowdhury and Dhar, 2012; Heffernan and Fu, 2008; and Bashir, 2003) etc. the general findings are different from one another. This is due to the fact that the results are influenced by the changes of a bank's internal condition and the macroeconomic environment. There are a number of papers that concentrate on how Islamic banking principals could generate income by excluding the concept of interest and utilizing the concept of profit sharing. Although most papers focus on the theoretical part of generating profit using the Syari'ah concept, there is not much research done on the factors which affect this significant amount of profit generated by the Islamic banking sector.

The aim of this study is to examine the drivers of profitability of the Islamic sector in Malaysia. It has focused on the contribution of bank-specific factors to the variation of the profitability as measured by ROE across Islamic and conventional banks in Malaysia. By using the same determinants and quantitative methods as those done in studies of conventional banks, the results for Malaysian banks might differ from the results obtained from other countries banks, as there could possibly be other factors not important in determining the profitability of other countries' banks that affect Malaysian banks or vice versa. The remaining sections of this research are designed as follows: Section 2 conducts a literature review on the topic; Section 3 focuses on methodology; Section 4 analyses the data and Section 5 represents conclusion which includes future research directions.

## **2. Literature Review**

### *2.1 Determinants of the Malaysia Islamic Banks performance*

Many studies on Islamic bank profitability concentrated on specific country such as Malaysia. Abdus and M. Kabir (1999) assessed interbank and inter temporal performance of Bank Islam Malaysia Berhad (BIMB) in terms of profitability, community involvement, liquidity, risk and solvency for a period between 1984 to 1997. In measuring these

performances, many financial ratios were applied, and their findings indicated that Islamic banks performances in terms of return on assets and return on equity were greatly improved during the period.

Nur and Abdul (2005) investigated the internal, external and financial structure determinants of Malaysian Islamic banks' profitability. ROA, ROE and ROD were assumed to function as bank specific factors and financial structure, while other macroeconomic factors were used as external factors. In other to take into account the heterogeneity of these factors, a panel estimation technique was used. The study used a sample of fifteen windows and full-fledged Islamic banks for the period of 1995 to 2004.

Pratomo and Abdul (2006) tested the agency cost hypothesis for Malaysian Islamic banks for the period of 2005 to 2008. The study found low equity capital ratio in relation with high profit. The study also revealed insignificant relationship between size and banks profitability.

Shaista and Hanimas-Ayu (2010) concentrated their study on the impact of bank-specific and macroeconomic factors towards Islamic banks' profitability in Malaysia. OLS data analysis was employed in the analysis of sixteen windows of Islamic banks for the period between 2005 to 2008. As a proxy of profitability, average return on asset (ROAA) ratio was used. Bank-specific factors included in the study were capitalization, liquidity, asset quality, and operational efficiency. These factors were subsequently regressed against profitability. Furthermore, external factors such as inflation and GDP were used as control variables in the study.

Asma'et al. (2011) analyzed the Islamic banks profitability in Malaysia by using only banks that are listed on the Bursa Malaysia. Factors including liquidity, credit risk, bank size, capital adequacy and management expenses were used as bank-specific determinants, while Return on Assets (ROA) was used as a proxy to measure profitability. Generalized Least Square (GLS) panel data analysis method was employed in the study, in which quarterly data of nine Islamic banks were used as sample. The sample included both local and foreign Islamic banks operated in Malaysia during the period between 2007 to 2009.

Yap et al. (2012) examined the performance of 11 local Malaysian Commercial Islamic banks between 2006 to 2009. Return on Asset (ROA) and Returns on Equity (ROE) were used as dependent variables and regressed against numerous independent variables. Findings of the research showed that concentration, liquidity, level of capital and GDP per capita do not influence these banks' performance.

What we can conclude from the above studies is the limitation in the number of studies for banks performance in Malaysia, whereby most of the studies used either ROA or ROE as proxies of profitability. Most studies also used either OLS or GLS panel methodology to analyse the data, partly due to their appropriateness with this kind of study. Finally, the determinants (both bank specific and external factors) are different from one study to another. As for the bank-specific, Nur and Abdul (2005) revealed that high profitability was correlated with banks that had high relatively of total loans ratio, high zakat payment, low earning on non-interest activities, and low total assets growth. In a study by Shaista and Hanimas-Ayu (2010), it was revealed that asset quality and capital are inversely related with banks' profitability. However, operational efficiency and liquidity positively influenced profitability. In their studies, Asma' et al. (2011) found that size of bank was among the important determinants of Islamic banks profitability in Malaysia because big banks will normally have better access to instruments in the capital markets. With regards to macroeconomic variables, Shaista and Hanimas-Ayu (2010) found that banks profitability had positive relationship with inflation and GDP. By contrast, Nur and Abdul (2005) established that GDP growth did not have any impact on profitability of banks. In addition, Yap et al. (2012) maintained that GDP per capita did not have any impact on the profitability of Islamic commercial banks.

## 2.2 Determinants of the Malaysia Conventional Banks Performance

Guru et al. (1999) used the linear model to analyse the pooled cross section time series data to isolate the profitability determinants of Malaysian commercial banks during the period of 1985 to 1998. Profitability ratios of ROA and ROE were used in the study as the dependent variables. In addition, the external and internal determinants were also included in the study. In line with this, Fadzlan and Muzafar (2010a) examined how regulation and supervision affected the profitability of Malaysian banking sector by using bank level data between 1992–2003. Rasidah and Mohd (2011) also investigated the impact of bank-specific factors on commercial banks in Malaysia and China for the period of 2001 to 2007. The data set consisted of 4 state-owned commercial banks in China and 9 local commercial banks in Malaysia. Return on Average Assets (ROAA) and Return on Average Equity (ROAE) were used. In another study, Jasmine et al. (2011) used eight commercial banks in Malaysia from 2004 till 2010 to find out the profitability determinants of these banks after the 2008 financial crisis. The chosen independent variables were the gross domestic production, inflation rate, capital adequacy ratio, total income, expenses management, total loans, total deposits, and bank size.

Fadzlan and Muzafar (2010a) found that economic growth and inflation bore some positive impact towards profitability of the Malaysian banking sector. Meanwhile, Jasmine et al. (2011) found that the gross domestic production and inflation rate are insignificant in determining the profitability level of commercial banks in Malaysia after the 2008 financial crisis. The results of Rasidah and Mohd (2011) and Jasmine et al. (2011) suggested that bank size did not have any influence on the profitability of commercial banks in Malaysia.

Besides the internal determinant of commercial banks' profitability in Malaysia, Guru et al. (1999) suggested the negative impact of total expenditure to total assets variable towards bank profitability, whereas current account deposits of each commercial bank as a percentage of total assets had positive impact on bank profitability. The results indicated that liquidity, loans, and advances variables in each commercial bank as a percentage of the total assets are all negatively related to ROE. However, a positive relation between the ROA and loans and advances as a percentage of total assets was also found. The study indicated no relation existed between bank profitability and capital, reserves, time, and savings deposits of each commercial bank as a percentage of their total assets.

Fadzlan and Muzafar (2010a) agreed with Guru et al. (1999) that Malaysian commercial banks with higher liquidity levels had lower profitability level. Said and Tumin (2011) found that operating expenses were significantly negative and related to bank performance, whereas liquidity of banks did not have any influence on the performance of Malaysian commercial banks. While Rasidah and Mohd (2011) showed insignificant effect of capital on Malaysian commercial banks, Jasmine et al. (2011) provided evidence of the significance of capital adequacy ratio. The latter study showed that the internal variables, or namely expenses management, total loans and total deposits are insignificant in determining the profitability of commercial banks in Malaysia.

Previous studies on commercial banks' profitability in Malaysia revealed various affecting factors, inclusive both macroeconomic and bank specific factors. Although the above studies are conducted in the same environment and market (Malaysian commercial banks), some findings are inconclusive and propel further studies to be conducted.

## 3. Methodology

The data for this research were elicited for the annual reports of Foreign and Domestic banks in Malaysia for the period between 2009 and 2016. The data was divided in to Foreign and domestic banks accordingly and descriptive test analysis was conducted. The local banks are the banks that were more than 50% shares was owned by government or privates' individuals in Malaysia while the foreign Banks are the ones that were 50% of its shares was subscribed by foreigners. This means the descriptive analysis were done for domestic as well as foreign banks operated in Malaysia for the period of 2009 to 2016.

Banks liquidity can be affected by its internal activities (Management). This is due to the importance function played by the management in banking institutions. Thus, it is given a particular attention by regulators during their examinations of safety and soundness of a Bank. CAMEL rating which is also known as safety and soundness check, reflect the bank's ability to withstand liquidity shocks as well as the soundness of its management. In summary; management through a CAMEL rating plays a prominent role in determining the banks performance. Following this evidence, this study will examine and analyze the relationship between CAMEL-type variables and Malaysian banks profitability (ROE).

The study began by testing the mean variables in order to determine whether there are significant differences in the average values of these variables for domestics as well as foreign Banks in Malaysia. The following CAMEL-type variables were employed: capital buffer ratio and capital ratio as a proxy of Capital adequacy ratio, Gross NPA /Net advances as a proxy to asset quality, Total expenses to total revenue and Overhead/Total Assets as a proxy to management efficiency, Loan Loss Reserve, Loan growth and Non-Interest Share as a proxy to earning. The study then examines the impact of CAMEL-type variables on ROE of both domestic and foreign banks in Malaysia by pooling our data to perform panel regressions for the whole study period.

The empirical analysis of this study is based on the panel data fixed effect model (FEM) that incorporates annual data series of both domestics and foreign commercial banks operated in Malaysia. The study established the evidence for profitability-CAMEL variables link in these banks. This was done through estimates of the below equation:

$$ROE_{it} = \alpha_1 + \alpha_2 CAR_{2it} + \beta_3 ASSET_{3it} + \beta_4 EFFICIENCY_{4it} + \beta_5 EARNING_{5it} + \beta_6 LIQUIDITY_{6it} + \mu_{it}$$

CAMEL-type variables include; capital buffer ratio and equity over total assets as a proxy of Capital adequacy ratio, NPLs /Gross loans and growth of gross loans as a proxy of assets quality, cost efficiency ratio, non-interest expenses over average assets and interest expenses on customer deposits over average customer deposits as a proxy of management inefficiency, non-interest income over gross revenue, interest earning ratio, operating profit over average equity as a proxy of earning ratio and ratio of 'available stable funding over required stable funding (NSFR) as a proxy of liquidity.

The ROE<sub>i,t</sub> can a ratio of: ROE<sub>i,t</sub> which is the measure of bank i in the year t,  $\alpha$  is a constant, CAR<sub>i,t</sub> indicates the capital adequacy of bank i in the year t, the ASSET<sub>i,t</sub> is a measure of asset quality of bank i at time t, EFFICIENCY<sub>i,t</sub> is the ratio of inefficiency of bank i in year t, EARNING<sub>i,t</sub> measures to what extent bank i earnings in year t and LIQUIDITY<sub>i,t</sub> measures to what extent bank i liquidity in year t influences the level of ROE.

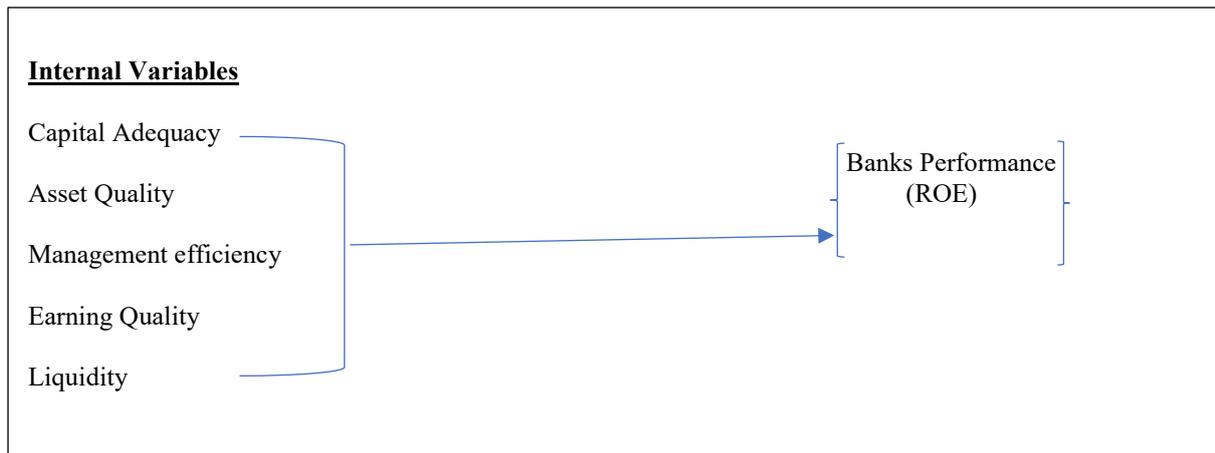


Fig. 1. Research conceptual model.

#### 4. Data and Variables

The sample is composed only of banks for which it was possible to measure the NSFR. Year 2009 is chosen because this is the first year in which the banks started taking measures in order to recover from the recent crisis, also if we consider years before 2009 the data to measure the NSFR are uncompleted and more estimations and rigorous evaluations will be required.

One of the independent variables used in the empirical analysis is newly introduced liquidity measure (i.e., NSFR). Based on previous studies (Giannotti et al., 2010; Angora, & Roulet, 2011; Giordana, & Schumacher, 2012), the net stable funding ratio and the liquidity coverage ratio are the two dependent variables considered, which are the two liquidity measures proposed by the Basel Committee (2010). In this study; we decided to incorporate only one (NSFR) in order to reduces the extent of assumptions and approximations in calculating LCR.

The net stable funding ratio (NSFR), which is a measure of structural liquidity (with a one-year time horizon) and is calculated as follows:

$$NSFR = \geq 100$$

A high value of this ratios means high bank liquidity. Appendix 1 show the term considered to quantify NSFR liquidity ratio proposed by the Basel Committee (2010) guided by the general availability of Banks data reported by Fitch-connect database.

The difficulty of including all terms required by the Basel Committee, which entails a precise calculation, is a main limitation of this method. However, the use of the NSFR measures instead of the balance sheet indices usually used in literature can more effectively indicate bank liquidity risk.

Table 1 in the appendix presents the details of the variables and their definitions.

#### 5. Data Analysis and Results

##### 5.1 Descriptive Statistics

In order to know the statistical characteristics of every independent variable to be used in this research a descriptive statistic was conducted. This includes mean, standard deviation, minimum, maximum, kurtosis and skewness. The mean of the variable refers to the average value of that variable within the entire sample. Standard deviation is defined as the degree of variation or scattered data from the mean value. The minimum value refers to the least element in a sample and maximum value refers to the maximum observations in a sample, Kurtosis is a measure of the combined sizes of the two tails while Skewness measured of the symmetry in a distribution. Table 2 in the appendix summarized the descriptive statistics of the variables involved in this research for the entire Banks in Malaysia.

## 5.2 Correlation Matrix

Prior to the conduct of regression analysis of the panel data, a correlation analysis was carried out in order to make sure that data did not contains any severe multicollinearity problem. Table 3 shows the correlations matrix for ROE which is the dependent variable and its relationship with other independent variable for all the sample banks. The findings show that the correlation coefficient of all the variables are less than 0.8, which means absence of severe multicollinearity issues in our data sets.

## 6. Discussion and implications

Table 4 shows the result of regression analysis through ROE as a performance indicator, ROE measure the banks actual performance in terms of return per dollar invested by the shareholders.it is the ratio of net income to shareholder's equity. The higher this ratio the higher the banks performance in terms of equity. The ROE is important in analyzing the profitability of the banks as compared to its competitors as well as during a particular period. It shows how effective banks are in utilizing the cash invested by the shareholders into greater gain and growth for the benefit at the shareholders. Table 4 shows the result of the panel regression analysis for all the banks in Malaysia. Firstly, the regression analysis was run using pooled OLS, this will allow us to compare with other method (random and fixed effect models) to ascertain the best and accurate result for our analysis. In the first regression; using OLS and random effect model; Breuch-pagan test show the result that p value is less than 0.05 which means that the random effect is more appropriate than pooled OLS. Furthermore, a fixed effect regression was carried out to ascertain the most appropriate method between random and fixed model, hausman test which was carried out for this purpose shows a p value of less than 0.05, this means the most appropriate method for our data analysis is fixed effect model. After getting the most appropriate model for our analysis as fixed effect model, some diagnostic tests were conducted on the model. Firstly, a test for variance inflation factor (VIF) was conducted and the result shows a mean of less than 10 value. This means there is no multicollinearity problems in all our data. A further test for heteroscedasticity was carried out using modified test for group wise, the result shows a p value of less than 0.05, this indicated the existence of heteroscedasticity problems in our data, before we diagnose another test was conducted through the Wooldridge test in order to test the presence of serial correlation in our data; the result of the test shows a presence of autocorrelation in our data as p value is less than 0.05.

In order to rectify the above 2 standard errors in our data, appropriate rectifications procedures were adopted to correct the standard errors in our data, and then a new regression was conducted based on the panel corrected standard error(PCSE) and a subsequent analysis was done on the data based on the results by PCSE under model D in our regression table.

Model D in the regression model table show a result of our analysis based on PCSE.

Ratio of equity over total and assets cost efficiency ratio have negative and significant effect on banks performance in other words a negative and significant relationship was noticed between banks performance, this means an improve in banks capital and efficiency in term of overhead cost does not translate to the overall banks performance in Malaysia, in other words an excessive or increase in banks capital make banks less profitable because they did not use the fund to finance the profitable operations, also an increase in cost does not translate to an increase in profitability as increase in expenses reduces profitability. On the other side, increase in capital buffer help to increase the average profitability of banks in Malaysia, perhaps due to the facts that capital buffer is used to cover to loss of some banks which otherwise will eat capital with will undermine the general profitability of all the banks.

Thus in order to find other factors that affect the Malaysian banks performance, other factors used to be considered looking for other factors, we found that, the ratio of non-interest income over gross revenue, growth of gross loan interest earning ratio, net stable funding ratio( liquidity) and ratio of non-performing loans (NPL) over gross loans have a negative and insignificant relationship with Malaysian banks performance, while the ratio of non-interest income over average asset, and interest expenses on customers deposits over average customers deposits have a positive but insignificant impact on ROE, thus the only factors which has the effect of Malaysian banks ROE are capital ratio, capital buffer ratio and cost efficiency ratio.

## 7. Conclusion

The recent 2008 financial crisis indicated the importance of liquidity for the survival and increased profitability of Banks, likewise, lack of enough liquidity proves to be hurdles which can reduced the bank's profitability and threat to bankruptcy, this research, found a contrary result that newly introduced long-term liquidity measured (NSFR) did not significantly affect the Malaysian Banks performance as measured by ROE, the other bank-specific factors acts as control variables. Thus, the future study should focus to find whether NSFR has effect of banks profitability through other internal of external factors (i.e. mediating or interacting effect of NSFR and banks performance).

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## Appendix

**Table 1: Operational Definition**

No.	Variable	Description	Type
1	Capital Ratio	Equity over total assets (in %)	Micro Variable
2	Non Interest Share	Total non-interest income over total income (in %)	Micro Variable
3	Growth Net loans	Annual growth of net loans (in %)	Micro Variable
4	LCR	This ratios is defined as the sum total of high quality liquid assets divided by total cash outflows, the ratios is defined based on the funding weight shown in table....	Micro Variable
5	NSFR	Ratio is defined as a bank's available stable funding (ASF) divided by its required stable funding (RSF) (in %). ASF and RSF are calculated based on funding weights shown in Table.....	Micro Variable
7	Overhead/Total Assets	Overhead expenses over average <sup>a</sup> total assets (in %)	Micro Variable
8	Asset Quality	Gross NPA /Net advances	Micro Variable
9	Liquid Asset / Deposits	Total loans to total deposits	Micro Variable
10	Loan Loss Reserve	Loan loss Reserve/(Equity + Loan Loss reserve)	Micro Variable
11	Capital Buffer Ratio	(Equity + Loan Loss Reserve)/Loan	Micro Variable
12	Cost Efficiency	Total Expenses/Total Revenue	Micro Variable
13	Interest Earning Ratio	Net Interest Income/Total Revenue	Micro Variable
20	Net Interest Margin	Net interest margin (in %), defined as net interest income divided by total average <sup>a</sup> assets	Performance
222	ROE	Net profits over average <sup>a</sup> total equity (in %)	Performance

a. Average of beginning and end of year reported value.

Note: Casu and Girardone (2006); for Islamic Banks, 'loans' are identified as financing activities, 'interest income' are called 'financing revenue' and 'interest expenses' are labelled as 'financing expenses'

**Table 5****Funding Factors Used for Calculation of NSFR. Source: Fitch Connect Data Item Structure**

<b>Available stable funding (ASF)</b>		<b>ASF factors (%)</b>
<b>Equity</b>	Total equity	100
	Pref. shares and hybrid capital accounted for as debt	100
	Pref. shares and hybrid capital accounted for as equity	100
	Non-controlling interest (minorities) <sup>a</sup>	-100
<b>Liabilities</b>	Total customer deposits	90
	Deposits from banks	0
	Repos and cash collateral	50
	Other deposits and short-term borrowings	0
	Total long term funding	60
	Reserves for pensions and other	100
	All other liabilities and equity	0
a.	Minus factor to eliminate ASF related to non-controlling interests, which were added as component of total equity.	
<b>Required Stable Funding (RSF)</b>		
<b>RSF Factors (%)</b>		
	Data item	
<b>Loans</b>	Residential mortgage loans	65
	Other mortgage loans	65
	Other consumer/retail loans	85
	Corporate and commercial loans	85
	Other loans	100
<b>Other</b>	Loans and advances to banks	0
	Total securities	40
	Investments in property	100
	Insurance assets	100
	Other earning assets	100
	Cash and due from banks	0
	All other non-earning assets	100
<b>Off-balance sheet:</b>	Guarantees	5
	Acceptances and documentary credits reported off-balance sheet	5
	Committed credit lines	5
	Other contingent liabilities	5

**Table 4****Regression results (different models) explaining the different Performance (Equity) levels among all the Banks**

1. Figures in the parenthesis are t-statistics, except for Breusch-Pagan LM test, Hausman test, Heteroskedasticity

VARIABLES	Model A Pooled OLS	Model B Random effect	Model C Fixed Effect	Model C Panel corrected Standard errors
Constant	59.63 (7.03)***	55.48 (6.75)***	47.42 (5.11)***	58.75 (6.53)***
Equity/Total assets	-0.746 (-10.61)***	-0.505 (-7.52)***	-0.410 (-5.43)***	-0.487 (-4.85)***
Non-Interest Income/ Gross Revenues	-0.0861 (-1.34)	-0.0685 (-1.08)	-0.0243 (-0.34)	-0.0873 (-1.22)
Growth of Gross Loans	-0.00888 (-0.92)	-0.00120 (-0.16)	0.000329 (0.04)	-0.0309 (-0.63)
Non-Interest Expense/ Average Assets	0.754 (0.71)	1.596 (1.41)	1.109 (0.85)	1.121 (0.79)
Capital buffer ratio	0.00664 (5.00)***	0.00872 (4.47)***	0.0140 (4.37)***	0.00692 (5.06)***
Cost efficiency ratio	-51.98 (-9.52)***	-49.87 (-9.53)***	-44.88 (-7.47)***	-49.55 (-7.54)***
Interest earning ratio	-10.98 (-1.15)	-11.37 (-1.31)	-6.448 (-0.69)	-15.27 (-1.51)
Int. Exp. on Customer Dep./ Av. Customer dep	1.134 (1.32)	1.309 (1.57)	1.539 (1.71)*	0.888 (1.36)
NSFR	0.353 (1.62)	-0.102 (-0.46)	-0.166 (-0.60)	-0.0653 (-0.32)
Impaired Loans(NPLs)/ Gross Loans	-0.136 (-0.97)	-0.315 (-2.35)**	-0.390 (-2.68)***	-0.236 (-1.15)
Breuch-Pagan LM test	142.97 (0.0000)***			
Hausman test		32.17 (0.0004)***		
Observations	267	267	267	267
Multicollinearity (Mean vif)			4.43	
Heteroskedasticity (X <sup>2</sup> -stat)			5619 (0.0000)***	
Serial correlation (F-stat)			13.185 (0.0009)***	
R-squared	0.671		0.446	0.643
Number of code		37	37	37

and serial correlation tests, which are p-values.

2. asterisks \*, \*\* and \*\*\* shows the significant level of 1%, 5% and 10% respectively.

**Table 1****Descriptive statistics for all the Banks in Malaysia**

Variables	1 Obs	2 Mean	3 Std.Dev.	4 Min	5 Max	6 Skew.	7 Kurt.
Equity/Total assets	296	10.36	5.654	2.93	63.28	3.718	29.051
Non-Interest Income/ Gross Revenues	296	24.012	16.38	-3.78	95.2	1.339	5.406
Growth of Gross Loans	270	13.936	32.061	-96.89	183.69	2.349	12.615

Non-Interest Expense/ Average Assets	271	1.363	.514	.54	3.39	.833	3.433
Capital Buffer Ratio	296	185.256	301.059	1.831	2634.8	3.851	23.135
Cost Efficiency Ratio	296	.702	.107	.405	1.083	.264	3.614
Interest Earning Ratio	296	.446	.102	.039	.914	-.053	5.947
Int. Exp. on Customer Dep./ Av. Customer dep	268	2.221	.717	.45	4.03	-.322	2.417
NSFR	296	3.759	2.035	.925	15.094	2.798	11.942
Impaired Loans(NPLs)/ Gross Loans	296	2.387	2.723	.01	23.23	3.484	19.56
ROE	271	13.994	8	-8.09	41.04	-.022	3.048

The table reports the means for the variables in our study as defined in table 1. Data are Fitch –connect x and y and includes 3448 observations over 2009-2016.

**Table 6**  
**Correlation matrix of all Malaysian banks for all the variable**

(1)	ROE	Equity/Total assets	Non-Interest Income/ Gross Revenues	Growth of Gross Loans	Non-Interest Expense/ Average Assets	Capital Buffer Ratio	Cost Efficiency Ratio	Interest Earning Ratio	Int. Exp. on Customer Dep./ Av. Customer dep	NSFR	Impaired Loans(NPLs)/ Gross Loans
ROE	1										
Equity/Total assets	-0.530***	1									
Non-Interest Income/ Gross Revenues	-0.105	0.256***	1								
Growth of Gross Loans	0.0595	-0.183**	0.0194	1							
Non-Interest Expense/ Average Assets	-0.296***	0.101	0.222***	-0.0374	1						
Capital Buffer Ratio	0.344***	-0.188**	0.00452	-0.0722	-0.0139	1					
Cost Efficiency Ratio	-0.522***	-0.113	-0.181**	-0.0212	0.297***	-0.134*	1				
Interest Earning Ratio	0.153*	0.0823	-0.546***	0.00296	0.209***	0.181**	-0.338***	1			
Int. Exp. on Customer Dep./ Av. Customer dep	-0.0123	-0.254***	-0.561***	-0.134*	-0.258***	-0.0966	0.433***	-0.214***	1		
NSFR	-0.340***	0.455***	0.529***	0.0724	0.184**	-0.241***	0.0415	-0.191**	-0.517***	1	
Impaired Loans(NPLs)/ Gross Loans	-0.297***	0.325***	-0.00461	-0.298***	0.228***	0.0657	0.171**	0.0573	0.0304	-0.00171	1

The table reports correlation coefficients of the explanatory variables of all banks with ROE as dependent variable. The variables are defined as outlined in Table 1. The period covers the years 2009–2016.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$