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THE EFFICIENCY OF *BAITUL MAL WA TAMWIL* (BMT) IN SURABAYA USING DATA ENVELOPMENT ANALYSIS (DEA)

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ABSTRACT

This study aims to find out whether Islamic microfinance, especially in *Baitul Maal wat Tamwil* in Surabaya has reached the level of efficiency in its operational activities from or not. This research uses a quantitative approach within Data Envelopment Analysis (DEA) technique. This study uses primary data which directly retrieves Islamic microfinance financial report data from Islamic microfinance. The results showed that the efficiency value of Variable Returns to Scale (VRS) processing was higher than the Constant Returns to Scale (CRS) processing result. From five BMT that become research objects of this study, just one institution that pass efficiency level and able to optimally use its resources (inputs) to produce certain outputs. On the assumption of CRS and VRS, most of Islamic Microfinance in Surabaya has not been efficient from 2012-2017 and Islamic microfinance in Surabaya is on the scale of diseconomies, that is Islamic Microfinance in Surabaya not yet optimally in empowering its resource (*input*) to produce *output.* So that Islamic microfinance in Surabaya must make improvements in managing *input*s in order to improve efficiency value by doing selective funding to avoid default payment and the increase of uncollectible accounts expense. Each BMT has a different efficiency level that need to improved by treatment, including reduce operational expenses, reduce assets, and increase income. The implication of this study is an improvement strategies for each BMT to get their efficiency level betterment.

Keywords : Efficiency, BMT, Data Envelopment Analysis (DEA), CRS, VRS.

1. Introduction

According to Soemitra (2015), Baitul Maal Wat Tamwil (BMT) is a microfinance institution that operates based on sharia principles. This institution has two functions, namely *Baitul Maal* and *Baitul Tamwil*. *Baitul Tamwil* functions as a place to carry out economic activities, such as providing financing for economic activities to members, encouraging saving activities, developing productive businesses, and investing in improving the economic quality of micro and small entrepreneurs. While the *Baitul Mal* (house of property) functions as a place that has social activities such as receiving deposits of zakat funds, *infaq*, alms, and their distribution. Recently, Baitul Maal Waa Tamwil (BMT) has developed very significantly in recent years. This is inseparable from the development of the performance of BMT nationally this year, which has reached Rp 4.7 trillion in assets and Rp 3.6 trillion in financing (Alamsyah, 2015).

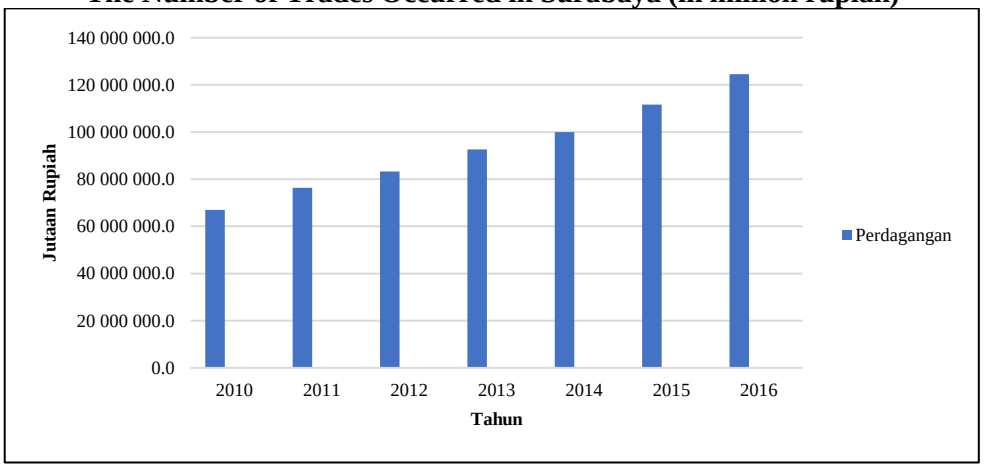
This shows that the government is developing BMT to be able to overcome financing problems that occur when Micro, Small, and Medium Enterprises (MSMEs) need funds to develop their businesses. The existence of BMT in Indonesia is an alternative for financial inclusion when people are unable to access finance due to limitations and several prerequisites that must be met in the banking system so that the financing provided by Islamic banking institutions is still unable to reach MSMEs and this makes the banking institution that has a function as intermediary institutions have not been able to carry out this function properly. In fact, MSMEs are one of the sectors that contribute to the country's economy. Therefore, Islamic financial institutions are needed which are expected to be able to reach MSMEs, such as Baitul Maal Wat Tamwil (BMT).

However, the many challenges and problems that arise in the development of BMT as a sharia microfinance institution that favors the lower class of society, have made many BMTs disband or stagnate in their development (Apriadi & Alexandi, 2013). Some of the causes of the unsustainability of BMT in Indonesia are poor management, untrustworthy managers, human resources who are not able to work professionally, cannot attract public trust, capital difficulties, and so on. One of them is BMT Fajar Mulia which has bad credit problems because hundreds of debtors failed to pay loans to BMT Fajar Mulia (Hardoko, 2015). This can cause the BMT to experience financial difficulties in paying savings funds to customers and of course, also have an impact on the level of public trust in BMT Fajar Mulia which has begun to decline. If this phenomenon continues, over time, BMT Fajar Mulia will go bankrupt. Therefore, to be able to maintain the existence of BMT, one of them is to increase its financial efficiency by controlling or reducing its operational costs to produce output at a certain level so as not to cause losses to BMT.

To maintain ke financial health of BMT, it needs to regularly check the efficiency scale. Efficiency scale can be calculated as the ratio of total technical efficiency to pure technical efficiency. If the efficiency scale is equal to one, then the company operates with the assumption of CRS, whereas otherwise the company is characterized by the assumption of VRS (Hadad, dkk, 2013). This Efficiency Scale will determine whether the work unit is on an economic or diseconomies scale, which is able to describe the optimal ability of the work unit in empowering its resources to produce output. (Wulansari, 2010). According to (Coelli et al., 2005) if there is a difference in efficiency scores between CRS and VRS, it can be said that the company has an inefficiency scale. Efficiency is the ability to produce a certain output with a minimum level of input. Efficiency is an important indicator in measuring the overall performance of a company's activities to produce at the lowest possible cost. One of the causes of inefficiency is the imperfect allocation of inputs in the operational activities of a financial institution. It is hoped that by finding the factors causing inefficiency, corrective policies can be used to improve the quality of bank performance (Sutawijaya & Lestari, 2009).

In previous studies, it is still rare to examine the efficiency of Islamic Microfinance Institutions in Indonesia by using the assumptions of CRS and VRS and calculating the efficiency scale because this study will determine the efficiency level of BMT seen from the efficiency scale. The study was conducted in the Surabaya area because Surabaya was designated as one of the centers of Islamic economic and financial development in Indonesia by Bank Indonesia considering that Surabaya has the potential for an Islamic religion-based economy in the region (Yakub, 2014). Not only that, Surabaya as the capital of East Java is considered a promising place for investment (Kurniawan, 2014). This was triggered by an increase in business investment confidence which is still strongly influenced by economic growth in an area considering that Surabaya has a very positive economic growth trend so that this makes many businesses appear, including MSMEs and can increase the amount of trade in Surabaya as shown in the following graph.

Figure 1
The Number of Trades Occurred in Surabaya (in million rupiah)



Source : BPS (edited 2017)

The purpose of this study is to determine whether the operational activities of the BMT in Surabaya have reached an efficient operational level or not. This research analysis tries to provide an overview of the performance of the BMT by measuring how far the use of inputs used for operational activities to produce a certain level of output and can be used as an input evaluation in future decision making.

2. Literature Review

Baitul Maal Wat Tamwil (BMT)

BMT (Baitul Maal Wat Tamwil or Balai Usaha Mandiri Terpadu) is a microfinance institution that operates based on sharia principles. The economic activities within BMT is to develop productive businesses and investments in improving the economic quality of micro and small entrepreneurs as well as receiving deposits of *zakat* funds, *infaq*, alms and optimize its distribution in accordance with the regulations and mandates (Soemitra, 2015:451).

Efisiensi

Muhibah, (2016) states that efficiency is a comparison between sources and results. If it is associated with system theory, efficiency is a comparison between input and output. Muharam & Pusvitasari, (2007) defined efficiency as an ability to complete a job correctly or in a mathematical view is defined as the calculation of the ratio of output or input or the number of outputs produced from one input used. A company is said to be efficient if: a) Using a smaller number of inputs when compared to the number of input units used by other companies to produce the same amount of output; and b) Using the same number of input units, can produce a larger number of outputs.

Efficiency Measurement Approach

Based on Muharam & Pusvitasari (2007), there are three types of efficiency measurement approaches, namely:

1. Ratio approach used to compare the output produced with the input used.
2. Regression approach used to measure efficiency in this approach using a method of a certain level of output as a function of various levels of certain inputs.
3. Frontier approach used to measuring the level of efficiency is divided into two types, namely parametric and nonparametric frontier approaches. The parametric approach is measured by parametric statistical tests such as using the Stochastic Frontier Approach (SFA) and the Distribution

Free Approach (DFA). While the non-parametric Frontier approach is measured by non-parametric statistical tests, namely by using the Data Envelopment Analysis (DEA) method.

Efficiency Measurement Technique

Efficiency measurement techniques according to the following (Zaenal Abidin & Endri Endri, 2009) :

1. *Input based Measurement* shows that the number of inputs can be reduced proportionally without changing the amount of output produced.
2. *Output based Measurement* measures when several outputs can be increased proportionally without changing the number of inputs used.

Input and Output Approach

The concepts used in defining the relationship between inputs and outputs in the behavior of financial institutions based on (Ascarya & Yumanita, 2006), are:

1. Production Approach sees financial institutions as producers of savings accounts and credit loans. This approach defines output as the sum of these or related accounts.
2. Intermediation Approach sees financial institutions as intermediaries. These financial institutions convert and transfer financial assets, from overfunded units to underfunded units.
3. Asset Approach sees the primary function of a financial institution as the creator of loan credit.

Variable Relationship to Efficiency

1. Operational Cost
   Based on Sofyan Asasuri (1999:11), operational costs are a sacrifice of resources spent in the context of company activities in transforming inputs into outputs, including all activities or activities that produce goods and services, as well as other activities that support or support businesses to produce these products. The selection of operational expenses as an input variable because operational expenses are assets that are used by outsiders which will later generate income (output) because in operational expenses there are production factors, such as labor and labor as actors in creating financing so that this is in accordance with the measurement approach. efficiency, namely the production approach where this approach sees BMT activities as a service production for depositors and credit borrowers by providing financing from using all production factors, such as labor used in BMT operational activities.
2. Asset
   Assets are wealth or anything with economic value owned by an entity. In the financial statements of BMT, in the asset account there are financing investments, murabahah receivables, *qardh* loans, BMT savings in other banks, leased assets, and so on. The selection of assets as an input variable is in accordance with the production approach where in the asset account there is a financing investment provided by BMT which will generate revenue sharing on the financing.
3. Operational income
   Hanafi dan Abdul, (2008) stated that revenue is defined as advance assets or assets that increase in value or debt that decreases or a combination of the three advances, during the period during which the company produces and delivers goods or services. The choice of operating income as an output variable is because BMT operational activities are seen from the production approach as a service creator for credit borrowers in the form of loans or financing provided, for example, investment financing (input) is BMT operational activities which can later generate revenue sharing (output) on the financing.

Data Envelopment Analysis (DEA)

The DEA method was developed to measure productive efficiency based on production possibilities consisting of various input-output lines. The measurement of efficiency with a single input/output by Farrell was developed by multiple input/output and formulated as a mathematical

programming by Charnes, Cooper and Rhodes (1978). Charnes, Cooper and Rhodes called the method Data Envelopment Analysis (Amalia, 2013). According to Handoyo in (Gunawan & Utiyati, 2013) there are two models used in the DEA approach, namely the CRS (1978) and VRS (1984) models. The following is an explanation of the two models:

1. Constant Returns to Scale (CRS)
   The Constant Return to Scale model was developed by Banker, Charnes, Cooper, and Rhodes in 1978. Therefore, the CRS model can also be called the CCR model. Constant Returns to Scale (CRS) ie the ratio between the addition of input and output is the same. This means, if there is an additional 1%, the output will increase by 1% as well. Another assumption of this model is that each DMU operates at an optimal scale.
2. Variable Return To Scale (VRS)
   This model was developed by Banker, Charnes, Cooper in 1984. Therefore, the VRS model can also be called the BCC model. This model is a development of the CRS model. This model assumes that the ratio between the addition of inputs and outputs is not the same (variable returns to scale). This means that an increase of 1% in input will not cause a 1% change in output, but it can be larger (increasing returns to scale) or smaller (decreasing returns to scale).

Previous Research

Research conducted by Indra Widiarto and Ali Emrouznejad regarding the social and financial efficiency of Islamic microfinance institutions shows that overall, Islamic Microfinance Institutions (LKMI) have lower efficiency values than Conventional Microfinance Institutions (LKMK) on the VRS and CRS assumptions in 2009. However, in 2010, the efficiency value of LKMI increased higher than that of LKMK under the VRS assumption, while the efficiency value of LKMI remained below LKMK under the CRS assumption.

Research conducted by Ascarya and Yumanita in 2006 examined the measurement of the relative efficiency of Islamic banking in Indonesia and identified the causes of inefficiency. The input variables used are interest costs, personnel costs, operational costs. While the output variables are interest income, operating income. The results of the research are overall, BUS2 and UUS5 are the most efficient in Indonesia. Furthermore, research on the efficiency analysis of baitul maal wat tamwil with a two-stage Data Envelopment Analysis approach (case study of BMT MMU and BMT UGT Sidogiri) conducted by Mahbubi Ali and Ascarya showed that overall technical efficiency, BMT MMU (0.84) and BMT UGT (0.88) in 2008 is still not optimal. This also happened in research conducted by Ratna Dumilah, Gustian Juanda, Khayatun Nufus (2016) who examined cost efficiency analysis with the Stochastic Frontier Approach (SFA) at Baitul Maal Wat Tamwil cooperative, South Tangerang City in 2011 - 2015). The results of panel data analysis from this study show that overall, the BMT studied is not efficient where the value is below 100%, among others, KBMT Al Fath IKMI 86.84%, KBMT Al Munawwarah 97.36%, KBMT Mekar Da'wah 97.62% and KBMT UMJ 97.25%.

3. Method

This study uses a quantitative approach, namely research that focuses on hypothesis testing. This approach uses analytical tools that are quantitative by using the Data Envelopment Analysis method. Based on this research model, the approach used is the production approach so that the selected variables are operating expenses and assets as input variables and income as output variables. The data on the amount of operating expenses and income used is data sourced from the annual BMT income statement from 2012-2017 and the total asset data is taken from the annual BMT balance sheet from the same year.

The type of data used is primary data which directly meets the BMT management to obtain financial reports from 2012-2017. In this study the population used is BMT in Surabaya. The sampling technique in this study is purposive sampling. The sample was selected based on certain considerations, namely BMTs who were registered and registered with the Cooperatives and UMKM Service in Surabaya and BMTs that had and were willing to provide annual financial reports from 2012-2017.

The formula used to calculate efficiency is:

$$Efficiency = \frac{\sum_{r=1}^{s} u_r y_r}{\sum_{i=1}^{m} v_i x_i} \leq 1$$

where u_r and $v_i \geq 0$

Description :
y_r = number of outputs r produced
u_r = weight for output r generated
x_i = number of input i used
v_i = weight of input i used

With the limitation or constraint that no other DMU will have an efficiency greater than 1 or 100% (Gunawan & Utiyati, 2013). . BMT will be said to be efficient if it has an efficiency value close to 1 or 100 percent. On the other hand, BMT will be said to be inefficient if it has a value close to zero (0) (Sutawijaya & Lestari, 2009).

4. Result and Discussion

Efficiency Value

A BMT is said to be inefficient if the efficiency score is less than 100% where the BMT cannot use its input properly. Therefore, an inefficiency BMT can use an efficient BMT as a benchmark to increase its efficiency value. The following is the result of data processing on BMT in Surabaya City using the Data Envelopment Analysis (DEA) method.

Table 1
Efficiency BMT Tahun 2012-2017

Tahun	Name of BMT	Asumption	
		CRS	VRS
2012	BMT MD	67.11 %	69.22 %
	BMT P	89.82 %	100 %
	BMT R	88.14%	100 %
	BMT A	51.82 %	100 %
	BMT MB	100 %	100 %
2013	BMT MD	94.42 %	100 %
	BMT P	96.02 %	100 %
	BMT R	64.14 %	100 %
	BMT A	56.43 %	100 %
	BMT MB	100 %	100 %
2014	BMT MD	67.38%	68.48 %
	BMT P	100 %	100 %
	BMT R	66.42 %	100 %

	BMT A	64.08 %	100 %
	BMT MB	100 %	100 %
2015	BMT MD	62.89 %	65.41 %
	BMT P	100 %	100 %
	BMT R	59.8 %	100 %
	BMT A	66.1%	100 %
	BMT MB	100%	100 %
2016	BMT MD	62.57 %	62.66 %
	BMT P	97.81 %	100 %
	BMT R	82.45 %	100 %
	BMT A	68.35 %	100 %
	BMT MB	100%	100 %
2017	BMT MD	92.21 %	93.78 %
	BMT P	86.83 %	89.69 %
	BMT R	74.01 %	100%
	BMT A	75.45 %	100%
	BMT MB	100%	100%

Source : Data Process Result (edited 2021)

4.1.1. BMT MD

The way to increase the efficiency value for BMT MD is as follows:

1. Reducing Operational Expenses. The BMT experienced an increase in funds for the rights of third parties on the profit sharing of the financing that had not been paid by BMT MD. Therefore, the BMT pays the funds to third parties in stages so as not to make it difficult for the BMT when the third party later asks for their rights to the profit sharing from the financing.
2. Reduce Assets. BMT MD has a deferred margin which is increasing every year. Therefore, BMT MD conducts selective financing by being more selective in choosing debtors to provide financing in order to avoid the occurrence of payment failures by debtors in paying their debts when the due date arrives. This can have an impact on the ability of BMT MD to pay profit-sharing funds to third parties so that it will affect the level of the total profit-sharing burden borne by BMT MD.
3. Increase Income. BMT MD can increase the profit-sharing income of bank savings by diverting deposits to banks that have a higher profit-sharing ratio than the banks previously used.

4.1.2. BMT P

Ways to increase efficiency for BMT P are as follows:

1. Reducing Operational Expenses. The BMT has costs incurred for the elimination of losses. This shows that there is a loss of receivables borne by the BMT as a result of the debtor not being able to pay his debts for financing in a timely manner to the BMT. Therefore, BMT P should conduct selective financing by being more selective in choosing debtors to provide financing in order to avoid the occurrence of payment failures by debtors in paying their debts when the due date arrives.
2. Reduce Assets. One way to reduce assets is by reducing unproductive assets, there is a large amount of inventory in the form of nasyi'ah organization cloth, but it turns out that the sales results only produce half of the total inventory, which means the cloth has not been sold. all of them were sold in 2017 so the inventory of these items did not generate revenue at BMT P in 2017.

3. Increase Income. The way to increase income is by switching from small financing to large project financing and it can also be by diverting BMT deposits to banks that have a higher profit sharing ratio.

4.1.3. BMT R

Ways to increase efficiency for BMT R are as follows:

1. Reduce Operational Expenses, one of them is by reducing costs that are not really needed in BMT operational activities, such as costs that include other costs.
2. Reduce Assets. The BMT has a deferred margin which is increasing every year. Therefore, BMT MD develops selective financing by being more selective in choosing debtors to provide financing in order to avoid default on debtors in paying their debts when the due date arrives. This can have an impact on the ability of the BMT to pay profit-sharing funds to third parties so that it will affect the level of the total profit-sharing burden borne by the BMT.
3. Increase Income, one of which is by conducting selective financing by diverting the initial financing for small financing to project financing that can generate larger profits.

4.1.1. BMT A

Ways to increase efficiency for BMT A are as follows:

1. Reduce Operational Expenses by reduce unnecessary costs for BMT operational activities.
2. Reduce Assets, one of which is by reducing assets that are less productive in BMT A
3. Increase Income by doing selective financing by diverting the initial financing for small financing to project financing that can generate larger profits.

4.1.2. BMT MB

BMT MB is efficient because the BMT is able to use minimal input to produce the targeted output. From 2012-2017, most of the assets owned were obtained from mudharabah and murabahah financing receivables on average above 80% and most of the operating income was obtained from financing income on average of 90%. And in the financial statements, there is no reserve for receivables loss or allowance for receivables where this account is used when a company has bad debts as a result of debtors who fail to pay their debts for financing on time so it can be said that debtors from BMT MB can fulfill their payments. in a timely manner.

Benchmark of Efficiency

The table below shows that there are reference units where the BMT which is included in the reference unit can be used as a reference or benchmark for inefficiency BMT.

The table above shows that:

Table 2
Benchmark of Efficiency BMT Year 2012-2017 Assumption CRS

Year	DMU	Assumption CRS	
		Efficiency Score	Reference Unit
2012	BMT MD	67.11%	BMT MB
	BMT P	89.82%	BMT MB
	BMT R	88.14%	BMT MB
	BMT A	51.82%	BMT MB
2013	BMT MD	94.42%	BMT MB
	BMT P	96.02%	BMT MB
	BMT R	64.14%	BMT MB
	BMT A	56.43%	BMT MB

2014	BMT MD	67.38%	BMT MB
	BMT R	66.42%	BMT P
			BMT MB
	BMT A	64.08%	BMT P
			BMT MB
2015	BMT MD	62.89%	BMT P
			BMT MB
	BMT R	59.80%	BMT P
	BMT A	66.10%	BMT P
			BMT MB
2016	BMT MD	62.57%	BMT MB
	BMT P	97.81%	BMT MB
	BMT R	82.45%	BMT MB
	BMT A	68.35%	BMT MB
2017	BMT MD	92.21%	BMT MB
	BMT P	86.83%	BMT MB
	BMT R	74.01%	BMT MB
	BMT A	75.43%	BMT MB

Source : Data Process Result (edited 2021)

Table 3
Benchmark of Efficiency BMT Year 2012-2017 Assumption VRS

Year	DMU	Assumption VRS	
		Efficiency Score	Reference Unit
2012	BMT MD	69.22%	BMT R
			BMT MB
2014	BMT MD	68.48%	BMT MB
			BMT R
2015	BMT MD	65.41%	BMT P
			BMT MB
2016	BMT MD	62.66%	BMT P
			BMT MB
2017	BMT MD	93.78%	BMT MB
			BMT R
	BMT P	89.69%	BMT MB
			BMT R

Source : Data Process Result (edited 2021)

The results of data processing show that overall on the assumptions of CRS and VRS, BMT MB is widely used as a reference for inefficient BMTs from 2012-2017 because BMT MB consistently maintains its efficiency value and has the best efficient value for 6 years compared to other BMTs. This shows that the BMT MB is the BMT that has the best performance compared to other BMTs and the BMT that is inefficient can make the BMT MB a reference or benchmark to increase its efficient value.

Efficiency Scale

Tabel 4
Efficiency Scale BMT

Tahun	2012	2013	2014	2015	2016	2017
BMT MD	0.970	0.944	0.984	0.961	0.999	0.983
BMT P	0.898	0.960	1	1	0.978	0.968
BMT R	0.881	0.641	0.664	0.598	0.825	0.740
BMT A	0.518	0.564	0.641	0.661	0.684	0.754
BMT MB	1	1	1	1	1	1

Source : Data Process Result (edited 2021)

The table above shows that BMT MD, BMT R and BMT A are on an inefficient scale in 2012-2017 because they have different efficiency scores between the assumptions of CRS and VRS. This shows that the BMT is at a diseconomies scale where it has not been able to optimally empower its resources (inputs) to produce output. In other side, BMT P experienced a change in the value of the efficient scale. BMT P was on an efficient scale in 2014 and 2015. However, in 2012, 2013, 2016 and 2017 it was on an inefficiency scale. This shows that BMT P has not been able to consistently on an efficient scale. From all BMT researched, BMT MB is the most efficient compared to others because it has the same efficiency score between the assumptions of CRS and VRS. This shows that the BMT MB is at an economic scale, namely the BMT is able to optimally use its resources (inputs) to produce certain outputs.

Previous research conducted by Jaiyeoba Haruna, Abideen and Khairunisah in 2017 which examined the efficiency measurement of Microfinance Institutions in Bangladesh and Indonesia showed that in general, DEA results indicate that Bangladeshi and Indonesian MFIs are not efficient. (Sutawijaya & Lestari, 2009) BMT can be said to be efficient if it has an efficiency value close to 1 or 100 percent. On the other hand, BMT will be said to be inefficient if it has a value close to zero. The previous study and this research findings show that most of Islamic microfinance institution has a problem on efficiency except few BMT passed it smoothly. This finding could be

5. Conclusion

Based on the data and analysis results, it can be concluded that the overall DEA analysis results show that the average BMT in Surabaya has not been efficient in 2012-2017, both on the CRS and VRS assumptions so that the average BMT in Surabaya is on a diseconomies scale, namely BMT in Surabaya has not been able to optimally empower its resources (input) to produce output so that BMT in Surabaya must make improvements in managing inputs in order to increase the value of its efficiency, one of which is by doing selective financing to avoid payment failures by debtors because they do not can pay their debts when their due time arrives or avoid the risk of bad debts. This can have an impact on BMT's ability to pay profit sharing funds to third parties so that it will affect the level of total profit sharing burden borne by BMT.

6. Reference

Alamsyah, I. E. (2015). *Aset BMT Indonesia Capai Rp 4,7 Triliun _ Republika Online*.

Amalia, Z. R. (2013). Perbandingan tingkat efisiensi bank umum konvensional (buk) dengan bank umum syariah (bus) menggunakan metode data envelopment analysis (dea). *Kategori Peneliti Muda*, 1–20.

Apriadi, F., & Alexandi, M. F. (2013). Solusi Peningkatan Sumberdaya Manusia Pada Baytul Maal wat Tamwil (BMT) di Indonesia Melalui Pendekatan Analytic Network Process (ANP) The Solution of Human Resources Development for Baytul Maal wat Tamwil (BMT) in Indonesia : an Analytic Network Pr. *Al-Muzara'ah*, *1*(2), 107–118.

Ascarya, & Yumanita, D. (2006). Analisis Efisiensi Perbankan Di Indonesia Dengan Pendekatan Data Envelopment Analysis (DEA). *TAZKIA Islamic Finance and Business Review*, *1*(2), 1–32.

Assauri, Sofyan. 2000. *Manajemen Produksi dan Operasi*. Jakarta : Lembaga Penerbit FE UI

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European journal of operational research*, *2*(6), 429-444.

Coelli, T. J., Prasada Rao, D. S., O'Donnell, C. J., & Battese, G. E. (2005). An introduction to efficiency and productivity analysis. In *An Introduction to Efficiency and Productivity Analysis*. https://doi.org/10.1007/b136381

Dumilah, Ratna, dkk. 2017. *Analisis Efisiensi Biaya dengan Pendekatan Stochastic Frontier Approach (SFA) : Survey pada Koperasi Baitul Maal Wat Tamwil Kota Tangerang Selatan Periode 2011-2015.*

Gunawan, F. A., & Utiyati, S. (2013). Analisis Tingkat Efisiensi Bank Bumn Dengan Pendekatan Data Envelopment Analysis (Dea). *Ilmu Dan Riset Manajemen*, *2*(8), 1–17.

Hadad, dkk. 2003. *Analisis Efisiensi Industri Perbankan Indonesia : Penggunaan Metode Nonparametrik Data Envelopment Analysis (DEA).*

Hanafi, Mamduh M. dan Abdul Hanafi. 2008. *Analisis Laporan Keuangan.* Yogyakarta : UPP STIM YKPN

Hardoko, E. (2015). Akibat Kredit Macet, Lembaga Keuangan Syariah di Kabupaten Semarang Bangkrut. In *Kompas.com* (p. 1). https://regional.kompas.com/read/2015/02/15/01564431/Akibat.Kredit.Macet.Lembaga.Keuangan.Syariah.di.Kabupaten.Semarang.Bangkrut

Jaiyeoba, Haruna Babatunde, dkk. 2017. *Measuring Efficiencies of Bangladesh and Indonesian Microfinance Institutions :5 A Data Envelopment Analysis and Latent Growth Curve Modelling Approach.*

Kurniawan, D. (2014). 3 Sektor Ini Jadi Penunjang Utama Perekonomian Surabaya. In *Liputan 6* (p. 1). https://www.liputan6.com/bisnis/read/2098597/3-sektor-ini-jadi-penunjang-utama-perekonomian-surabaya?related=dable&utm_expid=.9Z4i5ypGQeGiS7w9arwTvQ.1&utm_referrer=https%3A%2F%2Fwww.google.com%2F

Mahbubi Ali Ketua KSEI PROGRES, M., & Efisiensi Baitul Maal Wat, A. (2010). Analisis Efisiensi Baitul Maal Wat Tamwil Dengan Pendekatan Two Stage Data Envelopment Analysis (Studi Kasus Kantor Cabang BMT MMU Dan BMT UGT Sidogiri). *Agustus– Desember TAZKIA Islamic Finance & Business Review M. Mahbubi Ali Ascarya TAZKIA Islamic Finance & Business Review*, *5*(52), 110–125.

Muharam, H., & Pusvitasari, R. (2007). Analisis Perbandingan Efisiensi Bank Syariah di Indonesia Dengan Metode Data Envelopment Analysis (periode Tahun 2005). *Jurnal Ekonomi Dan Bisnis Islam*, *II*(3), 80–116.

Muhibah, I. (2016). *Journal of Economics and Business Aseanomics (JEBA) EFISIENSI BAITUL MAAL WATTAMWIL KOTA TASIKMALAYA PERIODE 2011-2015 PENDEKATAN STOCHASTIC FRONTIER ANALYSIS (SFA) DERIVASI FUNGSI PROFIT DAN BOPO*. *1*(1).

Soemitra, Andri. 2015. *Bank dan Lembaga Keuangan Syariah*. Jakarta : Kencana

Sutawijaya, A., & Lestari, E. P. (2009). Efisiensi Teknik Perbankan Indonesia Pascakrisis Ekonomi: Sebuah Studi Empiris Penerapan Model Dea. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, *10*(1), 49. https://doi.org/10.23917/jep.v10i1.808

Widiarto, I., & Emrouznejad, A. (2015). Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application. *Socio-Economic Planning Sciences*, *50*, 1–17. https://doi.org/10.1016/j.seps.2014.12.001

Wulansari, Retno. 2010. *Efisiensi Relatif Operasional Puskemas-Puskemas di Kota Semarang Tahun 2009.*

Yakub, Edy M. (2014). *Gubernur BI Jadikan Surabaya Pusat Ekonomi Syariah _ Antara News.*

Zaenal Abidin, & Endri Endri. (2009). Kinerja Efisiensi Teknis Bank Pembangunan Daerah: Pendekatan Data Envelopment Analysis (DEA). *Jurnal Akuntansi Dan Keuangan*, *11*(1), 21–29. http://puslit2.petra.ac.id/ejournal/index.php/aku/article/view/17863