**Profitability Determinants of Islamic and Conventional Banks in Malaysia:
A Panel Regression Approach**

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Abstract
This paper examines the impact of bank-specific and macroeconomic factors upon the profitability performance of Islamic and conventional banks in Malaysia using panel data regression analysis. The sample comprises of seventeen conventional banks and thirteen Islamic banks covering the period of 2005-2009. The results show that liquidity ratios and macroeconomic condition are the profitability determinant under pooled OLS framework, while only liquidity ratio is significantly affecting profitability under random effects model. However, final result under fixed effects model shows that types of bank and macroeconomic condition are the significant determinants of bank profitability. This study also evidences that Islamic banks are more profitable than conventional banks during the period analyzed.

Keywords: *Profitability, Panel regression analysis, Islamic banks, Malaysia*

1. INTRODUCTION

Bank is a financial intermediary institution which connecting the surplus group with the deficit group so that productions do not stop and other economic activities can be financed. Mishkin (2006) says that indirect finance, which includes banks and involves the activities of financial intermediaries, is many times more important than direct finance, in which businesses raise funds directly from lenders in financial markets, towards economic growth. In fact, for the period of 1970-1996, sources of external funds of nonfinancial businesses in Japan were 85 percent from bank loans and 15 percent from financial markets while in Germany were almost 80 percent from bank loans and the rest from financial markets (Mishkin, 2006, p. 171). However, banks' ability to provide loans and financing–so that can promote growth in the economy–are also depend upon their capability to generate profit which its level is influenced by bank specific and environmental factors. Therefore, this study is aimed at investigating the profitability determinants of banking industry in Malaysia during the period of 2005-2009. In order to distinguish it from other studies in the same area, this paper uses dummy variable to distinguish between Islamic and conventional banks and focus on the impact of the volatility of GDP, net loans per total assets (liquidity ratio) and equity per total assets (capital adequacy) towards the profitability of Islamic and conventional banks in Malaysia.

2. LITERATURE REVIEW

2.1 Profitability of conventional banks
The profitability of commercial banks can be influenced by factors that are controlled by management or internal factors and factors that are beyond the control of management or external factors. The management controllable internal determinants include liquidity ratios, capital adequacy ratios, asset and liability portfolio mix and overhead expenses. Meanwhile,

the external factors are including regulation, market structure, inflation, interest rate, and economic growth.By examining the capital adequacy and reserves a bank chooses to hold as well as the bank's liquidity management policies, the bank management's attitudes towards risk can be observed (Guru et al, 2000). Koehn and Santomero (1980) points out that a regulation which increases the capital adequacy requirements will increase the capital-asset ratio and thus reduces risk. Guru et al (2000) finds that capital and reserves to total assets ratio as well as liquidity variable exhibit negative and significant impact towards the bank's profit which imply low leverage and low risk and thus would associated with low return. Herrero et al (2007) studies profitability determinants in chinese banks and confirms that better capitalized and more efficient banks are found to be more profitable.

Abreu and Mendes (2002) studies the profitability determinants in EU countries using inflation, exchange rates, economic growth, bank size and capitalization, and bank product mix as explanatory variables. Their study concludes that well-capitalized banks (i.e., banks with higher equity/assets) face lower expected bankruptcy costs and thus lower funding costs and better profitability ratios. Furthermore, their study also confirms that the loan to assets ratio has a positive impact on profitability. Interestingly, Abreu and Mendes (2002) finds that national economic indicators used in the models (i.e. inflation, unemployment rate and GDP growth) are negatively correlated with the banks' profitability. The latter finding goes along the lines of Wallich (1980) and Petersen (1986) but contradicts findings from recent publications such as Demirguç-Kunt and Huizinga (1999), Demirguç-Kunt and Huizinga (2000) and Denizer (2000).

2.2 Profitability of Islamic banks
It has been thirty years since Malaysia started its Islamic banking operations. Today it is worldly recognized as a country that successfully applies dual banking system. Not only in the practical area, numerous academic articles have also been published particularly those which examining vast variables and factors of banking performances and development in both Islamic and conventional system. Those studies have been conducted in various time periods and focusing on different variables. Samad and Hasan (1999) examines the performance of the first years of the bank's operations. By using ANOVA and intertemporal approach they study the performance of Bank Islam in terms of its profitability, liquidity, risk and solvency and community involvement in the period of 1984-1997. Bank Islam showed extensive level of liquidity and low degree of risk after being compared with 8 conventional banks.

On the other hand, similar comparative study has been conducted by Moin (2008) in Pakistan but with opposite findings. Moin (2008) evaluates the performance of Mezan Bank Limited versus the performance of five conventional banks in Pakistan in the period of 2003 to 2007. The results show high degree of inefficiency and solvency of the Islamic bank as well as low profitability and low risk level compared to conventional banks. These show that type of bank will also give impact upon the bank's profitability level.

Haron and Wan (2004) investigates the strength of influence between both internal and external variables and profitability of Islamic banks in selected countries using time-series techniques of cointegration and error-correction mechanism. The findings show a significant long-run relationship between profitability measures of Islamic banks and determining variables such as liquidity ratios, deposit items, assets structure, inflation and money supply. Ghazali (2008) studies 60 Islamic banks in 18 countries across the world during the period 2002 to 2007. The results from this study indicate that the main determinants of Islamic banks' profit are capital strength and efficiency factors, although the latter is negatively correlated to profitability. This study also found a positively significant relationship between

profitability measures of Islamic banks and macroeconomic variables such as GDP growth and inflation.

3. DATA AND METHODOLOGY

3.1 Data
The data for this study are collected from the BANKSCOPE Database of Bereau Van Dijk's Company and International Financial Statistic (IFS) of International Monetary Funds (IMF). It comprises of panel dataset of 30 banks from Malaysia. The study period includes five years from 2005 to 2009. There are seventeen observations for conventional banks and thirteen observations for Islamic banks. Altogether, there are 150 observations.

To estimate determinants of profitability, the study uses internal or bank's specific characteristic as well as external or macroeconomic parameters as the country's specific indicators. The profitability variable presented in this study is return on average assets (ROA). This ratio measures the bank's ability to generate profits from the bank's assets. It is computed by dividing the net profits with average total assets. In existing literature, many authors have associated ROA with return on equity (ROE), where both ratios are reflecting bank's profitability. Both measures are related to income statement, and reflect how banks are able to generate income from non-traditional services. For most of the banks, return on assets depends on bank's policy and on specific economic and government decisions. In addition, a bank's ROE is affected by its ROA, thus it is believed that ROA is better indicator of bank's profitability compared to ROE.

Table 1: Description of variables

Variables	Notation	Description	Expected Relationship
Dependent			
Profitability	ROA (y)	The return on average assets of the banks	
Independent			
Internal factors			
Liquidity ratios	LQR (x1)	Net Loans/Total Assets	+
Capital adequacy	EQA (x2)	Equity/Total Assets	+
Dummy	Dummy	Equal 1 if bank is Islamic or 0 otherwise	
External factors			
Real Gross Domestic Product Growth	GDP (x3)	GDP is a general index of economic development	+

Internal variables will include two ratios. First is liquidity ratio which will be characterized with the ratio of net loans to deposits and short term funding to total assets. Thus higher liquidity ratio means less liquidity possessed by the banks and hence increases the expected return and profit. Second is capital adequacy ratio which will be measured by taking the ratio of equity over total assets. Banks which have high capital ratio will be more profitable, thus much safer in the case of liquidation and will require less external funding as well. It is estimated that capital adequacy positively influence profitability. Furthermore, in order to isolate the effect of bank's characteristic on profitability, growth of real GDP is included in the model as an external determinant. Table 1 depicts the variables used in the analysis and provides also the expected relationship between all independent variables and the dependent variable.

3.2 Methodology

Panel data analysis is a method of studying a particular subject within multiple sites, periodically observed over a defined time frame (Yaffee, 2003). With repeated observations of enough cross-sections, panel analysis permits the researcher to study the dynamics of change with short time series. The combination of time series with cross-sections can enhance the quality and quantity of data in ways that would be impossible using only one of these two dimensions (Gujarati, 2003). There are several types of panel data analytic models i.e. constant coefficients models, fixed effects models, and random effects models. In the event that there is neither significant country nor significant temporal effects, all of the data can be pooled run an ordinary least squares regression model. This model is sometimes called the pooled regression model. To test the relationship between bank's profitability and the bank-specific and macroeconomic determinants described earlier, following is the estimated linear regression model:

$$y_{jt} = \delta_t + \alpha_{jt}X_{ijt} + \beta_{it}X_{ejt} + \gamma_{kt}D + \varepsilon_{jt}$$

(1)

where j refers to an individual bank; t refers to year, y_{jt} refers to the return on asset and is the observation of bank j in a particular year t; X_i represents the internal factors or determinants of a bank; X_e represents the external factors or macroeconomic determinants; D represents dummy variable whereby 1 is Islamic and 0 is conventional; and ε_{jt} is a normally distributed random variable disturbance term.

The two main approaches to the fitting of models using panel data are known as fixed effects regressions and random effects regression. Basically, random effects model is more attractive because observed characteristics that remain constant for each individual are retained in the regression model. In fixed effects estimation, they have to be dropped. Also, with random effects estimation we do not lose n degrees of freedom, as is the case with fixed effects. However, if either of the preconditions for using random effects is violated, we should use fixed effects instead (Dougherty, 2007). One precondition is that the observations can be described as being drawn randomly from a given population. The other precondition is that the unobserved effect be distributed independently of the Xj variables.

By extending equation (1) to reflect the variables, as described in Table 1, the baseline model is formulated as follows:

$$ROA_{jt} = \delta_0 + \alpha_1 Liq_{jt} + \alpha_2 Cap_{jt} + \beta_1 LGDP_{jt} + \beta_2 DUMISLMC + \varepsilon_{jt}$$

(2)

4. EMPIRICAL FINDINGS

4.1 Pooled OLS

Table 2 below is depicting the summary of the pooled OLS result. In this model, individual bank effects are ignored. The result shows that only liquidity and GDP are significantly affecting the bank's profitability. However, while liquidity ratio shows that it has a positive relationship with profitability, the GDP shows a negative relationship. This result goes along the lines of Wallich (1980) and Petersen (1986).

The next step is to run the Breusch-Pagan Lagrangian Multiplier (LM) test in order to confirm whether it is enough with pooled OLS or needs to go for random and fixed effects panel data analysis. The LM test formula is as given below:

$$LM = \frac{NT}{2(T-1)} \left[\frac{\sum_{i=1}^{N}(\sum_{t=1}^{T}\hat{\varepsilon}_{it})^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{\varepsilon}^2_{it}} - 1 \right]^2$$

(3)

where *N* is the number of Islamic banks included in the analysis and T is the time period used in this study. The epsilon ε is the residuals produced by the pooled OLS regression. In this test, LM is following the chi-square distribution with one degree of freedom under the null hypothesis.

Table 2: Summary of pooled OLS regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.308620	0.535971	0.575815	0.5656
DUMISLMC	-0.159892	0.224921	-0.710882	0.4783
LIQ	0.019350	0.006924	2.794453	0.0059***
CAP	0.002081	0.010107	0.205924	0.8371
LGDP	-8.04E-13	4.35E-13	-1.849075	0.0665*
R-squared	0.105022	Adjusted R-squared		0.080161
F-statistic	4.224449	Durbin-Watson stat		1.250314
Prob(F-statistic)	0.002904			

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

The calculated LM statistics for the pooled OLS model is 19.952, which is greater than the tabulated chi-squared value with one degree of freedom and 5 percent alpha which is 0.003, thus it is recommended in this study to further analyze the data using random effects model in panel data analysis.

4.2 Random effects model

In random effect model, it is assumed that all 30 banks have a common mean value for the intercept and the individual differences in the intercept values of each bank are reflected in the error term ε_i. Table 3 depicts the summary of the random effects model.

Table 3: Summary of random effects model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.304595	0.576250	0.528581	0.5979
DUMISLMC	0.063646	0.276942	0.229816	0.8186
LIQ	0.014615	0.007183	2.034768	0.0437**
CAP	0.002372	0.010185	0.232932	0.8161
LGDP	-4.60E-13	5.82E-13	-0.790293	0.4307
R-squared	0.037408	Adjusted R-squared		0.010670
F-statistic	1.399034	Durbin-Watson stat		1.747944
Prob(F-statistic)	0.237279			

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

It is shown in Table 3 that only liquidity is significantly affecting profitability while others are not. However, the probability of F-statistic is greater than 0.05 which shows that overall the model under the random effects assumption cannot fit the data very well. Thus, the next step is to conduct the Haussman test in order to find out whether random effects model is enough or it needs to go for fixed effects model. The chi-square statistic for the cross-section random and its degree of freedom in Haussman test are 10.17 and 4 respectively. Hence, the

probability value for Haussman test is 0.03 which is smaller than 0.05 and concludes that fixed effects will provide a better model compared to random effects.

4.3 Fixed effects model

The main assumption in the fixed effects model is that each unit (i.e. banks) has its own intercept, while restricting the slope to be homogenous. This is one way to take into account the "individuality" of each bank, where the intercepts are let to be varied for each bank but still assume that the slope coefficients are constant across banks. The intercepts of the 30 banks may differ and these differences may be due to special features of each the bank, such as managerial style. Table 4 depicts the regression model under the framework of fixed effects panel data analysis.

Table 4: Summary of fixed effects model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.751444	0.815919	-0.920978	0.3590
DUMISLMC	0.836513	0.426928	1.959378	0.0525*
LIQ	0.007421	0.008699	0.853099	0.3954
CAP	0.002232	0.011472	0.194567	0.8461
LGDP	2.25E-12	1.32E-12	1.710023	0.0900*
F-statistic	3.759417	R-squared		0.518951
Prob(F-statistic)	0.000000	Durbin-Watson stat		2.228564

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Under the fixed effects framework, economic growth has a significant and positive impact towards the banks' profitability in Malaysia which is supported by findings of Demirguç-Kunt and Huizinga (1999), Demirguç-Kunt and Huizinga (2000), Denizer (2000), and Ghazali (2008). Interestingly, dummy variable distinguishes between Islamic (dummy = 1) and conventional (dummy = 0) banks also significantly and positively the profitability of the banks. In other words, Islamic banks are more profitable during the period studied compared to conventional banks.

5. CONCLUSIONS

This paper aims at investigating the determinants of bank profitability by using bank internal factors as well as external factors as its independent variables. The internal factors used are liquidity and capital ratios while GDP growth is used for external factors. In addition, this study uses dummy variable to distinguish between Islamic and conventional banks. Using longitudinal data in the period of 2005 – 2009 for seventeen conventional banks and thirteen Islamic banks, this study utilizes panel data analysis to uncover the relationship between explanatory variables and the ROA as a proxy for bank's profitability.

After several steps, the analysis concludes that fixed effects model is the most appropriate model to be used in this study. The result from fixed effects model shows that in the period of 2005-2009, GDP and types of bank are among the significant factors that influence the profitability of Malaysian banks. It confirms that the better the economic performance of the country, the more the profit of the banks. Also, it is shown from the results that Islamic banks are more profitable during the period of analysis.

5.1 Limitations and suggestions

This paper is not without limitations. There are at least two limitations in this study. Firstly, it covers only five years period from year 2005 to year 2009 so that the conclusion derived might also restricted to only the period mentioned in the analysis. Secondly, it incorporates

direct variables such as net loan over total assets and equity over total assets without including derivative of the ratios.

Thus, in order to have better results in further researches in this field, following are suggestions can be made: First, to expand the period of analysis; Second, to include more explanatory variables in the model to prove the robustness of the model.

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