Profitability and Cost Efficiency of Islamic Banks: A Panel Analysis of Some Selected Countries

Sirajo Aliyu[1]*, Rosylin Mohd Yusof[2]

[1]Universiti Utara Malaysia, Malaysia, [2]Universiti Utara Malaysia, Malaysia. *Email: sirajoaliyu@yahoo.com

ABSTRACT

This study aims to investigate the significant elements that predict profitability behavior of Islamic banks within the composition of cost efficiency. It is not clear whether Islamic banks can simultaneously achieve higher profitability with cost efficiency. The result of the first model in this study found all predicting variables are significantly explaining profitability after robust standard errors of fixed effect model. Also, the interaction between cost efficiency and bank activities within each country's macroeconomic environment presents an attractive outcome of expense preference behavior. The paper advocated for prioritization of cost efficiency which has the tendencies of attaining both utilization of available resources and higher returns to satisfy all the stakeholders.

Keywords: Profitability, Efficient Behaviour, Islamic Banking
JEL Classifications: L25, D22, G2

1. INTRODUCTION

The World Islamic banks' asset accounted for $2 trillion at the end of 2014 and occupied a large proportion of the entire Islamic financial assets (Ernst & Young, 2014; Kammer et al., 2015; Hussain et al., 2015). Nonetheless, asset accumulations of the Islamic banks do not necessary interpret their efficiency on cost and profit performance. Thus, Beck et al. (2013) and Rosman et al. (2014) affirmed that Islamic banks' have higher liquidity and capital adequacy coupled with low-cost efficiency compared to conventional banks. These findings contradict the earlier claim that Islamic banks are more efficient than traditional banks (Samad, 1999; Al-Jarrah and Molyneux, 2005). Earlier literature explained that low-cost efficiency leads to bad management hypothesis which has tendencies to poor assets portfolio and non-performing loans of the bank (Berger and DeYoung, 1997). Similarly, it is not clear whether Islamic banks have the tendencies of improving profit and efficiency simultaneously. Though, Islamic banks' objectives differ from that of conventional in principles. The latter is established to maximize profit and minimize cost while the former has two different views that rationalize its formation. According to Chapra school of thought, Islamic banks have to sustain not only themselves but the generality of the society through capital allocation and financial decisions (Dusuki, 2008). In essence, this view claims the objective of Sharia through wellbeing enhancement is the prime goal of Islamic banks. The Ismaili school of thought (Ismail, 2002), considered the Islamic banks like any other business that is permissible within the framework of Sharia. Therefore, attaining high profit to maximize the values of all stakeholders is of paramount importance. In a nutshell, the two schools of thought do not differ in principles but rather in terms of the priorities.

However, Islamic banks are expected to attain higher profit that can sustain them in the system and to operate efficiently in protecting the right of all stakeholders. In this view, Shawtari et al. (2015) believe that efficiency is the sufficient condition to banks performance. Likewise, Berger and DeYoung (1997), claim that cost efficiency is one of the primary effect predictors of profitability performance than market power. Therefore, it is of keen interest to identify the significant factors that could predict the profitability of Islamic banks aligned with cost efficiency. Furthermore, it is ambiguous for Islamic banks whether cost efficiency interactions as a moderator would help in explaining profitability within the banks specific activities and macroeconomic environment. Similarly, the response of cost efficiency across a

period of each time is not known to Islamic banks which may hinder policymakers' decisions on a given priority.

The study begins with an explicit consideration of the banks value maximization through profit realization and efficiency. However, experimental test in the study explicates the expense-preference hypothesis can extend to banks' cost efficiency. Interestingly, a previous study (Purroy and Salas, 2000) supported our assertions. The paper is divided into five sections, and the review of literature preceded introductory part. Meanwhile, data and methodology section present the sample countries banks and methods of estimations. Section four concentrates on the empirical results of the four models presented in data and methodology section. The results are in four categories based on the designed models of the study. Finally, conclusion part summarizes the paper and provides possible directions for future research.

2. LITERATURE REVIEW

The efficiency of banks depends on their profitability functions (Berger et al., 1993). In essence, banks output determine its effectiveness through sufficient utilization of resources. In another study, Kraft et al. (2006) agitate that cost efficient banks are related with a low bound to failure. Most of the studies (Bashir, 2003; Naceur, 2003; Beck et al., 2013; Abduh and Idrees, 2013; Izhar and Asutay, 2007; Wasiuzzaman and Tarmizi, 2010; Samad, 2004; Tan and Floros, 2012; Al-Omar and Al-Mutairi, 2008) measure efficiency of banks based on the entire cost (i.e., overhead cost, provisions and/or cost to income ratio) and profitability on return to asset. The peculiarity of our sample to Islamic banks necessitate the paper to focus on the efficiency that is based on non-interest expenses as a percentage of the average asset. Though, DeYoung and Torna (2013) use a variable on nontraditional banking activities as an indicator for assessing cost efficiency. In essence, the paper assumed Islamic banks transactions are asset backed with non-interest bearing transactions. Similarly, it has been noted that profit enhancement is linked to improving non-interest income and size of the banks coupled with an excessive reduction in credit (Alper and Anbar, 2011). Also, similar affirmation has been concluded on banks' profit augmentation and reduction of risk through trading and other non-interest bearing diversifications (Stiroh, 2004; Demirguc-Kunt and Huizinga, 2010). All these assertions had been previously explicated in Quran 2:275 that: ".That is because they say: Trading is only like Riba (interest), whereas Allah has permitted trading and forbidden Riba (interest)." Specifically, to Islamic banks, interest bearing transactions are not permissible. Therefore, non-interest expenses have a greater influence on the Islamic banking transactions. In a contrasting view, Lepetit et al. (2008), assert that diversifications to non-interest businesses engulfed European banks to high-risk and insolvency positions. Indeed, this is a peculiar situation in Europe to have such experience. Similarly, as a result of business restrictions to the non-interest bearing transaction, Islamic banks are found less affected by the recent financial crisis (Beck et al., 2013).

Nonetheless, previous studies have found Islamic banks' returns on deposit mimic the conventional interest rates (Cevik and Charap, 2011; Anuar et al., 2014). Notwithstanding, large volumes of those banks transactions are backed with non-interest products. With this, net interest revenue of Islamic banks is the difference between the amounts paid on deposits and the return gain on financing. With regards to capitalization, Islamic banks have high capitalization with inefficient cost management (Bashir, 2003; Beck et al., 2013). Thus, this present study seeks to examine the interaction of cost efficiency of Islamic banks, specifically to non-interest expenses. Meanwhile, interactions between non-interest expenses to average asset has been considered instead of non-interest earnings and dummy variable of Islamic banks by existing literature (Bashir, 2003; Izhar and Asutay, 2007; Beck et al., 2013; Pappas et al., 2016). Consequently, previous studies of expense-preference behavior theorized using non-interest expenses (Edwards, 1977; Hannan, 1979; Hannan and Mavinga, 1980; Verbrugge and Jahera, 1981). The theory was developed for non-profit maximization objectives in relations to banking industries. In sum, it has been noted that banks with expenses preference behavior have tendencies to perform better than merely focusing on profit maximization (Purroy and Salas, 2000). Nonetheless, Smirlock and Marshall (1983) find profit maximization prevails than expenses preference hypothesis. In essence, the concept is about extending expenses for enhancing utility. According to Albertazi and Gambacorta, (2009) such situation of positive cost-efficient has the possibility of high services quality that could be required in the developed financial market through the need of professionals staffs. However, depending on the bank's objective, hiring professional and increase in monitoring cost is certainly beavering towards expense preference and later influences performance efficiency. For Islamic financial sector, it has been reported that there is an inadequate staff quality compared to that of conventional banks due to limited professional staff that acquires both Islamic and traditional skills (Khan, 2013; Archer and Haron, 2013; Nienhaus, 2013; White and King, 2013; Archer and Abdel Karim, 2013). Similarly, Drake and Hall (2003) acknowledge that banks with quality staff have higher output expectations and in turn, will improve both efficiency and profitability.

Another strand of literature such as Cihak et al. (2012) reaffirms that banks' efficiency depends on their countries' macroeconomic viability. Therefore, macroeconomic variables in terms of gross domestic product (GDP) per capita, exchange rate, and inflation are used to serve as control variables for the first two models in the study. In this way, the model is consistent with the previous Islamic banking profitability and efficiency studies (Guru et al., 2002; Bashir, 2003; Naceur, 2003; Izhar and Asutay, 2007; Wasiuzzaman and Tarmizi, 2010; Alper and Anbar, 2011; Abduh and Idrees, 2013). In contrast, those studies neglected the influence of exchange rate despite most of the Islamic banks transact with foreign currencies across borders and some countries have foreign Islamic banks (Ariff, 1988; Bashir, 2003; Samad, 2004). Though, other Islamic banking studies consider exchange rate as a country specific controlling variable (Pappas et al., 2016). Furthermore, bank-specific financial variables such as fixed asset, size, and non-loan earning assets are found to function as a control in a comparative study of Islamic and traditional banking (Beck et al., 2013). Nonetheless, investment securities are considered part of the banks owned assets (Miller and Noulas, 1997). Previous banking studies

considered securities as an ingredient to profit determination (Flannery, 1981; Bourke, 1989; Molyneux and Thornton, 1992; Miller and Noulas, 1997; Albertazi and Gambacorta, 2009; DeYoung and Torna, 2013). Prior studies conducted on banks concentrate on classified securities (those for trading, maturity, cash collateral, and equity investments) and overlook those associated with non-interest bearing securities (unclassified). Against this backdrop, this study focused on non-interest bearing banks and selected bank specific control variable. In essence, we postulate that banks with significant and positive effects of the banks specific control variables are possible to have higher non-interest income.

3. DATA AND METHODOLOGY

3.1. Data
Bankscope database is used to gather data on bank financial information as well as world development indicators are extracted for the macroeconomic variables. The reliability of Bankscope data has been testified in the previous banking and finance studies (Bhattacharya, 2003; Gennaioli et al., 2014). The data consists of the banks' specific variables which are in four categories as a percentage of the asset as contained in Table 1. First, the performance profitability ratio (return on average asset) which reveals the percentage of profit generate as asset employed. Secondly, operational/cost efficiency (non-interest expenses as a percentage of the average asset) which have a direct link to Islamic banking transactions since they operate on non-interest products.

Third, capitalization (equity to the total asset) measures the level of protections as a result of the equity. Fourth, liquidity ratio (net interest revenue/income to the average asset) which is the difference between the amounts paid on deposits that amount earned on the asset.

Apart from financial ratios, other securities serve as investment control variables among the financial variables. It is the unclassified securities that are not inclusive in trading, repos and cash collateral, equity investment, sales and maturity securities. Similarly, in order to have control to the business cycle in the model, macroeconomic variables such as inflation, GDP per capita and official exchange are also included. The data covers 19 years between 1995 and 2013 of seven countries of three regions. Our present study selects seven banks to achieve the balanced data requirement and to have enough time split for experimentation. Those seven banks are selected across countries which include

Iran, Jordan, Kuwait, Saudi Arabia, United Arab Emirate, Sudan, and Tunisia.

3.2. Model Specification
Islamic banking transactions operate on the non-interest exchange through trading, fees income, and participatory partnerships. This study focuses on the efficiency on profit with particular interest to non-interest expenses (Sufian and Chong, 2008; Sufian and Noor, 2012). It acknowledged that non-interest transactions reduce risk and accelerate profit (Stiroh, 2004; Demirguc-Kunt and Huizinga, 2010). A parametric model of ordinary least square (OLS) method coupled with maximum likelihood estimator is then applied in his study. Thus, the methods are similar to that of Iršová and Havránek, (2010) in assessing profit and cost efficiency. Therefore, the paper sets out the models around factors influencing the profit performance of Islamic banks. The first model exhibits the bank-specific and macroeconomic variables that predict Islamic banks profit across countries.

$$\Pi_{it} = c + \sum_{f=1}^{F} \beta_f X_{it}^f + \beta_s \log X_{it}^s + \sum_{m=1}^{M} \beta_m \log X_{it}^m + \varepsilon_{it},$$

$$\varepsilon_{it} = \upsilon_{it} + u_{it}, \tag{1}$$

Where, Π_{it} is the profitability ratio (return on average asset) of bank i at the time t, with $i = 1,\ldots,T$, c is constant, the explanatory variables are X_{it}'s, X_{it}'s are grouped to bank-specific financial variables X_{it}^f, other securities for bank-specific variable X_{it}^s, macroeconomic variables X_{it}^m, and disturbance ε_{it} which can be decomposed into υ_i as the effect of the unobserved bank specific, and u_{it} as idiosyncratic error. According to Baltagi (2013), the decomposed one-way error term is independent of each other as follows: $\upsilon_{it} \sim \text{IID}(0, \sigma_\upsilon^2)$ and $u_{it} \sim \text{IID}(0, \sigma_u^2)$.

Beck et al. (2013) found Islamic banks are efficient with regards to intermediation and have the likelihood to absorb shocks during the crisis but less cost efficient compared to conventional banks. Cost efficiency has a direct influence on the profitability performance and growth of banking industries. In this view, Jensen (1986) proposes the cost control hypothesis that supports debt financing instead of equity. However, Stiglitz (1988) laments that the control hypothesis will only reduce the tendency of bankruptcy but will not increase performance in return. Specifically to Islamic banking businesses, debt with interest is not permissible. As an alternatively, we introduce interaction with efficiency (denoted as [ξ]) on the bank-specific financial variables. Specifically to Islamic (Bashir, 2003) and

Table 1: Definition of variables and data sources

Variables	Definition	Source
Return on average asset	Profitability ratio	Bankscope
Equity/asset	Bank protection due to equity/capitalization	Bankscope
Non-interest expense/average asset	Operating expenses to average asset for efficiency	Bankscope
Other operating Inc/average asset	Operating: Fees, trading and other incomes on asset	Bankscope
Net interest revenue/average asset	Revenue gains between paid and earned amounts	Bankscope
Inflation	Inflation as implicit of GDP deflator (annual growth)	WDI
GDP per capita	GDP per capita as constant of 2005 (US$)	WDI
Exchange rate	Annual average of local currency related to (US$)	WDI
Other securities	Any other unclassified securities	Bankscope

WDI: World development indicators, GDP: Gross domestic product

conventional (Demirgüç-Kunt and Huizinga, 1999) banks, interaction models have been developed with non-interest earning asset and GDP per capita. Similarly, multiplicative interaction has been applied in a comparative study between Islamic and conventional banks (Asbeig and Kassim, 2015). In general, previous studies have utilized multiplicative interaction model to assess the moderation effects of response and explanatory variables (Friedrich, 1982; Agung, 2014). Accordingly, we also adapt multiplicative interaction which squares the efficiency variable (ξ) with itself predicting whether it will significantly improve profit performance. Extending on Equation 1 with multiplicative interaction of the interactional model is therefore specified as:

$$\Pi_{it} = c + \sum_{f=1}^{F} \beta_f X_{it}^f * \xi + \beta_s \log X_{it}^s + \sum_{m=1}^{M} \beta_m \log X_{it}^m + \varepsilon_{it}, \quad (2)$$

4. EMPIRICAL FINDINGS

4.1. Results

This study uses a balanced panel of seven banks in seven countries between 1995 and 2013. The summary of the descriptive statistic is presented in Table 2 with 133 observations. Table 2 initiates the foundation of our estimation which is derived from the first model. Table 3 presents the results of the Model 1 which specifies the panel form of relationships in within and between variations.

Table 2: Descriptive statistics

Variables	Obs	Mean±Standard deviation	Min	Max
Return on average asset	133	1.14203±1.852783	−10.8	13.2
Equity/asset	133	11.49135±7.652519	−3.23	35.44
Non-interest expense/average asset	133	2.77188±1.826481	0.59	14.33
Other operational Inc/average asset	133	1.723233±2.028908	−0.16	14.21
Net interest revenue/average asset	133	2.650977±2.228398	−1.26	22.98
Log of inflation	118	2.057102±1.017133	−1.514128	4.649761
Log of GDP per capita	133	8.659374±1.392748	6.177487	10.75485
Log of exchange rate	133	1.522305±3.028902	−1.309333	9.820891
Log of other securities	133	12.00273±2.492748	3.663562	15.37774

GDP: Gross domestic product

Table 3: Results of the profitability model

Return on average asset	OLS	FE	RE	Robust Standard error for FE
Equity/asset	0.0385***	0.0499***	0.0385***	0.0499***
	(0.00587)	(0.0101)	(0.00587)	(0.00823)
Non-interest expense/average asset	−0.829***	−0.727***	−0.829***	−0.727***
	(0.0623)	(0.0654)	(0.0623)	(0.121)
Other operational Inc/average asset	0.832***	0.830***	0.832***	0.830***
	(0.0288)	(0.0285)	(0.0288)	(0.0984)
Net interest revenue/average asset	0.476***	0.447***	0.476***	0.447***
	(0.0273)	(0.0270)	(0.0273)	(0.0618)
Log of inflation	−0.0897*	−0.0831	−0.0897*	−0.0831*
	(0.0488)	(0.0519)	(0.0488)	(0.0377)
Log of GDP per capita	0.0794*	0.833**	0.0794*	0.833*
	(0.0433)	(0.319)	(0.0433)	(0.426)
Log of exchange rate	0.0315	−0.380***	0.0315	−0.380**
	(0.0194)	(0.136)	(0.0194)	(0.140)
Log of other securities	0.165***	0.178***	0.165***	0.178***
	(0.0285)	(0.0300)	(0.0285)	(0.0178)
Constant	−2.203***	−8.427***	−2.203***	−8.427*
	(0.381)	(2.586)	(0.381)	(3.575)
R^2	0.917			
Adjusted R^2	0.911			
R^2 within		0.917	0.908	0.917
R^2 between		0.704	0.972	0.704
R^2 overall		0.539	0.917	0.539
Sigma_u		1.884	0	1.884
Sigma_e		0.424	0.424	0.424
rho		0.952	0	0.952
F test u_i=0		3.11***		
Wald χ^2			1204.49***	
Mean VIF	2.49			
Observations	118	118	118	118
Number of countries	7	7	7	7

***,**,*Donate significance of the level at 1%, 5%, and 10% respectively. GDP: Gross domestic product, RE: Random effect, FE: Fixed effect, VIF: Variance inflation factor

Given different estimations and initiates with OLS and random effect (RE), all the variables explaining profitability performance are significant except official exchange rate. Similarly, the fixed effect (FE) suggest significant relationships between the predictors and the response variable with an exclusion of inflation. Also, specification tests are conducted and started with multicollinearity test and found that the mean for variance inflation factor to be at 2.49, indicating an absence of multicollinearity. In order to select between FE and RE, we then employ Hausman test (Hausman, 1978). The test revealed that the $\chi^2(8) = 15.80$, $P < 0.05$ explains sufficient evidence for rejecting the null hypothesis that RE offers consistent estimates. Therefore, FE prevails as an efficient estimator for the model.

At the same time, modified Wald statistic for group-wise heteroskedasticity and Wooldridge (2002) test for autocorrelation are employed in the FE model. The test detects evidence for heteroskedasticity and fails to reject the null hypothesis. Thus, FE with cluster robust for standard error has been estimated for the reliability of result (Huber, 1967; White, 1980; Arellano, 1993) and the result is depicted in the last column of Table 3. The R^2

of 0.917 appears for the OLS, the within the variation of the FE (including robust of standard error), and the overall variation of RE model. Baltagi (2013) reports the similar size of the R^2 result on the FE and RE of 93% and 94% based on the Swamy and Arora (1972) estimation. Based on the FE robust standard error, the results also reveal that all the variables in the model are significant, and thus, can explain profitability performance of the seven Islamic banks in their respective countries. The results are in three categories on the scale of confidence intervals and two based on the relationships signs.

We find that the variables such as ratios of capitalization, cost efficiency, operation income and gains revenue between deposits and financing coupled with other unclassified securities. Significantly explain profitability at 99% confidence interval. The second Model with the inclusion of macroeconomic indicators such as exchange rate, inflation, and GDP explain with 95% confidence interval (exchange rate) 90% confidence (for inflation and GDP).

In Table 4, the result explains profitability predictors in a positive direction such as; capitalization (5%), operating income (83%),

Table 4: Results of the efficiency interactional model

Return on average asset	OLS	FE	RE	Robust standard error for FE
Equity/asset	0.0161	0.00174	0.0161	0.00174
	(0.0121)	(0.0141)	(0.0121)	(0.0105)
Non-interest expense/average asset	−0.947***	−1.043***	−0.947***	−1.043***
	(0.160)	(0.164)	(0.160)	(0.182)
Other operational Inc/average asset	1.237***	1.268***	1.237***	1.268***
	(0.0513)	(0.0515)	(0.0513)	(0.0804)
Net interest revenue/average asset	0.882***	0.879***	0.882***	0.879***
	(0.0555)	(0.0559)	(0.0555)	(0.119)
Log of inflation	−0.107***	−0.0797**	−0.107***	−0.0797**
	(0.0338)	(0.0343)	(0.0338)	(0.0263)
Log of GDP per capita	0.146***	0.0699	0.146***	0.0699
	(0.0296)	(0.220)	(0.0296)	(0.408)
Log of exchange rate	0.0253*	−0.227**	0.0253*	−0.227
	(0.0137)	(0.0888)	(0.0137)	(0.120)
Log of other securities	0.0688***	0.0910***	0.0688***	0.0910**
	(0.0213)	(0.0208)	(0.0213)	(0.0320)
ξ*(equity/asset)	0.00551	0.00981*	0.00551	0.00981*
	(0.00516)	(0.00508)	(0.00516)	(0.00497)
ξ*(Non-interest expense/average asset)	0.0700***	0.0913***	0.0700***	0.0913***
	(0.0237)	(0.0247)	(0.0237)	(0.0246)
ξ*(Other operational Inc/average asset)	−0.102***	−0.109***	−0.102***	−0.109***
	(0.0126)	(0.0127)	(0.0126)	(0.0114)
ξ*(Net interest revenue/average asset)	−0.0672***	−0.0725***	−0.0672***	−0.0725***
	(0.00920)	(0.00940)	(0.00920)	(0.0112)
Constant	−2.340***	−1.448	−2.340***	−1.448
	(0.381)	(1.868)	(0.381)	(3.373)
R^2	0.965			
Adjusted R^2	0.961			
R^2 within		0.967	0.961	0.967
R^2 between		0.758	0.988	0.758
R^2 overall		0.818	0.965	0.818
Sigma_u		0.769	0	0.769
Sigma_e		0.272	0.272	0.272
rho		0.889	0	0.889
F test u_i=0		4.21***		
Wald χ^2			2895.22***	
Observations	118	118	118	118
Number of countries	7	7	7	7

***,**,*,Donate significance of the level at 1%, 5%, and 10% respectively. Standard errors in parentheses. ξ: Non-interest expenses/average asset, OLS: Ordinary least square, GDP: Gross domestic product, RE: Random effect, FE: Fixed effect

gains revenue (45%), GDP per capita (83%), and unclassified securities (18%). Similarly, those with inverse relationships are cost efficiency (73%), inflation (8%), and exchange rate (38%). The finding of this study on capitalization corresponds to the previous positive relation on efficiency and profitability studies (Athanasoglou et al., 2008; Beck et al., 2013; Rosman et al., 2014). Moreover, it has reflected the sound capital adequacy of the Islamic banks during such periods. The expectations for banks with adequate capital are liable to have more liquidity and higher return in the event of efficient utilization of business opportunities.

Similarly, positive outcome on operation income coupled with revenue gain supported other previous studies (Sufian and Chong, 2008). Furthermore, a positive sign of per capita GDP and other securities explains the possible real sector engagements of Islamic banks. As such, individual income and other securities income increase proportionately with the level profitability on the same direction. Consistently, the inverse relation between profitability, inflation and cost efficiency indicators was found in another study (Rachdi, 2013). According to Dietrich and Wanzenried (2011), inverse relation of the cost efficiency outcome predicts reasonable expectation and predicts Islamic banks with higher efficiency are expected to gain higher profitability and *viz*.

For inflation, the negative relationship between inflation and profitability exhibits similar outcome to profitability determinants in Philippines (Sufian and Chong, 2008). The cost increases at the inflationary period instigate clients to reduce their deposit size and demand more money for consumption rather than investment (Amin et al., 2014). Therefore, inverse relation of inflation explains that Islamic banks' profitability will reduce due to decreases in banking activities by the investment account holders. Similarly, inverse relationships of exchange rate associated with one unit decrease lead to 38% increase in profit.

The present paper extends the interactional model among variables with cost efficiency. The model documents consistent result as the first model and supports for FE after Hausman test (Hausman, 1978). The test shows that the $\chi^2(12) = 30.79$, $P < 0.05$ explains the strong evidence for rejecting the null hypothesis that RE offers consistent estimates. After that, modified group wise Wald test for heteroskedasticity result shows that $\chi^2(7) = 116$, $P < 0.05$; which implies the evidence of heteroskedasticity in the model. Meanwhile, Wooldridge (2002) test for autocorrelation indicates no first-order autocorrelation in the model (i.e., $F(1, 6) = 1.471$, $P > 0.05$). Therefore, a robust standard error is estimated on the FE to rectify the heteroskedasticity problem. The R^2 for the within and overall variation on the robust FE accounts for 97% and 82%. Interestingly, cost efficiency has an inverse relation, i.e., a unit decrease in the cost will efficiently improve profitability performance to 104% at 99% confidence interval. Likewise, a unit decrease in inflation will lead to 8% increase in profit performance.

In contrary to the first model, capitalization, GDP per capita, and exchange rate became insignificant after interaction while operation income, revenue gain, and unclassified securities are all positively related to profitability performance. Consistently, all the interacted variables are significant with an inverse relationship

to operating income and revenue gain. At the same time, capitalization and square of cost efficiency are positively related to profitability performance. The cost efficiency has changed in terms of the direction of the relationship after interaction from negative to positive, reflecting cost efficient preference behavior which in turn influences bank performance (Edwards, 1977; Hannan, 1979; Hannan and Mavinga, 1980; Verbrugge and Jahera, 1981; Sufian and Noor, 2012). This finding is similar to that of Purroy and Salas (2000) which asserted that such preference behavior would perform better than just merely focusing on profit maximization. The situation has many explanations to the policy makers in strategizing towards extending cost to have skill staff who are technologically inclined, the ability of Islamic banks to monitor and control them. For instance, Islamic banks are generally asset based focusing on participatory business which is built on trust, justice and transparency between the financier and the entrepreneur (Beekun and Badawi, 2005). Therefore, efficient monitoring and control are essential in discharging real profit and loss contracts without the undue advantage of any other party (Khan and Mirakhor, 1990; Iqbal and Mirakhor, 1999). Likewise, professionals are required that can feasibly manage transactions within global changes without compromising the objectives of Sharia. Nowadays, a lot of financial products and soft wares are becoming superficial opportunities to financial sectors, but their applications require professional staffs that can skillfully operate and manage them with ease. This, therefore, leads to efficient services in the banking environment which in turn translates to higher returns. As such, the non-performing loan will reduce, the predicting survival and solvency for the banks will increase coupled with the easy assessment of the financial impacts. The bank will be able to deliver to the society and influence GDP performance of the respective country through the efficient allocation of resources.

5. CONCLUSION

It is empirically clear that capitalization ratio, cost efficiency, operating income, revenue gain, other securities, and macroeconomic variables explain the behavior of profitability performance in our sample. Similarly, the findings of this study highlight the moderating role of cost efficiency with the capital, operating income, revenue gain, and other securities. The self-interaction of cost efficiency reveals an indication of cost efficient preference. Therefore, we test for it viability using time interval between before and after interaction and found the cost efficient hypothesis is supported.

The outcomes of this study have other implications to Islamic banking regulators and operators in ensuring efficient services being practiced within the industry. Monopolistic unethical behavior has to be controlled by the regulators in such a way that investment account holders are fairly and justly compensated in the event where the gain is realized and vice versa. The operators are recommended to be efficient in discharging their responsibilities and ensure possible financial decisions and capital allocations are for the benefit of all stakeholders. Similarly, cost efficient preference strategy can be applied with caution as where the need is required. Therefore, it will be fit where the financial market

is developed, and competition is high. As such, targets through frequent assessment have to be in place to achieve the outcomes of the cost efficient strategy. It is suggested that future studies should consider incorporating asset quality, regulations, monitoring and control indicators, market concentrations and staff expertise to the model for a more robust model on profitability determinants within the constraints of cost efficiency.

REFERENCES

Abduh, M., Idrees, Y. (2013), Determinants of Islamic banking profitability in Malaysia. Australian Journal of Basic and Applied Sciences, 7(2), 204-210.

Agung, I.G.N. (2014), Panel Data Analysis Using EViews. New York: John Wiley & Sons.

Albertazzi, U., Gambacorta, L. (2009), Bank profitability and the business cycle. Journal of Financial Stability, 5(4), 393-409.

Al-Jarrah, I., Molyneux, P. (2005), Efficiency in Arabian banking. In: Iqbal, M., Wilson, R., editors. Islamic Perspectives on Wealth Creation. Edinburgh: Edinburgh University Press.

AL-Omar, H., Al-Mutairi, A. (2008), Bank-specific determinants of profitability: The case of Kuwait. Journal of Economic and Administrative Sciences, 24(2), 20-34.

Amin, M.A.M., Sanusi, N.A., Kusairi, S., Abdallah, Z.M. (2014), Inverse relationship of financial risk and performance in commercial banks in Tanzania. Investment Management and Financial Innovationas, 11(4), 279-291.

Anbar, A., Alper, D. (2011), Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. Business and Economics Research Journal, 2(2), 139-152.

Anuar, K., Mohamad, S., Shah, M.E. (2014), Are deposit and investment accounts in Islamic Banks in Malaysia interest free? JKAU: Islamic Economics, 27(2), 27-55.

Archer, S., Abdel Karim, A.A. (2013), Conclusion remarks. In: Karim, R.A.A., Archer, S., editors. Islamic Finance: The New Regulatory Challenge. Singapore: John Wiley & Sons. p495-502.

Archer, S., Haron, A. (2013), Operational risk exposures of Islamic banks. In: Karim, R.A.A., Archer, S., editors. Islamic Finance: The New Regulatory Challenge. Singapore: John Wiley & Sons. p133-152.

Arellano, M. (1993), On the testing of correlated effects with panel data. Journal of Econometrics, 59(1-2), 87-97.

Ariff, M. (1988), Islamic banking. Asian-Pacific Economic Literature, 2(2), 48-64.

Asbeig, H.I., Kassim, S.H. (2015), Monetary transmission during low interest rate environment in a dual banking system: Evidence from Malaysia. Macroeconomics and Finance in Emerging Market Economies, 8(3), 275-285.

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.

Baltagi, B. (2013), Econometric Analysis of Panel Data. Chichester, England: John Wiley & Sons.

Bashir, A.H.M. (2003), Determinants of profitability in Islamic banks: Some evidence from the Middle East. Islamic Economic Studies, 11(1), 31-57.

Beck, T., Demirgüç-Kunt, A., Merrouche, O. (2013), Islamic vs. conventional banking: Business model, efficiency and stability. Journal of Banking and Finance, 37(2), 433-447.

Beekun, R.I., Badawi, J.A. (2005), Balancing ethical responsibility among multiple organizational stakeholders: The Islamic perspective.

Journal of Business Ethics, 60(2), 131-145.

Berger, A.N., DeYoung, R. (1997), Problem loans and cost efficiency in commercial banks. Journal of Banking and Finance, 21(6), 849-870.

Berger, A.N., Hancock, D., Humphrey, D.B. (1993), Bank efficiency derived from the profit function. Journal of Banking and Finance, 17(2), 317-347.

Bhattacharya, K. (2003), How Good is the Bank Scope database? A Cross-validation Exercise with Correction Factors for Market Concentration Measures (No. 133). Basle: Bank for International Settlements.

Bourke, P. (1989), Concentration and other determinants of bank profitability in Europe, North America and Australia. Journal of Banking and Finance, 13(1), 65-79.

Cevik, S., Charap, J. (2011), The behavior of conventional and Islamic bank deposit returns in Malaysia and Turkey. IMF Working Papers, 1-23.

Cihak, M., Demirgüç-Kunt, A., Feyen, E., Levine, R. (2012), Benchmarking financial systems around the world. World Bank Policy Research Working Paper, 6175.

Claessens, S., Demirgüç-Kunt, A., Huizinga, H. (2001), How does foreign entry affect domestic banking markets? Journal of Banking and Finance, 25(5), 891-911.

Demirgüç-Kunt, A., Huizinga, H. (1999), Determinants of commercial bank interest margins and profitability: Some international evidence. The World Bank Economic Review, 13(2), 379-408.

Demirgüç-Kunt, A., Huizinga, H. (2010), Bank activity and funding strategies: The impact on risk and returns. Journal of Financial Economics, 98(3), 626-650.

DeYoung, R., Torna, G. (2013), Nontraditional banking activities and bank failures during the financial crisis. Journal of Financial Intermediation, 22(3), 397-421.

Dietrich, A., Wanzenried, G. (2011), Determinants of bank profitability before and during the crisis: Evidence from Switzerland. Journal of International Financial Markets, Institutions and Money, 21(3), 307-327.

Drake, L., Hall, M.J. (2003), Efficiency in Japanese banking: An empirical analysis. Journal of Banking and Finance, 27(5), 891-917.

Dusuki, W.A. (2008), Understanding the objectives of Islamic banking: A survey of stakeholders' perspectives. International Journal of Islamic and Middle Eastern Finance and Management, 1(2), 132-148.

Edwards, F.R. (1977), Managerial objectives in regulated industries: Expense-preference behavior in banking. The Journal of Political Economy, 85(1), 147-162.

Ernst & Young, (2014), World Islamic Banking Competitiveness Report 2014-15: Participation Banking 2.0. Dubai, UAE: Ernst & Young.

Flannery, M.J. (1981), Market interest rates and commercial bank profitability: An empirical investigation. The Journal of Finance, 36(5), 1085-1101.

Friedrich, R.J. (1982), In defense of multiplicative terms in multiple regression equations. American Journal of Political Science, 26, 797-833.

Gennaioli, N., Martin, A., Rossi, S. (2014), Banks, government bonds, and default: What do the data say? European Corporate Governance Institute (ECGI)-Finance Working Paper, 425.

Guru, B.K., Staunton, J., Shanmugam, B. (2002), Determinants of commercial bank profitability in Malaysia. Journal of Money, Credit, and Banking, 17, 69-82.

Hannan, T.H. (1979), Expense-preference behavior in banking: A reexamination. Journal of Political Economy, 87(4), 891-895.

Hannan, T.H., Mavinga, F. (1980), Expense preference and managerial control: The case of the banking firm. The Bell Journal of Economics, 11, 671-682.

Hausman, J.A. (1978), Specification tests in econometrics. Econometrica: Journal of the Econometric Society, 46, 251-1271.

Huber, P.J. (1967), The behavior of maximum likelihood estimates under nonstandard conditions. In: Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability. Vol. 1. p221-233.

Hussain, M., Shahmoradi, A., Turk, R. (2015), An overview of Islamic finance. International Monetary Fund Working Paper, WP/15/120.

Iqbal, Z., Mirakhor, A. (1999), Progress and challenges of Islamic banking. Thunderbird International Business Review, 41(4-5), 381-405.

Iršová, Z., Havránek, T. (2010), Measuring bank efficiency: A meta-regression analysis. Prague Economic Papers, 4, 307-328.

Ismail, A.H. (2002), The Deferred Contracts of Exchange: Al-Quran in Contrast with the Islamic Economists Theory on Banking and Finance. Kuala Lumpur: Institute of Islamic Understanding Malaysia.

Izhar, H., Asutay, M. (2007), Estimating the profitability of Islamic banking: Evidence from bank Muamalat Indonesia. Review of Islamic Economics, 11(2), 17-29.

Jensen, M.C. (1986), Agency cost of free cash flow, corporate finance, and takeovers. Corporate Finance, and takeovers. American Economic Review, 76(2), 323-329.

Kammer, M.A., Norat, M.M., Pinon, M.M., Prasad, A., Towe, M.C.M., Zeidane, M.Z. (2015), Islamic Finance: Opportunities, Challenges, and Policy Options (No. 15). Washington, DC: International Monetary Fund.

Khan, M.M. (2013), Developing a conceptual framework to appraise the corporate social responsibility performance of Islamic banking and finance institutions. Accounting and the Public Interest, 13(1), 191-207.

Khan, M.M., Hilaali, T.U.D. (1998), Translation of the Meanings of the Noble Quran in the English Language. King Fahd Complex for Printing the Holy Quran.

Khan, M.S., Mirakhor, A. (1990), Islamic banking: Experiences in the Islamic Republic of Iran and in Pakistan. Economic Development and Cultural Change, 38(2), 353-375.

Kraft, E., Hofler, R., Payne, J. (2006), Privatization, foreign bank entry and bank efficiency in Croatia: A Fourier-flexible function stochastic cost frontier analysis. Applied Economics, 38(17), 2075-2088.

Lepetit, L., Nys, E., Rous, P., Tarazi, A. (2008), Bank income structure and risk: An empirical analysis of European banks. Journal of Banking and Finance, 32(8), 1452-1467.

Miller, S.M., Noulas, A.G. (1997), Portfolio mix and large-bank profitability in the USA. Applied Economics, 29(4), 505-512.

Molyneux, P., Thornton, J. (1992), Determinants of European bank profitability: A note. Journal of Banking and Finance, 16(6), 1173-1178.

Naceur, S.B. (2003), The determinants of the Tunisian banking industry profitability: Panel evidence. Universite Libre de Tunis Working Papers.

Nienhaus, V. (2013), Human resource management of Islamic banks: Responses to conceptual and technical challenges. In: Karim, R.A.A., Archer, S., editors. Islamic Finance: The New Regulatory Challenge. Singapore: John Wiley & Sons. p493-503.

Pappas, V., Ongena, S., Izzeldin, M., Fuertes, A.M. (2016), A survival analysis of Islamic and conventional banks. Available from: http://www.ssrn.com/abstract=2070957. [Last accessed on 2016 Jan 30].

Purroy, P., Salas, V. (2000), Strategic competition in retail banking under expense preference behavior. Journal of Banking and Finance, 24(5), 809-824.

Rachdi, H. (2013), What determines the profitability of banks during and before the international financial crisis? Evidence from Tunisia. International Journal of Economics, Finance and Management, 2(4), 330-337.

Rosman, R., Wahab, N.A., Zainol, Z. (2014), Efficiency of Islamic banks during the financial crisis: An analysis of Middle Eastern and Asian countries. Pacific-Basin Finance Journal, 28, 76-90.

Samad, A. (1999), Comparative efficiency of the Islamic bank vis-à-vis conventional banks in Malaysia. IIUM Journal of Economics and Management, 7(1), 1-27.

Samad, A. (2004), Performance of Interest-free Islamic banks vis-à-vis interest-based conventional banks of Bahrain. International Journal of Economics, Management and Accounting, 12(2), 1-15.

Shawtari, F.A., Saiti, B., Razak, S.H.A., Ariff, M. (2015), The impact of efficiency on discretionary loans/finance loss provision: A comparative study of Islamic and conventional banks. Borsa Istanbul Review, 15(4), 272-282.

Smirlock, M., Marshall, W. (1983), Monopoly power and expense-preference behavior: Theory and evidence to the contrary. The Bell Journal of Economics, 14(1), 166-178.

Stiglitz, J.E. (1988), Why financial structure matters. The Journal of Economic Perspectives, 2(4), 121-126.

Stiroh, K.J. (2004), Diversification in banking: Is noninterest income the answer? Journal of Money, Credit and Banking, 36(5), 853-882.

Sufian, F., Chong, R.R. (2008), Determinants of bank profitability in a developing economy: Empirical evidence from the Philippines. Asian Academy of Management Journal of Accounting and Finance, 4(2), 91-112.

Sufian, F., Noor, M.A.N. (2012), Determinants of bank performance in a developing economy does bank origins matters? Global Business Review, 13(1), 1-23.

Swamy, P.A.V., Arora, S.S. (1972), The exact finite sample properties of the estimators of coefficients in the error components regression models. Econometrica: Journal of the Econometric Society, 261-275.

Tan, Y., Floros, C. (2012), Bank profitability and inflation: The case of China. Journal of Economic Studies, 39(6), 675-696.

Verbrugge, J.A., Jahera, J.S. (1981), Expense-preference behavior in the savings and loan industry. Journal of Money, Credit and Banking, 13(4), 465-476.

Wasiuzzaman, S., Tarmizi, H.A.B. (2010), Profitability of Islamic banks in Malaysia: An empirical analysis. Journal of Islamic Economics, Banking and Finance, 6(4), 53-68.

White, A., King, C.M. (2013), Legal risk exposure in Islamic finance. In: Karim, R.A.A., Archer, S., editors. Islamic Finance: The New Regulatory Challenge. Singapore: John Wiley & Sons. p225-233.

White, H. (1980), A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica: Journal of the Econometric Society, 48(4), 817-838.

Wooldridge, J.M. (2002), Econometric Analysis of Cross Section and Panel Data. Massachusetts: MIT Press.