

## Research Article

# Efficiency of Bank Aceh Syariah and Bank NTB Syariah After Conversion

Faqih Wildan Hakim<sup>1\*</sup>, Roikhan M. Aziz<sup>2</sup>, Nur Hidayah<sup>2</sup><sup>1</sup>Universitas Islam Negeri (UIN) Raden Intan Lampung, Indonesia<sup>2</sup>UIN Syarif Hidayatullah Jakarta**ORCID**Faqih Wildan Hakim: <https://orcid.org/0000-0002-6641-3970>**Abstract.**

This study aims to compare the efficiency levels of Islamic commercial banks using the Data Envelopment Analysis (DEA) and Hahslm Reflexivity Dynamics (HEFDYN) methods before and after the spin-off period from 2008 to 2021. The implementation of Law (UU) No. 21 of 2008 concerning Sharia banking requires conventional commercial banks (BUK) to separate their Sharia business units (UUS) and establish Sharia commercial banks (BUS) when the assets of the UUS reach at least 50% of the total assets of the parent bank or after 15 years from the enactment of the Law. This research adopts a quantitative approach and focuses on a case study of two converted banks, namely Bank Aceh Syariah and NTB Syariah. The research methodology involves employing the data envelopment analysis with the VRS approach and the Hahslm Reflexivity Dynamics (HEFDYN) method. Based on the results of the DEA analysis, Bank Aceh Syariah successfully achieved a perfect efficiency value after undergoing conversion, demonstrating effective resource utilization and optimal operational performance. Conversely, Bank NTB Syariah experienced a slight decline in efficiency values, primarily attributable to decreased income variables and financing output in 2019. The HEFDYN analysis also revealed that although Bank Aceh Syariah attained perfect efficiency post-conversion, there is still potential for improvement, particularly in terms of financing growth. Similarly, Bank NTB Syariah, despite the decrease in efficiency values, has the opportunity to enhance its financial performance through targeted improvement efforts.

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Wildan Hakim; email: Faqih-  
wildanhakim@radenintan.ac.id**Published:** 17 May 2024Publishing services provided by  
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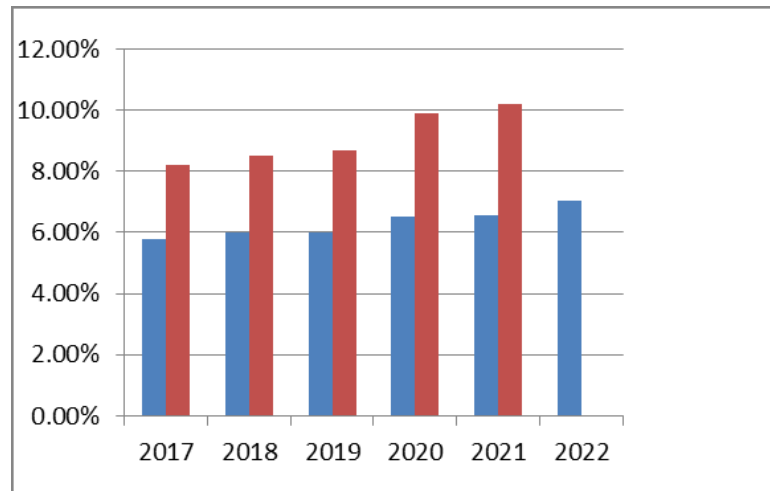
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## 1. Introduction

Islamic banking plays a crucial role in maintaining the stability of the Sharia-based economic sector, particularly in Indonesia. Islamic banks serve as financial intermediaries with the responsibility of collecting and distributing funds in a balanced manner, by relevant regulations [1]. As per the Asian Development Bank's report in 2016, Indonesia accounted for 13.4% of the total assets in the Asian Islamic banking sector, amounting to \$209.3 billion. However, there is still a significant gap between Indonesia and Malaysia,

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which holds the second position globally with total assets of \$156.7 billion in the Asian region [2].



**Figure 1:** Asian Development Bank's report in 2011. Source: Snapshot OJK, Data processed, 2023.

In Figure 1, it is evident that the market share of Islamic banks has witnessed an increase until August 2022, reaching 7.03% compared to 6.55% in 2021. This growth can be attributed to the rising awareness of Islamic banking and finance, resulting in a heightened demand for products that adhere to Sharia principles. Recognizing the vast potential of this market, banks are actively transforming themselves by offering Sharia-compliant transaction services. Over the past few decades, the banking sector has undergone significant changes, driven by the processes and strategies adopted by Islamic banks aiming to spin off, convert, or merge, to enhance competitiveness and efficiency [2].

The government aims to enhance the market share of Islamic banks in Indonesia by implementing regulations governing the establishment of Islamic banks. These regulations can serve as a means of corporate restructuring, which is undertaken when a company's performance necessitates significant and fundamental measures to either rescue and improve its performance or implement growth strategies to enhance the company's expansion [3]. According to Law No. 21 of 2008 on Sharia banking, conventional commercial banks (BUK) are required to separate their Sharia business units (UUS) and establish Sharia commercial banks (BUS) when the assets of the UUS reach at least 50% of the total assets of the parent bank or after 15 years from the enactment of the law. Since the implementation of Law No. 21 of 2008, the development of Sharia banking has been regulated through various mechanisms, including the acquisition and conversion of conventional banks into Sharia commercial banks, the

merger of multiple UUS-or BUS, and the spin-off of UUS owned by conventional banks to form BUS [4].

Two types of UUS separation can be conducted by Bank Indonesia Regulations. The first type is pure separation, where a conventional commercial bank (BUK) establishes a new legal entity to separate its UUS, and the UUS is transformed into an independent Sharia commercial bank (BUS). The second type is impure separation, where a BUK that possesses a UUS acquires an existing relatively small bank and converts it into a BUS. Subsequently, the BUK separates its UUS and merges it with the recently converted bank to form a separate Sharia commercial bank (BUS), thus executing a spin-off of the UUS [5].

Conversion is a strategy that can be carried out by UUS or BUK. The technical provisions regarding the conversion of conventional banks into Sharia commercial banks are regulated in Bank Indonesia Regulation No. 8/3/PBI/2006, which governs the change of business activities from BUK to a commercial bank that operates based on Sharia principles, as well as the opening of bank branches that operate based on Sharia principles by BUK [6]. This regulation was later amended by PBI No. 9/7/PBI/2007, which has now been revoked and replaced by No. 11/15/PBI/2009, which regulates the change of business activities of conventional banks to become Islamic banks. This PBI explains that a bank can only change its business activities to become a bank that operates based on Sharia principles with permission from the Governor of Bank Indonesia. For example, Bank Aceh obtained the permit through the decision of the OJK Board of Commissioners, Number KEP-44/D.03/2016, which permitted changes in business activities from conventional commercial banks to Sharia commercial banks [7].

In the research conducted by Asif cited by Deddy (2020) on the conversion of conventional banks to Islamic banks in Pakistan, it was found that Islamic compliance (SC), Islamic banking performance (PI), and customer needs (CN) had a significant influence on the motives behind converting conventional banks to Islamic banking in Pakistan. However, the risk and return factor (RR) was not found to be statistically significant. These findings suggest that the decision to convert conventional banks to Islamic banks is influenced by factors such as Islamic compliance, Islamic banking performance, and customer demand for Islamic products [8]. The research conducted by Hasan (2016) reveals that conventional banks in Bangladesh that have converted to Islamic banks demonstrate improved performance after the conversion. Various financial performance indicators indicate positive outcomes post-conversion, although the funding cost indicator still requires further enhancement. The research findings also indicate a transformation in banking activities after the conversion, evident through the

establishment of the Sharia Committee Board and the inclusion of operational expenses such as zakat. Additionally, this conversion has contributed to the growth of the banking industry in Bangladesh, fostering internal growth within the sector [9]. The research conducted by Purba (2017) suggests that Bank Aceh Syariah's financing performance still faces challenges. The rate of financing growth in this bank is not as rapid as that of other financial institutions. Moreover, in comparison to the industrial growth rate, Bank Aceh Syariah's financing growth is lower. The data from the 2021 report indicates that the average growth in financing disbursed by Bank Aceh Syariah has reached 6.21% [7].

The decision made by Bank Aceh and Bank NTB to convert all of their activities is a significant one, as it affects not only product and system changes but also the services provided to the community, the execution of tasks by bank employees, and the work culture embraced by all employees in various branch offices. Furthermore, this conversion has altered the business direction, human resources, market, and future development of the banks. Therefore, studying and researching the efficiency of Bank Aceh Syariah before and after the conversion becomes a compelling subject of interest [8].

Efficiency is a fundamental performance parameter that serves as the theoretical basis for an organization's overall performance. It represents the ability to achieve maximum output with the given input, making it a crucial performance measure [10]. In the context of Islamic banks, efficiency aims to achieve a minimum level of input to attain a certain level of output. This can be measured by comparing the output to the input, specifically, the amount of output produced per unit of input utilized. Banks that operate efficiently are capable of generating more output with the same input or achieving the same output with less input. Bank efficiency is closely tied to cost control, whereby the costs incurred to generate profits must be lower than the profits earned [11].

Banks must prioritize efficiency as the business competition intensifies and consumer living standards rise. Failure to enhance efficiency levels can result in a loss of competitiveness in attracting public funds and channeling them as business capital. When measuring efficiency, two commonly used approaches exist: parametric and non-parametric approaches. Parametric approaches, such as the Stochastic Frontier Approach (SFA) and Distribution Free Approach (DFA), employ mathematical models involving specific variables. This approach yields statistically analyzable conclusions, providing banks with detailed information about their efficiency levels. On the other hand, non-parametric approaches, such as Data Envelopment Analysis (DEA) and Free Disposable Hull, do not rely on a particular mathematical model. Instead, they compare

banks' relative performances by measuring how effectively a bank can generate maximum output with a given input. While non-parametric approaches cannot be statistically analyzed, they offer valuable insights into banks' efficiency levels and can identify areas for improvement. By utilizing these two approaches, banks can gain a comprehensive understanding of their operational efficiency, identify factors influencing efficiency levels, and implement appropriate strategies to achieve optimal performance [10].

Efficiency holds significant importance in the banking sector as it provides insights into the operational cost structure, enabling banks to effectively and efficiently manage available resources. As intermediary institutions, banks face intense competition within the industry. Thus, achieving a high level of efficiency becomes crucial for banks to maintain their competitiveness in the market. Given the rising competition and increasing consumer living standards, banks must prioritize efficiency. Failure to do so may result in the loss of competitiveness in attracting public funds and channeling them as business capital. By focusing on efficiency, banks can optimize resource utilization, enhance operational performance, and sustain their competitiveness in a fiercely competitive market [12].

## 2. Literatur Review

Research on the conversion of Islamic banking in Indonesia is an interesting topic to study. Up to this point, research on the conversion of Islamic banks remains limited, necessitating further investigation to provide deeper insights into the conversion process. The conversion of conventional banks into Islamic banks in Indonesia is regulated by Bank Indonesia Regulation (PBI) Number 8/3/PBI/2006. This regulation stipulates that a bank can only alter its business activities to operate based on Sharia principles with the permission of the Governor of Bank Indonesia [13].

The permit is a crucial requirement in the bank conversion process. The implementation of changes in business activities from conventional banks to Islamic banks is further regulated in the Financial Services Authority Regulation (POJK) No. 64/POJK/03/2016. This regulation guides the requirements that conventional banks must fulfill to convert into Islamic banks. During the conversion process, conventional banks undergoing conversion must amend their Articles of Association and meet the capital requirements outlined in the applicable regulations. Furthermore, the requirements concerning the Board of Directors and Board of Commissioners must also align with Sharia principles. Banks undergoing conversion are also obligated to establish a Sharia Supervisory Board (DPS) responsible for ensuring the bank's compliance with Sharia principles. As part

of the conversion process, banks are required to present initial financial statements as Islamic banks. These reports are crucial in depicting the bank's financial position following the conversion and serve as important references for evaluating its financial performance. Conducting further research on the conversion of Islamic banking in Indonesia can provide a deeper understanding of the legal aspects, requirements, and mechanisms associated with this process. This will contribute to the development of Islamic banking in Indonesia and enhance our comprehension of its role and contribution to the national banking system [13].

Conversion is a mechanism used to establish a legitimate alternative Islamic bank, and it is based on the principle of convenience. According to Law No. 21 of 2008 concerning Islamic Banking, conversion can be accomplished through acquisitions, which involve the transfer of shares. Acquisitions are legal actions taken by legal entities or individuals to acquire shares of a bank, resulting in a change in control over the bank. Subsequently, the acquired bank undergoes a conversion of its business activities from conventional banking to Islamic banking. This conversion process is governed by Law No. 21 of 2008 and Bank Indonesia Regulation (PBI) Number 11/15/PBI/2009, which outline the requirements for changing the business activities of a conventional bank into an Islamic bank. Throughout the process of acquiring and converting banks, it is important to adhere to the provisions stipulated in Law Number 40 of 2007 concerning Limited Liability Companies and Bank Indonesia Regulation (PBI) Number 8/3/PBI/2006, as well as any special regulations applicable to the banking sector. The conversion process entails changes in the ownership and control structure of the bank [14].

During the conversion process, conventional banks undergo significant changes in their business activities and adopt Sharia principles as their operational guidelines. These changes encompass various aspects, including policies, procedures, products, and services, all of which are aligned with sharia principles. The bank conversion process must adhere to the requirements specified by banking regulations and supervisory authorities. These requirements encompass meeting capital requirements, submitting a comprehensive business plan, appointing directors and board members who comply with Sharia principles, and establishing a Sharia Supervisory Board (DPS) responsible for ensuring the bank's adherence to Sharia principles. The existence of rules and legal provisions governing bank conversion guarantees that the process is carried out in compliance with the applicable regulations, thus maintaining the integrity of the banking system. Consequently, bank conversion serves as a mechanism that enables conventional banks to adopt sharia principles and operate as sharia banks legally by the prevailing regulations [15].

Efficiency is a highly significant performance parameter that highlights a bank's capability to maximize resource utilization and achieve optimal output levels with the given inputs. In the context of Islamic banks, efficiency holds a crucial role in attaining sustainable profitability. Islamic banks bear the responsibility of conducting their business activities in alignment with Islamic principles, incorporating religious values. Hence, it becomes imperative to consider the notion of worship when assessing the efficiency of Islamic banks. This implies that Islamic banks not only adhere to conventional efficiency theories but also incorporate worship theory as a vital component in measuring their efficiency [16]. In a study conducted by Hadad et al. (2003:1), efficiency in Islamic banks is defined as the endeavor to attain a predetermined output level by minimizing the input requirements [10]. In this context, Islamic banks strive to optimize resource utilization to achieve their goals efficiently, while also considering the principles of sharia and religious values. When evaluating the efficiency of Islamic banks, it is crucial to consider not only conventional economic aspects but also the adherence to Sharia principles. Therefore, the measurement of efficiency in Islamic banks takes on a holistic approach that encompasses both economic and religious dimensions, aiming to achieve sustainable operational success [17].

Efficiency plays a crucial role in bank management, particularly in understanding the structure of operational costs. By gaining a comprehensive understanding of the cost structure, banks can optimize resource utilization more effectively and efficiently. As intermediaries in the financial industry, banks operate within an increasingly competitive environment. In assessing bank efficiency, financial reports serve as the primary source of information. Through these reports, banks can examine items related to operational costs and utilize relevant financial ratios to measure efficiency. The objective of this analysis is to evaluate the level of efficiency and effectiveness of the bank, enabling them to enhance their performance in achieving future goals. Understanding efficiency within financial reports empowers banks to better manage their resources. By identifying areas where efficiency can be improved, such as reducing unnecessary costs, leveraging technology, enhancing employee productivity, or developing more efficient business strategies, banks can drive improvements in their overall operations. In the face of intensifying competition in the banking industry, comprehending efficiency and effectively managing costs are of utmost importance. Efficient banks possess a competitive advantage in attracting public funds and utilizing them as working capital. To address this challenge, banks must uphold their operational performance to remain efficient and competitive in the market. Therefore, a sound understanding of efficiency within financial reports enables banks to effectively manage resources, enhance operational

performance, and sustain competitiveness amidst the increasingly fierce competition in the banking industry [12].

In addition, Aziz (2022) introduced the concept of reflexive efficiency, which is rooted in the theory of worship within a sustainable economic system that encompasses the creation of the universe, the passage of time, and the afterlife. This theory is based on three fundamental theories derived from Allah, as revealed in Surah Al-Hijr verse 87 of the Qur'an. These theories are the theory of worship, economic theory, and monotheism theory. Within this framework, the theory of efficiency falls under the realm of economic theory, while the theory of reflexivity aligns with the theory of worship. Islamic banks, operating by Islamic principles, not only embrace the theory of efficiency in their management practices but also integrate the theory of worship. Consequently, Islamic banks strive to achieve efficiency not only in operational and financial aspects but also in conducting their business activities in harmony with the values of worship in Islam. By combining the concepts of efficiency and reflexivity, Islamic banks aim to attain sustainable economic success that aligns with Islamic principles. Through the implementation of these principles, Islamic banks are expected to contribute positively to society and the environment, while promoting justice, sustainability, and prosperity for all stakeholders involved [18].

### 3. Research Methods

This study employs the Data Envelopment Analysis (DEA) analysis technique to assess the efficiency levels of two converted Islamic banks, namely Bank Aceh Syariah and Bank NTB Syariah. The DEA analysis technique, assuming Variable Return to Scale (VRS), is utilized to determine the efficiency values of Islamic Commercial Banks. The selection of the VRS model as the efficiency measurement approach is based on the understanding that not all Decision Making Units (DMUs) operate at an optimal scale. By employing the VRS model, this study can evaluate and compare the relative efficiency levels of each DMU, regardless of whether they operate below or above the optimal scale. The Variable Return to Scale (VRS) model was initially developed by Banker, Charnes, and Rodes in 1984 as an extension of the Constant Return to Scale (CRS) model, which assumes a constant input-to-output ratio. In contrast, the VRS model acknowledges that not all DMUs can achieve optimal operations due to factors such as imperfect competition, financial constraints, or sub-optimal operating scales.

The DEA method was created as a tool for evaluating the performance of an activity within an entity unit (organization). The working principle of the DEA model is to compare



the input and output data from a data organization (decision-making unit, DMU) with other input and output data at similar DMUs. This comparison is made to obtain an efficiency value [19]. DEA is a development of linear programming techniques in which there are objective functions and constraints. The following is the general equation in the Data Envelopment Analysis method (DEA): 
$$\frac{\sum_{i=1}^m u_{is} y_{is}}{\sum_{j=1}^n v_{js} x_{js}}$$

Which means:

$H_s$  = the technical efficiency of a DMU

$u_{is}$  = the weight of the resulting output  $i$

$y_{is}$  = the weight of the input  $i$  produced

$v_{js}$  = input weight  $j$

$x_{js}$  = the number of inputs  $j$  supplied by a DMU

In this case, it is also necessary to determine values for  $u$  and  $v$ , which serve as measures of maximum efficiency ( $H_s$ ). However, one issue with the ratio formulation is that it yields an infinite number of solutions due to the constraint that all efficiency measures must be less than or equal to one. To address this, constraints can be defined to specify and facilitate the subsequent process, utilizing evolutionary computational techniques. The efficiency of banking techniques is assessed by calculating the ratio of output to input. DEA evaluates the efficiency of banks by using  $n$  inputs to produce  $m$  different outputs. Bank efficiency is then determined by: 
$$\frac{\sum_{i=1}^m u_{is} y_{is}}{\sum_{j=1}^n v_{js} x_{js}} \leq 1 ; r = 1, 2, \dots, N \text{ and } u_i, x_j \geq 0$$

The Decision Making Unit (DMU) is a business unit whose level of efficiency is being assessed. If the DMU has a ratio close to 1 or 100 percent, it can be considered efficient. Conversely, if the value is less than 1 or 100 percent, it indicates inefficiency. Once an efficiency value is obtained, the factors contributing to inefficiency can be identified, and an efficient DMU can serve as a reference for the inefficient ones.

The first inequality indicates that the efficiency ratio for other companies should not exceed 1, while the second inequality requires a positive weight. The efficiency ratio ranges from 0 to 1, where a value close to 1 or 100 percent indicates high efficiency, while a value close to 0 indicates lower efficiency. By applying DEA, the weighting of each factor can be determined, ensuring that the chosen weights result in the best performance measure [20].

The measurement results obtained using the DEA method are categorized into 5 categories, namely:

category 1 : 100 % (perfectly efficient)

category 2 : 80% - 99,99 % (efficient)

category 3 : 60% - 79,99 % (fairly efficient)

category 4 : 40% - 59,99 % (fairly inefficient)

category 5 : 0% - 39,99 % (very fairly inefficient)

About the inputs and outputs used in measuring efficiency, there are 3 approaches used: the asset approach, the production approach, and the intermediation approach. In this study, the intermediation approach was used because, according to Hadad (2003), it explains the actual activities of a banking institution with its function as an intermediary institution. Moreover, the intermediation approach has been widely employed in research to measure the level of banking efficiency conducted in various countries [10].

The reflexivity of HEFDYN can also be measured by comparing the reflexivity of the input in the form of Appreciation with the reflexivity of the output in the form of Depreciation. If a company has a high level of input reflexivity but a low level of output reflexivity, then the HEFDYN score will be low. This shows that the company is not efficient and does not use resources properly. Conversely, if the company has a high level of input and output reflexivity, then the HEFDYN score will be high. This shows that the company is efficient and can use resources properly [16].

As an example we will compare the Reflexivity of  $p$  banks, Each bank uses  $m$  types of inputs to produce  $n$  types of outputs.

$X_{ip} > 0$  is the amount of input  $i$  used by the  $p$ -bank;

$Y_{jp} > 0$  is the amount of output  $j$  produced by the  $p$ -bank.

The decision variable in this case is the weight assigned to each input and output by the  $p$ -bank. For instance,  $U_{ik}$  represents the weight assigned to input  $i$  by the  $k$ -th bank, and  $V_{jk}$  represents the weight assigned to output  $j$  by the  $k$ -th bank. Therefore,  $U_{ik}$  and  $V_{jk}$  are decision variables that will be determined through a linear program. Subsequently,  $p$  fractional linear programs are formulated, with each bank in the sample having one linear programming formulation

## 4. Result and Discussion

Based on Table 1, it is evident that the efficiency level of Bank Aceh Syariah, as measured using the DEA method, remains stable both before and after the conversion, reaching optimal levels. This indicates that Bank Aceh Syariah has effectively utilized its resources and achieved efficiency in its operations. This finding aligns with a previous study conducted by Sinathrya (2019), which also concluded that after the conversion, Bank Aceh Syariah exhibited a lower level of risk compared to its previous state as

a conventional Aceh bank. This indicates that the conversion to an Islamic bank has positively influenced the bank’s risk management and financial stability. Consequently, the analysis results demonstrate that Bank Aceh Syariah has successfully maintained an optimal level of efficiency following the conversion, while also improving its risk management practices in the context of Islamic banking. This highlights the bank’s accomplishment in adhering to sharia principles and achieving commendable performance over a stable period of time [21].

TABLE 1: Result of DEA of Aceh Sharia Bank as a result of Conversion.

	Year	Efficiency Level	Mean
Before Conversion	2013	1	1
	2015	1	
	2016	1	
After Conversion	2017	1	1
	2018	1	
	2019	1	
	2020	1	
Mean		1	1

Source: The DEA assumes VRS, and the data will be processed in 2023

Based on Table 2, it is evident that Bank NTB Syariah experienced a decrease in efficiency, particularly in 2019, after the conversion. Prior to the conversion, the bank displayed fluctuating efficiency levels. However, even after the conversion, the bank has not yet reached the optimal level of efficiency. The decline in the efficiency value of Bank NTB Syariah after the conversion occurred specifically in 2019. During that year, certain input and output variables exhibited inefficiencies. The analysis results indicate that the bank achieved an efficiency level of only 93% for the financing output variable and 67% for the income output variable, based on the Projected Value. The decrease in efficiency value for Bank NTB Syariah after the conversion aligns with the findings of a study conducted by Fahdiansyah (2021). The research revealed an increase in the financial performance of PT. Bank NTB Syariah, albeit not reaching optimal levels. The lingering economic conditions faced by the people of NTB, who were still recovering from the impact of a natural disaster in the form of an earthquake in the region, have been identified as a factor influencing the decline in efficiency after the conversion. In light of these findings, greater efforts are necessary to improve the financial performance of PT. Bank NTB Syariah. This entails revitalizing the economic condition of the people in NTB and implementing effective resource management strategies within the bank.

By doing so, it is hoped that Bank NTB Syariah can enhance its efficiency and achieve optimal performance in the future [22].

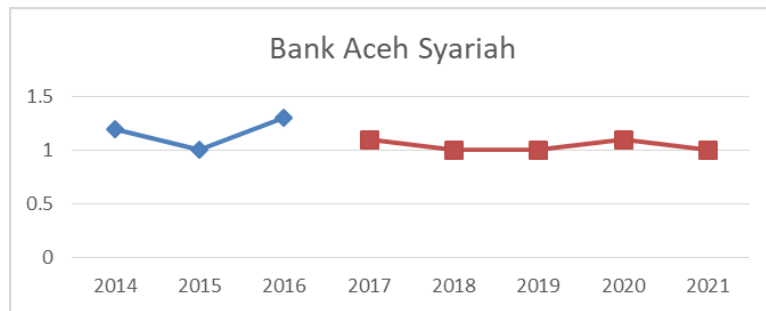
TABLE 2: Result of DEA of NTB Sharia Bank as a result of Conversion.

	Year	Efficiency Level	Mean
Before Conversion	2008	1	0.98
	2009	1	
	2010	1	
	2011	1	
	2012	1	
	2013	0,99	
	2014	0,98	
	2015	1	
	2016	0,99	
	2017	0,88	
After Conversion	2018	1	0,97
	2019	0,93	
	2020	1	
	2021	1	

Source: The DEA assumes VRS, and the data will be processed in 2023

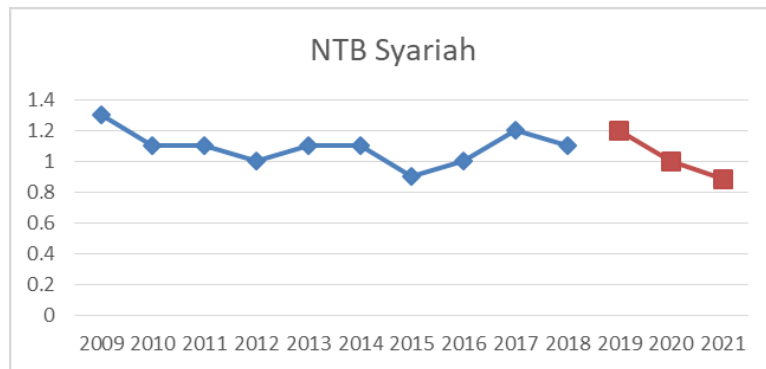
Based on Figure 2, it is evident that the efficiency level of Bank Aceh Syariah has decreased in terms of efficiency values by 10% after the conversion, with an average efficiency value of 100%. This decline in efficiency value is observed through the HEFDYN analysis. The decrease in efficiency value can be attributed to the fact that the weight assigned to the value of worship in the analysis does not reach 100%. In the context of measuring the efficiency of Islamic banks, the value of worship holds significant importance in assessing efficiency. When the weight assigned to the value of worship falls short of 100%, it results in a decrease in the bank's efficiency value. This indicates that Bank Aceh Syariah needs to enhance the aspects related to the value of worship in its operations to achieve a more optimal level of efficiency. By doing so, the bank can improve its service quality, compliance with sharia principles, and overall attainment of goals in the context of operational efficiency.

Based on Table 3, it is evident that the efficiency level of NTB Syariah bank has remained unchanged in terms of efficiency values after the conversion. This efficiency level continues to maintain perfect efficiency values both before and after the conversion, with an average efficiency value of 100% after conversion based on the HEFDYN approach. This indicates that NTB Syariah bank has successfully maintained its optimal



**Figure 2:** Result of HEFDYN of Aceh Sharia Bank as a Result of Conversion. Source: Hahslm Refelxivity Dynamics, data processed 2023.

level of efficiency following its conversion into an Islamic bank. The bank has effectively utilized its resources and achieved maximum results with the available inputs.



**Figure 3:** Result of HEFDYN of Aceh Sharia Bank as a result of Conversion. Source: Hahslm Refelxivity Dynamics, data processed 2023.

Based on the research results using DEA analysis, there are differences in efficiency values among converted Islamic commercial banks. Bank Aceh Syariah successfully achieved a perfect efficiency value after conversion, while Bank NTB Syariah experienced a decrease in efficiency value of 1%, with an average efficiency value of 97% after conversion. The decrease in efficiency value at Bank NTB Syariah was attributed to a decline in the income and financing output variables in 2019. These findings are consistent with Sinathrya’s research (2019), which indicates that bank conversion results in a lower level of risk in Islamic banks compared to when the bank operated as a conventional Aceh bank. This highlights the benefits of conversion to Islamic banks in reducing financial risk [21]. Trinugroho’s research (2021) also supports these results, suggesting that the conversion strategy yields better outcomes, particularly in terms of profitability and efficiency, compared to a pure spin-off strategy [23]. However, Purba’s research (2017) presents slightly different findings. According to this study, Bank Aceh Syariah’s financing performance still faces challenges, as the growth in bank financing does not match the overall growth of the banking industry. The 2021 report indicates that

the average growth in financing disbursed by Bank Aceh Syariah was only 6.21%. Thus, although Bank Aceh Syariah managed to achieve perfect efficiency after conversion, there are areas of performance that still require improvement, particularly in terms of financing growth. Similarly, Bank NTB Syariah, despite experiencing a decrease in efficiency values after conversion, can focus on improvement efforts to enhance its financial performance [7].

Based on the results of the HEFDYN analysis, it is evident that Bank Aceh Syariah's efficiency level has decreased by 10% after conversion, but it still maintains an average efficiency value of 100%. This decrease is attributed to the weight assigned to the value of worship in the analysis, which falls short of reaching 100%. In the context of measuring the efficiency of Islamic banks, the value of worship plays a crucial role, and when its weight is less than 100%, it leads to a decline in the bank's efficiency value. This highlights the need for Bank Aceh Syariah to enhance aspects related to the value of worship in its operations to achieve a more optimal level of efficiency. The bank should prioritize improving service quality, adherence to sharia principles, and overall objectives aimed at increasing operational efficiency. Conversely, the efficiency level of Bank NTB Syariah did not witness a change in efficiency value after conversion. The bank continues to maintain perfect efficiency values both before and after conversion, with an average efficiency value of 100% based on the HEFDYN approach. This indicates that Bank NTB Syariah has successfully preserved an optimal level of efficiency following its transition to an Islamic bank. The bank has effectively utilized its resources and achieved maximum results with the available inputs. Therefore, despite the differing changes in efficiency values between Bank Aceh Syariah and Bank NTB Syariah after conversion, both institutions have the potential to further enhance operational efficiency by focusing on relevant aspects within the context of Islamic banking.

## 5. Conclusion

In conclusion, the research results utilizing DEA and HEFDYN analyses demonstrate differences in efficiency values among converted Islamic commercial banks. Bank Aceh Syariah achieved a perfect efficiency value after conversion, while Bank NTB Syariah experienced a slight decrease in efficiency value. The decrease in efficiency at Bank NTB Syariah was attributed to a decline in income and financing output variables in 2019. These findings align with previous research, indicating that bank conversion to Islamic banking reduces financial risk and yields better outcomes in terms of profitability and efficiency compared to other strategies. However, Purba's research highlights that

Bank Aceh Syariah still faces challenges in its financing performance, with growth in financing not keeping pace with the overall banking industry. Therefore, although Bank Aceh Syariah attained perfect efficiency after conversion, improvements are needed, particularly in terms of financing growth. Moreover, the HEFDYN analysis reveals that Bank Aceh Syariah experienced a decrease in efficiency level, primarily due to the weight assigned to the value of worship falling short of 100%. Enhancing aspects related to the value of worship is crucial for Bank Aceh Syariah to achieve a more optimal level of efficiency, including improving service quality, adhering to Sharia principles, and striving for increased operational efficiency. On the other hand, Bank NTB Syariah maintained a consistent level of perfect efficiency after conversion, showcasing effective resource utilization and maximum results with the available inputs. Both Bank Aceh Syariah and Bank NTB Syariah have the potential to enhance their operational efficiency by focusing on relevant aspects within the context of Islamic banking. In summary, while Bank Aceh Syariah and Bank NTB Syariah have different efficiency trends after conversion, they can both work towards improving their financial performance and operational efficiency to achieve better outcomes in the realm of Islamic banking.

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