**Study on the Efficiency of Indonesian Sharia Rural Banks: Two Stage Approach**

**Rindang Nuri Isnaini Nugrohowati,**

**Lak Lak Nahzat El Hasanah**

**Abstract**

This paper aims to measure the efficiency level of Sharia Credit Banks in Indonesia over the period of 2012 to 2015. In the first stage, this study uses a Two Stage Approach to measure the level of efficiency with Data Envelopment Analysis (DEA) using the Banxia Frontier Analysis (BFA) software. Then, the second stage involves the analysis of factors that influence the efficiency level of a bank by panel data regression method. On the basis of the test, it is revealed that the Sharia Rural Banks in Indonesia during the study period are not been fully efficient. Some internal factors of the bank, namely BOPO ratios, have a significant adverse impact on the efficiency, while KPPM has a positive and significant influence on the efficiency of BPRS in Indonesia. Meanwhile the total asset, NPF and ROA variables have no significant effect on the efficiency, while the interest rate or BI Rate and inflation have a positive and significant influence on the efficiency of the BPRS.

**Keywords:** Efficiency, internal factors and macro factors, Two Stage Approach

1. **Introduction**

The sharia banking industry has been witnessing an encouraging growth rate for more than two decades since it was first established in 1992. Every year the sharia banking industry experiences a varied rate of growth in accordance with the current economic conditions and other various influential factors. As an effort to create financial system stability through a sound, strong and efficient banking system, it is necessary to increase resilience and competitiveness by increasing bank efficiency. Measurement of efficiency levels is increasingly needed along with the rapid development of the banking industry in Indonesia. In addition, given the increasingly tight competition in the banking industry, it is essential to carry out the measurement of efficiency level. Knowing the level of bank efficiency enables us to gain knowledge over the bank's ability to optimize its resources (Firdaus and Muhammad, 2013).

Until now, there are countless incessantly developing researches on the level of bank efficiency in various countries considering that efficiency is one of the most pivotal parameters of bank performance in banking industry. Staub et al. (2012) who conducted a study on the efficiency level of banks in Brazil revealed that banks in Brazil had lower economic costs than those in Europe and the United States. Meanwhile in Indonesia, some of the most interesting phenomena are related to profitability performance and operational efficiency which incline to be unhealthy and are less sustainable. The weak structure of the bank's earning assets revealing the use of bank funds, the banking revenues derived from traditional activities with high levels of fluctuations, and the low asset ratios per customer, are some factors that lead to relatively higher banking operating costs in Indonesia compared to those of other countries (Subandi and Imam, 2013).

As compared to the conventional banks, it is clearly observable that Islamic banks in Indonesia are still less efficient. This is primarily because Islamic banks are still in the expansion stage and have not reached economies of scale as that of the conventional banks. Hasan (2006), Firdaus and Muhammad (2013) and Karimah et al (2016) in their research revealed that generally Islamic Commercial Banks in Indonesia have not operated efficiently. Meanwhile, the research of Fadhullah (2015), Abidin and Endri (2006) which took a case study at the BPD Syariah bank in Indonesia came up with the conclusion that the BPD bank's technical efficiency performance has not yet reached a 100 percent optimal efficiency level. On average, BPD banks with larger assets are more efficient than medium and small-scale BPD banks.

In addition to the BUS and Sharia BPD, another concerning thing is the level of efficiency of the Sharia Rural Bank. Thus, there has been attempt to consistently encourage BPRS to expand its business because the BPRS has an important role in increasing the growth of micro, small and medium enterprises (MSMEs) which are the objects of BPRS financing in driving the real sector of economy. This is in line with the research conducted by Anwar (2011) which shows that Islamic banks have better performance than conventional banks in a model that incorporates the financing element of the SME sector as one of the output components of the model. Islamic banks have a higher average SME sector of financing portfolio compared to conventional bank portfolios.

**Table1.1 Sharia Rural Bank Financing Based on Financing Groups**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Financing Class** | **2013** | **2014** | **2015** | **2016** | | | |
| **AGS** | **SEP** | **OKT** | **NOV** |
| SME | 2,620,263 | 3,005,858 | 3,377,987 | 3,643,769 | 3,473,147 | 3,467,101 | 3,498,449 |
| Portion of    total (%) | 59 | 60 | 59 | 56 | 54 | 53 | 53 |
| Besides SMEs | 1,813,230 | 1,999,051 | 2,387,184 | 2,842,086 | 2,974,698 | 3,026,501 | 3,092,767 |
| Portion of    total (%) | 41 | 40 | 41 | 44 | 46 | 47 | 47 |
| **Total** | 4,433,492 | 5,004,909 | 5,765,171 | 6,485,856 | 6,447,845 | 6,493,602 | 6,591,216 |

Source: Sharia Banking Statistics 2016

A bank is said to be efficient when it is able to get an optimal level of output with the existing input level, or is able to reach a certain level of output with minimum input. Knowing the allocation of inputs and outputs enables further analysis on the factors that lead to bank inefficiency. The development of research on measurement of efficiency calls for a research procedure known as Two-Stage Data Envelopment Analysis (Firdaus and Muhammad, 2013). This approach will provide a comprehensive picture of the level of a bank efficiency while knowing the determinants of efficiency (Subandi and Ghozali, 2013).

There are many researches on efficiency determination in various countries, one of which is by Harimaya and Kazumine (2014) which attempted to look at the impact of branch opening on bank efficiency in Japan. The research shows that expanding branch networks to a certain level enables regional banks to lower inefficiency costs. Delis and Nikolaos (2014) conducted a study on the determinants of bank efficiency by using semi-parametic methods which concluded that determinants such as bank size, industry concentration and investment environment had a positive impact on bank efficiency.

Another study conducted by Omar et al (2006) reveals that it is not the bank size which becomes an important factor in increasing bank efficiency, but the utilization of technology and human resources capabilities that are more influential on high productivity growth. Garza-Garcia (2012) in their research found that the main variables that increase bank efficiency are loan intensity, GDP growth and foreign ownership. On the other hand, non-interest costs, non-performing loans and inflation rates reduce the level of bank efficiency. Hassan and Sanchez (2007) conducted research by taking banking case studies in Latin America. The results delineates that capitalization rates, profitability ratios, differences in interest rates, and GDP growth have a positive effect on bank efficiency and that the inflation rate has a negative impact on efficiency.

Meanwhile Endri (2015) who conducted research on macroeconomic variables and banking efficiency in Indonesia indicates that on the average, the level of technical efficiency of the bank has not yet reached 100% optimal efficiency level. The measurement results also find that the variable interest rates affect the bank's technical efficiency negatively, while the inflation rate and exchange rate have positive impact. This result is in line with the research of Widiarti et al (2015) which reveals that the Indonesian banking industry is not efficient in the intermediation function.

Based on some previous researches abovementioned, it is still necessary to re-examine the level of efficiency and determinants of efficiency, especially for BPRS, given that BPRS has an important role for the development of MSMEs. This study aims to measure the level of efficiency, and to look at the internal and external factors that affect the level of efficiency of the BPRS. To get a comprehensive picture of the efficiency level of an SRB, a Two-Stage Methodology approach was carried out.

1. **Theoretical basis**

The concept of efficiency was first introduced by Farrel (1957) in his research entitled "The Measurement of Production Efficiency". Farrel (1957) describes a condition of achieving efficiency in a company as illustrated in the following curve:



Source: Farrel,1957

**Figure 2.1 Technical, Allocative, and Economical Efficiency of the Input Side Approach**

It is clearly observable from the above curve that there are three efficiency conditions namely Technical Efficiency, Allocative Efficiency and Economic Efficiency.

1. Technical Efficiency. To produce an output of Q, the company uses two inputs of x and y assuming constant return to scale (CSR). As an illustration, it is easier to use the right-hand curve, that is, when a company uses a total input of 27 (9X and 18Y) at P point to produce Q output, there will be a technical inefficiency. This is because Q output is resulted from a total input of 18 (6X and 12Y). QP distance is the amount of all inputs that can be proportionally reduced without causing a reduction in output that can be produced. In the mathematical formulation, the percentage of input that can be reduced is QP/0P. The technical efficiency (TE) of a company can be measured using a ratio of:

The above equation is the same:

1. Allocative Efficiency. On the curve (figure 1), the AA’ line represents the ratio of input prices or is what is known as the isocost curve which is a curve that describes the combination of the use of production factors (inputs) with the same budget. It is possible to calculate the allocative production point through the isocost curve represented by the AA line. Allocative Efficiency (AE) level oriented at point P can be measured by the following ratio:

The level of allocative efficiency is located at point Q' that is when the isocuant curve intersects with the isocost curve. The distance between RQ illustrates the production costs that can be reduced if the production is in an allocative (Q') efficient condition. Thus, it can be said to be technically efficient, but not necessarily allocatively efficient. Point Q as discussed in the first point illustrates the condition that is technically efficient but not allocatively efficient because producing output at point Q requires a higher cost compared to Q'. This can be seen from the location of the Q point which is to the right of the isocost line which means that the cost is greater.

1. Economic Efficiency. Economic efficiency (EE) is a compilation between Technical Efficiency and Allocative Efficiency that can be measured by the following ratio:

Thus it can be concluded that products that are technically efficient and allocatively meaningful have achieved economic efficiency conditions.

It is possible to analyze the concept for measuring efficiency from two sides, namely the input and output sides. The input side approach answers the question of how much input quantity can be reduced to produce the same quantity of output, while the output side approach answers how much output quantity can be proportionally increased with the same quantity of inputs (Abidin and Endri, 2009). It is possible to explain the concept of efficiency with the output side approach as follows:



Source: Coelli (2005)

**Figure 2.2 Technical, Allocative, and Economical Efficiency of the Output Side Approach**

1. Technical Efficiency. In the abovementioned picture, the ZZ curve shows a Production Possibility Frontiers (PPF), a curve that shows all possible combinations that can be produced with all available resources that have been fully and efficiently utilized. Meanwhile, the DD line is the isorevenue line which shows the price ratio of both outputs. The efficient condition is technically located at point B while point A shows technical inefficiency. AB Distance shows the amount of potential improvements that may be made by the company to become a technically efficient company. In terms of mathematical formulation, the percentage of potential improvement that can be done by the company is AB/0B. The technical efficiency (TE) of a company can be measured using a ratio of:

The above equation is the same:

1. Allocative Efficiency. The DD’ line shows the output price (isorevenue). Knowing the output price enables the calculation of Allocative Efficiency (AE) with:

The level of allocative efficiency is located at point B’, but it is different from the abovementioned point B’ which describes the technically efficient but not allocatively efficient condition. This is because at point B the company can still increase its income. Thus, the improvement up to point C means that the company increases its income by producing at an allocatively efficient point, point B’. The distance between BC describes income that can be increased if production is in an allocative (B’) efficient condition.

1. Economic Efficiency. Economic efficiency (EE) is a compilation or multiplication between Technical Efficiency and Allocative Efficiency. Mathematically Economic Efficiency (AE) can be calculated by:

The measurement of relative efficiency, both with input and output side approaches, both require defining frontier lines that show companies that are relatively more efficient than other companies (Abidin and Endri, 2009).

1. **Research Methodology**

Measurement of banking efficiency is carried out using a non-parametric approach, namely Data Envelopment Analysis (DEA) using the Banxia Frontier Analysis (BFA) software. DEA is used to estimate the technical efficiency score (TE), pure technical efficiency (PTE), and efficiency scale (ES) using the intermediation approach. TE and PTE scores range from 0-1. The closer the number is to 1 (one), the more efficient is the bank. The division of the TE score by the PTE score will produce an ES that ranges from 0-1.

**SE = TE / PTE**

Where:

SE = Scale Efficiency,

TE = Overall Efficiency (CRS model),

PTE = Technical Efficiency (VRS model)

Selection of input and output variables to measure the level of efficiency using the DEA method is as follows:

**Table 3.2 Input-output of the DEA model**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Definition** | **Reference** |
| **Input**  DPK  Total assets  Operating cost | Wadiah Deposits Fund  Total assets  Operating cost | Firdaus dan Muhamad (2013), Widiarti dkk (2015) |
| **Output**  Financing  Operating Income | Murabahah Financing  Funds distribution income | Firdaus dan Muhamad (2013),  Widiarti dkk (2015) |

In the first stage of this study, the researcher carried out the estimation of efficiency scores using DEA. The second stage involved the analysis of the influence of internal and external factors of the bank as an independent variable on the dependent variable, namely the efficiency of the results of the DEA measurement using panel data regression. The resulted data panel models were analysed using three kinds of approaches namely the common effect approach, fixed effect approach, and random effect approach.

Considering the panel data is a combination of time-series and cross-section, the model can be written as follows:

**EFFit = β0 + β1 SIZEit + β2 NPLit + β3 BOPOit + β4 KPPMit + β5 ROAit + β6 INFLit + β7 BIRit + β8 GDPit +µit**

i = 1, 2, ..., N ; t = 1, 2, ..., T

Where :

EFF= Efficiency

SIZE = Total Asset

NPL= Problematic Credit to Total Credit

BOPO = Operational Costs to Operating Income

KPMM = Minimum Capital Requirement

ROA = Income on Average Total Assets

INFL=Inflation

BIR= BI Rate

GDP = Real GDP

# Results And Discussion

* 1. **Result**

The data used in this study is secondary data in the form of panel data derived from financial reports published by Bank Indonesia and the Financial Services Authority.

**Table 4.1 BPRS Data in Indonesia (Data Per December 2015)**

|  |  |
| --- | --- |
| **Region** | **Sample** |
| Aceh | 7 |
| Sumatera Utara | 8 |
| Riau | 2 |
| Lampung | 1 |
| Jawa Barat | 14 |
| Jawa Tengah | 9 |
| DIY | 2 |
| Jawa Timur | 8 |
| Banten | 6 |
| Bali | 1 |
| DKI Jakarta | 1 |
| **Total** | **59** |

* + 1. **Measurement Results of the Efficiency Level of Sharia Credit Banks (Sharia Rural Banks) Semester I 2012 up to Semester II Year 2015**

This section will present the measurement of the efficiency of the Sharia Rural Bank (BPRS) in Indonesia using the Banxia Frontier Analysis (BFA) software. Overall, the efficiency level of Sharia Rural Banks in Indonesia until the end of 2015 fluctuated. From the measurement results through the Frontier Analyst method, the score of efficiency score was between 0 and 1 which means that the Sharia BPR is said to be very efficient when the value of efficiency scores is 1. Meanwhile, the efficiency score which is further away from 1 or close to 0 means that the BPRS is inefficient. The achievement of the efficiency level of each BPRS on a semester basis will be presented in graphical form grouped by region.

**Table. 4.2 Efficiency Level of BPRS Semester I of 2012 - Semester II of 2015**

| **Name of BPRS** | **2012.1** | **2012.2** | **2013.1** | **2013.2** | **2014.1** | **2014.2** | **2015.1** | **2015.2** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| BPRS Renggali | 0.4662 | 0.9976 | 0.4885 | 0.8488 | 0.7517 | 0.596 | 0.7904 | 1 |
| BPRS Hareukat | 0.5351 | 0.7675 | 0.4173 | 0.7083 | 0.4395 | 0.6816 | 0.3652 | 0.6627 |
| BPRS Tengku Chiek Dipante | 0.4543 | 0.6691 | 0.3416 | 0.5479 | 0.3191 | 0.461 | 0.4436 | 0.6318 |
| BPRS Rahmania Dana Sejahtera | 0.353 | 0.5354 | 0.4118 | 0.6793 | 0.5516 | 0.7436 | 0.5393 | 0.7066 |
| BPRS Hikmah Wakilah | 0.5437 | 0.7578 | 0.5179 | 0.7519 | 0.5728 | 0.772 | 0.5395 | 0.7476 |
| BPRS Adeco | 0.5255 | 0.6833 | 0.5144 | 0.6659 | 0.6186 | 0.8299 | 0.5923 | 0.7708 |
| BPRS Rahman Hijrah Agung | 0.4809 | 0.7534 | 0.3923 | 0.6111 | 0.4567 | 0.6391 | 0.5716 | 0.6034 |
| BPRS Puduarta Insani | 0.5208 | 0.7153 | 0.5612 | 0.7427 | 0.9422 | 0.7244 | 0.5418 | 0.7202 |
| BPRS Amanah Insan Cita | 0.4583 | 0.6734 | 0.5923 | 0.7876 | 0.5304 | 0.7215 | 0.5505 | 0.7787 |
| BPRS Al-Yaqin | 0.6733 | 0.8158 | 0.5499 | 0.8095 | 0.4548 | 0.7048 | 0.5083 | 0.7571 |
| BPRS Al Washliyah | 0.2998 | 0.5717 | 1 | 0.6687 | 0.4132 | 0.6408 | 0.4717 | 0.6604 |
| BPRS Carana Kiat Andalas | 0.421 | 0.6872 | 0.4212 | 0.6207 | 0.3427 | 0.5704 | 0.3678 | 0.5231 |
| BPRS Ampek Angkek Candung | 0.5262 | 0.7328 | 0.5549 | 0.7406 | 0.5205 | 0.712 | 0.5162 | 0.6303 |
| BPRS Barakah Nawaitul Ikhlas | 0.5191 | 0.779 | 0.5535 | 0.7741 | 0.6029 | 0.8488 | 0.6228 | 0.8322 |
| BPRS Gajah Tongga Kota Piliang | 0.6575 | 0.7318 | 0.6735 | 0.7331 | 0.4999 | 0.7411 | 0.4442 | 0.6677 |
| BPRS Berkah Dana Fadhilah | 0.4696 | 0.5716 | 0.4234 | 0.4735 | 0.5119 | 0.6467 | 0.4682 | 0.6462 |
| BPRS Hasanah | 0.4968 | 0.6202 | 0.4909 | 0.6077 | 0.66 | 0.5871 | 0.4015 | 0.6664 |
| BPRS Way Kanan | 0.5432 | 0.7889 | 0.6645 | 0.8895 | 0.61 | 0.8051 | 0.6086 | 0.8095 |
| BPRS Cempaka Al Amin | 0.6549 | 0.8839 | 0.6716 | 0.8679 | 0.6342 | 0.8366 | 0.6384 | 0.8095 |
| BPRS Amanah Ummah | 0.4925 | 0.6139 | 0.466 | 0.6284 | 0.544 | 0.6289 | 0.5257 | 0.664 |
| BPRS Bina Rahmah | 0.5694 | 0.7874 | 0.5472 | 0.7152 | 0.502 | 0.6765 | 0.5236 | 0.7447 |
| BPRS Rif’atul Ummah | 0.2822 | 0.4799 | 0.3967 | 0.6604 | 0.4909 | 0.7464 | 0.4591 | 0.6943 |
| BPRS Insan Cita Artha Jaya | 0.4128 | 0.6259 | 0.3878 | 0.4806 | 0.5642 | 0.6836 | 0.5672 | 0.6841 |
| BPRS Artha Fisabilillah | 0.7092 | 0.8447 | 0.7389 | 1 | 0.6859 | 0.9091 | 0.7057 | 0.8073 |
| BPRS Amanah Rabbaniah | 0.5895 | 0.8473 | 0.6251 | 0.8447 | 0.5797 | 0.8235 | 0.6031 | 0.8492 |
| BPRS Al Ma soem Syariah | 0.6444 | 0.8012 | 0.5906 | 0.7764 | 0.5793 | 0.7393 | 0.5773 | 0.6936 |
| BPRS Al Ihsan | 0.5171 | 0.9535 | 0.4623 | 0.8042 | 0.5475 | 0.7031 | 1 | 0.7002 |
| BPRS Harta Insan Karimah Parahyangan | 0.7477 | 1 | 0.755 | 0.9572 | 0.6574 | 0.9043 | 0.6693 | 0.9135 |
| BPRS Artha Madani | 0.6056 | 0.8171 | 0.5777 | 0.9396 | 0.6695 | 0.9662 | 0.6269 | 0.8404 |
| BPRS Al Barokah | 0.791 | 1 | 0.7083 | 1 | 0.647 | 0.9953 | 0.7351 | 0.9754 |
| BPRS Al Hijrah Amanah | 0.4974 | 1 | 0.5546 | 0.7809 | 0.5283 | 0.7309 | 0.9969 | 0.6875 |
| BPRS Al Salaam Amal Salman | 0.6159 | 0.8627 | 0.533 | 0.7995 | 0.567 | 0.7202 | 0.5477 | 0.7781 |
| BPRS Cipaganti | 0.4059 | 0.6637 | 0.5085 | 0.8014 | 0.6073 | 0.8064 | 0.5419 | 0.6671 |
| BPRS Suriyah | 0.6046 | 0.7406 | 0.5471 | 0.7214 | 0.5231 | 0.7387 | 0.4949 | 0.6994 |
| BPRS Bumi Artha Sampang | 0.4861 | 0.6897 | 0.4998 | 0.7254 | 0.4965 | 0.773 | 0.498 | 0.7343 |
| BPRS Gunung Slamet | 0.6221 | 0.8641 | 0.6521 | 0.9301 | 0.6333 | 0.8248 | 0.656 | 0.8685 |
| BPRS Khasanah Ummat | 0.5618 | 0.7105 | 0.5558 | 0.7655 | 0.5309 | 0.7509 | 0.5337 | 0.6543 |
| BPRS Arta Leksana | 0.5373 | 0.7852 | 0.5499 | 0.7657 | 0.5767 | 0.7033 | 0.5686 | 0.6535 |
| BPRS Meru Sankara | 0.4829 | 0.6702 | 0.6291 | 0.859 | 0.4843 | 0.6928 | 0.4827 | 0.6564 |
| BPRS Al Mabrur | 0.9322 | 0.834 | 0.6013 | 0.8321 | 0.5843 | 0.78 | 0.4764 | 0.7435 |
| BPRS Artha Amanah Ummat | 0.6428 | 0.8421 | 0.5988 | 0.8609 | 0.614 | 0.8544 | 0.5853 | 0.8287 |
| BPRS Dana Mulia | 0.5528 | 0.6844 | 0.584 | 0.7309 | 0.5681 | 0.5311 | 0.4278 | 0.5558 |
| BPRS Madina Mandiri Sejahtera | 0.6784 | 0.9214 | 0.6574 | 1 | 0.2998 | 0.5292 | 0.5655 | 0.7256 |
| BPRS Barokah Dana Sejahtera | 0.4767 | 0.6502 | 0.5467 | 0.6982 | 0.542 | 0.7345 | 0.5476 | 0.7534 |
| BPRS Al Mabrur Babadan | 0.5388 | 1 | 1 | 1 | 1 | 1 | 0.9706 | 0.9046 |
| BPRS Rahma Syariah | 0.4641 | 0.6434 | 0.4515 | 0.8122 | 0.4565 | 0.6777 | 0.4841 | 0.6567 |
| BPRS Bhakti Haji | 0.5532 | 0.8803 | 0.5758 | 0.706 | 0.4639 | 0.7239 | 1 | 0.6727 |
| BPRS Situbondo | 0.4981 | 0.7415 | 0.479 | 0.7056 | 0.5088 | 0.6907 | 0.4365 | 0.7192 |
| BPRS Jabal Tsur | 0.5443 | 0.8085 | 0.566 | 0.8056 | 0.5131 | 0.8138 | 0.4752 | 0.7216 |
| BPRS Unawi Barokah | 0.4413 | 0.6653 | 0.4767 | 0.6154 | 1 | 0.6589 | 0.5115 | 0.7977 |
| BPRS Amanah Sejahtera | 0.5895 | 0.7285 | 0.4861 | 0.6167 | 0.4447 | 0.6271 | 0.3258 | 0.5282 |
| BPRS Sarana Prima Mandiri | 0.4548 | 0.6154 | 0.4899 | 0.6516 | 0.515 | 0.8876 | 0.5011 | 0.7002 |
| BPRS Al Attaqwa Garuda Utama | 0.4968 | 0.5765 | 0.5524 | 0.806 | 0.4925 | 0.6325 | 0.4853 | 0.6 |
| BPRS Wakalumi | 0.5618 | 0.6932 | 0.5258 | 0.7142 | 0.5872 | 0.7148 | 0.5476 | 0.6669 |
| BPRS Berkah Ramadhan | 0.4347 | 0.6881 | 0.4777 | 0.6808 | 0.4723 | 0.653 | 0.5163 | 0.7591 |
| BPRS Muamalah Cilegon | 0.4821 | 0.6336 | 0.4528 | 0.5767 | 0.3999 | 0.5387 | 0.414 | 0.5021 |
| BPRS Harta Insan Karimah | 0.9724 | 1 | 1 | 1 | 0.9771 | 0.9776 | 0.8071 | 0.9151 |
| BPRS Mulia Berkah Abadi | 0.6075 | 0.7777 | 0.5609 | 0.801 | 0.5006 | 0.578 | 0.6084 | 0.7375 |
| BPRS Syariat Fajar Sejahtera Bali | 0.6853 | 0.8422 | 1 | 1 | 1 | 1 | 0.6783 | 1 |

* + 1. **Estimated Results of Factors Affecting the Efficiency of an SRB**

Based on panel data processing with several stages, the best estimation results are Random Effect models. From the results of data processing as shown in the table above, it can be interpreted that this regression model has an R-squared value of 0.2185. This shows that the variation of independent data is only able to explain the dependent variable, in this case is the efficiency of 21.85%, while 78.15% is explained by other variables outside the model.

**Table 4.3 Estimates of Internal Factor Models and External Factors Affecting Efficiency**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 0.616981 | 0.052849 | 11.67451 | 0.0000 |
| TA | 1.15E-10 | 1.28E-10 | 0.896546 | 0.3704 |
| NPF | -0.000182 | 0.000329 | -0.551473 | 0.5816 |
| BOPO | -0.253551 | 0.037729 | -6.720268 | 0.0000 |
| KPMM | 8.80E-05 | 3.91E-05 | 2.248306 | 0.0250 |
| ROA | -2.31E-05 | 0.000212 | -0.109012 | 0.9132 |
| INFL | 0.020721 | 0.003198 | 6.479547 | 0.0000 |
| BIR | 0.017470 | 0.007039 | 2.481968 | 0.0134 |
| GDP | 8.53E-08 | 1.02E-07 | 0.834698 | 0.4043 |
| R-squared | 0.218587 | Mean dependent var | | 0.321804 |
| Adjusted R-squared | 0.205085 | S.D. dependent var | | 0.134860 |
| S.E. of regression | 0.120238 | Sum squared resid | | 6.693679 |
| F-statistic | 16.18956 | Durbin-Watson stat | | 2.657609 |
| Prob(F-statistic) | 0.000000 |  |  |  |

Source: Data Processed

* 1. **Discussion**
     1. **Level of Efficiency of BPRS in Aceh**

**Figure 4.1 Average Score of Seven BPRS Efficiency Score in Aceh During Semester I 2012 - Semester II 2015**

As seen from the size of the bank whose indicator is in the form of total assets, PT BPRS Hikmah Wakilah has the highest total assets of all other six BPRS. But in this case the average score of efficiency of PT BPRS Wisdom Wakilah is still below BPRS Renggali that is equal to 0.6504 or 65.04%. In this case, it is conclusive that the number of assets is not the main determinant for a bank to achieve efficiency, but the ability of banks to optimize output obtained by utilizing existing input is the key for the bank to be efficient. This result is consistent with research conducted by Omar et al (2006) which revealed that bank size is not an important factor in increasing bank efficiency, but it is the utilization of human resources technology and capabilities that have a large influence on high productivity growth. This is not in line with research conducted by Abidin and Endri (2006) which reveals that on average, larger banks are more efficient than medium and small-scale banks. During the first semester of 2012 to semester 2 of 2015, the total assets of PT BPRS Hikmah Wakilah continued to increase, but the acquisition of ROA was relatively stable at 2% to 3%. Thus, it can be said that the SRB has not been able to utilize the existing inputs to achieve optimal output.

**4.2.2. Level of Efficiency of BPRS in North Sumatra**

Measurement of efficiency level was also carried out on BPRS in North Sumatra by taking 4 BPRS samples. From the samples taken by PT BPRS Al Washliyah, they were able to achieve efficiency score of 1 in the first semester of 2013. In that period, the total assets of PT BPRS Al Washliyah decreased as compared to the previous period, but ROA increased from -4.76 to 0.10. The level of efficiency achieved in this period illustrates that despite the decline in input, in this case the decrease in total assets, PT BPRS Al Washliyah is able to maximize its output as indicated by an increase in ROA. This is consistent with the research conducted by Hasan (2006) which reveals that efficiency is highly correlated with bank profitability, namely ROA and ROE ratios.

In this case, it is rarely found that banks are able to maintain their efficiency values steadily over time. There are many factors to help determine the level of efficiency of a bank, such as the bank's internal factors in the form of financial indicators. It is in line with the research conducted by Widiarti et al (2015) which shows that internal factors of banks such as Non Performing Loans (NPL), Loan to Deposit Ratio (LDR), Bank Size, Cost Efficiency Ratios, and Capital Adequacy Ratio (CAR), significantly affect the efficiency level of banks in Indonesia. Based on the results above, the overall level of efficiency of BPRS efficiency in North Sumatra has a fluctuating trend both for individual banks and on average.

**Figure 4.2 Efficiency of Seven BPRS in Aceh During Semester I 2012 - Semester II 2015 in North Sumatra**

**4.2.3. Level of Efficiency of BPRS in West Sumatra**

The measurement results of efficiency level of BPRS in West Sumatra by taking a sample of 4 BPRS during the first semester of 2012 to the second semester of 2015 reveals that there were no BPRS that achieved 100% efficiency. The BPRS that is closest to the efficient value is BPRS Barakah Nawaitul Ikhlas in the second semester of 2014 with a score of 0.8488 or 84.88%. In this period, the potential improvement done by BPRS Barakah Nawaitul Ikhlas to achieve a 100% efficiency level is by increasing total financing by 17.81% and operating income by 17.81%. Potential is an improvement that can be made by the bank to become a technically efficient company.

Meanwhile, the bank with lowest level of efficiency is BPRS Carana Kiat Andalas in the first semester of 2014 with an efficiency score of 0.3427 or 34.27%. Potential improvement that can be done by BPRS Carana Kiat Andalas to achieve 100% efficiency level is by increasing total financing and operating income by 191.76%. It is also necessary to make some improvement efforts by setting a target of 1075.19 wadiah deposits whose value was 7308.94. In this case it is necessary to reduce the target of wadiah deposits, because the efficiency of a bank is not measured based on the magnitude of the number, but based on the relationship between input and output to determine whether or not an institution is efficient or not.

**Figure 4.3 Efficiency of Four SRBs in West Sumatra During Semester I 2012 - Semester II 2015**

**4.2.4. Level of Efficiency of BPRS in Riau and Lampung**

**4.2.4.1 Efficiency of BPRS in Riau**

Measurement of the efficiency of BPRS in Riau was carried out by taking two samples, namely SRB Berkah Dana Fadhilah and SRB Hasanah. During the study period, the efficiency of the two BPRS showed a fluctuating value with the average efficiency of BPRS Berkah Dana Fadhilah amounting to 0.5263 and BPRS Hasanah valued at 0.5663. Overall, it can be said that both BPRS are not efficient because the value of the efficiency score is far from 1 or 100%.

**Figure 4.4 Efficiency of Two SRBs in Riau During Semester I 2012 - Semester II 2015**

The highest efficiency value of SRB Berkah Dana Fadhilah was achieved in the second semester of 2014 with an efficiency value of 0.6467. Potential improvement that can be done by SRB Berkah Dana Fadhilah to achieve 100% efficiency value is by increasing total financing and bank income by 54.62%.

**Table 4.1 SRB Target Input and Output Blessing Dana Fadhilah**

**(Second Semester Period 2014)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | | **Actual** | **Target** | ***Potential Improvement*** |
| **Input** | Wadiah Savings | 605.78 | 605.78 | 0% |
| Total assets | 18082110 | 18082110 | 0% |
| Operating costs | 2298557 | 2298557 | 0% |
| **Output** | Financing | 11845664 | 18315700 | 54.62% |
| Operating Income | 3054648 | 4723080 | 54.00% |

On the other hand, the highest efficiency score for SRB Hasanah was achieved in the second semester of 2015 with an efficiency value of 0.6664 or 66.64%. To achieve 100% efficiency some improvements to be done are by increasing total financing and operating income by 50.06%.

**Table 4.2. SRB Hasanah Target Input and Output (Second Semester Period 2015)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | | **Actual (Juta Rupiah)** | **Target (Juta Rupiah)** | **Potential Improvement** |
| **Input** | Wadiah Savings | 174,94 | 174,94 | 0% |
| Total assets | 7883535 | 7883535,00 | 0% |
| Operating costs | 1470674 | 1470674,00 | 0% |
| **Output** | Financing | 6298660 | 9451989,19 | 50.06% |
| Operating Income | 1553943 | 2331901,14 | 50.06% |

**4.2.4.2 Efficiency of BPRS in Lampung**

Measurement of the efficiency level of BPRS in Lampung is done by way of taking one sample, namely SRB Way Kanan. Based on the measurement results, it is known that the efficiency level of BPRS Way Kanan has an increasing tendency in the second semester and a decrease in the first semester. During the study period, Way Right BPRS had not been able to achieve 100% efficiency level. The highest level of efficiency was achieved in the second semester of 2013 with a score of efficiency of 0.8679 or 86.79%.

**Figure 4.5 Efficiency of Two BPRS in Lampung During Semester I 2012 - Semester II 2015**

Potential improvements that can be made by BPRS Way Kanan are by reducing the target of 1705.16 wadiah deposits or 63.59%. In addition to achieving 100% efficiency level, it is also necessary that BPRS Way Kanan increase its financing by 110.96% and increase its operating income by 12.42% because the realization is still below the targeted amount.

**Table 4.2. BPRS Way Kanan Target Input and Output (Second Semester Period 2013)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variabel** | | **Actual (Juta Rupiah)** | **Target (Juta Rupiah)** | ***Potential Improvement*** |
| **Input** | Tabungan Wadiah | 4683,86 | 1705,16 | -63,59% |
| Total Aset | 25181696,00 | 25181696,00 | 0% |
| Biaya Operasional | 1969571,00 | 1969571,00 | 0% |
| **Output** | Pembiayaan | 9098662,00 | 19194894,84 | 110,96% |
| Pendapatan Operasional | 5072394,00 | 5702565,30 | 12,42% |

**4.2.5 Efficiency of BPRS in West Java**

Efficiency measurement in West Java is carried out by taking a sample of 14 BPRS. In general, the efficiency level of 14 BPRS in West Java experienced fluctuations with an upward trend in the second semester. 100% efficiency rate was achieved by 5 SRBs, namely BPRS Artha Fisabilillah in the second half of 2013, BPRS Al Ihsan in the first period of 2015, BPRS Harta Insan Karimah Parahyangan for the second period of 2012, BPRS Al Barokah for the second period of 2012 and 2013, and BPRS Al Hijrah Amanah for the second period of 2012. Efficacy level 1005 shows that in a certain period the five BPRS are relatively quite efficient as compared to other BPRS. In other words, the five BPRS have succeeded in optimizing the use of inputs at the level of output they have achieved.

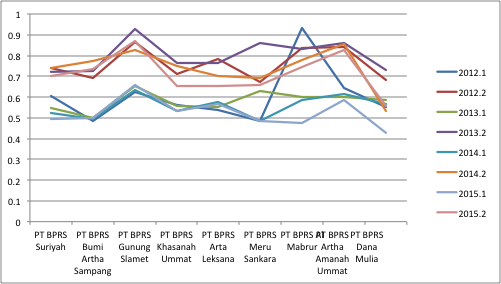
**Figure 4.6 Efficiency of Two BPRS in West Java During Semester I 2012 - Semester II 2015**

During the period of 2012 to 2015, the highest average score of efficiency was achieved by PT BPRS Al Barokah with a value of 0.856 or 85.6%. Meanwhile, PT BPRS Rif'atul Ummah has the lowest efficiency score compared to 13 other BPRS with a value of 0.5262 or 52.62%.

**4.2.6 Level of Efficiency of BPRS in Central Java**

The samples taken from 13 BPRS in Central Java present a fluctuating level of efficiency with a better second semester trend compared to the first semester. From the samples taken, during the study period there was no BPRS that was able to achieve 100% efficiency level. PT BPRS Al Mabrur in the first semester of 2012 reached the highest level of efficiency with a value close to 100%, namely 0.9322 or 93.22%. Efficiency improvements can be made by PT BPRS Al Mabrur by reducing the total asset target by Rp8,676,540.81, which currently amounts to Rp10,233,117.00. So it is necessary to reduce the total asset target by 15.21% of the total assets that are now possessed.

This happens because there is no correlation between efficiency and the magnitude of the number, but it is the relationship between input and output that can determine the level of efficiency of a bank. Then PT BPRS Al Mabrur also needs to raise its total financing target and operating income by 7.27%. It is also necessary to increase financing to reach the target of Rp. 7,387,011.06 which is currently worth Rp. 6,886,471.00 and it is important to increase its operating income to reach the target of Rp 1,108,647.37 which is currently valued at 1,033,525.00. Meanwhile, operating expenses and wadiah savings are in line with the current conditions.



**Figure 4.7 Efficiency of 13 BPRS in Central Java During Semester I 2012 - Semester II 2015**

**4.2.7 Level of Efficiency of BPRS in East Java**

Measurement of BPRS efficiency in East Java was carried out by taking a sample of 7 BPRS. From the samples taken, it is clearly observable that there is one BPRS which shows a fairly good efficiency value, namely PT BPRS Al Mabrur Babadan. For five consecutive periods from the second semester of 2012 to the second semester of 2014, PT BPRS Al Mabrur Babadan was able to achieve 100% efficiency level. The next period in the first and second semester of 2015, the efficiency level experienced a slight decrease to 97.06% and 90.46%. What is noteworthy is the ability of PT BPRS Al Mabrur Babadan to improve its efficiency. As seen from the first period of 2012, it is prominent that the level of efficiency was 53.88%, but in the following period the level of efficiency increased sharply at the level of 100%.

In this fashion, it is apparent that the Sharia Rural Bank (BPRS) has a large role in the economy, especially on a local scale. This is related to its role in providing services to MSMEs as well as the community in rural areas. In this line, Anwar (2011) delineates that sharia banks have better performance than conventional banks in models that incorporate elements of financing of the SME sector as one of the output components in the model. Sharia banks have an average SME sector financing portfolio that is higher than conventional bank portfolios.

In carrying out its role, BPRS has specific characteristics, namely inefficient operations and difficulties in obtaining capital assistance under conditions of structural problems. To increase the intended role, the BPRS must operate on a certain economic scale and must be supported by a larger Minimum Capital Requirement (KPPM) ratio to absorb potential risks. Capital limitations are the main factor that prevent the BPRS from reaching economic of scale. This occurs because capital constraints result in the inability to recruit qualified human resources, inability to provide reliable IT facilities, inability to realize good corporate governance and inability to develop competitive products and services. Those things can trigger the potential for fraud and mismanagement that may worsen the performance of BPRS and even suffer from greater losses so that economic of scale cannot be realized. Its inability to achieve this economic of scale will lead to inefficiencies for rural banks and rural banks.

**Figure 4.8 Efficiency of 7 BPRS in East Java During Semester I 2012 - Semester II 2015**

The lowest level of efficiency data that PT BPRS Amanah Sejahtera experienced in the first semester of 2015 was of 0.3858 or 38.58%. To improve the efficiency level, some important steps to be done is to set a target of Rp. 3,097.79 wadiah savings which is currently Rp. 15,306.82. In other words, it is necessary to reduce the target of wadiah deposits by 79.76%. Improvements also need to be made by increasing the financing target of 254.23% from the value of Rp.15,153,577.00 to Rp. 53,679,093.49. In addition, it is also necessary to increase operating income by 206.91% from the value of Rp. 5,184,548.00 to Rp. 15,911,731.96.

**4.2.8 Level of Efficiency of BPRS in Banten and The Special Region of Yogyakarta**

**4.2.8.1 Efficiency of BPRS in Banten**

From the measurement of efficiency of 6 BPRS in Banten, it is unveiled that PT BPRS Harta Insan Karimah has the best efficiency level. During the study period the efficiency value of PT BPRS Harta Insan Karimah was quite stable, although in the first period of 2015, it experienced a slight decline. The efficiency value of 100% was achieved by PT BPRS Harta Insan Karimah in the second semester of 2012 until the second semester of 2013. In the first semester of 2012 and the 2014 period the efficiency value was 97% or 0.97. Meanwhile, in the first semester of 2015, it experienced a slight decrease with the efficiency score of 80.71%. Overall, the average efficiency score of PT BPRS Harta Insan Karimah is 95.61%. Thus, from the sample size of BPRS taken in various regions, it shows that PT BPRS Harta Insan Karimah is a BPRS that has the best average efficiency value.

**Figure 4.9 Efficiency of BPRS in Banten Semester I 2012 - Semester II 2015**

Given the internal factors in the form of financial indicators, it is indicated that PT BPRS Harta Insan Karimah has a pretty good financial performance. During the study period, its total assets had a positive trend trend, while the BOPO, ROA and KPMM ratios had a fairly stable value. On the other hand, the ratio of Non Performing Financing (NPF) which illustrates the problematic credit level shows a stable value over the period 2012 to 2014, but in the first half of 2015, the NPF value increased. By looking at internal factors, it was suspected that the decrease in efficiency that occurred in the first half of 2015 was 97.76% to 80.71% due to an increase in NPF. This is consistent with research conducted by Widiarti et al (2015) which shows that internal factors of banks, one of which is Non-Performing Loans (NPLs), have a significant effect on bank efficiency in Indonesia.

**4.2.9 Efficiency of BPRS in Yogkayarta**

Two samples were taken to see the level of efficiency of BPRS in Yogyakarta, namely PT BPRS Madina Mandiri Sejahtera and PT BPRS Barokah Dana Sejahtera. The efficiency level of 100% was achieved by PT BPRS Madina Mandiri Sejahtera in the second half of 2013, but in the following period, there was a sharp decline in efficiency by 29.98% in the first half of 2014. Increasing efficiency in that period can be done by reducing the deposit target by 53.58% or IDR1721.32 which was originally valued at IDR3708.19. Increasing efficiency also needs to be done by increasing the total financing target and operating income by 233.61%.

**Figure 4.10 Efficiency of BPRS in Yogyakarta Semester I 2012 - Semester II 2015**

During the research period, PT BPRS Barokah Dana Sejahtera showed that it had not been able to achieve 100% efficiency level. The highest efficiency score achieved in the second semester of 2015 was 75.34%. Improving efficiency can be done by way of reducing the target of wadiah savings by 60% to Rp3,518.88 from the original value of Rp.8,796.56. Other improvements can be done by increasing total financing by 89.65% and increasing operating income by 32.73%.

* + 1. **Impact of Bank Internal Factors on Efficiency**

Internal factors are micro or specific factors that can determine bank efficiency. The first financial indicator that will be seen is the effect of efficiency on total assets that indicate the size of the bank. The size of the bank proxied by the total assets owned by the bank shows that it does not have a significant effect on the efficiency of the BPRS. This can be seen from the probability value above 0.05%, so the size of the bank does not significantly influence the efficiency of the BPRS. The results of this study are in line with the study conducted by Omar et al (2006) which revealed that bank size is not important in increasing bank efficiency, but the use of human resources technology and capabilities that have a large influence on high productivity growth.

Rural Banks (BPR) and Sharia Rural Banks (BPRS) have different characteristics compared to other commercial banks. This is inseparable from the role of rural banks and rural banks that provide more services to MSMEs and small communities. To date, the weaknesses faced by the BPRS are limited capital which results in low human resource capabilities and limited provision of reliable IT. The inability to recruit qualified human resources and the development of integrated human resources are obstacles to the productivity of BPRS. In addition, weak IT capabilities lead to potential fraud or greater errors. For example, the system cannot validate the data that has been inputted. Another possibility is that the system has the possibility to be manipulated. All of these are considered as triggers for why BPRs or BPRS cannot reach economic of scale which lead to inefficiencies for BPRS. The results of this study are not in line with the studies conducted by Delis and Nikolas (2009) which show that a number of determinants such as bank size, industry concentration and investment environment have a positive impact on bank efficiency. Other research shows that the type of bank, NPL, LDR, Bank Size, Cost Efficiency Ratio, and CAR, significantly affect the efficiency of banks in Indonesia (Widiarti et al, 2015). This is in line with the research conducted by Abidin and Endri (2009) which present that on average, BPD banks with larger assets were more efficient than medium and small-scale BPD banks.

The effect of NPF on efficiency is shown by the coefficient value of -0.000182 with a probability value of 0.5816 greater than alpha 5%, which means that the NPF has a negative effect on the efficiency although not significantly. The results of this study are not in line with the study conducted by Widiarti et al (2015) which shows that internal factors of banks, one of which is Non-Performing Loans (NPF), have a significant effect on bank efficiency in Indonesia. NPF is a comparison between non-performing loans, namely the sum of loans with substandard, doubtful and loss quality with total credit. There are two primary factors which may trigger the high level of NPF. The first factor is because the problematic loans are greater or the total financing is getting smaller. If the increase in NPF is triggered by the increasing amount of problem loans, the efficiency of the bank will be affected. High non-performing loans can threaten bank capital, because the function of bank capital is to absorb risk. However, if the high NPF is caused by the low total financing due to decreasing credit demand and reduced credit distribution, the NPF has no significant effect on efficiency.

The effect of KPMM or CAR on efficiency is shown by the coefficient value of 0.00088 with a probability value of 0.0250 smaller than alpha 5%, which means that KPMM has a positive and significant effect on bank efficiency. This result is in line with the study conducted by Widiarti et al (2015) and Karimah et al which concluded that the bank's capital adequacy ratio had a significant effect on bank efficiency. The Minimum Capital Requirement (CAR) is a comparison between capital and Risk Weighted Assets used to measure the ability of bank capital to absorb risk. When the Capital Adequacy Ratio is high, the ability of the capital to absorb risk will be greater, thus the bank is considered to be more efficient. In this case, the role of bank capital is very large in absorbing risk. Capital limitations are the main factor that causes the BPRS to be unable to reach economic of scale. This occurs because capital constraints result in the inability to recruit qualified human resources, inability to provide reliable IT facilities, inability to realize good corporate governance and inability to develop competitive products and services. These things make the SRB worse and even suffer losses. Not achieving this economic scale will lead to inefficiencies for both BPR and and BPRS.

The effect of BOPO ratio on bank efficiency is indicated by the coefficient value of -0.253551 with a probability value of 0.0250 smaller than alpha 5%, which means that BOPO has a negative and significant effect on the efficiency of BPRS. BOPO is the ratio between operational costs and operating income, which is one indicator of bank efficiency. Banking can be said to be efficient if the BOPO ratio has decreased, so the relationship between BOPO and efficiency is negative. The test results indicate that the BOPO ratio which is the Cost Efficiency ratio significantly affects the efficiency of banks in Indonesia. Meanwhile, the effect of ROA ratio on bank efficiency shows a coefficient value of -0.000231 with a probability value of 0.9132 5% greater than alpha, which means that ROA has a negative but not significant effect on efficiency. This is a study conducted by Subandi and Imam (2013) and Hassan (2006) whose studies show that efficiency is highly correlated with ROA and ROE. In the research sample, there were quite a number of BPRS whose ROA ratios were negative. This will affect the probability calculation of ROA regression on efficiency.

* + 1. **Effect of Macro Factors on the Efficiency of SRB**

This study also wants to see how to use macro variables in the efficiency of SRB in Indonesia. Macro variables or external factors are variables that are not related to bank management but reflect the economic environment that also influences banking operations and performance. The influence of inflation variables on efficiency is shown by the coefficient value of 0.020721 with a probability value of 0.0000. These results indicate that inflation has a positive and significant effect on the efficiency of BPRS in Indonesia. When inflation gets higher, the bank is considered to be more efficient. It is in line with the study conducted by Endri (2015) which revealed that inflation and exchange rates have a positive effect on efficiency. However, it is not in line with the research of Garza-Garcia (2012) and the study of Hassand and Sanchez (2007) that inflation rates affect the efficiency of banks negatively.

Inflation has two opposite sides, on the one hand, when inflation is too low, the economy will be sluggish. On the other hand, if the inflation is too high it will reduce the purchasing power of the people. The policy response from the central bank to control the inflation rate is to raise interest rates. This result in a more expensive cost of capital to be paid by the debtor, so that the increase in inflation will limit the demand for personal credit. The positive influence of inflation on the efficiency of an SRB is suspected because an SRB runs its operational system using the sharia principles, namely the principle of profit sharing. With the increase in interest rates as a result of rising inflation causes debtors to look for other financing alternatives with much lower capital costs. Islamic banks that are not interest-based are alternative options for people who want to apply for financing. Thus, when inflation increases, people will tend to shift to Islamic banking, therefore the relationship between inflation and bank efficiency increases. This is consistent with studies conducted by Garza-Garcia (2012)

The influence of interest rates on efficiency is shown by the coefficient value of 0.017470 with a probability of 0.0134 less than 5%. This means that interest rates have a positive and significant effect on the efficiency of BPRS in Indonesia. This research is carried out by Endis and Nikolaos (2009) and Hassand and Sanchez (2007). The high interest rates have been made by the NIM to be higher because of the greater difference in loan interest and deposit interest. High NIMs make banks feel they don't need to operate at a low cost, resulting in inefficiencies for the bank. In this case, the impact of inflation on bank efficiency. When interest rates increase, the cost of capital becomes more expensive, the intensity of financing in conventional banking decreases. On the other hand, the public will look for financing alternatives that are not interest based, namely Islamic banking and Sharia BPR.

Testing of the influence of GDP on efficiency shows that GDP has a positive but not significant effect on the efficiency of BPRS. This is indicated by the coefficient value of 0.01747 with a probability of 0.0134 smaller than 5%. In line with Anwar's (2011) study, the macro GDP does not have a significant effect on efficiency. Other studies conducted by Garza-Garcia (2012) and Delis and Nikolaos (2009) show different results, namely GDP growth which influences bank efficiency.

**5. Conclusions and Suggestions**

**5.1 Conclusion**

Based on the results of the above research, it can be concluded that:

1. The Sharia Rural Bank in Indonesia during the study period, namely the first semester of 2012 to the second half of 2015, is not yet fully efficient. From all samples taken, there were 59 BPRS which obtained an average score of efficiency of 0.7238 or 72.38%.
2. During the study period, BPRS that had the best average efficiency score were PT BPRS Harta Insan Karimah with a value of 95.61% which was close to the 100% efficiency score.
3. Bank internal factors, namely BOPO ratios, have a negative and significant influence, while KPPM has a positive and significant influence on the efficiency of BPRS in Indonesia. Meanwhile, the total asset, NPF and ROA variables have no significant effect on efficiency.
4. Macro variables in the form of interest rates or BI Rate and inflation have a positive and significant influence on the efficiency of BPRS, while GDP does not have a significant effect on efficiency.

**5.2 Suggestions**

Based on the above conclusions, the bank needs to pay attention to internal factors and external factors that also influence the efficiency of the bank by doing several things namely increasing the bank's capital capability because capital serves to absorb risk. Bank operations that are increasingly complex must be supported by strong capital. Therefore, banks must maintain the value of the Minimum Capital Requirement in the range set by the regulator. Macro variables are variables that are not related to bank management but reflect the economic environment that also influences banking operations and performance. Thus, the bank needs to pay attention to external factors in determining the strategy of developing competitive products and services.

**Bibliography**

Abidin, Zaenal dan Endri, 2009, Kinerja Efisiensi Teknis Bank Pembangunan Daerah: Pendekatan Data Envelopment Analysis (DEA), *Jurnal Akuntansi dan Keuangan*, Vol 11, No 1.

Anwar, Mokhamad, 2011, Efisiensi Perbankan di Indonesia: Bank Syariah VS Bank Konvensional, *Buletin Ekonomi Moneter dan Perbankan*, Vol 18, No 3.

Coelli, T., Prasada Rao, D. & Battese, G. E., 2005, *An Introduction To Efficiency And Productivity Analysis*. Massachusetts, USA: Kluwer Academic Publishers.

Delis, Manthos D. dan Nikolaos I. P., 2009, *Determinants of bank efficiency: evidence from a semi‐parametric methodology*, Emerald Group Publishing Limited.

Endri (2015), Variabel Makroekonomi Dan Efisiensi Perbankan Di Indonesia, *Proceeding of Seminar Nasional Ekonomi Manajemen Dan Akuntansi (Snema) Fakultas Ekonomi Universitas Negeri Padang.*

Fadhlullah, Ahmad H., 2015*,* Efisiensi Bank Pembangunan Daerah: Pendekatan Stochastic Frontier, *Jurnal Signifikan*, Vol 4, No1.

Farrell, M.L, 1957, “The Measurement of Productive Efficiency”, *Journal of The Royal Statistical Society*, 120, p.253-281.

Firdaus , Muhammad F dan Muhamad N, 2013, Efficiency of Islamic Banks Using Two Stage Approach of Data Envelopment Analysist, *Bulletin of Monetary, Economics and Banking*.

Garza-Garcia, J.G., 2012, Determinants of Bank Efficiensy in Mexico: a Two- Stage Analysis, Bristol: Centre for Global Finance, Bristol Business School, Unversity of The West of England.

Hassan, K. and Sanchez, B. (2007) Efficiency determinants and dynamic efficiency changes in Latin American banking industries, Networks Financial Institute, *Working Paper No. 32*, Indiana University.

Hassan, M. Kabir, 2006, The-X Efficiency in Islamic Banks, *Islamic Economic Studies,* Vol 13, No 2.

Harimaya, Kozo dan Kazumine Kondo, 2016, *Effects Of Branch Expansion On Bank Efficiency: Evidence From Japanese Regional Banks,* Emerald Group Publishing Limited.

Hadad, M.D., Santoso, W., Mardanugraha, E., & Illyas, D, 2003, Analisis Efisiensi Industri Perbankan Indonesia: Penggunaan Metode Nonparametrik Data Envelopment Analysis (DEA), Biro Stabilitas Sistem Keuangan Bank Indonesia, *Research Paper*.

Karimah, S, Tanti N, Jaenal E, 2016, Kajian Efisiensi Bank Umum Syariah Indonesia, *Jurnal Al-Muzara’ah*, Vol 4, No 1.

Omar, Mohd Azmi, Rahman, Abdul Rahim Abdul, Yusof, Rosylin Mohd, Majid, M Shabri Abd dan Rasid. (2006). MESM. Efficiency of Commercial Banks in Malaysia. *Asian Academy of Management Journal of Accounting and Finance.*

Pratikto, Heri dan Iis Sugianto, 2011, Kinerja Efisiensi Bank Syariah Sebelum dan Sesudah Krisis Global Berdasarkan Data Envelopment Analysis, *Jurnal Ekonomi Bisnis*, Th.16, No.2.

Rahmawati, Rafika, 2015, Strategi Peningkatan Efisiensi Biaya Pada Bank Umum Syriah Berbasis Stochastic Frontief Approach dan Data Envelopment Analysis, *Buletin Ekonomi Moneter dan Perbankan*, Vol 17, No 4.

Subandi dan Imam Ghozali, 2013, Determinan Efisiensi dan Dampaknya Terhadap Kinerja Profitabilitas Industri Perbankan di Indonesia, *Jurnal Keuangan dan Perbankan*, Vol 17, No 1.

Staub, Roberta B, Geraldo al Silva, Benjamin M, 2010, Evolution of Bank Efficiency in Brazil: A DEA Approach, *European Journal of Operational Research*, Vol 22, Issue 1, Pages 204-213.

Widiarti, A, Hermanto S, Trias A, 2015,The Determinants of Bank’s Efficiency in Indonesia, *Buletin Ekonomi Moneter dan Perbankan*, Volume 18, Nomor 2.

Worthington Andrew C, 2004, Frontier Efficincy Measurement in Healthcare: A

Review of empirical Techhniques and Selected Applications, *Medical Care Research and Review.*