

INDONESIAN BANKING EFFICIENCY: TRANSMISSION TO THE FINANCIAL STABILITY CONFRONTING ASEAN ECONOMIC COMMUNITY

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Abstract

Banks are a particular type of institution within the financial system that have influence on financial stability. Their readiness will determine the government's policy, notably in an economic era of integration. In the case of South East Asia, there is the ASEAN Economic Community (AEC) which facilitates economic integration to strengthen all the member countries. This study aims to measure bank efficiency (conventional and syariah) in Indonesia, and also establish the transmission scheme based on the estimated result through financial stability issues confronting the AEC. Data Envelopment Analysis (DEA) is used to estimate banking efficiency statically and dynamically (Malmquist Index). The result showed that technical efficiency of conventional banks is statically better than syariah banks. Meanwhile, dynamically, considering technological index, both types of banks have good results. The optimizing effort by each bank in order to increase their input utilization can be maintained through intensification of the financial program and making it more comprehensive. Subsequently, this effort hopefully can increase the number of financial participants. Eventually, increasing the number of participants will strengthen the financial stability of Indonesia.

Keywords: Banking; Efficiency; Financial Stability; AEC

JEL Classification: E50, G14, O16

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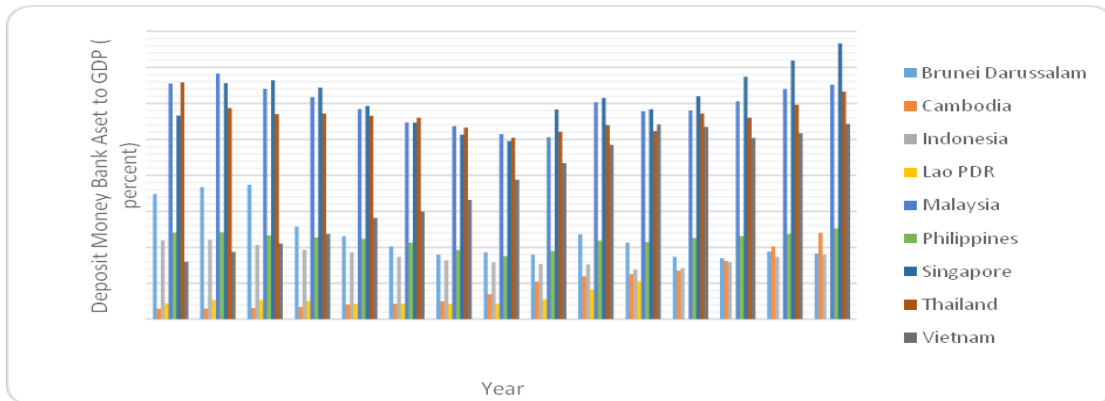
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1. Introduction

The ASEAN Economic Community (AEC) defined as the economic integration body formed among the countries in South East Asia (Wangke, 2014). Since 1997 in the ASEAN Leader Summit, it was dedicated to be concerned with the socio-economic aspects of the prosperous, highly competitive region, as well as to ensure equitable economic development and poverty reduction. Subsequently, several advanced meetings had been held, viz., in 2003 in Bali and 2006 in Kuala Lumpur. Eventually, it was crystalized to be the

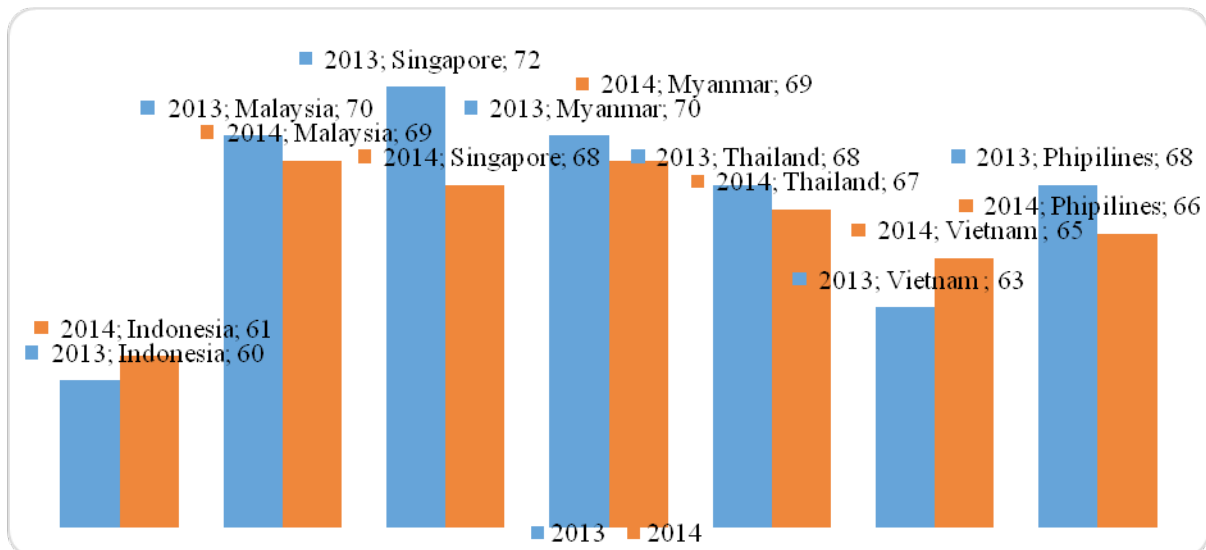
AEC agreement by 2015. This agreement will be regionalization of Southeast Asia to promoting international trades in good and services by means of free trade areas, custom unions, and other preferential trade arrangements (Serstic, 2000).

Approaching this deal, each country attempted to intensify development in all sectors they had within their economies, for instance, the financial and banking sector which has made great contributions toward development in South East Asia. Figures are depicted in Figure 1 below.



Source: World Bank, 2016

Figure 1 : Money Deposit Bank Asset to GDP (percent) in 2000-2014



Source: Mastercard Intelligent, 2015

Figure 2 : Financial Literacy Index of 7 South East Asia Country in 2013 and 2014

Based on the figure above, the financial and banking sector in South East Asia makes great contributions towards the Gross Domestic Product (GDP). There are even some countries which have bank deposits beyond their GDP. It was literally proven that the financial sector has great leverage toward the development of the country.

However, in spite of the financial and banking sector making a large contribution toward the ASEAN GDP particularly, there are some remaining problems. Those problems have been confronted by some countries in

South East Asia in terms of financial literacy index. It is depicted in the graph above.

According to the graph above, Indonesia had the lowest level of Financial Literacy in both 2013 and 2014 (assumed that Cambodia and Brunei Darussalam had higher scores of FLI). Klapper *et al.*(2015), contended that the financial literacy index will depict the level of participation in a country. It will have implications on the financial and banking system in a country depending on whether they successfully spread the basic knowledge of finance. Moreover, financial literacy

will also have implications on financial stability due to their participation in financial institutions (Klapper & Zia, 2009). Hence, it is important to know more about the financial sector in Indonesia as a country which has the lowest financial literacy level in South East Asia.

In terms of the Indonesian financial sector, there are some indicators used to know particularly about the condition such as Non Performing Loans of the banking institutions, the growth of financial institutions, etc. However, further dynamic banking sectors imposed not only those indicators, but also the magnitude of efficiency of the financial institution (Firdaus & Hosen, 2013). It is efficiency that represents the optimization of the institutions empowered with their input.

Research on financial institution efficiency in Asia, notably on banking institutions, has been prolific such as Thangavelu & Findlay (2013). More specific, in Indonesian Banking, some research has been prolific as well such as Sutawijaya & Lestari (2009), Gumilar & Komariah (2011), Amirillah (2014), Hosen & Rahmawati (2017). Most of those researches, however, focus on a kind of bank (either conventional or shariah bank). Amirillah (2014), for instance, was focusing on shariah banking efficiency. Moreover, there wasn't elaboration and transmission scheme toward financial literacy and also financial stability. Hence, comparison between conventional and Shariah bank efficiency transmitted into financial literacy and stability have not been explored in detail. Therefore, this study would like to fill the gap through comparing the efficiency of Indonesian banking. Thus, it will bring the transmission scheme toward financial literacy to have an impact on the financial stability in ASEAN, notably on the AEC. Hence, the following specific objectives have been arranged in order to conduct a critical analysis of financial institutions in terms of financial stability in Indonesia: 1) to estimate bank efficiency (conventional and shariah) in Indonesia; 2) to establish the transmission scheme based on the estimated results and some

financial policies toward financial stability issues facing the ASEAN Economic Community.

2. Methods

In order to measure the banks' efficiency, this study utilizes data of 9 conventional banks and 9 Shariah Banks during 2011 to 2014. The conventional banks are Bank Negara Indonesia (BNI), Bank Rakyat Indonesia (BRI), Bank Tabungan Mandiri, Bank Mandiri, Bank Central Asia (BCA), Bank Bukopin, CIMB Niaga, Bank Danamon, and Bank Ekonomi Raharja. Meanwhile, the Shariah Banks are BNI Syariah, Bank Mega Syariah, Bank Muamalat, Bank Syariah Mandiri (BSM), BRI Syariah, Bank Jabar Banten Syariah, Bank Panin Syariah, and Bank Victoria Syariah.

In this study, Data Envelopment Analysis (DEA) method was used to measure and assess financial efficiency. Output oriented approach was used due to the condition of analysis instead of input oriented approach. Moreover, this study will be used on dynamic measurement imposing output oriented. Subsequently, DEA output oriented model with Variable Return to Scale (VRS) is used to measure banking efficiency in Indonesia.

Ji & Lee (2010) as well as Stewart, Matousek, & Nguyen (2016) contended that DEA allows the consideration of multiple input and outputs at a time without any assumption of the data's distribution. In the beginning, Charnes, Cooper, & Rodes (1978) proposed efficiency measurement through constant return to scale regarding which decision making unit will operate in its own optimal scale. Afterwards, Banker, Charnes and Cooper introduced the Variable Return to Scale which allowed for the measurement of Technical Efficiency and Scale Efficiency.

Havrylchuk (2006) and Vinh (2012) found that DEA allows us to calculate the total cost, technical efficiency, allocative efficiency, pure technical efficiency, and scale efficiency. Technical efficiency (TE) refers to the ability to generate maximum output at a certain level of input, or

the ability to use the minimum input to produce a given level of output. Allocative efficiency (AE) refers to the ability to use the optimal combination of inputs at a specific price level to produce a given level of output. Cost efficiency is combination from both technical efficiency and allocative efficiency. Measurement of technical efficiency can further be subdivided into pure technical efficiency and scale efficiency Chu & Lim (1998), argue that pure technical efficiency measures how efficient a Decision Making Unit utilizes its resources. Meanwhile, scale efficiency reflects how a Decision Making Unit can operate at the scale of operations and the exact size.

Apart from statistical measurement, this study also attempts to measure Indonesian banking efficiency from a dynamic perspective. Dynamic measurement uses the Malmquist Index to depict technology for input, output, and productivity index (Surjaningsih & Permono, 2014). Moreover, the Malmquist Index has a function to discover the change of productivity in a DMU (Indrawati, 2009). Those results can be decomposed through technological change and efficiency change. (Indrawati, 2009).

In terms of efficiency measurement, notably in DEA, there are some variables used. In this study 2 input variables (fix asset and equity) and 2 output variables (profit and loan) were used. They were considered from research such as Johnes *et al.* (2012); Rahman & Rosman (2013); Zeitun & Benjelloun (2013); Rozzani & Rahman (2013); Yadav & Katib (2015); Sillah & Harrathi (2015). Those researches covered variables used in this study.

In this study, a model has been arranged based on the BBC model. It attempts to accommodate some objective function.

Max θ

$$\begin{aligned} \text{Subject to : } & \theta y + Y\lambda \geq 0 \\ & \theta oz + Z\lambda = 0 \\ & x - X\lambda \geq 0 \end{aligned}$$

Where:

Θ = Radial whenever input reducing measure of technical efficiency (efficiency parameter)

Λ = a matrix of intensity factors that defines the hypothetical DMU to which DMU_{j_0} is compared

Banker, Charnes, and Cooper (1984) in Wasiaturrehma and Ajija (2017) conveyed that each DMU will be in a strongly efficient condition when it has $\theta = 1$, all slacks s_i^- and s_i^+ are equal to zero. Meanwhile, it will be weakly efficient when $\theta = 1$, slacks s_i^- and s_i^+ aren't equal to zero.

3. Result and Discussion

3.1 Efficiency Analysis of Bank in Indonesia

In this research, the efficiency measurement of Indonesian banks has been analyzed with DEA-Program (DEAP). This result will depict the performance of each bank (both conventional and Shariah bank). Hence, this study attempts to measure the given factors statically and dynamically.

3.1.1 Static Estimation

Appendix 1 consists of the result of efficiency measurement statically in conventional banks. Efficiency was measured in 2012, 2013, 2014, and 2015. According to the results, statically, conventional banks still have inefficiency in some units. The lowest point of VRS Technical Efficiency (TE) in 4 period (2012, 2013, 2014, 2015) is 96.4 percent (Bank Central Asia), 83.5 percent (Bank Tabungan Negara), 82.2 percent (Bank Negara Indonesia), and 66.6 percent (Bank Negara Indonesia). Meanwhile, the highest point of VRS-TE was 100 percent in all periods. Hence, VRS-TE means on the conventional bank in 2012, 2013, 2014, and 2015 reached 99.6 percent, 97.4 percent, 95.5 percent, and 92.5 percent. Regardless of its decreasing trend, conventional banks still operate efficiently enough although not at their maximum capability.

In terms of Scale Efficiency (SE), it depicts bank performance in terms of production. Appendix 1 shows that in 2012, 2013, 2014, and 2015 some banks were not in constant return to scale (CRS) condition. It was shown by the

result in Appendix 1 where on 2012, 2013, 2014, and 2015 the percentage of the banks which reached CRS was 33.3 percent, 33.3 percent, 33.3 percent, and 11.1 percent. Hence, the SE's mean of 4 periods was 77.6 percent, 85.6 percent, 81.9 percent, and 34.9 percent. It can be interpreted that conventional banks are still not empowered and allocated their input optimally. Therefore, conventional bank needs more attention in order to increase their efficiency (both TE and SE).

Appendix 2 consists of the results of efficiency measurement statistically in Shariah banks. Efficiency was in 2012, 2013, 2014, and 2015. According to those results, statically, Shariah banks still have inefficiency in some units (same as conventional banks). The lowest point of VRS Technical Efficiency (TE) in 4 periods (2012, 2013, 2014, 2015) was 22.3 percent (Bank Mega Syariah), 22.2 percent (Bank Mega Syariah), 47.2 percent (BNI Syariah), and 22.2 percent (Bank Mega Syariah). Meanwhile, the highest point of VRS-TE was 100 percent in all periods. Hence, the VRS-TE mean for the conventional banks in 2012, 2013, 2014, and 2015 reached 84 percent, 83.5 percent, 85.5 percent, and 80.5 percent. Regardless of their decreasing trend, Shariah banks still operate efficiently enough although not their maximum capability and also lower than that of conventional banks.

For this research, Scale Efficiency (SE), will depict bank performance of production. Appendix 1 shows that in 2012, 2013, 2014, and 2015 some banks were not in constant return to scale (CRS) condition. It was showed by the result on Table 2 where in 2012, 2013, 2014, and 2015 the percentage of banks which reached CRS was 33.3 percent, 33.3 percent, 33.3 percent, and 44.4 percent. Hence, the SE's mean of 4 periods was 79.7 percent, 67 percent, 73.7 percent, and 66.9 percent. It can be interpreted that Shariah banks are still not empowered and have not allocated their input optimally. Therefore, it needs more attention in order to increase the efficiency in Shariah banks (both TE and SE).

Comparison between conventional banks and Shariah banks emphasized on the figures of TE and SE during the 4 periods. Periodically during 2012, 2013, 2014 and 2015, conventional banks had respectively for each year; 8 units, 6 units, 7 units, and 8 units of bank branches which had a TE higher than their TE's mean. Meanwhile, periodically, Shariah banks had consecutively 7 units, 6 units, 5 units and, 6 units of bank branches which had TE higher than their TE's mean. Therefore, conventional banks had a greater TE.

Further comparisons are from their Scale Efficiency depicting in what condition their production is. Conventional banks had 3 units, 3 units, 3 units, and 1 unit of bank branch reaching CRS condition. Meanwhile, Shariah banks had 3 units, 3 units, 3 units, and 4 units of bank branches reaching CRS condition. Therefore, in terms of scale efficiency, Shariah banks have a greater number of banks reaching CRS than conventional banks. Moreover, Shariah banks have greater power in terms of input allocation and empowerment.

The implication of these result is the depicting of financial literacy. The condition of inefficiency showed that the supply of banking products is still low. For instance, loans as one of the output variables is not efficient enough related to fixed assets and equity, in terms of allocation. Therefore, the number of people who know about loan supply are low as well.

3.1.2 Dynamic Estimation

Table 3 on Appendix 1 consists of the measurement result of conventional bank efficiency dynamically. This result will depict Technological Change (TechCh) as in impact factor on the Total Factor Productivity Change (TFPCh). Dynamic analysis is distinguished into 4 types: 1) dynamic efficiency in 2012-2013, 2) dynamic efficiency in 2013-2014, 3) dynamic efficiency in 2014-2015, and 4) dynamic efficiency in 2012-2014. By using Malmquist Index, the estimation has been found.

According to Table 3, in the 2012-2013, Technological Change (TechCh) has a good result enough. It was shown by the amount of TechCh in a whole bank over 1. Furthermore, it had an impact on Total Factor Productivity Change (TFPCh) which had a good result as well. However, this condition unfortunately could not be continued during 2012-2013. On those periods, TechCh dominantly could not reach 1 thus it impacted on the TFPCh. Subsequently, in 2014-2015, TechCh improved tremendously. It was shown by the indicators reaching over 4, thus it also impacted on TFPCh. Eventually, during the period 2012-2015, TechCh had good results (dominantly over 1.00) as well as its TFPCh (in spite of 20 percent of conventional banks still having less than 1.00).

Similar with conventional banks, dynamic analysis also hold as the comparison Table 4 in Appendix 1 consists of the measurement result of Shariah bank efficiency dynamically. Those results were also distinguished into 4 kinds: 1) dynamic efficiency in 2012-2013, 2) dynamic efficiency in 2013-2014, 3) dynamic efficiency in 2014-2015, and 4) dynamic efficiency in 2012-2014.

According to Table 4, in 2012-2013, technological change (TechCh) had good results. It was displayed by the amount of TechCh which was over 1.000. Furthermore, it had an impact on Total Factor Productivity Change (TFPCh) which had good results as well. However, this condition unfortunately cannot be carried on 2013-2012. On 2013-2012 period, TechCh of sharia banks 44 percent cannot reached 1.000 (even though they were better than conventional bank), thus the impact on the TFPCh. During 2014-2015, TechCh has the result was almost the same with the previous period. Eventually, during 2012-2015, TechCh had a good result (dominantly over 1.000) as well as its TFPCh (in spite of some banks having TFPCh less than 1.000).

The implication of this result is about the condition of the macro economy. For instance, Bank Indonesia (2014) explained that in 2013, there were some macroeconomic problems such

as global shock economy in the financial system, balance of payment pressure, and so on. It had an impact on the banking system particularly. For instance, whenever the technological change was less than 1.000, it means there was technological regress and *vice versa*. The condition of both conventional banks and Shariah banks which dominantly had over 1.000 on TechCh indicators implicate that conventional and Shariah banks had modern technology in terms of operational activity. Therefore, microeconomic instability particularly will influence macroeconomic factors as well.

3.2 Transmission Scheme of Bank Condition toward Financial Stability

The estimation which was calculated has some implications, notably in terms of financial literacy which finally ended up influencing financial stability. This implication will be illustrated on the transmission scheme of banking efficiency toward financial stability based on some programs arranged by the Indonesian government. Some programs in terms of banking can be found in the following explanation.

3.2.1 Indonesian Banking Policy

Financial stability in Indonesia is not spate from the existence of policy, most notably; banking policy. This policy should have a positive universal impact on a whole society. Recently this has been termed as financial inclusion. Inclusivity of financial literacy will hopefully increase the rate of financial participation. Due to high financial participation thus will influence financial stability. Therefore, it needs appropriate policy to embody this planning.

One of the efforts which attempted to increase the rate of participation in financial institutions is Kredit Usaha Rakyat (KUR). Through credits access expansion, KUR attempted to reach lower-middle scale enterprises (Damayanti & Adam, 2015). Other urgency is due to not maximum interaction between the

number of lower-middle scale enterprises and their productivity, notably their gap with large enterprises. Moreover, in terms of banking institutions which provide this program, KUR will help them increase their market share. It is because they can reach a segmentation which couldn't be reached before.

There is also Lak Pandai which is a program that provides a kind of branchless banking which aims to provide financial access to the rural society. The urgency of this program existed due to the low rate of financial access in rural areas, notably for banking services. Moreover, Otoritas Jasa Keuangan (OJK) as the main authority for Indonesian banks insisted on developing national financial inclusion. Therefore, this program is also a tool to increase the number of participants in Indonesian financial institutions.

Apart from KUR and Laku Pandai as the effort to increase the market share for maximize factor productivity of the bank, there should be provided special program which can accommodate a sectoral. In other words, banking not only intensified the existing programs, but also should extensively financing in order to increase their market share.

3.2.2 Transmission Scheme

The urgency of financial stability related to particular financial institutions in Indonesia has increased. It begins with efficiency measurement as the performance depiction of each institution, especially in this case for banking. Therefore, there is a relationship between financial stability as the AEC's urgency and banking efficiency in Indonesia which is illustrated in Figure 3 Appendix 2. According to the picture in Figure 4, the banking efficiency in terms of the urgency of financial stability will show 2 results, viz., and maximum efficient and minimum efficient. Confronting this result, each bank as the decision making unit (DMU) should attempt to optimize all input they had. For instance, when a bank has inefficient results, it means that those banks are still yet to optimize their own input.

An effort to increase efficiency rate is through intensifying the program that they had, or extensity a new program to maximize the use of their input. Intensification can be executed through programs such as KUR and Laku Pandai. Meanwhile, Extensification can be done through the program which specifically gives financing for a specific sector. Eventually, both of these hopefully can increase the number of financial participants in Indonesia

ASEAN Economic Community will be focused on, one of which, financial services liberalization (Verico, 2015), it means there will be an impact toward financial stability in each country. Subsequently, the increasing number of participants in banking institutions will be the way to create financial stability. This is because the number of participants will be significantly cooperatively support and substantiate their financial institution through their involvement. In other words, the number of participants is increasingly strengthening their financial foundation. Eventually, the focus and the goals of AEC hopefully can be reached.

4. Conclusion

According to calculation of technical efficiency, Conventional and Sharia Bank of Indonesia show mostly inefficient condition. It was shown by the lowest point of technical efficiency which reach 66.6 percent (for conventional bank) and 22.2 percent (for sharia bank). According to the results, hence, the conventional should maximize the utility of their inputs, i.e. bank assets and equity to reach the higher profit and loan distributed. Meanwhile, Sharia banks should improve their efficiency because their profit and financing are still not as much as the inputs. They have to reduce their branch because and utilize the technology such as branch less banks in order to reach the higher profit.

This circumstances will transmit into the financial stability, thus transmit as well into ASEAN Economic Community. The ASEAN Economic Community as the concord among

South East ASEAN countries should be followed by the readiness of each member country. It includes their financial and banking sectors. Particularly, the financial and banking sectors are indicators depicting a country's performance in terms of efficiency. The implication of this indicator is about the depiction of financial access of the society through financial institutions. Subsequently, a high rate of financial access will impact the resilience of the financial stability. This condition occurs as participation of people toward financial activity will strengthen financial institution. Eventually, financial stability should be begun from the readiness of Indonesian banking. It is because of the increasingly people will support their financial institution due to their participation. Therefore, it is started on the readiness of Indonesian banking, depicting in efficiency, till eventually related on the financial stability as a goals of ASEAN Economic Community.

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7. Appendixes

Appendix 1 : Conventional Bank Efficiency (Static) in Indonesia

No	Code of Bank	2012			2013			2014			2015						
		CRS	VRS	SCALE	CRS	VRS	SCALE	CRS	VRS	SCALE	CRS	VRS	SCALE				
1	1.1	0.482	0.997	0.484	drs	0.511	0.965	0.529	drs	0.499	0.822	0.607	drs	0.059	0.666	0.089	drs
2	1.2	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-	0.335	1.000	0.335	drs
3	1.3	0.730	1.000	0.730	drs	0.832	0.835	0.997	irs	0.816	1.000	0.816	drs	0.392	1.000	0.392	drs
4	1.4	0.694	1.000	0.694	drs	0.933	1.000	0.933	drs	0.785	1.000	0.785	drs	0.285	1.000	0.285	drs
5	1.5	0.535	0.964	0.535	drs	0.707	0.967	0.731	drs	0.546	0.956	0.571	drs	0.196	0.931	0.211	drs
6	1.6	1.000	1.000	1.000	-	1.000	1.000	1.000	-	0.822	0.823	0.999	i	0.198	0.745	0.266	drs
7	1.7	0.890	1.000	0.890	drs	0.831	1.000	0.831	drs	1.000	1.000	1.000	-	0.449	1.000	0.449	drs
8	1.8	0.629	1.000	0.629	drs	0.864	1.000	0.684	drs	0.859	0.995	0.592	drs	0.116	0.986	0.117	drs
9	1.9	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-
	Mean	0.773	0.996	0.776		0.833		0.836		0.784	0.955	0.819		0.337	0.925	0.349	

Where :

CRS : Technical Efficiency with Constant Return to Scale

VRS : Technical Efficiency with Variable Return to Scale

SCALE : TE_{VRS} / TE_{CRS}

Drs : Decreasing return to scale

Irs : increasing return to scale

Appendix 2 : Sharia Bank Efficiency (Static) in Indonesia

No	Code of Bank	2012			2013			2014			2015						
		CRS	VRS	SCALE	CRS	VRS	SCALE	CRS	VRS	SCALE	CRS	VRS	SCALE				
1	2.1	0.352	0.428	0.822	drs	0.341	0.504	0.676	drs	0.412	0.472	0.874	drs	0.223	0.601	0.371	drs
2	2.2	0.035	0.223	0.157	drs	0.034	0.222	0.152	drs	0.323	1.000	0.323	irs	0.055	0.222	0.250	drs
3	2.3	0.912	1.000	0.912	drs	0.584	1.000	0.584	drs	0.741	1.000	0.741	drs	1.000	1.000	1.000	-
4	2.4	0.372	0.910	0.409	drs	0.265	0.791	0.335	drs	0.083	0.765	0.109	drs	0.114	0.861	0.133	drs
5	2.5	1.000	1.000	1.000	-	0.898	1.000	0.898	irs	0.626	0.656	0.955	irs	0.374	0.572	0.653	drs
6	2.6	0.893	1.000	0.893	drs	0.387	1.000	0.387	drs	0.506	0.807	0.627	drs	0.606	0.988	0.613	drs
7	2.7	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-
8	2.8	0.983	1.000	0.983	drs	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-
9	2.9	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-	1.000	1.000	1.000	-
	Mean	0.727	0.840	0.797		0.612	0.835	0.670		0.633	0.855	0.737		0.597	0.805	0.669	

Appendix 3 :Conventional Bank Efficiency (Dynamic) in Indonesia

No	Bank Code	2012-2013			2013-2014			2014-2015			2012-2015									
		effch	techch	pech	tfpch	effch	techch	pech	sech	tfpch	effch	techch	pech	sech	tfpch					
1	1.1	1.059	1.621	0.968	1.094	1.716	0.978	0.565	1.147	0.552	1.119	4.643	0.810	0.147	0.552	0.497	1.620	0.874	0.569	0.806
2	1.2	1.000	1.799	1.000	1.000	1.799	1.000	0.488	1.000	0.488	0.335	4.601	1.000	0.335	1.539	0.694	1.592	1.000	0.694	1.105
3	1.3	1.140	1.414	0.835	1.366	1.612	0.981	0.829	1.197	0.819	0.813	4.800	1.000	0.480	2.240	0.813	1.761	1.000	0.813	1.432
4	1.4	1.343	1.776	1.000	1.343	2.385	0.842	0.513	1.000	0.842	0.432	4.606	1.000	0.363	1.670	0.743	1.613	1.000	0.743	1.198
5	1.5	1.321	1.745	1.003	1.317	2.305	0.772	0.529	0.988	0.781	0.408	4.609	0.974	0.369	1.656	0.716	1.620	0.988	0.724	1.160
6	1.6	1.000	1.737	1.000	4.000	1.737	0.822	0.675	0.823	0.999	0.555	4.640	0.905	0.267	1.120	0.583	1.759	0.906	0.643	1.026
7	1.7	0.933	1.792	1.000	0.933	1.672	1.203	0.645	1.000	1.203	0.776	4.412	1.000	0.449	1.853	0.796	1.683	1.000	0.796	1.340
8	1.8	1.087	1.725	1.000	1.087	1.876	0.861	0.549	0.395	0.865	0.472	4.649	0.990	0.198	0.912	0.568	1.639	0.395	0.571	0.931
9	1.9	1.000	1.262	1.000	1.000	1.262	1.000	1.417	1.000	1.417	1.000	3.955	1.000	1.000	3.955	1.000	1.920	1.000	1.000	1.920
	Mean	1.090	1.642	0.977	1.116	1.790	0.932	0.651	0.979	0.952	0.607	4.492	0.962	0.348	1.504	0.698	1.687	0.973	0.718	1.178

Appendix 4 :Sharia Bank Efficiency (Dynamic) in Indonesia

No	Bank Code	2012-2013			2013-2014			2014-2015			2012-2015										
		effch	techch	pech	tfpch	effch	techch	pech	sech	tfpch	effch	techch	pech	sech	tfpch						
1	2.1	0.969	1.238	1.178	0.823	1.200	1.210	1.452	0.936	1.293	1.756	0.541	1.090	1.275	0.424	0.590	0.859	1.251	1.120	0.767	1.075
2	2.2	0.966	1.202	0.996	0.969	1.160	0.572	0.369	4.500	2.127	3.529	0.172	3.113	0.222	772.000	0.534	1.166	1.113	0.999	1.168	1.298
3	2.3	0.640	1.238	1.000	0.640	0.792	1.270	1.146	1.000	1.270	1.455	1.349	2.960	1.000	1.349	3.994	1.031	1.613	1.000	1.031	1.663
4	2.4	0.711	1.238	0.869	0.819	0.880	0.315	2.793	0.967	0.326	0.880	1.371	0.892	1.126	1.218	1.223	0.675	1.455	0.981	0.687	0.982
5	2.5	0.898	1.084	1.000	0.898	0.973	0.697	1.453	0.656	1.063	1.013	0.597	1.092	0.872	0.684	0.651	0.720	1.198	0.830	0.868	0.863
6	2.6	0.434	1.730	1.000	0.434	0.750	1.308	0.874	0.807	1.620	1.142	1.196	1.745	1.224	0.977	2.088	0.879	1.382	0.996	0.882	1.214
7	2.7	1.000	1.436	1.000	1.000	1.436	1.000	0.636	1.000	1.000	0.636	1.000	3.097	1.000	1.000	3.097	1.000	1.414	1.000	1.414	
8	2.8	1.017	1.504	1.000	1.017	1.529	1.000	1.388	1.000	1.000	1.388	1.000	0.850	1.000	1.000	0.850	1.006	1.211	1.000	1.006	1.217
9	2.9	1.000	2.538	1.000	1.000	2.538	1.000	0.426	1.000	1.000	0.426	1.000	1.930	1.000	1.000	1.930	1.000	1.278	1.000	1.278	
	Mean	0.821	1.420	1.002	0.819	1.165	1.174	0.978	1.089	1.078	1.147	0.792	1.642	0.887	0.893	1.300	0.914	1.316	0.989	0.924	1.202