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Islamic Versus Conventional Banking: An Insight into the Malaysian Dual Banking System

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**Zeeshan Khan[2]** ✉ iD
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Abstract

This research aims at examining to match the performance of both Malaysian Islamic and conventional banking through profitability, efficiency, solvency and liquidity and risk management ratios using independent t-test and discriminant regression models. Fifteen financial ratios are applied to examine the competitiveness of the both industries created on the financial data of ten Malaysian banks, five from both industries, over the period of six financial years (2009-2015). According to the independent t-test descriptive statistics, the result finds that conventional banks perform well than Islamic banks in the context profitability and efficacy ratios. Nevertheless, in terms of solvency and liquidity & risk management ratios Islamic banks outperform conventional banks operating in Malaysia. Further, it has been revealed by the disciriminant analysis that in general conventional banks execute well than Islamic banks operating in Malaysia when it comes to the profitability, solvency, efficiency and liquidity & risk management ratios.

Contents

1. Introduction

Islamic finance in the Middle East and especially in the Southeast Asian economies has now converted an important component in their societies' development. The flexibility of the Islamic financial system to the worldwide financial catastrophe and the comparative growth of oil wealth in the Middle East allowed the Islamic financial industry to develop with an extraordinary growth rate (Masood *et al.*, 2011). Islamic banks emerged relatively unharmed from the initial banking collapse as they are not permitted to contract in mortgage-backed securities or credit default swaps, two of the main practices behind the financial crisis (Alzalabani and Nair, 2012). According to the president of Islamic Development Bank (IDB), Ahmad Mohammad Ali, the total assets of Islamic financial industry are expected to exceed $1.5 trillion by 2012 (IDB Seeks New Economic Order, 2011). As a result of these advancements, Asia in particular is expected to remain as the world's fastest growing region over the ongoing decade. According to IMF world economic outlook report (2011) the region is expected to generate one third of the world's output by 2015.

Malaysia's extensive track record of, straddling over thirty years, emerging Islamic financial industry empowered the country to offer compact basics for the anew evolving sector. Malaysia initiated its Islamic banking operations by the founding of Bank Islam Malaysia Berhad (BIMB) in 1983. As a result of its outstanding performance, BIMB soon floated on the Malaysian stock exchange in 1992 (Yahya *et al.*, 2012). In order to meet the short-term investment necessities of Islamic banking that are based on Shariah principles, the Islamic Inter-bank Money Market (IIMM) was introduced in 1994 which resulted in the formation of another Islamic bank, Bank Muamalat Malaysia Berhad (BMMB). At present there are 40 financial instruments which are being used for Islamic based financial intermediation. Amongst them are: Musyarakah (partnership), Mudarabah (profit sharing), Bai' Bithaman Ajil (deferred payment sale), Wadiah Yad Dhamanah (savings with guarantee), Ijarah (leasing), Ijarah Thummah Al-Bai, Murabahah (cost plus) and Qardul Hasan (benevolent loan). These instruments are analogous to conventional banks instruments but with adherence to Shariah's principles (Yahya *et al.*, 2012).

As a result of these efforts, at present the Malaysia Islamic banking sector has extended from 6% to 22% of the overall Malaysian banking sector while the Sukuk (Islamic bonds) market accounts for 55% of the debt securities market. As a result Malaysia has appeared as a prominent international hub for Islamic finance. Malaysia being the world's largest Sukuk market and a leading Islamic equity, Islamic funds management and Islamic banking and takaful (insurance) market, is home to most of the key international financial groups that offer Islamic financial products and services. Moreover, the modifications in the guiding infrastructure, it has been assessed, as an effect of Malaysian economy changeover into great value added income economy, there is a massive prospective bazaar for Islamic based financial products and services. It has been forecasted (see figure 1.1) that financing based on Islamic principles would grow to account for 40% of total financing in 2020 (BNM Financial Sector Blueprint, 2011-2020). The Malaysian Islamic banking model has been recognised by many Muslim countries as a perfect model and many countries have started working to develop similar model (Mokhtar *et al.*, 2008).

Parallel to Islamic financial industry a robust conventional financial industry exists in Malaysia which has a catalyst role in the economic development of Malaysia and of course it enjoys several advantages over Islamic banks in Malaysia i.e. it has a relative long history and experience, wider presence, more avenues for investments and much more developed technologies and human resource etc. The methods of processes of Islamic and conventional banks differ considerably. The conventional banks operate on the basis of pre-fixed interest rate whilst Islamic banking is based on profit and loss sharing. According to the Malaysian Islamic Banking Act 1983 (276) Islamic banking business objectives and operation should not mix elements that are prohibited in Islam. In other words, it is a system that is entirely value based that purposes at confirming moral and material welfare of individual and society as a whole (Yahya *et al.*, 2012) more precisely actions that include gambling (maisir) interest (riba) and speculative activities (gharar) which are strictly prohibited in Islam. Islamic banking is being guided by the principles of Shariah (Islamic Law) where Shariah prohibit dealing in interest (Riba). Moreover, Shariah also prohibits trading in financial risks such as financial speculations like the one engineered by Collateral Debt Obligation (CDOs). On the contrary, conventional banks make profit by attracting deposits from customers at a lower price while resell them (in the form of debt) to entrepreneurs at higher prices. Thus, both industries are based on two different paradigms where interest is the bedrock of one industry (conventional banks) while another completely negates it.

1.1. Islamic Banks and Financial Recession

The world is still struggling to get out of the recession, on the contrary Islamic banking is accomplishing reputation in developing as well as developed economies as it strengthened financial institutions evade the wickedest of the economic collapse (Alzalabani and Nair, 2012). As irresponsible banking practices, prevalent in the conventional industry, turned out to be the sole cause for bringing about the global financial crisis, as a result there has been a growing interest for Islamic based financing. However, a question is always being discussed among financial analysts that the global financial crisis caused by housing bubbles and subprime credit disaster in the US could have been avoided had the Islamic finance framework in place. In response to this question, Masud (2009) argues that Islamic finance would have resisted the sub-prime crisis leading to the global economic recession because the very establishing spirit of Islamic finance is anti-speculations. Besides, Islamic finance explicitly negates dealing in usury or charging interest for the usage of money, investing in speculative financial produces such as definite derivatives and engaging in businesses, products and services that are prohibited in Islam. Most importantly Islamic banking emphasise in profit and loss sharing, thus it is very unlikely that a situation like Northern Rock and RBS might happen where government of UK had to bailout both banks for not having sufficient liquidity to meet their customers' deposits claims. It is because under the Islamic law (Shariah) lending money to make money is prohibited as well as debt cannot be taken lacking collateral or asset baking.

The major factor behind the achievement of Islamic banking is that all its products and services are being backed by real assets different conventional banking where securitization of the assets are in vague (Alzalabani and Nair, 2012). On the contrary, Islamic banking does not create value without real assets which makes Islamic banking

resilient to any potential financial crisis. It is through this structure that Al Rajhi bank, which is one the largest Saudi banks, operated exceptionally well during the beginning of the recessionary period compared to any other banks globally. Total assets of the bank (Al Rajhi) increased by 18% to SAR 124.9 billion (USD 33.2billion) during 2007 and grew by another 31% during the first three quarters of 2008 (Standard and Poor, 2008). Conventional banks, on the other side, have made considerable losses on personal loans in the ongoing financial recession as a result of their loans not had been backed by real assets. Thus, hundreds of customers had been defaulted on their repayments obligations while the conventional banks had nothing to recover their deficits from. This is apparent from latest financial crisis which triggered by the subprime mortgage disaster recorded as an exceptional in the history, which cost the UK and the US in specific, about $11.9 trillion (IMF Put Total Cost of Crisis at 7.1 Trillion, 2009). Looking the gauge of the catastrophe, which is a fifth of the whole global productivity, makes everybody i.e. government, standard setters, economic think tanks and individual to discover the way frontward for structural modifications in the conventional banking sector.

2. Literature Review

A huge literature is existent aimed at investigating the financial soundness of both conventional banks (CB) and Islamic banks (IB). In the Malaysian context the literature can be categorized into two parts. The first part of study focus on the performance of Islamic banks over a certain time period and then investigating whether they show refining performance (Samad and Hassan, 1999). The second part consists of comparing the performance of Islamic banks with conventional banks both at specific time using time series analysis.

On the basis of Profitability and Solvency, according to the recent findings of Masruki et al. (2011); Zoubi and Olson (2008) suggest that CBs are more profitable, but IBs are more liquid than CBs. Moreover, they found that CBs are more susceptible towards credit risks and insolvency as compared to IBs. Similarly, on the basis of service quality the findings of Ahmad et al. (2010); Haron and Azmi (2008); Chazi and Syed (2010); Samad and Hassan (1999); Echchabi and Olaniyi (2012) and Dusuki and Abdullah (2007) argued that the scale of the relationship between service quality and customers satisfaction is more in IBs than matched to CBs. In contrast, Tafri et al., findings suggest that risk management tools of IBs are inadequate as compared to CBs.

Moreover, the findings of Mokhtar *et al.* (2008) suggest that the performance of IBs were far better than the Islamic windows. Though, the efficacy level of IBs was still less effective than that of full-fledged CBs. Similarly, Johnes *et al.* (2010) argued that IBs are less cost efficient and more revenue and profit efficient than conventional banks operating in the GCC region. They further argue that gross efficiency is significantly higher in among CBs compared to IBs.

According to the findings of Rosly and Bakar (2003) which argued that the performance of IBS and BIMB is less convincing compared to conventional banks. Moreover, Johnes *et al.* (2010) argue that IBs products and services need to be more innovative and yet customised according to the operating region in order to gain wider acceptance. In contrast, the findings of Samad (2004) revealed that in terms of profitability, measured by ROA and ROE, there exists no difference between IBs and CBs performance. However, he argues that credit performance of IBs is far better than their counterparts CBs. This is mainly because IBs are much liquid as a result of their cautious approach towards credit advancement. Besides, IBs credit advancement is also limited by various factors such as Shariah which prohibits investments in un-Islamic avenues including gambling, pornography, alcohol and other associated projects. Furthermore, being new entrants in the market, IBs cannot afford to sustain losses and dent the general repute of Islamic banking system.

3. Data and Research Methodology

This empirical research undertakes to assess the performance of conventional and Islamic banks in Malaysia in terms of profitability, efficiency, solvency and risk and liquidity management on the bases of financial ratios. The evaluations of these four types of financial ratios would give indications whether Islamic banking industry in Malaysia has established itself to compete with its counterpart conventional banking industry in Malaysia as well as to assess whether Islamic banking industry has the capability to withstand financial recession and similar financial shocks. In order to undertake this assignment, a total of 10 banks have been selected containing five banks from each industry. This study mainly relies on data that will be retrieved from selected banks' annual reports for the fifteen financial ratios. Though there are 16 conventional banks in total but majority of the banks have recently entered the banks, thus, only six of them have been filtered out. The data used in this research is collected over the period of 2009 to 2015.

Though there are 16 Islamic banks (see figure 3.1) and 18 (local and foreign) conventional banks in Malaysia but only five banks have been selected from either industry (see table 3.1). The banks selection criteria from either industry were based on a number of variables to ensure that we have equal research sample for the intended research. This includes the selection of those banks from either industry that have almost equal assets, market capitalisation and operational bases; while also looking into the availability of data for the selected period.

3.1. Hypothesis

H_0: There exist is no substantial variation concerning the performance of jointly conventional banks and Islamic banks in Malaysia.

According to the different methodologies used in the literature in the context of Malaysian dual banking system, financial ratios seem to be widely used indicators for measuring the financial performance of IBs and CBs as well as other financial institutions. It is because; ratios analyses remove the disparities in size, if existent in the sample, and bring them at par. Thus, it further asserts the reliability of financial ratios to be used for comparing financial entities. However, the literature reveals that only limited statistical tools have been used (in the Malaysian banking context) to

analyse financial ratios, therefore, the aid of MDA analysis through this research work will prove to be much more appropriate to discriminate significantly between IBs and CBs.

4. Results and Discussions
4.1. Descriptive Statistics
Rendering to the descriptive statistics results (check table 4.1) the mean for ROA transmits a positive value for both conventional and Islamic banks. However, the mean for CBs (.01) is larger than the means (.00) for IBs but the relationship is not statistically significant as having p-value of .266. On the contrary, ROE results in a relatively larger mean (.27) for IBs as compared to a mean (.11) for CBs but again the relationship is not statistically significant (p-value .316). OMR, another probability ratio, also has a higher mean (21.81) for IBs compared to the mean (.29) for CBs however carries no statistical significance. ROD on the other side has an equal mean (.01) for both IBs and CBs but is not statistically significant. However, IEE, which is the last of the five profitability ratios, shows a higher mean (.038) for CBs than the mean (.002) for IBs and also statistically significant at the 99% confidence level (p-value .000). This shows that in general, conventional banks appear to be more profitable than Islamic banks in Malaysia. However, these results are inconsistent with the results of Zoubi and Olson (2008) who argue that IBs are extra profitable than CBs in the GCC region. But the results are reliable with the results of Masruki *et al.* (2011) who contend that CBs are more profitable than IBs in Malaysia. The profitability of CBs can also be refers to some other factors prevalent in the Malaysian conventional banking industry i.e. a comparative strong network, greater market stake, human resource capital and economy of scale.

In order to measure how efficiently both Islamic and conventional banks perform in Malaysia four efficiency ratios have been statistically measured. The first ratios OEA, which measures operating expense in relation to total assets, yields a higher mean (.01) for CBs than compared to a mean (.00) for IBs and the relationship is also statistically significant at the 99% confidence level (.000). This specifies that CBs incurs more expenses in order to generate profit from its existing assets than its counterpart Islamic banks. On the other hand, OIA, which measures operating income in relation to total assets, results in equal mean (.01) for both Islamic and conventional banks but the relationship is not statistically significant. Similarly, OER, which measures operating expense in relation to operating income, results in considerably higher mean (.49) for IBs than compared to a mean (.27) for CBs but again the relationship is not statistically significant. However, the last of the four efficiency ratios ATO, which measures interest/commission income in relation to total assets, results in higher mean (.04) for CBs than the mean (.00) for IBs while the relationship is also statistically significant. It shows that CBs efficiency use its available funds to attract more revenue than its counterpart IBs in Malaysia. Thus, it can be argued that CBs are relatively more efficient in terms of using shareholders and customers funds than their counterpart IBs in Malaysia. The obtained outcomes are reliable with the conclusions of Sufian (2007) and Mokhtar *et al.* (2008) who argue that IBs are not that efficient in association with conventional banks operational in Malaysia.

Examining the solvency of both Islamic and conventional banks in Malaysia two ratios i.e. PEA, which measures provision for loan losses against total loans and advance, and WRL, which measures actual bad debts against total loans and advances, have been statistically measured. PEA results in a relative higher mean (.012) for IBs than the mean (.007) for CBS but the relationship is not statistically significant. However, WRL yields a higher mean (.009) for CBs than the mean (.001) for IBs and the relationship is also statistically significant at 99% confidence level (p-value .000). This shows that CBs maintains less provision against loans and advances as compared to IBs but incurs more losses in the form of bad debts on its loans and advances than compared to IBs. This puts CBs at relative disadvantage in terms of solvency than compared to IBs which seems more solvent. These outcomes are supporting with the results of Masruki *et al.* (2011) who contend that according to the risk and solvency analysis CBs are much more susceptible towards credit risks and insolvency compared to IBs in Malaysia. This can, therefore, be contributed to the prevailing facts that IBs are found to be more resistant to financial recession than CBs (Masood *et al.*, 2011).

Further, to measure the level of liquidity and risk management of both Islamic and conventional banks, four ratios i.e. CTA, CTD, LTD and TLE have statistically been measured. The CTA, which measures the level of cash against total assets, results in higher mean (.26) for IBs than the mean (.14) for CBs while the relationship is also statistically significant at 99% confidence level (p-value .000). This shows that IBs are more liquid to withstand any potential financial shocks than CBs. Similarly, CTD, which measure cash against total customer deposits, also results in higher mean (.29) for IBs than compared to the mean (.19) for CBs and the relationship is again statistically significant at 99% confidence level (p-value .000). This further proves that IBs maintain adequate level of liquidity to meet future contingency than CBs operating in Malaysia. Besides, LTD, which measures the level of total deposits embedded into non-liquid assets, results in higher mean (.78) for CBs than the mean (.61) for IBs and the relationship is also statistically significant at 99% confidence level (p-value .000). This reaffirms that CBs has concentrated high amount of liquid cash into non-liquid assets compared to IBs, which expose CBs to a high level of liquidity risk. Finally, TLE, which measure total liabilities in relations to shareholders' equity, results in higher mean (11.54) for CBs than compared to a mean (10.46) for IBs, however, the relationship is not statistically significant (p-value .660). These results are supporting the early results of Chazi and Syed (2010) and Samad and Hassan (1999) who contend that IBs maintain better capital ratio to deal with any potential financial shocks than their counterparts conventional banks, thus IBs are less risky and more solvent. However, Tafri *et al.* (2011) argue that risk management tools of IBs are inadequate compared to CBs in Malaysia.

4.2. Discriminant Analysis
Wilks' Lambda model is applied to examine to check that whether independent variables estimated are correct to separate the performance of Islamic and conventional banks operating in Malaysia. The data in the subsequent table (4.2) depicts that the p-value is significant at 99% confidence level i.e. the independent variables are adequate to differentiate variable y. The p-value (.000) is also supporting the designed hypotheses and found that H_0 is overruled

and H_1 is accepted due to the value of significance level which is less than <95%. This indicates that significant levels of variances exist in the performance of conventional and Islamic banks operating in Malaysia built on their financial ratios. Moreover, the Chi-square (189.972) value that is high enough to demonstrate that discriminant analysis can be applied to differentiate between the two industries.

The test depicts (see table 4.3) there are only four variables (ATO, IEE, LTD and WRL) that significantly distinguishing conventional and Islamic banks included in the sample. The test more discloses that the statistic value (.042) for ATO is the maximum ratio amongst variables discriminating the performance of the two groups or industries.

To support the outcomes from stepwise test, a summary of discriminant function is applied. This will also benefit us to know the impact value of those four variables to the variable y (4.4). The following table displays the value of canonical correlation which is 98.4%. It shows that there is 98.4% impact en route for variable y from the four mentioned variables. it further strengthen the preceding stepwise test that those four variables highly influence the performance of conventional and Islamic banks in Malaysia and is valid measuring scales to differentiate between the position of the two industries.

Likewise the resulting table (4.5) indicates a discriminant function that is collected from all of the steps in discriminant analysis being in the research. On the basis of this function it can be examined that variables that have a greater value if coefficient would show a positive relationship to the performance of Islamic and conventional banks while variables with lower or minus values of coefficients would reveal a negative relationship. According to the table ATO has the highest positive value of 156.105 while WRL has the highest negative value of -69.605. Discriminants function results are as follows:

$$Z \text{ scores} = -7.113 + 136.603_{IEE} + 156.105_{ATO} - 69.605 WRL + 1.953_{LTD}$$

The using of the Z score above would enable us to know which industry performance can be classified as improved performance or vice versa. Function at group centroid (see table 4.6) will be applied to make a cut off value to differentiate it.

The table (4.6) of function at group centroid below indicates the cut off value is 0 as the function both groups (conventional/Islamic banks) have same number i.e. 5.333 for group 0 (Islamic banks) and 5.33 for group 1 (conventional banks). Using cut-off value as the midpoint we can determine that a group which has a Z score above zero will be classified as an industry that has good performance while if a group has a Z score below 0 (zero) will be classified as an industry which is not good enough.

Further, Predicted group membership test are used to verify the results of Z Scores and to examine the reliability of the discriminant analysis. The outcomes indicates (see table 4.7) that the predicted value of 83.9% means that the actual number is 84% suitably classified after it has been tested with the recognized discriminant function. It shows the results obtained from this research using discriminant function are applicable and suitable for this research.

5. Conclusion

The performance of Islamic banking industry is concluded to be diverse in terms of profitability and managerial efficiency associated to conventional banking industry. Rendering to the descriptive statistics outcomes, the comparative higher mean of ROA, OMR and ROD for conventional banks, although not statistically significant, is revealing the fact that conventional banks outperform Islamic banks in terms of profitability. It is evident by the higher mean of IEE for CBs than IBs and the relationship is also statistically significant. This shows that CBs has invested their funds in profitable avenues which results in higher return compared to the expenses they incur. However, ROE carries greater mean for IBs than CBs but the relationship is not statistically significant. This supports the outcomes of Masruki *et al.* (2011) who finds that CBs are more profitable than IBs operating in Malaysia. Similarly, looking into the efficiency ratios' statistics of both industries, it is again evident that CBs exhibit greater efficiency than IBs. The relative higher mean of OEA with statistical significance for CBs indicate that although CBs are profitable but yet incur more cost than their counterpart IBs. The subsequent ratios OIA and OER exhibit no statistical significance although they have lower means for CBs than IBs. However, ATO results in higher mean for CBs than IBs with statistical significance. Thus, it can be argued in the context of efficiency ratios that CBs are relatively more efficient than IBs in using shareholders and customers' funds to result in higher profit. These results also support the findings of Sufian (2007) and Mokhtar *et al.* (2008) who argue that IBs are less proficient than compared to their counterpart conventional banks operating in Malaysia.

While looking the solvency ratios, it has been found that IBs are more solvent than CBs operating in Malaysia. This is well evident from the relative higher mean of WRL for CBs than IBs with statistical significance. This shows that CBs result in higher non-performing loan than compared to IBs. Moreover, PEA, which measures the level of provision for loan losses, carries smaller mean for CBs than compared to IBs but does not show statistical significance. However, it can be still argued that IBs are more solvent than CBs by maintaining an adequate level of provision against potential loan losses. In addition to this, IBs also seem to be making prudent financing decisions which results in minimal non-performing loans than that of CBs. These results, in terms of solvency, support the outcomes of Masruki *et al.* (2011) who finds that according to the risk and solvency analysis CBs are much more susceptible towards credit risks and insolvency compared to IBs in Malaysia. In order to evaluate the liquidity and risk management of both industries, CTA and CTD, which measure the level of cash against total assets and cash against customers' deposits respectively, carry higher mean for IBs than CBs with statistical significance. The significance of both ratios is indicative of the fact that IBs maintain an adequate level of liquidity to meet any financial contingency. Moreover, LTD, which measures the level of total deposits embedded into non-liquid assets, results in higher mean for CBs than compared to IBs while also exhibits statistical significance. This reaffirms that CBs has concentrated considerable amount of liquid cash into non-liquid assets compared to IBs, thus increasing its risk exposure considerably.

Further, the outcomes attained by using discriminant analysis supporting that conventional banks perform well than Islamic banks in Malaysia based on profitability, efficiency, solvency and liquidity and risk management. The

result of discriminant analysis shows that conventional industry is still a vibrant sector in the Malaysian dual banking market. However, the descriptive statistics have us to believe that the operations of conventional banking sector are much more vulnerable to financial shocks as compared to the IBs operations. These views are being supported by various researchers such as Sufian (2007); Mokhtar *et al.* (2008) and Yahya *et al.* (2012). Moreover, Islamic banking industry in Malaysia is indeed the fastest growing sector which succeeded in acquiring an asset base of USD 65.5 billion having Mean growth rate of 15-20% annually. The industry has extended from 6% to 22% of the overall Malaysian banking sector while the Sukuk market accounts for 55% of the debt securities market making Malaysia the biggest secondary market for Islamic based financial instruments (BNM Financial Sector Blueprint, 2011-2020).

As far the resilience to financial recession of both industries concern, it can well be argued from the descriptive statistics findings that Islamic banking seems to be more resilient to financial recession compared to conventional banking sector. This is well obvious from solvency and liquidity ratios of Islamic banking with statistical significance which shows that in the event of financial turmoil Islamic banking will be solvent enough to meet its payment obligations. Islamic banks have prudent risk management tools in place to combat eventualities. The findings re-establish the prevalent claims that Islamic banking has the capability to withstand financial recession than compared to its counterpart conventional banking. Looking to the overall descriptive statistics results in relation to previous research work, it can be argued that although IBs seem to be less profitable than CBs but yet they consistently demonstrate improved enactment in-terms of solvency, liquidity and risk management techniques. However, not everything goes smooth for Islamic banking i.e. it has its own problems to cope with. Most importantly the problems include excess liquidity, scarce human capital, lack of geographic diversification and the unavailability of vibrant secondary market for the trading of Islamic based financial instruments.

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Appendix-I
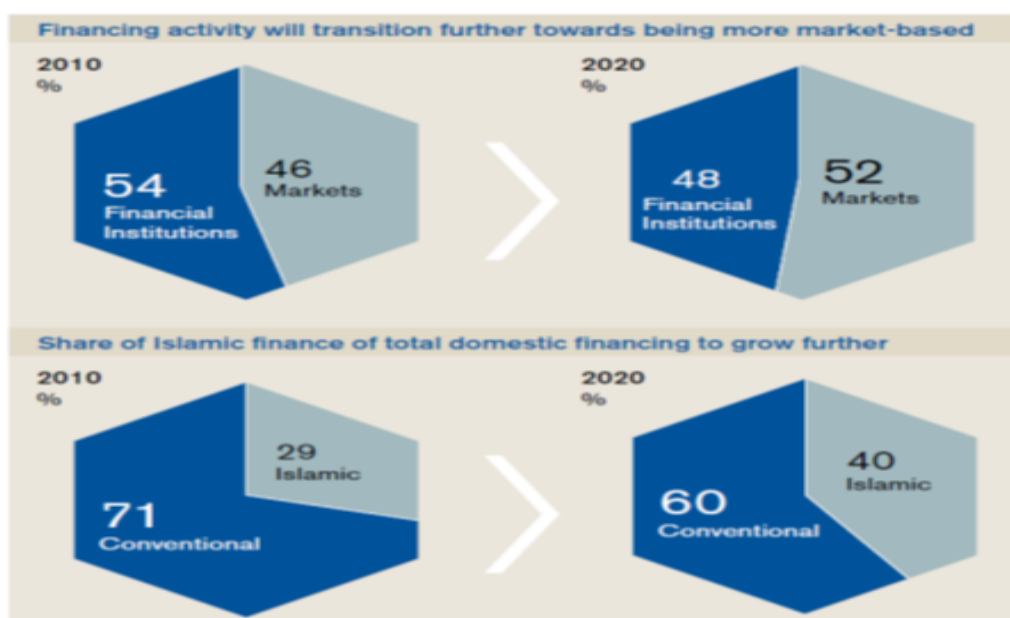
[1]**Figure-1.1.** Expected growth rate of Malaysia's financial market in 2020
Source: BNM, financial sector blueprint, 2011-2020

Appendix-II

Figure-2.1. Evolution of the Malaysian Financial Sector:
[2]**Source:** (BNM, financial sector blueprint, (2011-2020)

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[1] For more details see Financial Sector Blue-Print (2011-2020).
[2] For more details See Financial Blue-Print (2011-2020).

Appendix-III

Table 3.1: List of banks included in the research sample

	List of Islamic Bank in Malaysia		List of Conventional Banks in Malaysia
1	Bank Islam Malaysia Berhad	1	Hong Leong Bank Malaysia Berhad
2	Bank Muamalat Malaysia Ber	2	Alliance Bank Malaysia Berhad
3	Hong Leong Islamic Bank	3	RHB Bank Malaysia Berhad
4	Public Islamic Bank Malaysia	4	Malayan Bank Malaysia Berhad
5	RHB Islamic Bank Malaysia	5	CIMB Bank Malaysia Berhad

Appendix-IV

Figure-3.1. Number of Financial Institutions in Malaysia
Source: BNM, financial sector blueprint, 2011-2020

Appendix-V

Table 3.2: List of selected variables (financial ratios)

	Profitability ratios
1	Return on assets (ROA) = net income/ total assets
2	Return on equity (ROE) = net income/ stockholders' equity
3	Operating Margin Ratio(OMR) = operating income/ revenue
4	Return On Deposits (ROD) = net income/ total customer deposits.
5	Interest Income to Expenses (IEE) = (interest income – interest expenses)/ total loans and advances
	Efficiency ratios
6	Operating Expense to Assets (OEA) = operating expenses/ total assets
7	Operating Inocme to Assets (OIA) = operating income/ average total assets
8	Operating Expense to Revenue (OER) = operating expenses/ operating income (revenue)
9	Assets Turnover (ATO) = interest income/ total assets
	Solvency ratios
10	Provisions to earning assets (PEA) = provisions for loan losses/ average total loans and advances
11	Write-off ratio (WRL) = write-off of loans during the year/ average total loans and advances
	Risk and liquidity Ratios
12	Cash to assets (CTA) = cash/ total assets
13	Cash to deposits (CTD) = cash/ total customer deposits
14	Loans to deposits (LTD) = total loans and advances/ total customer deposits
15	Total liability to equity (TLE) = total liabilities/ stockholders' equity

Appendix-VI

Table-4.1. Descriptive statistics

Variables	N		Mean		Std. Deviation		Std. Error		t-test for equality of means	
	CBs	IBs	CBs	IBs	CBs	IBs	CBs	IBs	t-value	p-value
Profitability ratios										
ROA	30	29	.01	.00	.005	.019	.001	.003	-1.133	.266
ROE	30	29	.11	.27	.056	.848	.010	.157	1.022	.316
OMR	30	29	.29	21.89	.071	107.667	.013	19.993	1.081	.289
ROD	30	29	.01	.01	.007	.020	.001	.004	-1.348	.187
IEE	30	29	.038	.002	.004	.003	.000	.000	-32.20	.000
Efficiency ratios										
OEA	30	29	.01	.00	.003	.004	.000	.001	-10.56	.000
OIA	30	29	.01	.01	.003	.019	.000	.004	-1.792	.084
OER	30	29	.27	.49	.046	.535	.008	.099	2.187	.037
ATO	30	29	.04	.00	.006	.001	.001	.000	-36.92	.000
Solvency ratios										
PEA	30	29	.007	.012	.007	.027	.001	.005	.992	.328
WRL	30	29	.009	.001	.006	.002	.001	.000	-6.703	.000
Risk and liquidity ratios										
CTA	30	29	.14	.26	.056	.135	.010	.025	4.709	.000
CTD	30	29	.19	.29	.068	.119	.012	.022	4.105	.000
LTD	30	29	.78	.61	.134	.226	.024	.042	-3.431	.001
TLE	30	29	11.54	10.46	2.357	12.866	.430	2.389	-.444	.660

Appendix-VII

Table 4.2: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.032	189.972	4	.000

Appendix-VIII

Table-4.3. The Results of Discriminant Analysis:

Steps						Exact F			
	Entered	Statistic	df1	df2	df3	Statistic	df1	df2	Sig.
1	ATO	.042	1	1	57.000	1290.899	1	57.000	.000
2	IEE	.038	2	1	57.000	716.673	2	56.000	.000
3	LTD	.034	3	1	57.000	516.217	3	55.000	.000
4	WRL	.032	4	1	57.000	413.474	4	54.000	.000

Variables Entered/Removed[a,b,c,d] — Wilks' Lambda

Appendix-IX

Table (4.4): Summary of canonical discriminant function

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	30.628[a]	100.0	100.0	.984

a. First 1 canonical discriminant functions were used in the analysis

Appendix-X

Table-4.5. Canonical Discriminant Function Coefficients

	Function
	1
IEE	136.603
ATO	156.105
WRL	-69.605
LTD	1.953
(Constant)	-7.113
Unstandardized coefficients	

Appendix-XI

Table-4.6. Functions at Group Centroids

D-Vari	**Function**
	1
0	-5.533
1	5.348

Appendix-XII

Table-4.7. Results obtained from Predicted Group Membership:

Classification Results[b,c]					
			Predicted Group Membership		**Total**
		D-Vari	0	1	
Original	Count	0	29	0	29
		1	0	30	30
	%	0	100.0	.0	100.0
		1	.0	100.0	100.0
Cross-validated[a]	Count	0	29	0	29
		1	0	30	30
	%	0	100.0	.0	100.0
		1	.0	100.0	100.0