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ISLAMIC BANKING AND BANK PERFORMANCE IN MALAYSIA: AN EMPIRICAL ANALYSIS

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ABSTRACT

This paper examines the performance of Malaysia's banking sector and its relationship to the presence of Islamic banking in the country. More specifically, by controlling for the theoretically relevant determinants of bank performance we compare the efficiency, profitability and risk of Islamic banks to conventional banks and examine the spillover effects of Islamic banking penetration on bank performance. To these ends, we adopt a panel modelling approach. Taking note that our focal variables comprise the time-invariant Islamic banking dummy and potentially endogenous Islamic banking share, we apply the Hausman–Taylor (HT) instrumental-variable estimator in the analysis. Our results indicate that Islamic banks in Malaysia are less profitable than their conventional counterparts and that Islamic banking penetration is associated with lower bank profitability. However, the increasing presence of Islamic banking appears to make Malaysian banks less risky and, with limited evidence, more efficient. Finally, the efficiency–risk trade-off seems to have potential as the Islamic banking portion of the sector increases in size . These results are reasonably robust compared to alternative specifications of the model .

Keywords: Net margins, Profitability, Risk, Panel models.
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I. INTRODUCTION

The emerging prominence and systemic importance of Islamic banking in many Muslim countries, especially in Malaysia and the Gulf Cooperation Council (GCC) countries, has stimulated much interest in its financial and economic roles. Empirically, existing studies have predominantly compared the performance of Islamic and conventional banks based on various performance dimensions, most notably efficiency, profitability, and risk or stability. In these studies, the roles of the Islamic banking sector are based (implicitly) on the premise that if Islamic banks perform comparatively better than their conventional counterparts, for example if they are more efficient, more profitable or have better credit quality, then the Islamic banking sector contributes positively to the soundness of the banking sector and by implication to the health of the economy. Unfortunately, however, the evidence affirming this from existing studies is far from uniform.

Moreover, analyses conducted to investigate whether the performance of Islamic banks is significantly better or worse than their conventional peers capture only the direct effects of Islamic banking presence and hence do not provide a complete picture of their financial or economic roles. Specifically, in line with the argument by Poghosyan (2010) in his analysis of the role foreign banks play in the determination of bank margins, analysis must be extended to include the indirect roles of Islamic banking presence or penetration via its effects on the performance of other banks.

In view of these issues, in this study we empirically evaluate the contribution of Islamic banking by examining the impact of Islamic bank participation on bank performance. We use Malaysia as a case study, motivated by the fact that, since the 1997/1998 financial crisis, the development of Islamic banking in Malaysia has been strong and marked by steady increase in Islamic banking's market share. From below 5% of banking financing prior to the crisis, Islamic banking now captures more than 25% of the bank loan/financing sector. In addition, globally Malaysia is the leader in Islamic finance (Thomson Reuters, 2018). As many countries attempt to emulate its business model and framework (Lassoued, 2018), they may draw lessons from the Malaysian experience, particularly in terms of the potential implications of expansion of Islamic banking.

While our analysis belongs to the growing empirical literature on Islamic banking performance, our main contribution is to provide an assessment of both the direct and indirect effects of Islamic banking on various performance dimensions, including bank efficiency, profitability and risk. As alluded to above, the main focus in the literature is direct performance comparison between Islamic banks and conventional banks. Only recently have we seen several (but still a limited number of) studies that focus on the contributions of Islamic banking to the macroeconomy as well as its influences on other banks. In addition, existing analyses tend to focus on specific aspects of performance, and hence there remains a gap in the development of a more comprehensive picture of Islamic banking's contributions. The present paper fills this gap by integrating both the direct and indirect impacts of Islamic banking and by evaluating the impacts of Islamic banking on various performance indicators.

The paper is structured as follows: in the next section, we briefly review related literature and then, in Section III, we present the methodology, detailing the data,

empirical models and estimation methods used in the analysis. Section IV presents estimation results and Section V concludes the paper with a summary of the main findings and recommendations.

II. LITERATURE REVIEW

Theoretically, bank performance is driven by various factors, chiefly those related to bank-specific characteristics and the macroeconomic environment under which a bank operates. The main bank-specific factors that have been considered are bank size, capitalization, cost efficiency, diversification and market power. Meanwhile, the macroeconomic factors commonly included in the analysis of bank performance are GDP growth and inflation, to reflect, respectively, business cycle and macroeconomic uncertainty. The literature focusing empirically on how these factors affect bank performance is voluminous.

The emergence of Islamic banking in the global financial scene has rapidly attracted scholarly attention, and the list of papers assessing empirically the performance of Islamic banks is expanding. The early literature focuses mainly on measuring the efficiency of Islamic banks. It then evolves into identifying determinants of Islamic bank efficiency and later extends into other metrics or measures of bank performance, mostly evaluated in comparison to conventional banks (Narayan & Phan, 2019; Hassan & Aliyu, 2018). For instance, Beck, Jonghe, and Schepens (2013), Kabir and Worthington (2017), Zins and Weill (2017), and Ibrahim and Rizvi (2018) compare the risk and stability of Islamic and conventional banks. Meanwhile, Olson and Zoubi (2017) and Yanikkaya, Gumus, and Pabuccu (2018) comparatively examine the profitability of both types of banks. The efficiency of Islamic banks in comparison to that of conventional banks is assessed in studies by Abdul Majid, Falahaty, and Jusoh (2017) and Alqahtani, Mayes, and Brown (2017), to name but two.

While we may infer positive contributions of Islamic banking to the banking system from its superior performance in the forms of higher profitability and efficiency and/or lower risk, there are two important concerns. First, the existing evidence is not as yet concrete in suggesting the better performance of Islamic banks. And second, a comparison of performance may not provide a full picture of the contribution of Islamic banking. We may argue that Islamic banks may be costlier or less profitable due to their business model. However, this cannot be taken as suggesting that Islamic banks have no positive contribution to make to the banking system, since it ignores the indirect impacts of the presence of Islamic banking on the behaviour of other banks. In this respect, recent studies by Abedifar, Hasan, and Tarazi (2016) and Meslier, Risfandy, and Tarazi (2017) are notable. Utilizing bank-level data from 22 Muslim countries, Abedifar et al. (2016) verify the potential benefits of Islamic banking presence on conventional banks in those countries. Namely, conventional banks operating in predominantly Muslim countries record improvements in their cost efficiency when there are also large Islamic banks operating in the same country. Meslier et al. (2017) provide further support for the influences of Islamic banking presence on conventional banking behaviour. More specifically, according to Meslier et al. (2017), the deposit rates

of conventional banks tend to be higher and hence benefit depositors in countries where there is a strong presence of Islamic banks.

While these studies document evidence that the presence of Islamic banks affects the behaviour of other banks, this evidence remains scanty. In other words, further and more comprehensive evaluation of Islamic banking role is needed, which is the aim of this study.

III. METHODOLOGY

In this section, we detail the data and the empirical model used in the paper, the aim of which is to assess the direct and indirect contributions of Islamic banking on bank efficiency, profitability and risk. As will be explained below, the direct role is based on whether, in comparison with its conventional counterparts, Islamic banking is more or less efficient, profitable and/or risky. Meanwhile, the indirect role is drawn from the influences of Islamic banking presence on the performance of the banking sector as a whole as well as on conventional banks themselves .

3.1. Data

The dataset used in the analysis is drawn from three sources – Fitch Connect, Bank Negara Malaysia (BNM) and the World Bank's World Development Indicators database – and covers 37 commercial banks (21 conventional banks and 16 Islamic banks) for the period from 2003 to 2015. These include all commercial banks (Islamic and conventional) that are currently in operation, except recently incorporated foreign banks whose data are too limited. For the majority of banks, we have bank-level data from as early as 1997. However, we take note that Malaysia suffered from the 1997/1998 Asian financial crisis and subsequently underwent bank restructuring and consolidation activities which ended in 2002 (Ahmad, 2007). Accordingly, to avoid this tumultuous period we begin our sample in 2003. Extending our sample back to 1997, however, does not materially affect our main conclusions[1].

The bank-level data, i.e. bank performance measures and their bank-specific determinants as explained below, are drawn from Fitch Connect. Meanwhile, the classification of banks into Islamic and conventional banks and the market share of Islamic banks are based on information provided by Malaysia's central bank, BNM, in its Monthly Statistical Bulletin. Finally, the data pertaining to macroeconomic variables are drawn from the World Bank's World Development Indicators. Brief definitions and data sources of the variables are given in Table 1.

[1] At the time that this research commenced, we had data only up to 2015. Our recent check indicates that the data can be updated to 2016 for some banks and to 2017 for others. We believe that the results will not be materially affected by adding merely one or two more years into the sample.

Table 1.
Variables and Data Sources

Variable	Definition	Data Source
(a) Interest variables		
Net interest margin (NIM)	The ratio of net interest income (gross interest and dividend income minus total interest expenses) to average earning assets	Fitch Connect
Return on average assets (ROA)	The ratio of net income to average total assets	Fitch Connect
Non-performing loans (NPL)	The ratio of non-performing loans to total gross loans	Fitch Connect
Islamic bank dummy (IB)	A dummy variable of 1 if the bank is Islamic	BNM
Islamic financing share (IBSF)	The ratio of Islamic bank financing to total credit of commercial banks (conventional and Islamic)	BNM
Islamic asset share (IBSA)	The ratio of Islamic bank assets to total assets of commercial banks (conventional and Islamic)	BNM
(B) Bank-specific variables		
Bank size (SIZE)	The natural logarithm of bank assets	Fitch Connect
Capitalization (EQA)	The ratio of equity to total assets	Fitch Connect
Competition/market power (LERNER)	The difference between price and marginal cost as a percentage of price. The price is the ratio of total revenues to total assets. The computation of the marginal cost is based on the translog cost function, as in Turk Ariss (2010).	Fitch Connect Author's estimation
Operating costs (OPCOST)	The ratio of operating expenses to total assets	Fitch Connect
Diversification (NII)	The ratio of non-interest income to total income	Fitch Connect
(C) Macroeconomic variables		
GDP growth (ΔY)	The annual growth rate of real GDP	WDI
Inflation (INF)	The annual percentage change of the consumer price index	WDI

Note: BNM refers to Monthly Statistical Bulletin published by Malaysia's central bank, Bank Negara Malaysia, and WDI to the World Bank's World Development Indicators database.

3.2. Model Development

To assess the roles, both direct and indirect, which Islamic banking plays in the banking system, we adopt a panel-data modelling method that relates bank performance measures to their various determinants. More specifically, and taking our lead from Poghosyan (2010), we write the empirical model as:

$$y_{it} = \beta_1 IB_i + \beta_2 IBShare_t + \theta Bank_{it-1} + \gamma Macro_t + \mu_i + \varepsilon_{it} \quad (1)$$

where y is a measure of bank performance, *IB* is the Islamic bank dummy, *IBShare* is the market share of the Islamic banking sector, *Bank* is a vector of bank-

specific variables, *Macro* is a vector of macroeconomic variables, μ_i is bank-specific effect, and ε_{it} is the standard error term. It should be noted that we use one-year-lagged bank-specific variables to address the endogeneity concern stemming from the reverse causality from bank performance to the included bank-specific variables such as size and others.

As noted above, the bank performance measures considered in the present study are efficiency, profitability and risk. For the efficiency measure, we use bank interest/financing margin (NIM), which is a standard measure of financial intermediation costs and hence efficiency in the intermediation of financial resources (Beck & Hesse, 2009; Poghosyan, 2010)[2]. The prevailing view is that Islamic banks are cost inefficient, which is reflected by higher margins or higher cost-to-income ratios of Islamic banks (Ernst & Young, 2012; Beck et al., 2013). This view reflects only the direct role of Islamic banking presence on bank efficiency; in other words, the efficiency effect of Islamic banking needs to be reassessed taking into consideration both direct and indirect perspectives, as noted above. We use ROA as a measure of bank profitability. According to Athanasoglou et al. (2008), Garcia-Herrero, Gavila, and Santabarbara (2009), and Tan (2016), ROA is a common and direct measure of bank profitability in the literature. Finally, we use the ratio of non-performing loans to gross loans (NPL) as a measure of risk, on the basis that it is a primary driver of bank risk (Jimenez, Lopez, & Saurina, 2013) and a macroprudential indicator of banking crises (Chang, Guerra, Lima, & Tabak, 2008).

In the model, taking our lead from Poghosyan (2010) in his analysis of foreign bank participation and its impacts on the banking sector, the roles of Islamic banking are captured by the Islamic bank dummy (*IB*) and the share of the Islamic banking sector (*IBShare*). These are our focal variables in the model.

The *IB* dummy takes the value of 1 for Islamic banks and 0 otherwise, the classification of which is drawn from the information provided by BNM. The coefficient of *IB* measures whether the performance of Islamic banks is significantly different from the performance of conventional banks with comparable bank-specific characteristics and facing similar macroeconomic environments, as controlled by the inclusion of bank-level and macroeconomic determinants of bank performance. This is taken as the direct contribution of Islamic banking. Hence, if the coefficient of *IB* is positive in the NIM equation, then Islamic banks are less efficient. In other words, Islamic banking directly leads the banking sector to be less efficient in the provision of intermediation services. The coefficient of *IB* in other performance equations can be interpreted in the same manner.

The indirect contribution of Islamic banking, that is the spillover effect arising from Islamic banking penetration of the banking scene, is captured by the coefficient of *IBShare*. Thus, while Islamic banks may, for instance, be on average less efficient (i.e. positive coefficient of *IB* in the NIM equation), their presence in the banking system may at the same time lower average margins or result in a more efficient banking system (i.e. negative coefficient of *IBShare* in the NIM

[2] NIM has also been used as a profitability measure (Bikker & Vervliet, 2018; Claessens et al., 2018). NIM reflects bank profitability but also captures costs/efficiency associated with intermediation or bank operations. Accordingly, even if NIM declines, banks may still be profitable (i.e. higher ROA).

equation). Failing to capture the latter indirect impact of Islamic banking may lead to erroneous assessment of Islamic banking contribution. Taking our lead from Beck and Hesse (2009), we employ the financing share of Islamic banks as a measure of Islamic banking presence or penetration.

The bank-specific and macro-controlled variables used are standard and in line with the literature. The bank-specific variables include bank size, competition/ market power, capitalization, operating costs and diversification. We also include bank risk in the NIM and ROA models and profitability in the NPL model. Finally, we include real GDP growth and inflation rates, the two most common measures of macroeconomic variables, to control for the effects of macroeconomic performance and uncertainty, respectively, on bank performance. Please refer to Table 1 for their brief definitions.

We take Equation 1 as our baseline model. Then, we perform further analyses as robustness checks as well as in order to shed further insights on the issue at hand. First, we experiment with an alternative measure of Islamic banking share (*IBShare*). Namely, following Abedifar et al. (2016) and Imam and Kpodar (2016), we use the asset share of Islamic banking in place of its banking financing share in Equation 1. Second, as further robustness checks, we modify Equation 1 by adding the lagged dependent variable in the model to capture potential dynamics of bank performance, and incorporating Islamic banking share squared to assess whether there is non-linearity between Islamic banking presence and bank performance. These are represented respectively by Equations 2 and 3 below:

$$y_{it} = \rho y_{it-1} + \beta_1 IB_i + \beta_2 IBShare_t + \theta Bank_{it-1} + \gamma Macro_t + \mu_i + \varepsilon_{it} \quad (2)$$

$$y_{it} = \beta_1 IB_i + \beta_2 IBShare_t + \beta_3 IBShare_t^2 + \theta Bank_{it-1} + \gamma Macro_t + \mu_i + \varepsilon_{it} \quad (3)$$

The inclusion of the lagged dependent variable is common in the literature, given the fact that present bank performance may likely depend on past performance. Meanwhile, the inclusion of squared *IBShare* in the regression is based on the view that the Islamic banking sector must reach a certain size threshold for its impacts to be material (Ibrahim & Rizvi, 2017). And finally, we restrict our sample to only conventional banks, so that we can assess whether Islamic banking presence affects the performance of conventional banks more directly.

3.3. Method

The model entails two key statistical features. First, the Islamic bank dummy, which is vital to our assessment of the direct role of Islamic banking, is time-invariant. Second, the Islamic banking market share, which is another focal variable in the study, is potentially endogenous. Arguably, unobserved firm-specific factors, such as managerial style, managerial risk aversion or even initial conditions, are likely correlated with Islamic banking market share. Moreover, reverse causality from bank performance to Islamic banking market share is also possible.

Due to these factors, the traditional fixed-effects and random-effects panel estimators would not be appropriate . Despite its consistency in the presence of the correlation between explanatory variables and error terms, the fixed-effect panel

estimator will filter out the key Islamic banking dummy from the regressions and hence no assessment can be made of the direct role of Islamic banking. While the random-effect panel estimator would maintain *IB* in the model, the estimation of coefficients would be biased due to the endogeneity problem. Indeed, the presence of endogeneity calls for an instrumental-variable estimator. In our case, even if we extended the model to dynamic-panel models by adding the lagged dependent variable in our robustness check, the widely applied GMM-based estimators would not be suitable given the small number of banks (i.e. 37). In this setting, an instrument-proliferation problem is possible and, at the same time, the GMM-based estimators would yield biased estimates.

Taking all these factors into consideration, we apply the Hausman–Taylor (HT) instrumental-variable estimator. We deem the HT estimator to be most fitting since it is able to allow for time-invariant variables as well as addressing the endogeneity concern. It has been commonly applied in a panel-data settings similar to the present study (Kafle, Jollife, & Winter-Nelson, 2018; Lepetit, Meslier, Strobel, & Wardhana, 2018).

IV. RESULTS AND ANALYSIS

4.1. Baseline Results

Table 2 reports the baseline results from estimating Equation 1 in which the share of Islamic financing represents Islamic banking presence. Comparatively, after controlling for bank-specific characteristics and macroeconomic conditions, Islamic banks are less profitable, as indicated by the significance of the *IB* dummy in the ROA equation at 1% significance level. However, we do not find significant differences in the efficiency/ intermediation costs and bank risk of Islamic banks and conventional banks.

The lower profitability of Islamic banks does not conform to recent findings by Trad, Traabelsi, and Goux (2017) and Olson and Zoubi (2017) using bank-level data from many countries. They respectively document no major difference in the profitability of Islamic banks and conventional banks and convergence in their profitability over time. It is, however, in line with the Malaysia data contained in the recent multi-country report by the International Monetary Fund (2017) entitled 'Ensuring Financial Stability in Countries with Islamic Banking'. According to this report, this feature may be attributed to the higher overhead costs prevailing . Further, we may argue that the complexities of Islamic financial contracts and Islamic banking's governance structures impose additional costs on Islamic banks that are unlikely to be fully accounted for by the included bank-specific variables. Beck et al. (2013) demonstrate empirically that Islamic banks are less cost efficient, which may contribute to their lower profitability as compared to conventional banks.

Table 2.
Baseline Estimation Results

Variable	Bank Performance Measures		
	NIM	**ROA**	**NPL**
IB	0.0976	-0.9481***	-0.9725
	(0.613)	(0.000)	(0.430)
IBS	-0.0253***	-0.0189	-0.2884***
	(0.001)	(0.181)	(0.000)
SIZE	0.0023	0.0665	-0.6391
	(0.974)	(0.488)	(0.177)
LERNER	3.3666***	4.5679***	8.2228**
	(0.000)	(0.000)	(0.035)
EQA	0.0061	0.0028	-0.1084**
	(0.410)	(0.844)	(0.031)
OPCOST	0.7890***	0.2822*	0.8173
	(0.000)	(0.068)	(0.129)
NII	-0.0216***	-0.0269***	0.0104
	(0.000)	(0.000)	(0.633)
NPL	-0.0107*	-0.0437***	
	(0.075)	(0.001)	
ROA			-1.3231***
			(0.000)
ΔY	0.0094	0.0165	0.0963*
	(0.192)	(0.322)	(0.054)
INF	0.0016	0.0112	-0.2054*
	(0.920)	(0.767)	(0.067)
FB	-0.2968	-0.0688	-1.8812
	(0.129)	(0.749)	(0.129)
Constant	0.0495	-1.1529	12.4790**
	(0.949)	(0.325)	(0.015)
# Banks	37	37	37
# Obs	369	369	370

Note: *p*-values in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As for bank risk, the prevailing findings are mixed, ranging from higher risk of Islamic banks (Kabir, Worthington, & Gupta, 2015; Lassoued, 2018) to lower risk of Islamic banks (Beck et al., 2013; Sowar et al., 2016) to no significant difference in the risk level between Islamic and conventional banks (Trad et al., 2017). Further, Sun, Mohamad, and Ariff (2013) also document significance in the margins of Islamic and conventional banks. Thus, our finding for Malaysia is in line with Trad et al. (2017)[3]. We believe that, in a dual banking system where Islamic banks co-exist and compete with conventional banks, Islamic banks have to conform to the same pricing and risk-taking strategies and hence there are no differences in the net margins and risk levels of Islamic and conventional banks.

[3] It should be noted that these studies, except Lassoued (2017), employ bank-level data from many countries. Lassoued (2017), similarly to our case, focuses on Malaysia's dual banking system.

From Table 2 we may further note that Islamic banking presence exerts indirect effects on the banking system. The results suggest that bank margins and risk are inversely related to Islamic bank penetration, as indicated by the negative and significant coefficients of *IBS* in the NIM and NPL equations. These results add further to the evidence documented by Abedifar et al. (2016) and Meslier et al. (2017) indicating that the presence of Islamic banks can favourably affect the banking sector and conventional banking through efficiency improvements and higher returns to depositors, respectively. However, they are not in line with Alandejani and Asutay (2017), who document higher credit-risk exposure with increasing presence of Islamic banks.

Albeit with lower profitability, the competitive environment brought about by the increasing presence of Islamic banking leads the banking system to be more efficient and to experience lower risk. Our results demonstrate the economic importance of Islamic banking presence, particularly in mitigating credit risk. From the results, a one percentage point increase in Islamic banking presence is related to a reduction in non-performing loan ratio of 0.29 percentage points, or more than 7% of average credit risk. These indirect effects would likely inject stability into the banking system.

As for the controlled variables, we find bank market power to significantly account for bank margins, profitability and risk. The results suggest that banks with more market power charge higher margins, are more profitable, and undertake more risk. Banks that are cost inefficient tend to have higher margins and more risk. Diversification and low quality of loans or credit risk lead to lower profitability. We also note that profitable banks tend to take less risk. Finally, the macroeconomic environments turn out to be significant in explaining bank risk, but seem to have no bearing on bank margins and bank profitability.

4.2. Robustness Test

To further substantiate the findings on Islamic banking's direct and indirect roles, as well as to shed further insights onto the issues being considered, we perform further analyses. First, we employ the asset share of Islamic banks as an alternative measure of Islamic banking penetration. The results are presented in Table 3.

Table 3.
Estimation Results Using Asset Share of Islamic Banks

Variable	Banking Performance Measures		
	NIM	ROA	NPL
IB	-0.0798	-1.0678***	0.6035
	(0.738)	(0.000)	(0.519)
IBS	-0.0089	-0.0077	-0.3488***
	(0.217)	(0.563)	(0.000)
SIZE	-0.1383*	0.0197	0.2897
	(0.088)	(0.863)	(0.450)
LERNER	3.5535***	4.8123***	6.9055*
	(0.000)	(0.000)	(0.053)

Table 3.
Estimation Results Using Asset Share of Islamic Banks (Continued)

Variable	Banking Performance Measures		
	NIM	**ROA**	**NPL**
EQA	-0.0018	0.0033	-0.0577
	(0.807)	(0.826)	(0.206)
OPCOST	0.7733***	0.3356**	0.8472*
	(0.000)	(0.040)	(0.087)
NII	-0.0211***	-0.0308***	0.0305
	(0.000)	(0.000)	(0.143)
NPL	-0.0100	-0.0389***	
	(0.111)	(0.005)	
ROAA			-1.4178***
			(0.000)
ΔY	0.0076	0.0145	0.0362
	(0.294)	(0.381)	(0.464)
INF	0.0066	0.0159	-0.1952*
	(0.682)	(0.669)	(0.073)
FB	-0.5048**	-0.1493	-0.6533
	(0.035)	(0.575)	(0.471)
Constant	1.1206	-1.0327	5.9322
	(0.190)	(0.437)	(0.174)
# Banks	37	37	37
# Obs	369	369	370

Note: *p*-values in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As may be observed from Table 3 , the results reaffirm the lower profitability of Islamic banks (the direct effect) and the favourable effect of Islamic banking presence on credit risk (the indirect effect). In conformity with the baseline result, the coefficient of *IB* in the ROA equation is negative and statistically significant at 1% level. This estimate suggests that Islamic banks are on average one percentage point less profitable than their comparable conventional peers. Likewise, while the coefficient of Islamic banking presence is insignificant in the NIM equation, it is negative and significant in the NPL equation. Indeed, the increasing Islamic banking presence as measured by Islamic banking asset share tends to lead to a more pronounced reduction in bank risk. While there are small differences, our results in general do not overturn our earlier conclusion that Islamic banking presence has positive spillover effects. As regard the controlled variables, the earlier results prevail.

Apart from the above, we also experiment with alternative specifications of Equation 1 to serve as a further robustness check, as well as to add insights to the relations between Islamic banking and bank performance. First, we allow dynamics in model specification by including the lagged dependent variable and, since it is correlated with the bank-specific effect, treat it as a time-variant endogenous variable. Second, we explore potential non-linear relationship between bank performance and Islamic banking market share, by adding the squared market

share in the regression. This is in line with the argument by Ibrahim and Rizvi (2017) that Islamic banking may need to reach a certain size threshold for it to have beneficial effects, directly or indirectly, or the negative side of its being too large may set in and reduce its benefits. Finally, we re-estimate the model by restricting the sample to only conventional banks, to further ascertain the indirect spillover effects of Islamic banking presence on conventional banks. The results are presented in Table 4. To conserve space, we report only the results pertaining to our key variables, i.e. *IB* and *IBshare*[4].

Table 4.
Estimation Results – Alternative Model Specifications

Variable	Islamic Bank Financing Share			Islamic Bank Asset Share		
	NIM	ROA	NPL	NIM	ROA	NPL
(a) Dynamic specification						
IB	0.1269	-0.8729***	0.2483	0.0354	-1.0551***	0.4791
	(0.364)	(0.000)	(0.652)	(0.837)	(0.000)	(0.392)
IBS	-0.0210***	-0.0148	-0.1174***	-0.0105*	0.0003	-0.1272***
	(0.001)	(0.281)	(0.000)	(0.090)	(0.981)	(0.000)
(b) Non-linearity						
IB	-0.0153	-1.0401***	0.5643	0.0271	-1.0414***	0.4197
	(0.946)	(0.000)	(0.561)	(0.901)	(0.000)	(0.671)
IBS	0.0529	0.0517	-1.8637***	0.0822***	0.0348	-0.6433***
	(0.215)	(0.577)	(0.000)	(0.005)	(0.605)	(0.001)
IBS^2	-0.0018*	-0.0017	0.0388***	-0.0024***	-0.0011	0.0075
	(0.071)	(0.457)	(0.000)	(0.001)	(0.514)	(0.121)
(c) Conventional bank sample						
IBS	-0.0036	-0.0446***	-0.1987***	0.0003	-0.0301***	-0.2602***
	(0.663)	(0.000)	(0.000)	(0.971)	(0.008)	(0.000)

Note: *p*-values in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results presented in the dynamic-panel specification reaffirm the conclusions that we have made, i.e. that Islamic banks are comparatively less profitable (direct effect) but their presence improves efficiency and lowers credit risk of the banking sector as a whole (indirect effect). The results obtained from including the squared market shares are illuminating. More specifically, we document potential non-linear relationships between bank efficiency and bank risk and Islamic banking market share. Roughly, the results suggest that the efficiency effect (i.e. lower intermediation costs) is materialized only when the financing share (asset share) of Islamic banks exceeds 14.7% (17.1%). In other words, Islamic banking must be systemically significant[5]. As for credit risk, the risk-mitigation effect only holds up to a financing share threshold of 24%. Beyond

[4] The full results are available from the author upon request.

[5] A country with 15% or more Islamic banking asset share is considered to have a systemically important Islamic banking sector by the Islamic Financial Services Board (IFSB).

this threshold, increasing financing share of Islamic banks would worsen bank risk. Thus, it seems that as Islamic banking assumes larger market shares, there is the potential for efficiency–risk trade-off. From these results, we find no indication of non-linearity between risk and asset share of Islamic banks. Finally, we find that the presence of Islamic banks makes conventional banks less profitable and at the same time more conservative in their undertaking of risk. In other words, conventional banks become more prudent.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

This paper examines the contribution of Islamic banking presence to banking sector performance for the case of Malaysia. Comparatively, after controlling for bank-specific and macroeconomic determinants of bank performance, we find Islamic banks to be less profitable. Further, indirectly, the increasing presence of Islamic banks tends to lower the profitability of conventional banks and of the banking sector. However, despite lower profitability we find positive spillover effects of Islamic banking presence on, in particularly, bank risk and, to a limited extent, bank efficiency.

Our further analyses reveal that the relationship between bank efficiency and risk and Islamic banking presence may not be linear. The Islamic banking market share needs to reach a certain threshold for the efficiency effect to be materialized. Meanwhile, the risk-mitigating effect of Islamic banking presence holds only up to a certain market-share threshold. In other words, once the Islamic banking sector becomes large, the efficiency–risk trade-off is an important issue that must be addressed to ensure financial stability in countries with Islamic banking. In light of these factors, identifying the optimal size of the Islamic banking sector in the dual banking system is an important avenue for future research.

5.2. Recommendations

Our findings bear important implications and serve as lessons to other countries that have adopted the dual banking system and aim to expand their Islamic banking segments. On the basis that credit risk is the primary driver of a financial crisis and, once it erupts, has huge economic costs, we recommend further expansion of the Islamic banking sector to inject needed stability (i.e. lower risk) into the banking system. If our findings can be generalized, the size of the Islamic banking sector must be roughly more than 15%. Beyond this size, the banking system will also be efficient in the provision of intermediation services. As an example, with an Islamic banking share of far below the 15% mark, Indonesia must be more aggressive in expanding its Islamic banking sector such that the risk reduction and efficiency benefits of Islamic banking can be materialized. Given these recommendations, policy makers need to come up with mechanisms to mitigate Islamic bank risk when it becomes a large proportion of the overall banking sector, due to the potential efficiency–risk trade-off brought about by a bigger Islamic banking sector. In other words, like other banks, Islamic banks must be supervised and monitored when they become too large . Given that Islamic banks are exposed

to risks that are unique to the Islamic banking business model, in addition to the normal risks of banking business countries must be prepared to address the risks that would emerge from further expansion of their Islamic banking sectors.

REFERENCES

Abdul Majid, M., Falahaty, M., & Jusoh, M. (2017). Performance of Islamic and Conventional Banks: A Meta-Frontier Approach. *Research in International Business and Finance, 42*, 1327–1335.

Abedifar, P., Hasan, I., & Tarazi, A. (2016). Finance-Growth Nexus and Dual-Banking Systems: Relative Importance of Islamic Banks. *Journal of Economic Behavior & Organization, 132*, 198–215.

Ahmad, R. (2007). A Note on the 1999–2002 Malaysian Banking Consolidation. *Banker's Journal Malaysia, 131*, 4–8.

Alandejani, M., & Asutay, M. (2017). Nonperforming Loans in the GCC Banking Sectors: Does the Islamic Finance Matter? *Research in International Business and Finance, 42*, 832–854.

Alqahtani, F., Mayes, D. G., & Brown, K. (2017). Islamic Bank Efficiency Compared to Conventional Banks During the Global Crisis in the GCC Region. *Journal of International Financial Markets, Institutions and Money, 51*, 58–74.

Athenasoglou, P. P., Brissimis, N. S., & Delis, M.D. (2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Stability. *Journal of International Financial Markets, Institutions & Money, 18*, 121–136.

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank Competition and Stability: Cross-Country Heterogeneity. *Journal of Financial Intermediation, 22*, 218–244.

Beck, T., & Hesse, H. (2009). Why Are Spreads so High in Uganda? *Journal of Development Economics, 88*, 192–204.

Bikker, J. A., & Vervliet, T. M. (2018). Bank Profitability and Risk-Taking Under Low Interest Rates. *International Journal of Finance and Economics, 23*, 3–18.

Chang, E. J., Guerra, S. M., Lima, E. J. A., & Tabak, B. M. (2008). The Stability–Concentration Relationship in the Brazilian Banking System. *Journal of International Financial Markets, Institutions & Money, 18*, 388–397.

Claessens, S., Coleman, N., & Donnelly, M. (2018). "Low-For-Long" Interest Rates and Banks' Interest Margins and Profitability: Cross-Country Evidence. *Journal of Financial Intermediation, 25*, 1–16.

Ernst & Young. (2012). *The World Islamic Banking Competitiveness Report 2011–2012: A Brave New World for Sustainable Growth.*

Garcia-Herrero, A., Gavila, S., & Santabarbara, D. (2009). What Explains the Low Profitability of Chinese Banks? *Journal of Banking and Finance, 33*(1), 2080–2092.

Hassan, M. K., & Aliyu, S. (2018). A Contemporary Survey of Islamic Banking Literature. *Journal of Financial Stability, 34*, 12–43.

Ibrahim, M. H., & Rizvi, S. A. R. (2017). Do We Need Bigger Islamic Banks? An Assessment of Bank Stability. *Journal of Multinational Finance Management, 40*, 77–91.

Ibrahim, M. H., & Rizvi, S. A. R. (2018). Bank Lending, Deposits and Risk-Taking in Times of Crisis: A Panel Analysis of Islamic and Conventional Banks. *Emerging Markets Review, 35*, 31–47.

Imam, P., & Kpodar, K. (2016). Islamic Banking: Good for Growth? *Economic Modelling, 56,* 387–401.

International Monetary Fund. (2017). *Multi-Country Report: Ensuring Financial Stability in Countries with Islamic Banking*. IMPF Country Report No. 17/145.

Jimenez, G., Lopez, J. A., & Saurina, J. (2013). How Does Competition Affect Bank Risk-Taking? *Journal of Financial Stability, 9*, 185–195.

Kabir, M. N., & Worthington, A. C. (2017). The 'Competition–Stability/Fragility' Nexus: A Comparative Analysis of Islamic and Conventional Banks. *International Review of Financial Analysis, 50*, 111–128.

Kabir, M. N., Worthington, A., & Gupta, R. (2015). Comparative Credit Risk in Islamic and Conventional Bank. *Pacific–Basin Finance Journal, 34*, 327–353.

Kafle, K., Jollife, D., & Winter-Nelson, A. (2018). Do Different Types of Assets Have Differential Effects on Child Education? Evidence From Tanzania. *World Development, 109*, 14–28.

Lassoued, M. (2018). Comparative Study on Credit Risk in Islamic Banking Institutions: The Case of Malaysia. *The Quarterly Review of Economics and Finance, 70*, 267–278.

Lepetit, L., Meslier, C., Strobel, F., & Wardhana, L. (2018). Bank Dividends, Agency Costs and Shareholder and Creditor Rights. *International Review of Financial Analysis, 56*, 93–111.

Meslier, C., Risfandy, T., & Tarazi, A. (2017). Dual Market Competition and Deposit Rate Setting in Islamic and Conventional Banks. *Economic Modelling, 63*, 318–333.

Narayan, P. K., & Phan, D. H. B. (2019). A Survey of Islamic Banking and Finance Literature: Issues, Challenges and Future Directions. *Pacific–Basin Finance Journal, 53*, 484–496.

Olson, D., & Zoubi, T. (2017). Convergence in Bank Performance for Commercial and Islamic Banks During and After the Global Financial Crisis. *The Quarterly Review of Economics and Finance, 66*, 71–87.

Poghosyan, T. (2010). Re-Examining the Impact of Foreign Bank Participation on Interest Margins in Emerging Markets. *Emerging Markets Review, 11*, 390–403.

Sorwar, G., Pappas, V., Pereira, J., & Nurullah, M. (2016). To Debt or Not to Debt: Are Islamic Banks Less Risky Than Conventional Banks? *Journal of Economic Behavior & Organization, 132*(Supplement), 113–126.

Sun, P. H., Mohamad, S., & Ariff, M. (2017). Determinants Driving Bank Performance: A Comparison of Two Types of Banks in the OIC. *Pacific–Basin Finance Journal, 42*, 193–203.

Tan, Y. (2016). The Impacts of Risk and Competition on Bank Profitability in China. *Journal of International Financial Markets, Institutions & Money, 40*, 85–110.

Thomson Reuters. (2018). *State of the Global Islamic Economy Report 2018/2019*.

Trad, N., Traabelsi, M. A., & Goux, J. F. (2017). Risk and Profitability of Islamic Banks: A Religious Deception or an Alternative Solution? *European Research on Management and Business Economics, 23*(1), 40–45.

Turk-Ariss, R. (2010). Competitive Conditions in Islamic and Conventional Banking: A Global Perspective. *Review of Financial Economics, 19*(3), 101–108.

Yanikkaya, H., Gumus, N., & Pabuccu, Y. U. (2018). How Profitability Differs Between Conventional and Islamic banks: A Dynamic Panel Data Approach. *Pacific–Basin Finance Journal, 48*, 99–111.

Zins, A., & Weill, L. (2017). Islamic Ranking and Risk: The Impact of Basel II. *Economic Modelling, 64*, 626–637.