

## **TRANSMISSION OF BRANCHLESS BANKING IN STRENGTHENING OF INDONESIAN FINANCIAL INFRASTRUCTURE: DATA ENVELOPMENT ANALYSIS**

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### **ABSTRACT**

The Indonesian Financial Services Authority has initiated an inclusive financial vision as an effort to improve financial literacy in Indonesia. The manifestation of this vision depicted on branchless banking, named Laku Pandai, that have been able reached hinterland. However, the implementation of the program seems to have not been implemented by all banks in Indonesia. Whereas the involvement of all banks can accelerate the vision of inclusive finance as the improvement of financial infrastructure in Indonesia. This study aims to estimate banking efficiency in Indonesia, thus explain the urgency of branchless banking implementation and its transmission toward strengthening financial infrastructure based on efficiency calculation indicator. Methodology of this study is quantitative through nonparametric approach Data Envelopment Analysis. The static efficiency estimation results show that banks in Indonesia are in an inefficient condition (technical efficiency of 81 percent in conventional banks and 73.7 percent in *sharia* banks in 2014). However, the result of dynamic estimation shows in technological progress condition which means there is good technological progress in banking. Therefore, branchless banking program intensifying communication technology is expected to be implemented by banks that already have good technology. The low efficiency of banking means that there is still unfeasible input compared to the financing output provided. Therefore, branchless banking program is expected to improve banking efficiency as well as succession of inclusive financial vision in Indonesia

**Keywords:** Banking, Branchless banking, Financial infrastructure

### **1. INTRODUCTION**

Financial Inclusive is one of the government's development targets in the financial infrastructure sector. Such targets can be achieved through a financial inclusion program that is understood as the availability of access to communities in utilizing financial services products in financial institutions in order to create prosperity (Financial Services Authority, 2015). The effort is done given the low inclusion of finance in Indonesia.

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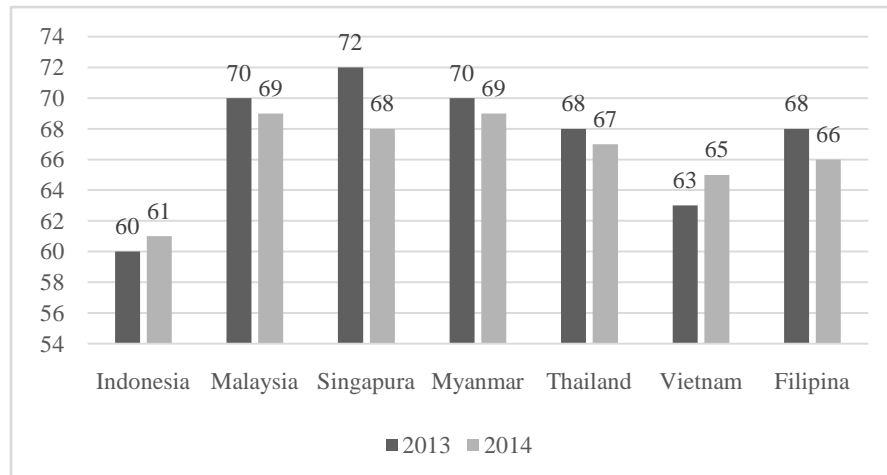


Figure 1. Financial Literacy Index of Countries in Southeast Asia 2013-2014  
(Source: Mastercard Financial Institution, 2015)

According to Figure 1, Indonesia has a Financial Literacy Index 60 point in 2013 and 61 point in 2014. This magnitude is the smallest compared to Southeast Asia countries. This is a reflection of the low inclusion of finance as a result of the low quality of financial infrastructure in Indonesia. The lack of financial inclusion is defined as access to financial institutions is also low. This has an impact on the difficulty of public access to financial instruments. In addition, Klapper and Zia (2009) mentioned that low inclusion will transmit to financial stability. Therefore, if the inclusion is low, then public access to finance is also low, so that the productivity of society due to economic activity is also low.

The Government through the Financial Services Authority in an effort to address these issues has initiated an inclusive financial vision. This vision is manifested in one of its programs, Laku Pandai (Non-Office Finance Service). Laku Pandai or generally called branchless banking is the government's effort to increase financial reach in rural areas, thus increasing public access to financial institutions in Indonesia.

The problem of the low financial infrastructure comes from the low efficiency of various financial institutions in a country. Therefore, optimal efficiency will impact on high productivity, hence financial institutions as one of the financial infrastructures will increase its quality. One of the financial institutions that became the benchmark of the quality of infrastructure is banking.

Banking performance in Indonesia will be a reflection of the quality toward financial infrastructure in Indonesia. This can be reflected through banking efficiency indicators. Banking efficiency will be a manifestation of the performance of financial institutions in Indonesia because this indicator will measure the level of banking operational optimization in Indonesia, so that the level of optimization can be used as an evaluation of the condition of financial institutions in Indonesia.

Various studies have been conducted in measuring the performance of banking efficiency in Indonesia, such as Gumilar and Komariah (2011), Firdaus and Hosen (2013), Amirillah (2014). However, these studies have not yet explained the transmission of technical efficiency to Indonesia's financial infrastructure, so the implications for development are not explicitly conveyed. Therefore, this study aims to measure the technical efficiency of banking in Indonesia. The results of these calculations will serve as urgency in explaining the transmission to the implementation

of branchless banking in strengthening the financial infrastructure in Indonesia. In the end, this study is expected to be a consideration in improving the implementation of branchless banking by all banks in Indonesia.

## 2. METHODOLOGY

### 2.1 Research Method

This study uses quantitative method with nonparametric approach Data Envelopment Analysis (DEA). DEA was first proposed by Charnes et al. (1978) who developed the concept of efficiency based on a piece-wise surface or called a frontier (Sari et al., 2016). The assumptions used in DEA tend to be more flexible because of the absence of certain production function assumptions. This study also uses a qualitative approach. The qualitative approach used is descriptive. This approach is a follow-up to the estimation results done, so it can be interpreted and proposed a specific policy.

### 2.2 Data And Variable

Data used in this research is secondary data. The form of data is panel data from conventional banks and sharia banks in 2012 until 2015. The number of banks tested is nine conventional banks and nine syariah banks, so there are 18 banks.

Sources of data come from several sources, namely the Financial Services Authority, Central Bureau of Statistics, and Bank Indonesia. The data is obtained from the annual report of each institution. Then the annual report is collected, so that the data is ready to be processed.

Variables used in this study include input and output. The input variables used are fixed assets and equity (capital). The output variables used are profit and financing (in syariah bank) / loan (in conventional bank). This variable is used in accordance of some previous studies such as Johnes et al. (2012); Zeitun and Benjelloun (2013); Rozzani and Rahman (2013); Wahab et al. (2014); Yadav and Katib (2015); Sillah and Harrathi (2015).

### 2.3 Model and analytical techniques

This study use the following model :

$$\begin{aligned} \text{Max } \theta & & (1) \\ \text{Subject to : } \theta y + Y\lambda & \geq 0 & (2) \\ \theta\sigma z + Z\lambda & = 0 & (3) \\ x - X\lambda & \geq 0 & (4) \end{aligned}$$

Equation (1) means that the use of DEA method in this study aims to maximize. In the case of profit and financing/loan, then this concept is theoretically appropriate. In equations (2), (3), and (4) explains constraints which are constraints of achieving the maximization to be achieved. DEA assumptions used are Variable Return to Scale (VRS) where benchmarks are taken at the nearest point of the actual output. The efficient condition is when the entity is in Constant Return to Scale (*crs*) condition because in that condition, the increase of 1 percent will increase also by the percent unit, while the inefficiency condition is when the calculation result is in Increasing Return To Scale (*irs*) or Decreasing Return to Scale (*drs*). The *irs* condition is defined as the condition when the increase in input by 1 percent, will increase output greater than 1

percent, while the condition drs is when there is an increase of input by 1 percent, then the output will increase less than 1 percent.

The analytical technique is related to the stages of analysis carried out in this study. The first analysis is on the calculation of technical efficiency (TE). Technical efficiency calculations are performed statically and dynamically. The static calculation is done by calculating the efficiency level in every year, while the dynamic calculation is done by considering Malmquist index, so that the productivity level of banking is obtained through indicator of total factor productivity change (*tfpch*) and technological progress indicator. After calculating the result of technical efficiency and justification of productivity, it is followed by qualitative analysis to explain the transmission of calculation result to financial infrastructure.

### 3. RESULTS

#### 3.1 The Result of Banking Efficiency

The statistical estimation result of banking efficiency in Indonesia is as follows.

Table 1. Static Calculation of Conventional Bank Efficiency Results 2012, 2013, 2014 and 2015

Bank	2012		2013		2014		2015	
	SE		SE		SE		SE	
1	0,3361	drs	0,3673	drs	0,4215	drs	0,089	drs
2	1.000	-	1.000	-	1.000	-	0,23264	drs
3	0,5069	drs	0,6923	irs	0,5666	drs	0,27222	drs
4	0,4819	drs	0,6479	drs	0,5451	drs	0,19792	drs
5	0,38542	drs	0,5076	drs	0,3965	drs	0,14653	drs
6	1.000	-	1.000	-	0,6937	irs	0,18472	drs
7	0,6180	drs	0,5770	drs	1.000	-	0,31181	drs
8	0,4368	drs	0,475	drs	0,4111	drs	0,08125	drs
9	1.000	-	1.000	-	1.000	-	1.000	-
<b>Mean</b>	<b>0,5388</b>		<b>0,5944</b>		<b>0,5687</b>		<b>0,24236</b>	

Note: SE: Scale Efficiency (TE Ratio from vrs and crs); drs: *decreasing return to scale*; irs: *increasing return to scale*; - : *constant return to scale*

Table 2. Static Calculation of Sharia Bank Efficiency Results 2012, 2013, 2014 and 2015

Bank	2012		2013		2014		2015	
	SE		SE		SE		SE	
1	0,5708	drs	0,4694	drs	0,6069	drs	0,2576	drs
2	0,1090	drs	0,1055	drs	0,2243	irs	0,1736	drs
3	0,6333	drs	0,4055	drs	0,5145	drs	1.000	-
4	0,2840	drs	0,2326	drs	0,0756	drs	0,0923	drs
5	1.000	-	0,6231	irs	0,6631	irs	0,4534	drs
6	0,6201	drs	0,2687	drs	0,4354	drs	0,4256	drs
7	1.000	-	1.000	-	1.000	-	1.000	-
8	0,6826	drs	1.000	-	1.000	-	1.000	-
9	1.000	-	1.000	-	1.000	-	1.000	-
	<b>0,5534</b>		<b>0,4652</b>		<b>0,5118</b>		<b>0,4645</b>	

Note: SE: Scale Efficiency (TE Ratio from vrs and crs); drs: *decreasing return to scale*; irs: *increasing return to scale*; - : *constant return to scale*

Based on Table 1 and Table 2, banks in Indonesia (conventional and *sharia*) are in an inefficient condition. This is shown by scale efficiency that has a number less than 1. The inefficiency condition means that the amount of input used is still not equal to the output (financing/loan) issued by banks. Therefore, banks need the expansion of new funding objects, so as to increase the level of technical efficiency.

Dynamic efficiency estimation of banking in Indonesia is as follows.

Table 3. Dynamic Calculation of Conventional Bank Efficiency Results 2012-2015

<i>Bank</i>	<i>2012-2015</i>				
	<i>effch</i>	<i>techch</i>	<i>pech</i>	<i>sech</i>	<i>tfpch</i>
<b>1</b>	0,3451389	1.620	0,6069444	0,3951389	0,5597222
<b>2</b>	0,4819444	1.592	1.000	0,4819444	1.105
<b>3</b>	0,5645833	1.761	1.000	0,5645833	1.432
<b>4</b>	0,5159722	1.613	1.000	0,5159722	1.198
<b>5</b>	0,4972222	1.620	0,6861111	0,5027778	1.160
<b>6</b>	0,4048611	1.759	0,6291667	0,4465278	1.026
<b>7</b>	0,5527778	1.683	1.000	0,5527778	1.340
<b>8</b>	0,3944444	1.639	0,6909722	0,3965278	0,6465278
<b>9</b>	1.000	1.920	1.000	1.000	1.920
<b>Mean</b>	0,484722	1.687	0,675694	0,498611	1.178

**Noted** : *effch* = efficiency change; *techch*= technical change/technical progress; *pech*= pure efficiency change; *sech*=scale efficiency change; *tfpch*=total factor productivity change

Table 4. Dynamic Calculation of Sharia Bank Efficiency Results 2012-2015

<i>Bank</i>	<i>2012-2015</i>				
	<i>effch</i>	<i>techch</i>	<i>pech</i>	<i>sech</i>	<i>tfpch</i>
<b>1</b>	0,5965278	1.251	1.120	0,5326389	1.075
<b>2</b>	1.166	1.113	0,69375	1.168	1.298
<b>3</b>	1.031	1.613	1.000	1.031	1.663
<b>4</b>	0,46875	1.455	0,68125	0,4770833	0,6819444
<b>5</b>	0,5	1.198	0,5763889	0,6027778	0,5993056
<b>6</b>	0,6104167	1.382	0,6916667	0,6125	1.214
<b>7</b>	1.000	1.414	1.000	1.000	1.414
<b>8</b>	1.006	1.211	1.000	1.006	1.217
<b>9</b>	1.000	1.278	1.000	1.000	1.278
<b>Mean</b>	0,6347222	1.316	0,6868056	0,6416667	1.202

**Noted** : *effch* = efficiency change; *techch*= technical change/technical progress; *pech*= pure efficiency change; *sech*=scale efficiency change; *tfpch*=total factor productivity change

Based on Table 3 and Table 4, conventional and sharia banks have technological progress. The indicator is seen in the *techch* (technological change) column. This means that conventional and sharia banks have used technology that is good enough to produce output, so that productivity is dominated by tech support. The impact of such technological advances is the total factor productivity change (*tfpch*) which also shows good numbers (productivity levels over 1).

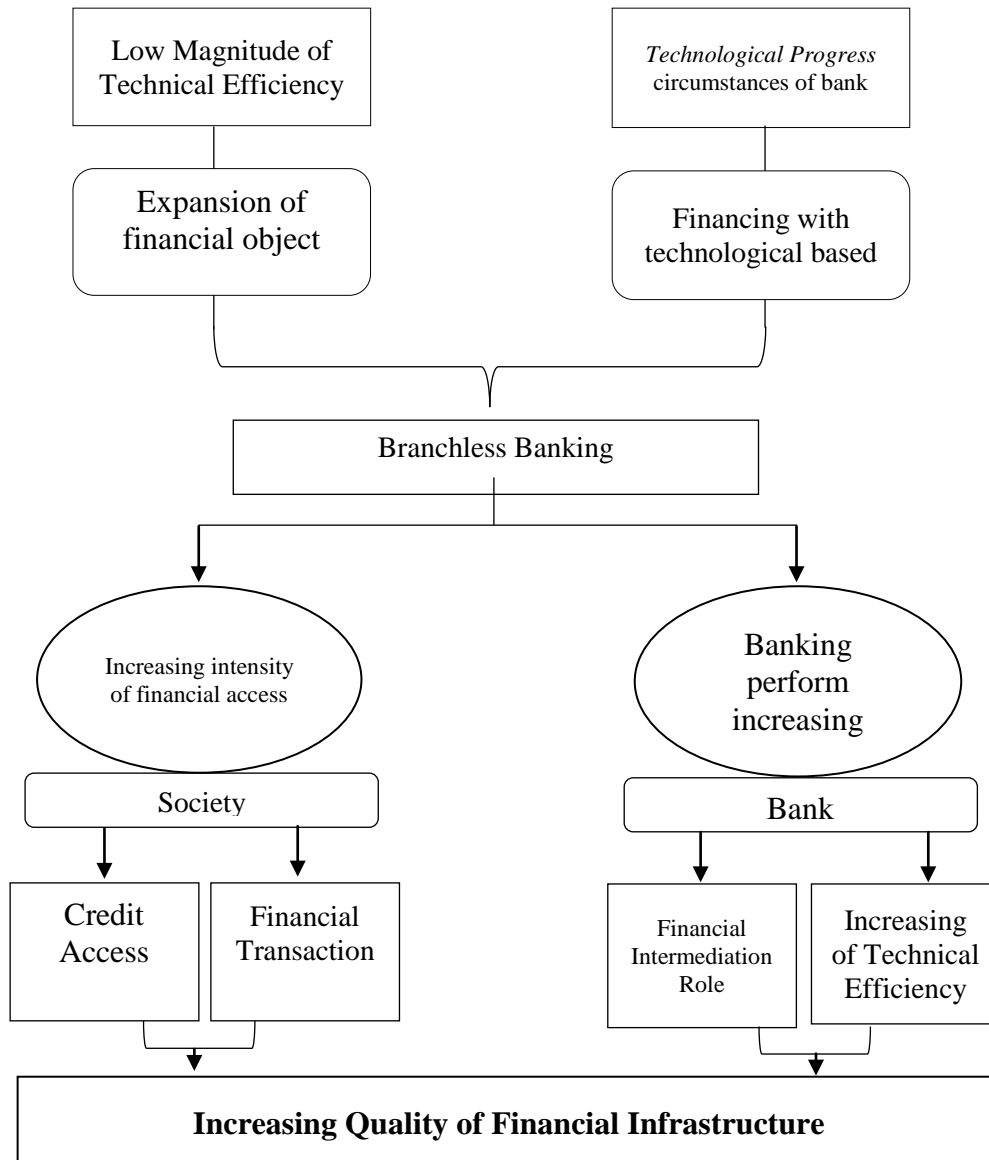
Based on the estimation that has been done, the static technical efficiency estimation which shows the inefficient condition means that banks need new financing object to increase the output in the form of financing/loan to the debtor. In relation to these results, the dynamic results show that banks have used technology optimally, meaning

that banks need a program of developing financing objects that intensify the use of technology. The program is one of them is through the concept of branchless banking that intensify the use of information technology and telecommunications in the implementation. It is also an effort to improve the improvement of financial infrastructure as one of the driving tools of the economy of the people in Indonesia.

#### **4. DISCUSSION: TRANSMISSION IMPLEMENTATION OF BRANCHLESS BANKING IN IMPROVING THE QUALITY OF FINANCIAL INFRASTRUCTURE IN INDONESIA**

Urgency of shariah banking in applying policy of development of new object of financing based on technology can be done through branchless banking program. This follows the estimation results of technical efficiency and total productivity factors. The program has been implemented by the Indonesian government in the Non Office Financial Services program (Laku Pandai). The program can transmit in strengthening the quality improvement of financial infrastructure in Indonesia. The transmission is illustrated in Figure 5.

Based on Figure 5, the transmission of quality improvement of financial infrastructure starts from the empirical condition of banks in Indonesia as one of the financial institutions. Banking has technical efficiency problems that are not yet optimal (inefficient). One solution to overcome this is through the expansion of new financing objects in order to increase the output of banking. However, based on testing, the bank turned out to have applied a pretty good technology, so it has a condition of technological progress. The follow up of this condition is by implementing a program involving technology.



Source: Author, 2017

Figure 5. Transmission of *Branchless Banking* toward Increasing Quality of Financial Infrastructure

Both of these conditions are framed in the branchless banking program currently developed by the Financial Services Authority (OJK) through the PANDAI LAKU program. The branchless banking program will be beneficial to the succession of financial inclusion that has been initiated, especially for the community and banking. The benefits to the community are increased access to credit and financing. With branchless banking, people will be easier to borrow and get financing (in *sharia* banks), because people do not have to travel far to reach the bank office. This also implies an increase in financial transactions of rural/inland communities when branchless banking programs are implemented. On the bank side, banks will also increase their role as a financial intermediary institution that brings together those who are over-funded with those who are short of funds, so that the role can be more optimal implementation. In addition, the benefits of branchless banking for banks is related to the empirical

condition of banks that are not yet in efficient condition. Such efficiencies can be enhanced by the addition of output in the form of credit or financing to customers. In the end, these benefits will lead to branding image of the quality of financial infrastructure in Indonesia. Through. This program, it is expected that banks can contribute to improve the financial infrastructure in Indonesia through various ease of financial access, so that financial inclusion as the vision of the government can be realized optimally.

## 5. CONCLUSION

The branchless banking program is one of the programs to succeed the vision of financial inclusion in Indonesia. This program has been manifested through the Laku Pandai (Non-Office Financial Service). Laku Pandai, which is branchless banking, will prosper the community (in terms of increasing access to financial institutions and improving financial transactions) as well as banks (related to improving their role as financial intermediary institutions and increasing inefficient technical efficiency of banks). The existence of the benefits of both parties is expected to further increase the participation of various banks in the implementation of branchless banking in Indonesia, so the alternative availability of financial institutions will be more diverse.

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