Restructuring and Bank Performance in Dual Banking System

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Abstract
This paper assesses the impact of changing competition landscape and Islamic bank penetration on bank risk, profitability and capitalization. This study utilizes an unbalanced panel dataset consisting of 37 commercial banks over the period 1997 to 2015. The paper uses a panel VAR methodology to discern the interactions between bank competition and Islamic banking presence on one hand and bank performance on the other hand. We find evidence supportive of both competition—stability and competition—fragility views for conventional banks. The results suggest that bank competition improves conventional bank risk and, at the same time, lower profitability and capital holdings. As for Islamic banks, competition seems to robustly influence only bank profitability. Finally, we note that increasing Islamic bank penetration improves the risk profile of conventional banks and, as expected, reduces their market power. These results bear important implications on the design of competition policies in a dual banking system as well as on the development of the Islamic banking sector.

Keywords:
bank competition, Islamic bank penetration, bank performance.

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Introduction

Bank consolidation and restructuring are common responses of many countries experiencing financial or banking crises. While Malaysia is no exception, the restructuring exercise that Malaysia undertook in the aftermath of the 1997/1998 Asian financial crisis has projected its conventional and Islamic banking segments into two different trajectories. In responses to surmounting non-performing loans of especially small financial intermediaries, Malaysia consolidated its conventional domestic banking sector to form few large conventional banks. At the same time, driven by the objective of becoming the international hub of Islamic finance, the government has facilitated greater penetration of the Islamic banking sector through establishment of new Islamic banks and Islamic bank subsidiaries of conventional banks. As a result of the former, the number of conventional banking institutions dropped substantially from 78 banks (35 commercial banks, 31 finance companies, and 12 merchant/investment banks) in 1998 to 38 banks in 2017 (27 commercial banks and 11 investment banks). Meanwhile, the latter has resulted in an increase not only in the number of Islamic banks from 1 prior to the crisis to 16 in 2017 but also in the Islamic banking market share from less than 5% to more than 25% over the same period.

The restructuring that Malaysia has undergone since the Asian financial crisis thus highlights two key features: the changing competition landscape and the systemic importance of Islamic banking. The questions are: How have changes in banking competition affected bank risk and performance? Does Islamic bank penetration affect the risk and performance of conventional banks? Despite extensive studies on the performance and risk implications of banking market structure and competition, the answer to the first question remains theoretically and empirically inconclusive. The second question has only attracted scholarly attention very recently and, hence, not much is known on the impacts of the Islamic banking presence on conventional banks. Given the policy relevance of the questions and limited understanding of the subjects for the dual banking system, this paper aims at addressing the above two questions.

In the paper, we make three contributions. First, we contribute to a large literature on the implications of bank competition. The conflicting findings from existing studies hint, among others, potentially different implications of banking market competition across countries. Moreover, given the predominant focus of the literature on developed and large economies, existing evidence may not be directly applicable to other countries. Recent studies have further emphasized that different banking types or systems may react differently to market competition (Clark et al., 2018a; Fiordelisi & Mare, 2014; Jeon & Lim, 2013). In the context of the dual banking system, Kabir & Worthington (2017) is perhaps the first study that looks at the impact of competition on risk of Islamic and conventional banks. By drawing the sample banks from 16 dual-banking jurisdictions,

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1 The banking system with both interest-based (conventional) banks and interest-free (Islamic) banks in operations is commonly termed as the dual banking system.

2 Takatoshi and Yuko (2007) provides a detailed description of the restructuring and consolidation exercises undertaken by Malaysia in the aftermath of the Asian crisis. See also Ahmad (2007).
their findings hold only on average and hence may not be applicable to a specific dual-banking country.

As many studies have suggested, the competition – bank performance relation may differ across countries depending on their institutional environments (Davis & Karim, 2019). Bank competition and its implications on particularly bank profitability, capital holdings and risk have received substantial theoretical attention and empirical scrutiny. According to the Structure-Conduct-Performance (SCP) hypothesis, banks with high market power or in a less competitive market tend to be more profitable (Tan, 2016). By implication of their ability to secure abnormal profits or monopoly rents, these banks would have high franchise value. Accordingly, to protect their franchise value, they tend to be more prudent by building up capital and avoiding risk (Keeley, 1990). Further, supervision of few large banks, which is a normal feature of a less competitive market, is easier and these banks would also have better ability to diversify risk (Allen & Gale, 2000). A competitive banking market, however, may not only erode the franchise value leading to high-risk strategies but also discourage investment in information for better screening and monitoring and in lending relationship since customers can switch banks more readily (Allen & Gale, 2000, 2004). On these bases, competition would lower profitability and capital holdings and increase risk undertaking, which is coined as the competition – fragility view.

A contrasting view, which is normally attributed to Boyd & De Nicolo (2005), is the competition – stability view. It is based on the risk-taking incentives of both borrowers and banks in the presence of asymmetric information. It is argued that high lending rates in a non-competitive market intensify adverse selection and moral hazard problems resulting in only riskier borrowers to seek and secure loans and incentivising borrowers to take risk. By contrast, the lower cost of funding in a more competitive market would minimize these problems and consequently make banks less risky. As banks tend to be large in an uncompetitive market, they tend to be “too big to fail” and accordingly be less prudent by holding less capital and undertaking greater risk (Mishkin, 1999). Adding to these, Demsetz (1973) argue that it is not the market power that shapes bank profitability. Instead, the value of banks derives from their efficiency. In short, these arguments postulate lower capital holdings and higher risk of banks with greater market power. Meanwhile, profitability is the result of efficiency and not the market power.

Empirically, these diverse views have their respective supports from studies based on individual countries and panels of countries. An early but oft-cited study by Beck et al. (2006) based on data from 69 countries from 1980 to 1997 suggests less likely occurrence of banking crises in more concentrated banking systems. This competition – fragility view is further substantiated by Yeyati & Micco (2007) for 8 Latin American countries, Turk-Aris (2010a) for 60 developing countries, Fungacova & Weill (2013) for the Russian banking sector, and Kasman & Kasman (2015) for the Turkish banking sector. In a more recent study, using a panel sample of European listed banks from 2004 to 2013, Leroy & Lucotte (2017) document supportive evidence for the competition – fragility view when bank-individual risk measures (i.e. Z-score and distance to default) are used.
By contrast, echoing the early results by Anginer et al. (2014), they also document bank systemic risk reduction in a more competitive environment. This competition – stability hypothesis receives further empirical supports from Schaeck & Cihak (2014) for Europe, Fu et al. (2014) for 14 Asia Pacific countries, Md Noman et al. (2018) for Southeast Asian countries, and Clark et al. (2018b) for the Commonwealth of Independent States (CIS).

Berger et al. (2009) reconcile the competition – fragility and competition – stability views by noting based on a sample of 8235 banks in 23 developed economies that banks with greater market power tend to have higher credit risk but, at the same time, they hold higher capital ratios. Soedarmono et al. (2013) observe similar results for Asia that banks in a less competitive market are better capitalized. These results may reflect the fact that, facing competition or market power, banks undertake risk taking strategies and determine capital holdings simultaneously. Still, how capital holdings are linked to market power or competition remains at best contentious. In a study of 1337 banks in 70 countries, Fonseca & Gonzales (2010) find capital buffers to be positively related to bank market power. Contradicting this finding, Schaeck & Cihak (2012) document evidence that capital ratios increase with competition in 10 European countries. The most recent study by Valencia & Bolanos (2018) further suggests different competition – capital relations for developed and developing economies. Namely, competition incentivises banks in developed economies to increase capital buffers. By contrast, banks in developing economies lower capital buffers when facing increasing competition.

As regards bank profitability, the literature seems to generally validate the SCP hypothesis, i.e. profitability is directly related to market concentration and bank market power. For instance, using a panel sample of banks from 61 countries, Hsieh & Lee (2010) document a positive relation between profitability and market power although it is likely weakened with activity restrictions, efficiency of judiciary systems, investors’ protection and levels of financial and economic developments. Further, although the effects of competition on bank risk in the long run are uncertain, Davis & Karim (2019) find evidence that competition suppresses profitability as well as lowers capital. Lee & Hsieh (2012) also provide support for the SCP hypothesis for the banking sector in China. This, however, contradicts a recent study on China by Tan (2016) indicating no robust relations between competition and profitability.

The literature on the issue further admits large cross-country variations in bank competition – stability nexus (Beck et al., 2013), their non-linear relations (Martinez-Miera & Repullo, 2010; Jimenez et al., 2013) and potential differential relations across bank types or systems (Liu & Wilson, 2013; Jeon & Lim, 2013; Fiordelisi & Mare, 2014; Kabir & Worthington, 2017; Clark et al., 2018a).

Few studies have extended the analysis to the cases of European cooperative banks. Given their significant presence and economic contributions, the analysis bears important policy implications especially regarding competition policies whether they should be subject to similar regulations as commercial banks. Assessing the issue using a sample of 2529 cooperative banks from 5 European countries (Austria, France, Germany, Italy, and
Spain), Fiordelisi & Mare (2014) document evidence consistent with the competition – stability view. The most recent study by Clark et al. (2018a), which is based on 1193 cooperative banks from Austria, Germany, Italy and Spain, however points to the contrary. That is, there is an inverted U-shaped relation between market power and stability, which supports the competition – fragility view up until a certain threshold level of market power/competition. The differential competition – stability relations across bank types are further uncovered by Liu & Wilson (2013) and Jeon & Lim (2013) for respectively the Japanese and Korean banking sectors.

The performance of a nascent but fast-growing Islamic banking sector under competition has received virtually no attention. This is surprising given the fact that it has assumed significant shares in several dual banking countries and hence the importance of re-looking into competition policies in a dual-banking system. To the best of our knowledge, Kabir & Worthington (2017) is perhaps the first study that undertakes a look at the competition – stability relation for the dual banking system. They draw bank-level samples from 16 dual banking countries from 2000 to 2012. Adopting panel vector autoregressions (PVAR) and panel quantile regressions, they conclude that (i) competition – fragility hypothesis describes both conventional and Islamic banks in these countries, (ii) the relation between market power and stability is stronger for conventional banks, and (iii) banks that are at the median level of stability tend to benefit most in term of risk reduction from market power.

Along this line of research, this paper focuses on a specific dual banking country, i.e. Malaysia. Given documented large cross – country variations in competition – stability relations, we believe that it would add further insights on the issue. In addition to our focus on Malaysia, we differ from Kabir & Worthington (2017) by considering various metrics of bank performance, namely bank profitability, capital holdings and risk. Further, we also assess the implications of Islamic banking presence on performance of conventional banks, as discussed next.

Along this line of research and reasoning, we focus on Malaysia’s dual banking system. We believe that answering the above questions would from the perspective of the dual banking system further add to our understanding on the competition – bank performance relation. Needless to state, the answers not only are important for Malaysia to ensure financial system soundness and strength but also serve as lessons to other countries having both Islamic and conventional banking systems.

Second, the paper assesses the implications of bank competition for various facets of bank performance and, at the same time, allows potential feedback effects among them. Existing studies on the issue, including Kabir & Worthington (2017), are mostly on one aspect of bank performance, e.g. either on bank risk or stability, profitability, costs of fund, lending, or capital holdings, and evaluate uni-directional effects of competition on these variables. In the present analysis, we consider three bank performance metrics, namely, profitability, capital holdings, and risk. Facing competition, banks take decisions regarding risk-taking strategies, profit maximization and capital holdings simultaneously.
and these decisions in turn may shape their market power (Clark et al., 2018a). That is, banks may take more risk to maximize profits and, at the same time, build up capital to cushion against potential losses. Conversely, profitable banks and better capitalized banks are likely to be in a better position to increase market shares and consequently enhance their market power. By allowing their feedback effects, our analysis would provide a more comprehensive look at the implications of changing banking competition and structure.

Third, the present paper forms a part of a growing list of studies on Islamic banking. The fast-growing Islamic banking sector and its alleged resilience during the global financial crisis has led to proliferation of studies on comparative performance and stability of Islamic banks vis-à-vis conventional banks leading some to recommend the Islamic banking system as a solution to the recurring financial instability. The studies on other contributive roles of Islamic banking remain scanty. In a recent study, Abedifar et al. (2016) document higher efficiency of conventional banks in the presence of large Islamic banks. Further, Meslier et al. (2017) suggest that conventional banks tend to set higher deposit rates when Islamic banking presence is strong. We contribute further by looking at the implications of Islamic banking presence on conventional banking market power, risk, profitability, and capital holdings.

As a preview, we find differences in the competition – performance relations between conventional banks and Islamic banks. For conventional banks, our results indicate that bank competition has a risk-mitigating effect, in line with the view that competition promotes bank stability. At the same time, it tends to lower bank profitability and capital holdings. As for Islamic banks, the results indicate positive impacts of market power on bank profitability while it does not seem to bear significant and robust implications on bank risk and capital holdings. We also find the benefits of Islamic banking presence in subduing conventional banks’ market power as well as enhancing the risk profile of conventional banks.

Methods

We employ an unbalanced panel dataset consisting of 37 commercial banks over the period 1997 to 2015. The sample includes all 16 Islamic banks and 21 of 27 conventional banks currently in operations. The 6 conventional banks excluded from the sample are recently incorporated foreign banks whose data are too scanty to be included in the sample. Data for the construction of competition measure and for the three bank performance variables (i.e. bank risk, profitability, and capital) are drawn from the Bankscope. To measure Islamic banking penetration, we source relevant data from Monthly Statistical Bulletin published by Bank Negara Malaysia (i.e. Malaysia’s Central Bank).

Our empirical analysis comprises bank competition, bank performance (profitability, capital, and risk), and Islamic banking penetration. Table 1 presents summary statistics of the variables under study together with their pairwise correlations. We use the Lerner index to measure the degree of bank competition, in line with many recent studies (Beck et al., 2013; Anginer et al., 2014; Kabir & Worthington, 2017).
Figure 1 depicts the evolution of bank competition since the Asian financial crisis, which is computed using the asset-weighted average of individual banks’ Lerner index. From the figure, three observations are notable. First, the consolidation exercise implemented after the 1997/1998 Asian financial crisis did increase the overall market power and the market power of conventional banks. However, with increasing penetration of Islamic banking especially after 2005, the overall banking sector and conventional banking sector have become more competitive. Second, it seems that the Islamic banking sector possesses higher market power in times of crisis, i.e. during 1997/1998 Asian financial crisis and 2008-2009 global financial crisis and after. Third, the market power of Islamic banking tends to behave more erratically, losing its market power during the conventional banking consolidation period and gaining market power during the crises. While its market power is higher than that of conventional banking sector in recent years, it has also become more competitive. With these changes in the competition landscape, it would be interesting to see how they shape banking performance and risk, the main focus of the present study.

As mentioned, we consider three bank-level performance indicators - profitability, capital holdings and bank risk. They are represented respectively by the return on average assets (ROAA), equity-to-asset ratio (EQA), and non-performing loans as a percentage of total loans (NPL). The ROAA captures the ability of a bank to generate profit from the utilization of its assets and it is considered the most common and direct measure of bank profitability (Athenasoglou et al., 2008; Garcia-Herrero et al., 2009; Tan, 2016). In the case of capital holdings, we use total equity relative to total assets and not to risk-weighted assets since the former is more closely related to bank stress (Acharya et al., 2014). Hogan (2015) further notes that the capital ratio is a better predictor of risk as compared to risk-based capital ratio. The NPL is an ex-post measure of credit risk.
We prefer NPL over another equally commonly used measure of bank risk or stability, namely the Z score, for several reasons. First, NPL is the primary driver of bank risk (Jimenez et al., 2013) and is a macro-prudential indicator of banking crises (Chang et al., 2008). Second, it is more closely related to the theoretical underpinnings of the issue at hand since it reflects both banks’ risk taking behaviour and the behaviour of the borrowers (Jimenez et al., 2013). Finally, given that we consider ROAA and EQA in the framework, the use of Z score may induce spurious correlations since it is computed based on ROAA and EQA.

Table 1. Summary Statistics and Correlations

(a) All Banks

| Variables | Summary Statistics | Correlations |
|-----------|--------------------|--------------|
|           | Mean | Std Dev | npl | roaa | eqa | lerner |
| npl       | 5.794 | 7.412 | 1.000 |
| roaa      | 0.979 | 1.102 | -0.260 | 1.000 |
| eqa       | 10.468 | 6.046 | 0.070 | 0.179 | 1.000 |
| lerner    | 0.404 | 0.109 | 0.091 | 0.405 | 0.153 | 1.000 |

(b) Islamic Banks

| Variables | Summary Statistics | Correlations |
|-----------|--------------------|--------------|
|           | Mean | Std Dev | npl | roaa | eqa | lerner |
| npl       | 4.301 | 5.148 | 1.000 |
| roaa      | 0.561 | 1.080 | -0.516 | 1.000 |
| eqa       | 8.424 | 3.883 | 0.109 | -0.032 | 1.000 |
| lerner    | 0.383 | 0.124 | 0.095 | 0.230 | -0.010 | 1.000 |

(c) Conventional Banks

| Variables | Summary Statistics | Correlations |
|-----------|--------------------|--------------|
|           | Mean | Std Dev | npl | roaa | eqa | lerner | dips |
| npl       | 6.376 | 8.058 | 1.000 |
| roaa      | 1.142 | 1.068 | -0.247 | 1.000 |
| eqa       | 11.266 | 6.536 | 0.032 | 0.173 | 1.000 |
| lerner    | 0.412 | 0.102 | 0.085 | 0.459 | 0.181 | 1.000 |
| dips      | 1.417 | 0.557 | -0.007 | -0.006 | 0.037 | -0.129 | 1.000 |

Descriptive statistics presented in Table 1 suggest that Islamic banks have better asset quality as reflected by lower credit risk. However, they are less profitable and hold less capital as compared to conventional banks. The pairwise correlation coefficients tend to be in line with the competition – stability view and the SCP hypothesis as reflected
by the positive correlations between competition and credit risk and between competition and profitability for both Islamic and conventional banks. Further, we may note that market power is positively correlated with capital for only conventional banks. We may also observe tighter correlations between risk and profitability and risk and capital for Islamic banks as compared to conventional banks. These correlations seem to provide indication supporting both competition – stability and competition – fragility views. While credit risk is related directly to market power, higher profitability and capital holdings in a less competitive market distance them from being insolvent.

As a measure of Islamic banking penetration, we employ the change in Islamic banking financing as a percentage of total banking financing. Abedifar et al. (2016) use the asset share of Islamic banks in their assessment of the roles of Islamic banks in funding mobilization, economic growth, inequality and poverty. Likewise, Lebdaoui & Wild (2016) use the asset share of Islamic banks in their analysis of financial development. Gheeraert (2014) and Imam & Kpodar (2014) employ three alternative measures of Islamic banking, the sizes of Islamic banking assets, financing and deposits relative to GDP. In our case, we use the change in Islamic banking financing as a percentage of total financing or credit to capture Islamic banking penetration for the following reasons. The measure better captures the importance of intermediation activities and is often linked to financial development. It is also more relevant to the issue of risk and return given the fact that financing is the main and traditional source of bank revenue and that it has direct implications on risk-taking and prudential strategies. Moreover, the credit market tends to be more relevant than the deposit market when it comes to the issue of bank competition (Clark et al, 2018a). Finally, the change in Islamic financing share captures the speed at which Islamic banking has penetrated the credit market, the aspect that we are interested in. In Table 1, we may see that the average change in Islamic financing share is 1.42, suggesting that the growth of Islamic financing is higher than the growth of total financing or of conventional credit. The correlation coefficients tend to suggest lower market power, lower risk and lower profitability of conventional banks with increasing presence of Islamic banking, though the correlations are marginal in the latter two cases.

To assess the impacts of market competition and Islamic banking penetration on bank performance and risk, we opt for a panel vector autoregression (PVAR) framework instead of the normally used dynamic panel modelling. As we argue above, competition (or Islamic bank penetration) would affect bank risk, profitability and prudential behaviour and it may endogenously respond to bank profit maximization and risk or prudential strategies. Moreover, the banking literature also highlights feedback effects among the three indicators of bank performance. For examples, facing lower loan quality, banks may suffer losses. They are also likely to build up capital to cushion against losses. In addition, given that capital is costly, banks may opt for high risk strategies to recover the costs of holding capitals. The risk – return trade-off that banks face also mean that they decide on profit and risk-taking strategies concurrently. On these bases, the PVAR is most appropriate since it treats all variables to be potentially endogenous and, at the same time, allows for unobserved individual heterogeneity (Love & Zicchino, 2006).
Consider the following PVAR model:

\[ y_{it} = \mu_i + A(L)y_{it} + \varepsilon_{it} \]  

where \( y_{it} \) is a \( k \times 1 \) vector of endogenous variables, \( \mu_i \) is individual fixed effects, \( A(L) \) is the lag operator, and \( \varepsilon_{it} \) is the standard error term. We set up two systems of endogenous variables to address our two objectives, namely, (i) the relations between market competition and bank performance measures and (ii) the implications of Islamic bank penetration on conventional bank performance. The first PVAR system includes risk, profitability, capitalization and competition and is estimated using the full sample and sub-samples of conventional banks and Islamic banks. The sub-sample analysis is to infer whether there are differences between Islamic and conventional banks. As for the second objective, we add a measure of Islamic bank penetration into the system but restrict our sample only to conventional banks.

In the implementation of the PVAR, we proceed in steps. First, we use the optimal moment and model selection criteria (MMSC) developed by Andrews & Lu (2001) to set the PVAR lag order. In line with Georgoutsos & Moratis (2017), we use the MMSC-Akaike Information Criterion (MAIC) for lag order selection since it works best in small samples. Once the PVAR lag order is set, the GMM-based estimator is used to estimate the model. Following Love & Zicchino (2006), we apply the Helmert transformation to filter out the individual fixed effects. By removing the forward mean, it preserves the orthogonality between the transformed variables and the lagged regressors and hence the lagged regressors can be used as instruments in the GMM estimation. Next, we examine whether the estimated model fulfils the stability condition.

Finally, based on the estimated PVAR, we simulate impulse-response functions as a basis of inferences. The shocks are identified recursively using the orderings (i) competition, capitalization, profitability and risk and (ii) Islamic bank penetration, competition, capitalization, profitability, and risk for the two PVAR systems. These orderings reflect our judgements on the relative endogenoneity of the variables, where the less endogenous (or more exogenous) variables are entered first in the orderings. Competition and market power is built over time and, thus, affected by bank performance with lags. We place capital before profitability and risk since bank capital is costly to adjust. We view credit risk to be most endogenous responding immediately to profit-maximization and capital holding strategies by banks. For the second PVAR system, we consider Islamic banking penetration to be least endogenous given the fact that the growth of Islamic banking in Malaysia has been driven mostly by government initiatives and policy directions.

**Result and Discussion**

**Islamic Banking Presence**

The rapid growth of Islamic banking in especially Malaysia and the Middle East and its penetration into even non-Muslim world coupled with its relative resilience during the global financial crisis have captivated much interest especially in its financial and economic contributions. Generally, the literature focusing on the financial and economic roles of
Islamic banking can be categorized into two strands. The first strand of the literature, which dominates the empirical Islamic banking research, performs comparative analyses of Islamic and conventional banking performance. The underlying view is that, if Islamic banking is found to be more efficient, more profitable and more stable, then Islamic banking would contribute positively to the well-functioning and stability of the financial system. The second strand of the literature, which begins to gain traction recently, makes direct assessments of the impacts of Islamic banking presence on such outcomes as financial deepening, economic development and even the behaviour of conventional banks. With still limited attention given to direct assessments on Islamic banking contributions to the economy, Ibrahim (2015) views that the research in this direction would be fruitful.

Few studies have evaluated the impacts of Islamic banking on financial and economic outcomes. Islamic banking has the potential to enhance financial inclusion since it has appeals to those who refrain from conventional banking services due to religious reasons (Demirguc-Kunt et al., 2014; Imam & Kpodar, 2016). Thus, the emergence and development of Islamic banking is expected to have positive effects on financial deepening and economic development. Gheeraert (2014) finds that Islamic banking contributes positively to banking sector development and exerts no crowding-out effect on conventional banking system. Lebdaoui & Wild (2016) further firms up the positive link between financial development and Islamic banking presence. Assessing Malaysian experience, Kassim (2016) documents positive effect of Islamic banking development on economic growth. Similar findings are provided by Gheeraert & Weill (2016) and Imam & Kpodar (2016) based on panel samples of many countries. Finally, Sukmana & Kassim (2010) examine the role of Islamic bank in monetary transmission mechanism and document evidence that the bank lending channel is at work even for Islamic Banks.

Both Abedifar et al. (2016) and Meslier et al. (2017) assess the impacts of Islamic banking presence on performance of conventional banks. According to Abedifar et al. (2016), conventional banks operating in predominantly Muslim countries tend to be more efficient especially when there are large Islamic banks. In a similar vein, Meslier et al. (2017) suggest that conventional banks tend to set higher deposit rates in countries with a strong presence of Islamic banks. Taking the leads from these studies, we analyse further whether the presence of Islamic banking affects profitability, capital holdings and risk of conventional banks. The issue is particularly relevant given the fact that a key feature underlying structural changes in Malaysia is the increasing significance of Islamic banking.

**Competition and Bank Performance**

We estimate the PVAR of order 1 for all banks, conventional banks and Islamic banks, which is selected based on the MAIC from the MSMC developed by Andrews & Lu (2001) as reported in Table 2. The stability of the estimated PVAR models are verified in Figure 2, where the moduli of the eigenvalues lie within the unit circle. Accordingly, we generate and plot the impulse-response functions with 90% confidence intervals generated by 1000 Monte-Carlo iterations. These are presented in Figure 3.
The results in panel (a), which are based on the full sample, clearly indicate the central role of bank competition or bank market power on all considered bank performance indicators. As can be seen in the last row of Figure 3, following one-standard deviation shock in the Lerner index, all bank performance measures (risk, profitability and capitalization) respond positively and significantly. We further note that the positive response of the non-performing loans is quite persistent. These results seem to be in line with both competition – stability and competition – fragility views along the line suggested by Berger et al. (2009) and indicate potential risk-return trade-off as competition landscape changes. That is, facing competition, banks tend to have lower credit risk but they are less profitable and become less capitalized. The concern, thus, is that they would have less ability to cushion against for example liquidity shocks under a competitive environment.

Table 2. Lag-Order Selection Statistics of PVAR – npl roaa eqa lerner

| Lag | All Banks | Conventional Banks | Islamic Banks |
|-----|-----------|---------------------|--------------|
|     | CD        | MAIC                | CD           | MAIC        | CD    | MAIC  |
| 1   | 0.984     | -51.710             | 0.986        | -53.201     | 0.999 | -43.586 |
| 2   | 0.988     | -38.798             | 0.990        | -39.632     | 0.999 | -35.412 |
| 3   | 0.986     | -19.693             | 0.982        | -25.452     | 0.998 | -21.459 |

The results also indicate that there are no feedbacks from risk, profitability and capitalization to bank competition (see the last columns Figure 3, panel(a)). Looking at the interactions among bank performance indicators, we observe the significance of profitability in improving credit risk and of bank capital in influencing positively bank profitability. We may also observe that credit risk tends to drain bank capital and more profitable banks are likely to hold less capital.

Figure 2. Stability Condition of PVAR System (npl roaa eqa lerner)

The competition – bank performance nexus for conventional banks, plotted in Figure 3 panel (b), mirrors well the results for all banks. Looking at only Islamic banks, however, we document a weak link between competition and bank performance (Figure 3, panel (c)). While Islamic banking market power tends to exert positive effect on Islamic
banking profitability, it does not seem to bear significant implications for credit risk and capital holdings. Like the cases of all banks and conventional banks, Islamic banking performance does not shape the market power. Thus, for Islamic banks, the evidence seems to be in line with the SCP hypothesis that market power makes banks to be more profitable. In other words, Islamic banks will be less profitable under competitive conditions. At the same time, they will not be less risky or less prudent by holding lower capital. As for the interactions among bank performance measures, we observe similar findings as in the case of conventional banks except for the impact of capital on bank risk. Namely, better capitalized Islamic banks tend to take more risk while better capitalized conventional banks do not seem to experience changes in credit risk.

We subject the results to several robustness checks by estimating four additional PVAR models for each case— all banks, conventional banks, and Islamic banks. The first model includes the Asian Financial Crisis and Global Financial Crisis dummies as exogenous factors. The other three PVAR models add alternatively bank size, real GDP growth and financial market development. The inclusion of bank size is to control for “too-big-to-fail” notion or economies of scale and its implications on bank performance and market power (Kabir & Worthington, 2017).

It is represented by the natural logarithm of total assets. Meanwhile, as in Love and Turk Ariss (2014), we add into the system real GDP growth to control for the business cycle and capture macro-financial linkages. Finally, the addition of financial market development, measured by credit to the private sector as a ratio of GDP, is to capture the view that banks will be better in managing risk under a more developed financial market.

Figure 3. Impulse-Response Functions of PVAR System (npl roaa eqa lerner)

(a) All Banks
Given our interest in the impacts of market competition or market power on bank performance and the differences between conventional and Islamic banks, we report only the responses of risk, profitability and capital holdings to impulses in the Lerner index for the two types of banks. These are presented in Figure 4. The results overwhelmingly
add credence to our conclusion. Namely, the competition – stability and competition – fragility views tend to describe the conventional banks. Meanwhile, in line with the SCP hypothesis, competition seems to impact only profitability for the case Islamic banks. Our results do not totally contradict the finding by Kabir & Worthington (2017) supporting the competition – fragility relation for the dual banking countries. Although we find the reduction in bank risk under a competitive environment, banks tend to experience lower profitability and hold less capitals. Moreover, in line with Kabir & Worthington (2017), the link between competition and Islamic bank performance is weak. Indeed, a closer look at Kabir & Worthington’s (2017) impulse-response functions for Islamic banks reveals that there is no significant link between competition and bank risk.

**Figure 4. Responses of Bank Performance Indicators to Competition – Robustness**

(a) Including AFC and GFC as exogenous factors

(b) Including Bank Size (Natural Log of Total Asset)
(c) Including GDP Growth

(d) Including Financial Development (Credit to GDP Ratio)
Islamic Bank Penetration and Conventional Banks

We repeat similar steps as above to assess the implications of Islamic bank penetration on the performance of conventional banks. As mentioned, in this case, we restrict the sample to only conventional banks and include the change in Islamic bank financing share to form a five-variable PVAR system consisting of Islamic banking market share (dibs), competition (lerner), capital (eqa), profitability (roaa), and risk (npl). The estimated PVAR model of order 1 as selected by MAIC criterion fulfils the stability condition, as shown in Figure 5. Accordingly, we simulate the impulse-response functions and present them in Figure 6.

The interactions among the four conventional bank-related variables (risk, profitability, capitalization, and competition) mirror well the earlier results. Particularly, we may observe the significant increases in non-performing loans and profitability following a positive shock in the Lerner index or market power. We also find for a sample of conventional banks the risk-mitigating effect of bank profitability and profit-enhancing effect of bank capital. Thus, the more profitable banks tend to be more conservative and
hence take less risk and better capitalized banks are more profitable. Finally, the results also indicate non-responsiveness of market power/competition to bank risk, profitability and capitalization as documented previously.

**Figure 6** Impulse-Response Functions of PVAR system (dibs lerner eqa roaa npl)

Collaborating evidence in Abedifar et al. (2016), Islamic bank penetration does affect conventional banks. As can be observed in the last row of Figure 6, increasing Islamic bank penetration subdues the market power of conventional banks and, at the same time, improves their credit risk. Following a one standard deviation shock in Islamic bank penetration, the non-performing loans as a ratio of gross loans increase initially but then decline at later horizons. Perhaps, facing competitive pressure from the Islamic banking sector, conventional banks become more prudent in their risk undertakings. The penetration of Islamic banking, however, seems to have an immediate positive impact on bank capital but exert a lagged negative effect on profitability of conventional banks. Abedifar et al. (2016) find that the presence of large Islamic banks make conventional banks to be more efficient. Our finding based on the Malaysian banking industry indicates that conventional banks are able to manage risk and hold more capital, although at the expense of lower profitability, when facing stronger presence of Islamic banking.
Figure 7. Responses of Conventional Bank Performance Indicators to Competition and Islamic Banking Penetration - Robustness

(a) Including AFC and GFC as exogenous factors

(b) Including Bank Size (Natural Log of Total Asset)

(c) Including GDP Growth
Notes: the shocks are identified using Choleski decomposition with the following ordering: x dibs lerner, eqa, roaa, and npl, where x is the added endogenous variable. The 90% confidence intervals are computed using Monte-Carlo with 1000 repetitions.

We also note the importance of conventional banking conditions in influencing Islamic banking penetration. This is not surprising given that 11 of Islamic banks currently in operations are subsidiaries of conventional banks. From the last column of Figure 6, a positive shock to conventional bank credit risk leads to larger penetration of Islamic banking while profitability and market power of conventional banks tend to suppress expansion of Islamic bank financing share. These are intuitive. The high credit risk of conventional banks may have slowed down their lending activities and paved way for higher market share of Islamic financing. Moreover, their Islamic bank subsidiaries may assume more intermediary role. However, in case that conventional banks are more profitable, then business activities would be better kept within the conventional wing. Finally, the market power of conventional banks can be a deterrent to greater penetration of Islamic banking.

We subject these results to robustness checks by expanding the PVAR model to include the crisis dummies and then alternatively bank size, GDP growth and financial development. The impulse-response functions presented in Figure 7 paint similar pictures on the implications of bank competition on conventional bank risk, profitability and capital holdings. Meanwhile, the above-noted findings on the effects Islamic banking penetration on conventional bank performance are further substantiated in most cases.

Conclusion

The restructuring exercise of Malaysia’s banking industry in the aftermath of the Asian financial crisis has been characterized by consolidation of conventional banking sector and penetration of Islamic banking. This paper analyses whether the changing competition landscape has affected bank risk, profitability and capital and whether increasing Islamic bank penetration has affected conventional banks. The results based on
all banks and conventional banks indicate that market competition has a risk-mitigating effect, in line with the competition – stability view. In addition, market competition lowers bank profitability and bank capital. When we confine the sample to only Islamic banks, we find only limited link between competition and Islamic bank performance. Namely, for Islamic banks, competition only impacts bank profitability in line with the SCP paradigm. These results are robust to additions of crisis dummies, bank size, real GDP growth and financial market development into the analysis. Finally, we further find that the penetration of Islamic banking has subdued market power as well as lead to a better risk profile of conventional banks.

These results have important implications or lessons. In the process of banking consolidation, government authorities should encourage bank competition as a way to curb credit risk. Indeed, in a dual banking system, the Islamic banking sector can be a competitive force that would lower the credit risk of a more dominant conventional banks. Still, given lower profitability and capital under a more competitive environment, the authorities should remain cautious of banks’ insolvency risk in the face of adverse exogenous shocks. Policymakers should look at both competition policies and capital regulation to promote resilience of the dual-banking system. At the same time, the further development of Islamic banking should be encouraged.

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