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PRODUCTIVITY OF ISLAMIC AND CONVENTIONAL BANKS IN MALAYSIA –DURING THE PRE AND POST GLOBAL FINANCIAL CRISIS

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ABSTRACT

The global financial crisis has evidenced sluggish progress in the growth of Malaysian banking sector's assets, deposits, and loans. The scenario could have affected the productivity of Malaysian banks which consists of Islamic and conventional banks. This study aims to evaluate and distinguish the productivity change of 17 Malaysian Islamic banks and 21 conventional banks during the pre and post global financial crisis. To estimate total productivity change of both type of banks, this study employs the Malmquist Productivity Index (MPI) method. In calculating the MPI, the study considers total deposits, personnel expenses and fixed assets as the inputs while for the outputs, the study considers loans, investment and non-interest income. The empirical results reveal that the Islamic and conventional banks have been productive throughout the period of observation. However, the results pointed out that Islamic banks have been more productive than its conventional counterparts. Interestingly, the study indicates that both Islamic and conventional banks have failed to operate at an optimal scale of operations. This could have negative effect on the productivity level of these banks. Furthermore, the recent global financial crisis has negative impact on the productivity level of Islamic and conventional banks in Malaysia.

Keywords: Productivity, Malmquist Productivity Index, crisis, Malaysian banks, Islamic banks

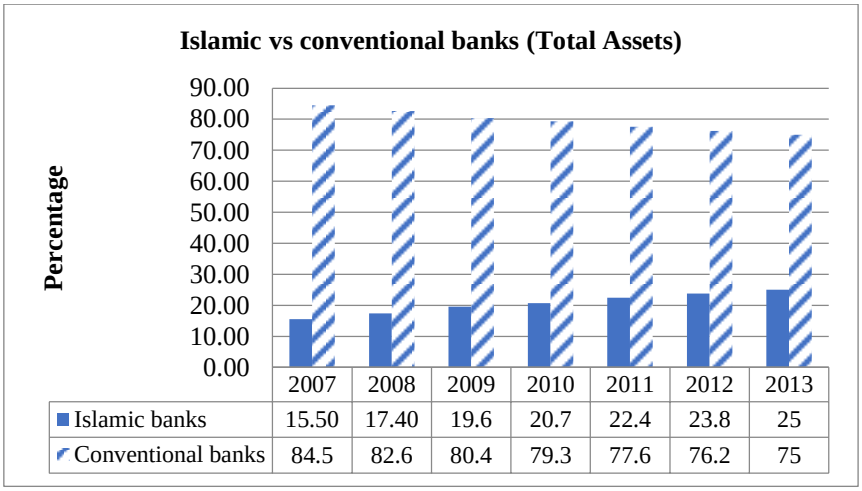
INTRODUCTION

Global financial crisis refers to the period where the global financial markets and banking systems faced extreme stress during mid 2007 till early 2009. Although the crisis originated from the United States, the shock reached Malaysia between 2008 and 2009. This was evidenced by the sharp declining trend of Malaysia's gross domestic product (GDP) from 6.30 percent in 2006 to 4.83 percent and -1.51 percent in the years of 2008 and 2009, respectively. Nevertheless, the impact of crisis on Malaysia was minimal (Zainal & Rasiah, 2009) as it was more on trade and GDP growth crises rather than a financial crisis (Khoon & Mah-Hui, 2010).

Nevertheless, the period of crisis has evidenced a sluggish progress in the growth of Malaysian banking sector's assets, deposits, and loans. Data shows that the percentage of Malaysian banking assets growth in 2008 was only 3.91 percent as compared to 14.74 percent in 2007. Similar trend can be observed in terms of the percentage of Malaysian banking deposits growth in 2007 which stood at 6.83 percent as compared to 16.52 percent in 2006. Corresponding to the reduction in growth of banking asset and deposits, the percentage of loans growth has also reduced to 5.68 percent in 2009 as compared to 11.09 percent in 2008. This scenario is not a good signal for the banking sector.

Despite sluggish progress of the banking system, the Islamic banking sector has continuously recorded tremendous growth in terms of its market share compared to

conventional banks. For instance, in **Figure 1**, it is evidenced that the total assets of Islamic banks increased from 15.50 percent in 2007 to 25 percent in 2013. This raised questions; firstly, whether these institutions are affected similarly like the conventional banks during the crisis? Secondly, are Islamic banks more productive than its conventional counterparts during these periods?



	2007	2008	2009	2010	2011	2012	2013
Islamic banks	15.50	17.40	19.6	20.7	22.4	23.8	25
Conventional banks	84.5	82.6	80.4	79.3	77.6	76.2	75

Figure 1: Market Share (Total Assets) Malaysian Islamic and Conventional Banks from 2007 - 2013

Source: Bank Negara Malaysia (2008, 2009, 2010, 2011a, 2012, 2013, 2014) with author's amendment.

To the best of our knowledge, studies that compare the productivity of Malaysian Islamic and conventional banks surrounding the crisis period are missing from the literature. Furthermore, literature examining the impact of crisis on bank productivity has evidenced mixed results. Hence, by employing the Malmquist Productivity Index method, this study contributes to the body of knowledge by providing empirical evidence on the productivity of Malaysian Islamic and conventional banks surrounding the recent global financial crisis.

The article is set out as follows: firstly, on literature review, followed by methodology employed in the study. Subsequently, it discusses on descriptive analysis while lastly presents on data analysis.

LITERATURE REVIEW

Numerous papers can be found examining bank productivity in a cross-country setting. Recent papers concerning this field have been focusing on the productivity of banks following the financial crisis. In general, previous literature suggests that banks have faced a deterioration of productivity levels during the crisis period. This can be observed in a number of literature such as Kevork et al. (2017) which involves Eastern European countries, Degl'Innocenti et al. (2017) which involves 28 European Union countries, Bahrini (2015) which involves Gulf Cooperation Council (GCC) countries banks. Similar observation could be found in the literature which focus Islamic banks in Southeast Asian countries (Kamarudin et al., 2017) and Qatar (Abdul-Wahab & Haron, 2017).

Despite of the declining trend of bank productivity, Nurboja & Košak (2017) which examined ten South East European Union countries revealed that banks' cost efficiency in the region has improved during the 2008 global financial crisis. This supported the study by Rosman et al. (2014) which found that Islamic banks were able to sustain operations during the crisis period. Abdul-Majid et al. (2011) revealed the possibility that the increase in efficiency might be due to cost-cutting initiatives by the banking institutions.

With regards to Islamic banks, recent studies on bank productivity have put emphasis on comparing Islamic banks' productivity with the conventional banks. Abbas et al. (2015) who

examined productivity change of Pakistan Islamic and conventional banking sector from 2005 to 2009, revealed that Islamic banks have higher productivity index in 2007 and 2008 as compared to conventional banks. In contrast, in 2009, the index revealed that conventional banks have higher productivity change. In a different study, Khan & Shah (2015) compared the productivity of Pakistan's Islamic banks, Islamic windows and conventional banks from 2007 – 2011. The study revealed that Islamic banks have the highest productivity score. Another study by Rodoni et al. (2017) distinguished the efficiency and productivity of Islamic banks in Indonesia, Malaysia and Pakistan. The research revealed that among those three countries, Pakistan Islamic banks have the highest efficiency rate followed by Malaysia and Indonesia.

Based on the review, a study that compares the productivity of Malaysian Islamic and conventional banks during the pre and post 2007-2009 global financial crisis is missing from the literature. Therefore, our study tends to fill this gap.

METHODOLOGY

Data Collection

The present study gathered data on Malaysian Islamic and conventional banks from the period of 2004 – 2013. The data that are used for this study were derived from the Bankscope database. Should the database is not complete, the study used the financial statement published in the website of each individual banks. The number of observations differed across time especially for Islamic banks. This is due to the entry of new banks during the period of study. In total, the observation involved a sample of 21 conventional banks and 17 Islamic banks.

Specification of Input and Output

An intermediation approach that has been widely used in banking literature (Kamarudin et al., 2017; Sealey & Lindley, 1977; Sufian & Kamarudin, 2017; Wahid, 2016), was adopted in this study due to its suitability with Islamic banks that play its' role as an intermediary between the depositors and the borrowers. In this study, three inputs and three outputs were used. On one hand, the inputs are total deposits (X1), personnel expenses (X2) and fixed assets (X3). The outputs, on the other hand, are loans (Y1), investment (Y2) and non-interest income (Y3).

Data Analysis Method – Malmquist Productivity Index (MPI)

This study employed Malmquist productivity index to measure the productivity changes between total outputs relative to total inputs. The selection of the MPI is due to its advantages as highlighted by Griffel-Tatje & Lovell (1996). Firstly, the MPI eliminates the requirement for assumptions of profit maximization or cost minimization. Secondly, this index does not require inputs' price and outputs' price. Lastly, the MPI can be broken down into technical efficiency change and pure technical change.

This study employed the output orientation analysis due to its suitability with the aims of banking sectors in developing countries (Casu et al., 2004; Jaffry et al., 2007). This study measures these items, following Färe et al. (1994) and Fukuyama (1995):

1. Total factor productivity index (TFPCH)
2. Technology change index (TECHCH)
3. Technical efficiency change index (EFFCH)
4. Pure technical efficiency change index (PTECH)
5. Scale efficiency change index (SECH)

According to Färe et al. (1994), the Malmquist index can be written as:

$$M(x^{t+1}, y^{t+1}, x^t, y^t) = \frac{D_0^{t+1}(x^{t+1}, y^{t+1})}{D_0^t(x^t, y^t)} \times \left[\left(\frac{D_0^t(x^{t+1}, y^{t+1})}{D_0^{t+1}(x^{t+1}, y^{t+1})}\right) \times \left(\frac{D_0^t(x^t, y^t)}{D_0^{t+1}(x^t, y^t)}\right)\right]^{1/2} \quad (1)$$

M is the productivity index between years' *t* (previous period) and *t+1* (recent time period) where recent time period production point (x^{t+1}, y^{t+1}) relates with the previous time period production point (x^t, y^t) and *D*s are functions of output distance.

Based on the MPI, any value that is bigger than 1.000 represents the increase of total factor productivity, whereby any value smaller than 1.000 represents the decrease of total factor productivity between two periods. Where else, any value that is equal to 1.000 represents unchanged productivity level of a firm.

The relationship between the MPI and its sub-indices can be written as:

$$M_0 = Efficiency\ Change \times Technical\ Change \tag{2}$$

where:

$$Efficiency\ Change = \frac{D_0^{t+1}(x^{t+1}, y^{t+1})}{D_0^t(x^t, y^t)} \tag{3}$$

$$Technical\ Change = \left[\left(\frac{D_0^t(x^{t+1}, y^{t+1})}{D_0^{t+1}(x^{t+1}, y^{t+1})}\right) \times \left(\frac{D_0^t(x^t, y^t)}{D_0^{t+1}(x^t, y^t)}\right)\right]^{1/2} \tag{4}$$

The EFFCH index can be further decomposed into PTECH $(\Delta PureEff^{t,t+1})$ and SECH $(\Delta Scale^{t,t+1})$. This is in accordance to the recommendation by Färe et al. (1994) as presented below:

$$Efficiency\ Change = \Delta PureEff^{t,t+1} \times \Delta Scale^{t,t+1} \tag{5}$$

where:

$$\Delta PureEff^{t,t+1} = \frac{D_{VRS}^{t+1}(x_j^{t+1}, y_j^{t+1})}{D_{VRS}^t(x_j^t, y_j^t)} \tag{6}$$

$$\Delta Scale^{t,t+1} = \frac{D_{CRS}^{t+1}(x_j^{t+1}, y_j^{t+1}) / D_{VRS}^{t+1}(x^{t+1}, y^{t+1})}{D_{CRS}^t(x_j^t, y_j^t) / D_{VRS}^t(x_j^t, y_j^t)} \tag{7}$$

Since the year 2004 is considered as the reference year to analyse bank productivity, the MPI and its components in this year take a preliminary score of 1.000. Hence, a bank with MPI score less than 1.000 in the following year i.e. 2005 indicates that the bank's productivity during 2005 has been decreasing compared to its productivity score in the previous year. In contrast, a bank with MPI score greater than 1.000 demonstrates that its productivity level in 2005 has been increasing compared to the previous year.

Research

In this study, the output-oriented Malmquist productivity index was employed to measure the banks' productivity changes. The VRS technology was used to calculate TFPCH(Mo) to EFFCH and TECHCH as presented in equation (2). Subsequent to that, following Färe et al. (1994), the EFFCH was segregated into an element of PTECH and SECH based on equation (5). The MPI allows this study to calculate the levels of TFPCH amongst two data points by computing the distances ratio of each data point in comparison to a common technology. The indices in Malmquist productivity index evaluation are constructed on an evaluation of different type of banks (Islamic - conventional).

DESCRIPTIVE ANALYSIS

Table 1 highlights inputs and outputs that are used for analysis of Malmquist Productivity Index. In general, it can be observed from **Table 1** that both Malaysian Islamic and conventional banks

showed an upward business trend between the years 2004 – 2013. Mainly, this observation can be evidenced from the total loans and total deposits which indicate an increase from year to year. Furthermore, it is found that on average the inputs and outputs for Malaysian Islamic banks were lesser than the conventional banks.

Table 1: Input and Output for Analysis of Malmquist Productivity Index

	Conventional Banks		**Islamic Banks**	
2004	**Mean**	**SD**	**Mean**	**SD**
Total loans	20,530,066	27,244,941	5,171,898	3,491,094
Investments	6,581,163	8,237,801	2,502,429	917,429
Non-interest income	492,166	729,472	27,018	19,855
Total deposits	27,490,205	35,761,175	9,538,527	2,940,851
Personnel expenses	254,826	342,919	80,253	19,251
Fixed assets	248,680	346,989	72,517	24,749
2005	**Mean**	**SD**	**Mean**	**SD**
Total loans	25,994,682	29,797,723	3,330,875	3,807,881
Investments	5,934,342	6,548,543	1,452,555	1,389,512
Non-interest income	571,058	997,405	28,084	41,869
Total deposits	32,562,873	36,445,638	6,322,861	6,254,531
Personnel expenses	237,179	289,833	48,518	55,969
Fixed assets	263,549	318,590	31,851	33,518
2006	**Mean**	**SD**	**Mean**	**SD**
Total loans	25,189,040	32,578,061	2,437,279	2,926,926
Investments	6,263,073	7,544,578	876,953	1,019,978
Non-interest income	424,248	539,502	28,067	33,268
Total deposits	33,249,418	40,349,537	4,780,731	5,159,556
Personnel expenses	274,446	345,801	31,583	51,036
Fixed assets	216,931	283,373	22,943	28,972
2007	**Mean**	**SD**	**Mean**	**SD**
Total loans	26,064,932	32,263,842	3,127,149	2,716,806
Investments	5,836,558	7,140,545	1,068,912	1,302,909
Non-interest income	563,501	742,954	40,753	42,622
Total deposits	39,863,475	46,325,907	5,985,002	5,211,503
Personnel expenses	337,662	396,111	39,798	53,620
Fixed assets	193,118	245,977	20,995	30,319
2008	**Mean**	**SD**	**Mean**	**SD**
Total loans	28,665,121	36,550,838	5,390,659	5,131,247
Investments	8,308,051	9,596,630	1,362,192	1,416,372
Non-interest income	524,965	602,223	30,695	35,449
Total deposits	41,203,962	49,618,845	8,459,475	6,771,694
Personnel expenses	357,489	418,723	36,623	56,474
Fixed assets	203,432	265,501	18,403	33,376
2009	**Mean**	**SD**	**Mean**	**SD**
Total loans	30,527,623	39,034,827	6,798,291	6,615,737
Investments	9,467,129	12,001,098	1,988,132	2,344,560
Non-interest income	466,381	556,250	37,567	32,692
Total deposits	45,096,464	54,233,542	10,824,310	9,331,692
Personnel expenses	397,358	521,358	49,607	60,883
Fixed assets	208,406	285,209	20,628	35,467
2010	**Mean**	**SD**	**Mean**	**SD**
Total loans	34,103,455	42,600,810	8,424,918	8,709,670

Investments	9,624,259	12,387,410	2,579,068	3,593,811
Non-interest income	600,062	853,063	44,613	44,583
Total deposits	47,555,644	56,370,493	12,568,279	11,616,363
Personnel expenses	441,415	575,024	66,454	101,668
Fixed assets	209,047	277,096	23,254	44,606
2011	**Mean**	**SD**	**Mean**	**SD**
Total loans	39,665,788	51,512,260	10,915,985	12,704,053
Investments	10,835,284	14,144,274	3,039,593	3,314,735
Non-interest income	650,845	860,429	44,873	43,919
Total deposits	55,147,248	67,342,259	16,517,251	17,040,773
Personnel expenses	428,411	477,897	62,011	81,309
Fixed assets	211,833	278,684	23,482	49,379
2012	**Mean**	**SD**	**Mean**	**SD**
Total loans	45,154,767	57,873,956	15,118,709	21,429,876
Investments	13,487,808	16,656,317	4,006,308	4,091,697
Non-interest income	846,581	1,526,771	75,160	92,588
Total deposits	60,968,124	73,484,831	19,159,512	20,727,347
Personnel expenses	574,323	758,099	72,297	93,018
Fixed assets	237,756	310,598	13,784	17,417
2013	**Mean**	**SD**	**Mean**	**SD**
Total loans	58,013,348	73,520,766	16,507,699	20,373,368
Investments	16,113,138	21,793,863	3,820,557	3,669,011
Non-interest income	808,925	1,309,399	120,038	160,651
Total deposits	76,738,458	93,936,839	22,694,531	27,416,887
Personnel expenses	758,727	1,177,431	78,755	107,188
Fixed assets	376,765	621,153	23,008	50,593
All Years	**Mean**	**SD**	**Mean**	**SD**
Total loans	33,390,882	44,859,286	8,874,452	13,048,481
Investments	9,245,080	12,654,382	2,438,119	3,010,233
Non-interest income	575,299	823,194	49,232	72,536
Total deposits	45,987,587	58,550,032	13,008,518	15,917,268
Personnel expenses	406,184	593,997	56,597	78,697
Fixed assets	236,952	335,842	21,902	37,669

***Note**: SD = standard deviation.*

***Source**: Banks' financial statement and Bankscope database. All figures are in thousands Ringgit Malaysia (RM)*

DATA ANALYSIS

This study investigates the productivity of Islamic banks in comparison to conventional banks. The results tabulated in **Table 2** is TFPCH of conventional banks and its decompositions from 2005 to 2013.

Table 2: TFPCH of conventional banks, and its decompositions

Years	Obs.	No. of Productive Banks	Tfpch	Techch	Effch	Ptech	Sech
2005	21	16	1.170	1.259	0.948	0.994	0.945
2006	21	9	1.070	1.041	1.024	1.018	1.005
2007	21	1	0.817	0.673	1.228	1.025	1.202
2008	21	18	1.322	1.429	0.911	1.047	0.865
2009	21	9	0.948	1.006	0.945	1.015	0.927
2010	21	12	1.007	0.843	1.219	1.007	1.204

2011	21	12	0.994	1.050	0.945	0.956	0.988
2012	21	12	1.103	1.191	0.948	1.040	0.903
2013	21	8	0.975	0.997	1.010	0.984	1.021
Mean			**1.045**	**1.054**	**1.020**	**1.010**	**1.007**

***Note**: Tfpch = total factor productivity index change, Techch = technology change index, Effch = technical efficiency change index, Ptech = pure technical efficiency change index, Sech = scale efficiency change index.*

***Source**: Author's own calculation.*

The results in **Table 2** indicate that the number of productive conventional banks in 2005 is 16 out of 21 banks. Compared to the year 2005, the number of productive banks declines to nine banks and one bank in 2006 and 2007 respectively. In 2008, the number of productive conventional banks increases tremendously to 18 out of 21 banks. Despite increases in the number of productive banks in 2008, the number of productive banks reduces again to nine banks in 2009. Subsequently, the number of productive banks from 2010 to 2012 increases to 12 banks out of 21. Later, in 2013, only eight conventional banks increase in its productivity.

Further analysis on productivity level of conventional banks suggest that banks are facing deterioration of productivity since the early period of crisis. This can be evidenced from the TFPCH which records a downward trend from the year 2005 to 2009. However, in the year 2008, the TFPCH of conventional banks increases from 0.817 in 2007 to 1.322 in 2008. The TFPCH of conventional banks reduces again in 2009 before it increases once again in the year 2010. In 2011, the index reduces to 0.994 before it increases in the year 2012. Finally, in the year 2013, the TFPCH index reduces to 0.975.

If anything could be suggested, there are at least two possible reasons for deterioration of conventional banks' productivity. Firstly, the year 2009 was the year in which the impact of global financial crisis reached Malaysia. This finding shows the negative effect of crisis on productivity of conventional banks. The result is in accordance to the study of Kevork et al. (2017); Degl'Innocenti et al. (2017); Bahrini (2015); Kamarudin et al. (2017) and Abdul-Wahab & Haron (2017) which evidenced deterioration of productivity of banks in their sample.

Secondly, deterioration of conventional banks' productivity in the post-crisis period i.e. 2011 could be due to changes in monetary policy related to statutory reserve requirement (SRR) and overnight policy rate (OPR). An increase in SRR from 1 percent to 4 percent in 2011 has led to a drop in the amount of deposit supply for banks to grant financing. In tandem with this change, the conventional banks were required to attract more deposits by offering higher return to depositors. This led to an increase in cost of funds for the bank. In order to cover this cost, the conventional banks, on average, have increased the base lending rate (BLR) by 27 basis point in the year 2011 (BNM, 2011b). The increase in BLR affected the growth of new loans for conventional banks in the post crisis period.

Moving on to findings of productivity for Islamic banks, **Table 3** highlights the TFPCH of Islamic banks and its decompositions.

Table 3: TFPCH of Islamic Banks, and its Decompositions

Years	Obs.	No. of Productive Banks	Tfpch	Techch	Effch	Ptech	Sech
2005	2	1	1.049	1.442	0.743	1.061	0.695
2006	5	2	1.090	0.875	1.222	1.042	1.168
2007	10	5	1.814	0.567	3.040	2.887	1.104
2008	12	6	1.016	1.313	0.789	1.081	0.856
2009	17	8	1.083	0.906	1.184	1.144	1.043
2010	17	10	1.276	1.015	1.285	1.028	1.259
2011	17	7	0.972	0.932	1.033	1.027	1.006

2012	17	13	1.076	1.120	0.929	0.966	0.959
2013	17	11	1.270	1.192	1.107	1.054	1.045
Mean			**1.180**	**1.035**	**1.242**	**1.211**	**1.041**

***Note**: Tfpch = total factor productivity index change, Techch = technology change index, Effch = technical efficiency change index, Ptech = pure technical efficiency change index, Sech = scale efficiency change index.*

***Source**: Author's own calculation.*

Results from **Table 3** show that the number of productive Islamic banks increases from year to year beginning from 2005 with one out of two banks to 10 out of 17 banks in 2010. In terms of productivity index, from 2005 to 2007, the TFPCH for the Islamic banks shows strong growth of productivity. In the year 2005, the TFPCH of Islamic banks is 1.049. While in 2006 and 2007, the TFPCH for Islamic banks are 1.090 and 1.814 respectively. If anything could be suggested, the increasing trend of productivity for Islamic banks during this period could possibly due to the new entry of Islamic banking institutions in the Malaysian market. New entry could have contributed to an increase in competition, hence, motivates Islamic banks to be more productive.

It is also noted that between 2008 to 2011, the TFPCH index shows a declining trend from 1.814 in 2007 to 0.972 in 2011. This could have been the negative effect of crisis on productivity of Islamic banks which is similar to the results of productivity for conventional banks. In addition, the result suggests that the TFPCH index in 2011 is the worst throughout the period of observation which possibly due to the impact of changes in BNM monetary policy.

In comparing the productivity level of Islamic and conventional banks, the findings reveal that both types of banks have been productive throughout the period of observation. Nevertheless, the TFPCH index for Islamic banks is higher compared to conventional banks. The mean TFPCH for Islamic banks for 2005-2013 is 1.180 while the mean TFPCH for conventional banks is 1.045. This result is in line with the findings of Abbas et al. (2015) and Khan & Shah (2015) which also revealed that Islamic banks productivity is superior than its conventional counterparts. Further analysis on PTECH and SECH indexes, which are the composition of the EFFCH index, reveals that the scale efficiency is considered as the principal source of unproductive Islamic and conventional banks. This can be evidenced from the SECH index which is higher than the PTECH index. This infers that although both types of banks have been efficient in managing and controlling the operating costs, these banks have been running their business at the non-optimal scale of operations. Both banks could have been expanding their business too much without knowing that it is not parallel with the increase in production of output. This scenario could lead to negative impact on the productivity level of both banks. Bacha (2019) confirms the scenario by highlighting that over expansion of an Islamic bank translates into higher management and administrative costs, lower quality of credit provided, thus, lower bank's profitability. This calls for improvement in utilization of financial technology by Islamic banks as it could assist in reducing personnel expenses and fixed assets of the bank.

CONCLUSION

The primary objective of this study is to evaluate and compare the productivity change and its decompositions between Malaysian Islamic and conventional banks. In order to address this objective, the study estimates the total productivity change of both Malaysian Islamic and conventional banks by employing the DEA-based Malmquist Productivity Index method on a data set of 17 Islamic banks and 21 conventional banks over the period of 2004 – 2013. This was an important time period as the study observed the productivity of both types of banks in the pre and post global financial crisis.

The empirical results reveal that the Islamic and conventional banks have been productive throughout the period of observation. However, the results also pointed out that

Islamic banks have been more productive than its conventional counterparts. Interestingly, the study indicates that both Islamic and conventional banks have failed to operate at an optimal scale of operations. This could have negative effect on the productivity of these banks. Furthermore, the recent global financial crisis has negative impact on the productivity level of Islamic and conventional banks in Malaysia.

The empirical results are useful for different group of people such as bank managers and researchers. First, the findings from this study offer guidance for bank managers in Islamic and conventional banks to understand which elements that have influence on bank productivity. Operating at wrong scale and the occurrence of crisis are important events for bank managers to put extra cautions as both events could affect bank's productivity in the future. Lastly, very few studies have focused on examining the productivity of Malaysian Islamic and conventional banks especially surrounding the crisis period. Hence, researchers in this area could utilize findings of this study in order to fill up research gaps in this field.

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