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Comparative Efficiency Analysis in Takaful Industry in Southeast Asia

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Abstract

This research aims to evaluate the comparative efficiency of the Takaful industry in Southeast Asia, specifically in Indonesia and Malaysia, highlighting the sector's performance and operational benchmarks. Utilizing Data Envelopment Analysis (DEA), this research measures the efficiency of various Islamic insurance companies in 2019-2023 by comparing input variables such as Total Assets and Operating Expenses to output variables such as Revenue and Profit (Loss). The selection of input and output variables is adjusted to the intermediation efficiency approach used in the study. The results reveal that the efficiency trend in Islamic insurance companies in Indonesia and Malaysia tends to fluctuate. Besides, there is no Islamic Insurance company in Indonesia and Malaysia has achieved the maximum average efficiency score (1.00) during 2019-2023. PT Asuransi Sonwelis Takaful (0.93) reached the highest average efficiency score (0.93) among Islamic insurance companies in Indonesia. Meanwhile, Etiqa General Takaful Berhad was the Islamic insurance company in Malaysia that achieved the highest average efficiency score (0.99). This study also found that the efficiency level of Islamic insurance Companies in Malaysia tend to be higher than that of Islamic insurance companies in Indonesia. To achieve maximum efficiency level, Islamic insurance companies in Indonesia and Malaysia can improve their performance by concerning to the Revenue and Profit as the input variables, which are the largest sources of inefficiency in Islamic Insurance companies in Indonesia and Malaysia respectively. Islamic insurance companies in Indonesia and Malaysia should focus on improving efficiency through regular performance evaluations and product innovation to enhance financial inclusiveness and expand their reach. Regulators and academics are encouraged to support this effort by monitoring industry performance, addressing operational challenges, and conducting further research to provide comprehensive insights into the efficiency of Islamic insurance companies.

Keywords: *Islamic Insurance, Efficiency, Data Envelopment Analysis (DEA), Indonesia, Malaysia*

1. Introduction

Islamic insurance has become an important component in the Islamic financial industry, both in Indonesia and Malaysia (Ardianto & Sukmaningrum, 2020). Indonesia and Malaysia have large Muslim populations and have adopted the Islamic financial system as part of a national strategy to strengthen financial inclusion towards economic stability (Parizi & Riani, 2024). The Islamic insurance industry in Indonesia and Malaysia has also shown development from year to year (Ardianto & Sukmaningrum, 2020).

Referring to the Indonesia Financial Group (2022), globally, the Islamic insurance industry in Indonesia has a relatively small contribution compared to other Islamic financial sectors, only recording a contribution of 1% of the total assets of the Islamic financial sector. The development of the Islamic insurance industry also has an impact on the suboptimal performance of the financial sector. This can also be seen from the small number of Islamic insurance companies that are already fully operating in Indonesia.

In Malaysia, the Islamic insurance industry is considered quite mature. This is reinforced by the government's support in formulating policies and regulations that allow the Islamic insurance industry in

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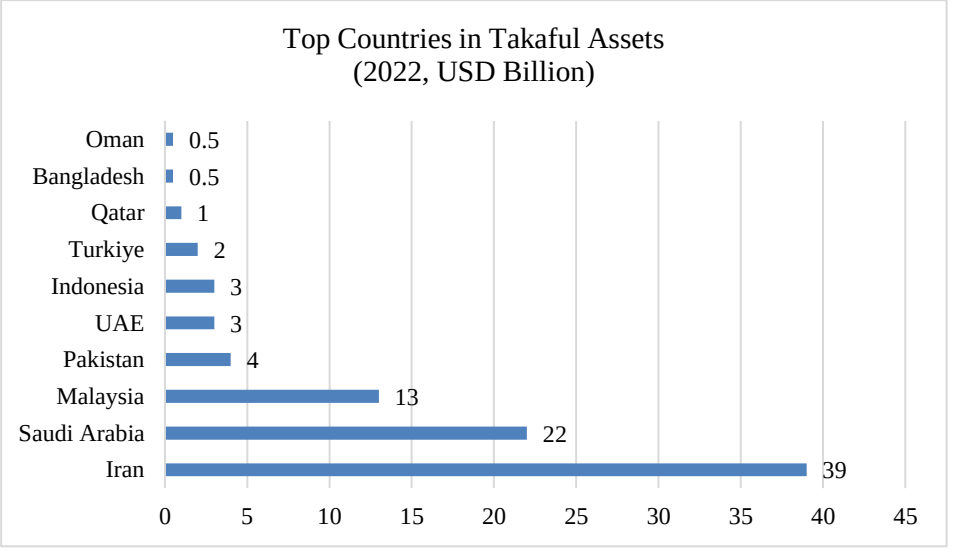
Malaysia to continue to grow and excel in world Islamic finance. Figure 1 below shows the countries with the highest number of assets in the Islamic insurance industry globally.

Figure 1: Top countries in Takaful assets



Source: IFDI (2023)

In Indonesia, the Islamic insurance industry is regulated by the Financial Services Authority (OJK) and supervised by the Deposit Insurance Corporation (LPS) based on the principles set out in the Fatwa of the National Sharia Council of the Indonesian Ulema Council (DSN-MUI). Meanwhile, in Malaysia, the Islamic insurance industry is regulated by Bank Negara Malaysia (BNM) through a comprehensive regulatory framework. Indonesia and Malaysia have the potential for the development of Islamic insurance, with their large Muslim populations.

Given the increasing growth of the Islamic insurance industry and global competition, it is important to measure the performance of the Islamic insurance industry in terms of efficiency (Parizi & Riani, 2024). The urgency of measuring this efficiency is reinforced to determine the extent to which Islamic insurance companies, both in Indonesia and Malaysia, are able to manage funds optimally. It is the expectation of hope that the Islamic insurance industry in Indonesia and Malaysia can provide maximum benefits to customers and continue to maintain the sustainability of the company and can contribute to maintaining national stability.

The purpose of this study is to measure the level of efficiency of Islamic insurance companies in Indonesia and Malaysia in the period 2019 to 2023. This study also captures a comparison of the efficiency conditions of Islamic insurance companies in Indonesia and Malaysia during and after the Covid-19 pandemic. This study also provides results of potential improvements to achieve maximum efficiency in Islamic insurance companies in Indonesia and Malaysia. This study can be useful for Islamic insurance companies to provide projections of company performance in terms of efficiency. For regulators, this study can provide alternative references in decision making. As for academics, this study can fill the gap in literature regarding the efficiency of Islamic insurance companies, especially in Indonesia and Malaysia, and become one of the references in future research.

2. Literature Review

2.1 Islamic Insurance

The word 'Insurance' in Arabic is also called *at-taimin* which means providing peace, a sense of security, protection, and a feeling of freedom from fear. Referring to DSN Fatwa No.21/DSN MUI/2001 concerning general guidelines for Islamic insurance, Islamic Insurance is also called *Ta'min*, *Takaful*, or *Tadhamun*, defined as an effort to help each other and protect a number of people in the form of *tabarru'* funds and can be returned when experiencing certain risks which are carried out through contracts that are following Islamic

principles, such as contracts that do not contain elements of usury, *gharar* (fraud), *maysir* (gambling), *zhulm* (abuse), *risywah* (bribery), illicit goods, and immorality. Based on its management system, Islamic insurance companies in Indonesia may only be carried out by an institution that functions as an Amanah holder. Islamic insurance companies can also obtain profit sharing from the management of funds collected on the basis of *tijarah* (*mudharabah*) contracts. In addition, Islamic insurance companies in Indonesia are also permitted to obtain ujrah from the management of *tabarru'* (grant) contract funds.

The Islamic insurance industry in Malaysia is regulated in the Takaful Act of 1984 which is the legal basis for the establishment of takaful industry operations. The expansion of the company's scope and product range, coupled with the increase in participants, has resulted in significant progress for the takaful industry in Malaysia in recent times. The explosive growth of this industry requires the establishment of an appropriate operational structure to direct takaful operators. This also contributes to making Malaysia a superior and advanced country in the field of Islamic finance.

Referring to the OJK, in Indonesia, Islamic insurance has various products such as Islamic Life Insurance, Islamic Education Insurance, Islamic Health Insurance, Insurance with Islamic Investment, Islamic Loss Insurance, Group Islamic insurance, and Hajj and Umrah Insurance. Meanwhile in Malaysia, the types of Islamic insurance (takaful) are divided into 2 products, namely General Takaful and Family Takaful.

2.2 The Concept of Efficiency

The concept of efficiency according to Farrell (1957) is formed from two components, namely technical components and allocative components. The technical efficiency component allows for efficient results that maximize output according to a certain amount of input. The allocative efficiency component measures efficiency that optimizes input. Referring to Ascarya & Yumanita (2008), economic efficiency will be achieved when both components have been met. Economic efficiency, according to economic theory is divided into two types, namely economic efficiency and technical efficiency. Economic efficiency measures efficiency from a macro perspective, while technical efficiency measures efficiency from a micro perspective by measuring technically and operationally. Mathematically, efficiency is formulated in the following formula:

$$Efficiency = \frac{output}{input}$$

Efficiency measurement can be done by using input variables and output variables as a measure of relative efficiency. Conceptually, if the output variables produced by a company/entity are greater than the input variables, then a DMU can be said to be efficient compared to other DMUs that use the same number of input variables. Referring to Cooper et al. (2011), efficiency measurement is divided into two orientations, namely input orientation and output orientation. Input-oriented efficiency identifies efficiency by minimizing input at the same output level. Output-oriented efficiency is measured by emphasizing output maximization without changing the amount of input.

2.3 Previous Studies

Previous studies related to the efficiency of Islamic insurance companies in various regions have been conducted. There are studies that discuss the efficiency of Islamic insurance in Indonesia (Sunarsih & Fitriyani, 2018; Ningsih & Suprayogi, 2017; Ghoni & Efendi, 2021; Sabiti et al.,2017; Benarda et al., 2016; Iskandar et al., 2020), in Malaysia (Antonio et al.,2013; Lee et al., 2019; Razaly et al.,2024). Other studies also compare the efficiency of Islamic and conventional insurance companies (Hasanatina et al.,2020; Astuti & Suprayogi, 2017; Suryoaji & Cahyono, 2019). There are also studies that analyze the efficiency of Islamic insurance companies in Indonesia and Malaysia (Ardianto & Sukmaningrum, 2020; Nasution, 2021).

Research by Ningsih & Suprayogi (2017) which analyzed the efficiency of 12 Islamic insurance companies in Indonesia in 2013-2015, found that the average Islamic insurance company in Indonesia is still inefficient. The input variables used in the study were total assets, expenses, and claim payments, and the output variables were income and *tabarru'* funds. The study stated that during the study period, the efficiency score based on the CRS assumption could reach 0.978, while with the VRS assumption it reached 0.925. The scale of operations and management of the use of input and output in Islamic insurance companies are sources of inefficiency in the study. In previous studies discussing the efficiency of Islamic insurance in Indonesia,

Ningsih & Suprayogi (2017), Ghoni & Efendi. (2021), Sabiti et al. (2017), and Benarda et al. (2016) found similar results, namely that Islamic insurance companies in Indonesia are considered inefficient. However, research conducted by Sunarsih & Fitriyani (2018) found that only four Islamic insurance companies in Indonesia had not achieved maximum efficiency (1.00).

Hasanatina et al. (2020) in a study comparing the efficiency levels of Islamic and conventional life insurance, showed that the efficiency level of conventional life insurance was higher than the efficiency level of Islamic life insurance in Indonesia. In addition, the results of the study also found that the average efficiency level for all DMUs, both Islamic and conventional life insurance companies, whereas considered inefficient. This result was also found in the study of Suryoaji & Cahyono (2019) which stated that the average efficiency level of Islamic and conventional life insurance companies was still inefficient.

A comparison of the efficiency of Islamic insurance companies in Indonesia and Malaysia was also carried out in the study of Ardianto & Sukmaningrum (2020). The study analyzed the efficiency level for the period 2015 to 2018 and found that the average efficiency score of Islamic insurance companies in Indonesia was relatively lower than the average efficiency score of Islamic insurance companies in Malaysia. The study stated that the cause of inefficiency of Islamic insurance companies in Indonesia and Malaysia is the total expenditure variable.

The efficiency analysis of the Islamic insurance industry, particularly through the lens of Data Envelopment Analysis (DEA), has garnered significant attention in recent years. This analytical approach allows for a comprehensive evaluation of the operational efficiency of Islamic insurance companies by comparing multiple inputs and outputs. The studies reviewed here provide a detailed examination of the input and output variables utilized in DEA assessments, as well as the conclusions drawn regarding the efficiency levels of Islamic insurance firms.

One of the prominent studies conducted by Puspitasari & Fauziyah (2022) emphasizes the importance of DEA in evaluating the efficiency of Islamic general insurance in Indonesia. The authors utilized various input variables, including total assets, general and administrative expenses and claim payments, while the outputs were measured through investment income and tabarru' funds. This study concluded that the Islamic general insurance sector demonstrated a commendable level of efficiency, although certain firms exhibited room for improvement, particularly in optimizing their resource allocation.

Further supporting this notion, Sabiti et al. (2017) conducted a similar analysis focusing on Islamic insurance companies in Indonesia, using data from 14 Islamic life insurance companies and 12 Islamic general insurance firms over the period from 2013 to 2015. Their findings revealed that while the Islamic insurance sector generally performed well in terms of technical efficiency, operational cost efficiency was identified as an area needing enhancement. This study underscored the necessity for Islamic insurance companies to refine their operational strategies to bolster competitiveness against conventional insurance providers.

In a broader context, the research by Tuffahati et al. (2019) also employed DEA to assess the efficiency of Islamic insurance companies in Indonesia, utilizing input variables such as total assets and operational expenses, while outputs included net premiums and investment returns. The study found that the Islamic insurance sector's efficiency levels were competitive yet highlighted the need for continuous improvement in managing operational costs to sustain growth and profitability.

Moreover, the comparative study conducted by Naushad et al. (2020) on the managerial efficiency of insurance companies in Saudi Arabia, which included both conventional and (Takaful) Islamic insurance firms, revealed that Takaful companies exhibited higher efficiency levels in certain operational aspects. This study utilized inputs such as total assets and operational expenses, while outputs were measured through net earnings and investment returns. The findings indicated that Takaful companies were effectively managing their resources, which contributed to their relative efficiency in the market.

The analysis by Rahman (2013) further contributes to the discourse by examining the efficiency of both life insurance and Islamic insurance industries in Bangladesh. This study employed DEA to explore the contributions of technical and efficiency changes to productivity growth, utilizing a panel of 13 life insurance and Islamic insurance companies. The results indicated that while both sectors showed potential for efficiency, the Islamic insurance industry was slightly more efficient, suggesting that the principles of Islamic finance may provide a competitive edge in resource management.

In Indonesia, the study by Sunarsih & Fitriyani (2018) specifically focused on the efficiency of Islamic insurance from 2014 to 2016, employing an intermediation approach in DEA. The input variables included

total assets and claims expenses, while outputs were represented by investment income and tabarru' funds. The results indicated that the efficiency of Islamic insurance companies was commendable, yet the study called for improved strategies to enhance operational efficiencies further.

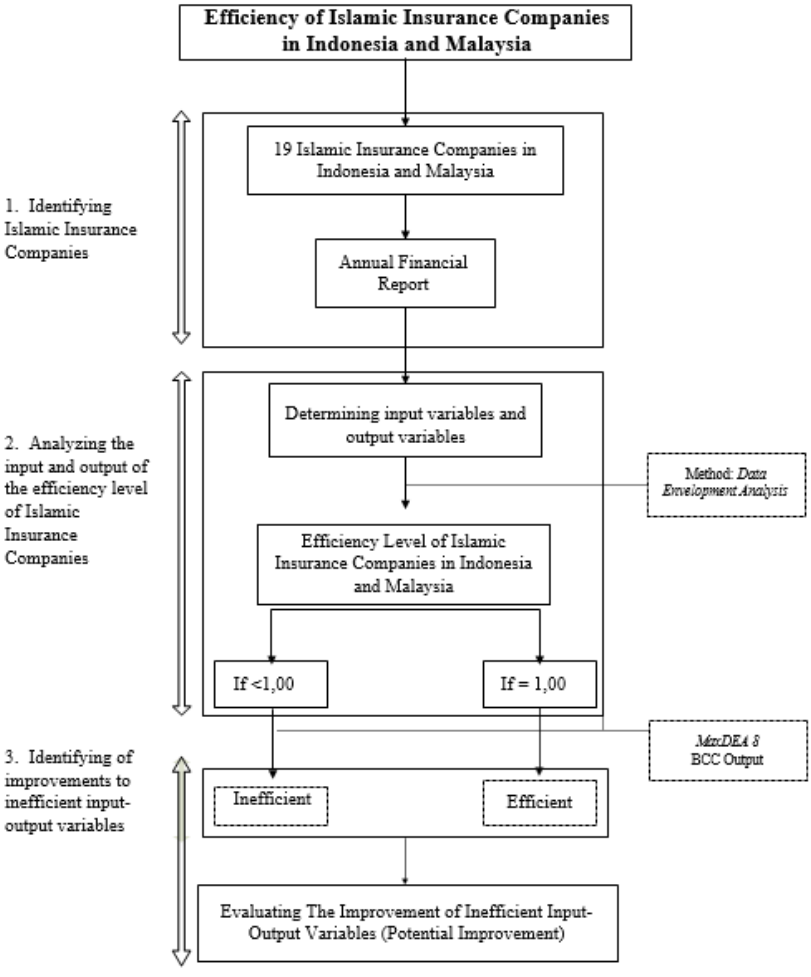
The comparative analysis of conventional and Islamic life insurance efficiency conducted by Ikhwan & Rusydiana (2022) during the COVID-19 pandemic revealed that while conventional insurance faced significant challenges, Islamic insurance maintained its efficiency levels. This study utilized a comprehensive set of input and output variables, reinforcing the resilience of the Islamic insurance sector during economic downturns.

In conclusion, the body of research surrounding the efficiency analysis of the Islamic insurance industry through DEA reveals a consistent theme: while Islamic insurance companies generally exhibit commendable efficiency levels, there remains considerable scope for improvement, particularly in operational cost management. The input and output variables utilized across these studies provide a robust framework for assessing efficiency, highlighting the importance of strategic resource allocation and operational optimization. As the Islamic insurance sector continues to evolve, ongoing efficiency assessments will be crucial in ensuring its competitiveness in the broader insurance market.

3. Conceptual Framework

This study measures the efficiency level of Islamic insurance companies in Indonesia and Malaysia with the following conceptual framework:

Figure 2: Conceptual framework



4. Research Methodology

4.1 Type of Research

This type of research is quantitative descriptive. Quantitative descriptive is a type of research that explains the results of numerical calculations using literature study analysis to obtain research conclusions. The type of approach in this study is a non-parametric approach with the Data Envelopment Analysis (DEA) method. The DEA method is used to obtain the results of the Decision-Making Unit (DMU) efficiency level. MaxDea 8 is used as a data processing analysis tool to measure efficiency in this study.

4.2 Data Identification

This study uses data from Islamic insurance companies in Indonesia and Malaysia from 2019 to 2023. The research year was chosen to capture the period during and after the Covid-19 pandemic. There is a total of 19 Islamic insurance companies in Indonesia and Malaysia that are the samples in this study. The research sample was selected based on data availability and the largest proportion of assets in each country. Table 1 below contains a list of Islamic insurance companies in Indonesia and Malaysia that are the research samples.

Table 1: List of sample

Countries	**Islamic insurance Companies**
Indonesia	1. PT Asuransi Askrida Syariah
	2. PT Asuransi Chubb Syariah Indonesia
	3. PT Asuransi Jasindo Syariah
	4. PT Asuransi Jiwa Syariah Al Amin
	5. PT Asuransi Jiwa Syariah Jasa Mitra Abadi
	6. PT Asuransi Sonwelis Takaful
	7. PT Asuransi Syariah Keluarga Indonesia
	8. PT Asuransi Takaful Keluarga
	9. PT Asuransi Takaful Umum
	10. PT Capital Life Syariah
Malaysia	1. AIA Public Takaful Berhad
	2. Etiqa Family Takaful Berhad
	3. Etiqa General Takaful Berhad
	4. FWD Takaful Berhad
	5. Hong Leong MSIG Takaful Berhad
	6. Prudential BSN Takaful Berhad
	7. Sun Life Malaysia Takaful Berhad
	8. Takaful Ikhlas Family Berhad
	9. Takaful Ikhlas General Berhad

4.2 Data Collection

The type of data in this study is secondary data. The data used comes from the financial statements of each company. The financial statements used are the financial position and profit and loss statements. The financial statements are used to obtain information on input and output variable data used in this study. This study uses two input and output variables each. The input variables used are Operating Expenses and Total Assets. The output variables used are Revenue and Profit (loss). The variables Operating Expenses, Revenue, and Profit (Loss) are included in the profit and loss statement. For data information regarding the Total Assets variable, it is provided in the financial position statement. The selection of input and output variables is adjusted to the intermediate efficiency approach used in the study. In addition, the availability of data on each Islamic insurance company in Indonesia and Malaysia used in the study is also a reason for selecting these variables.

4.3 Definition of Operational Variables

This study uses input and output variables based on previous studies. Table 2 below provides variable definitions and references for variable use in this study.

Table 2: Definition of operational variables

	Variable Name	Definition	Reference
		Input Variables	
X1	Operating Expenses	Expenses related to the company's operations.	Sabiti et al. (2017); Iskandar et al. (2020); Suryoaji & Cahyono (2019); Ningsih & Suprayogi (2017); Benarda et al. (2016)
X2	Total Assets	The total value of all assets owned by the company.	Sabiti et al. (2017); Suryoaji & Cahyono (2019); Ghoni & Efendi (2021); Ningsih & Suprayogi (2017); Sunarsih & Fitriyani (2018)
		Output Variables	
Y1	Revenue	Revenue obtained from company operations.	Hasanatina et al. (2020); Sabiti et al. (2018); Suryoaji & Cahyono (2019); Ghoni & Efendi (2021); Ningsih & Suprayogi (2017); Astuti & Suprayogi (2017); Benarda et al. (2016)
Y2	Profit (Loss)	Profit/loss obtained by the company.	Ghoni & Efendi (2021); Ardianto & Sukmaningrum (2020)

4.4 Data Analysis Method

The Data Envelopment Analysis (DEA) method is used in this study to answer the research objectives. Referring to Yildirim (2015) the DEA method produces information on the relative efficiency level of the Decision-Making Unit based on certain input and output variables. Mathematically, the DEA method is formulated with the following formula (Ascarya & Yumanita, 2008):

$$Efficiency\ of\ DMU = \sum_{k=1}^{p} \mu_k \gamma_{k0} \Big/ \sum_{i-1}^{m} v_i x_{i0}$$

DMU	: Decision-Making Unit	n	: number of DMU evaluated
m	: different inputs	x_{i0}	: number of inputs consumed by DMU_0
p	: different outputs	y_{k0}	: number of outputs consumed by DMU_0
μ_k	: average output	v_i	: average input

The DEA technique was first created by Banker, Charnes, and Cooper (BCC) in 1984 with the variable returns to scale (VRS) model, which was built on the work of Charnes, Cooper, and Rodhes (CCR) in 1978 with the constant returns to scale (CRS) model. According to the CRS model, there is a constant ratio between the addition of input and output. This indicates that there will be a corresponding increase in output of x times for every increase in input of x times. On the other hand, the VRS model assumes that the ratio of additional input to output is not constant. This means that an increase in input of x times does not necessarily result in an equivalent increase in output, which can be greater or smaller.

The efficiency measure in the CRS and VRS assumptions is scaled from 0 to 1. If the efficiency score shows a value of 0 or close to 0, then the DMU is declared inefficient. Conversely, if the efficiency score shows a value close to 1, then the DMU is declared efficient. An efficiency score of 1 indicates that a DMU has

achieved maximum efficiency.

Efficiency measurement using the DEA method also has two types of orientations, namely input orientation and output orientation. Input-oriented efficiency measurements with output have different assumptions. Input-oriented efficiency measurements assume that a DMU can increase efficiency by using fewer input variables to obtain the same output. Meanwhile, output-oriented efficiency measurements state that efficiency can be achieved by using more output variables while using the same amount of input. This study uses an output-oriented approach to measure efficiency.

In addition to answering the research objectives, the DEA method used in this study also has several advantages, namely: 1) The DEA method produces a relative level of efficiency based on the DMU used (Akbar, 2009). 2) The DEA method allows the results of each DMU used to be compared, while also showing the variables that cause inefficiency (Riani & Ikhwan, 2022). 3) The DEA method can handle several input and output variables simultaneously without requiring a functional relationship between the two (Rusydiana, 2018).

5. Results and Discussion

5.1 Descriptive Statistic

Descriptive statistics provide an overview of the data used in this study. Table 3 presents descriptive statistics of input and output variables used to measure the level of efficiency of Islamic Insurance in Indonesia and Malaysia in the period 2019 to 2023.

Table 3: Descriptive statistic

	Mean	Min	Max	St.Dev
Output Variables				
Revenue	$ 113.723.190	$ 361.383	$ 707.355.570	$ 170.477.435
Profit (Loss)	$ 8.489.858	$ 12.160	$ 122.020.290	$ 20.851.818
Input Variables				
Operating Expenses	$ 56.867.149	$ 758.952	$ 493.196.360	$ 97.392.957
Total Assets	$ 426.273.463	$ 4.695.086	$ 3.138.555.620	$ 676.371.868

The income variable has the highest value of USD 707,355,570 and the lowest value of USD 361,383, with an average income of USD 113,723,190. Other input variables, namely profit (loss), reached the highest value of USD 122,020,290 and the lowest production of USD 12,160, with an average profit (loss) of USD 8,489,858.

Meanwhile, in terms of output variable, namely Operating Expenses, the highest value was USD 493,196,360 and the lowest value was USD 758,952, with an average operating expense of USD 56,867,149. The Total Assets variable reached the highest value of USD 3,138,555,620 and the lowest value of USD 4,695,086, with an average total asset of USD 426,273,463.

5.2 Panel Efficiency

Using the DEA method, the level of efficiency of Islamic Insurance in Indonesia and Malaysia can be obtained with a general limit in each year. Table 4 presents the panel values of Islamic Insurance efficiency in Indonesia and Malaysia from 2019 (Panel A), 2020 (Panel B), 2021 (Panel C), 2022 (Panel D), 2023 (Panel E), and the overall year (Panel F).

Table 4: Panel Efficiency

	MEAN	MIN	MAX	ST.DEV
PANEL A (2019)				
TE	0,42	0,09	1,00	0,28
PTE	0,53	0,10	1,00	0,29
SE	0,81	0,24	1,00	0,22

PANEL B (2020)				
TE	0,43	0,09	1,00	0,28
PTE	0,56	0,10	1,00	0,31
SE	0,82	0,14	1,00	0,22
PANEL C (2021)				
TE	0,45	0,09	1,00	0,26
PTE	0,58	0,09	1,00	0,30
SE	0,82	0,14	1,00	0,22
PANEL D (2022)				
TE	0,37	0,11	0,90	0,23
PTE	0,47	0,11	1,00	0,28
SE	0,83	0,27	1,00	0,20
PANEL E (2023)				
TE	0,34	0,13	0,92	0,19
PTE	0,44	0,13	1,00	0,23
SE	0,83	0,27	1,00	0,20
PANEL F (ALL YEARS)				
TE	0,40	0,34	0,45	0,04
PTE	0,51	0,44	0,58	0,05
SE	0,82	0,81	0,83	0,01

The table above explains the level of efficiency of Islamic insurance in Indonesia and Malaysia based on Technical Efficiency (TE), Pure Technical Efficiency (PTE) and Scale Efficiency (SE). Based on the average value of the level of efficiency of Islamic insurance in Indonesia and Malaysia, the lowest average TE and PTE values were obtained in 2023, namely 0.34 (TE) and 0.44 (PTE). The highest average TE and PTE values were also obtained in 2021, namely 0.45 (TE) and 0.58 (PTE). The lowest average SE value was obtained in 2019, namely 0.81 and the highest average SE value was obtained in 2022, namely 0.83.

5.3 Efficiency Score

The table below shows the results of the calculation of the efficiency score of Islamic Insurance in Indonesia and Malaysia from 2019 to 2023. The results of the efficiency score are on a scale of 0 to 1, where a unit is considered inefficient if the resulting efficiency score is close to 0, while a unit is considered efficient if the resulting score is close to 1 and is considered to have achieved the maximum efficiency score if the resulting score is 1.

Table 5: Efficiency Score

No	**DMU**	**2019**	**2020**	**2021**	**2022**	**2023**	**Average**
1	AIA Public Takaful Berhad	1,00	0,94	0,86	0,35	0,32	**0,69**
2	Etiqa Family Takaful Berhad	1,00	0,98	1,00	0,44	0,48	**0,78**
3	Etiqa General Takaful Berhad	1,00	0,99	0,99	0,96	1,00	**0,99**
4	FWD Takaful Berhad	0,42	0,44	0,59	0,22	0,23	**0,38**
5	Hong Leong MSIG Takaful Berhad	0,61	0,53	0,53	0,65	0,62	**0,59**
6	Prudential BSN Takaful Berhad	0,92	0,87	0,94	1,00	0,41	**0,83**
7	PT Asuransi Askrida Syariah	0,55	0,55	0,65	0,69	0,59	**0,61**
8	PT Asuransi Chubb Syariah Indonesia	0,36	0,59	0,53	0,35	0,39	**0,44**
9	PT Asuransi Jasindo Syariah	0,30	0,31	0,33	0,35	0,31	**0,32**
10	PT Asuransi Jiwa Syariah Al Amin	0,26	0,15	0,21	0,25	0,25	**0,22**
11	PT Asuransi Jiwa Syariah Jasa Mitra Abadi	0,35	0,35	0,38	0,32	0,42	**0,37**
12	PT Asuransi Sonwelis Takaful	0,64	1,00	1,00	1,00	1,00	**0,93**

13	PT Asuransi Syariah Keluarga Indonesia	0,61	0,42	0,42	0,37	0,39	**0,44**
14	PT Asuransi Takaful Keluarga	0,14	0,13	0,12	0,12	0,13	**0,13**
15	PT Asuransi Takaful Umum	0,36	0,38	0,46	0,66	0,55	**0,48**
16	PT Capital Life Syariah	0,10	0,10	0,09	0,11	0,14	**0,11**
17	Sun Life Malaysia Takaful Berhad	0,85	1,00	1,00	0,20	0,23	**0,66**
18	Takaful Ikhlas Family Berhad	0,36	0,37	0,41	0,42	0,43	**0,40**
19	Takaful Ikhlas General Berhad	0,21	0,44	0,42	0,49	0,45	**0,40**
	Average	**0,53**	**0,56**	**0,58**	**0,47**	**0,44**	

Table 5 explains that among the Islamic insurance companies in Indonesia and Malaysia, no company has achieved the maximum average efficiency score. The Islamic insurance company that almost achieved maximum efficiency is Etiqa General Takaful Berhad from Malaysia with an average efficiency score of 0.99. In addition, a company from Indonesia, namely PT Asuransi Sonwelis Takaful, also almost achieved maximum efficiency, with an average efficiency score of 0.93.

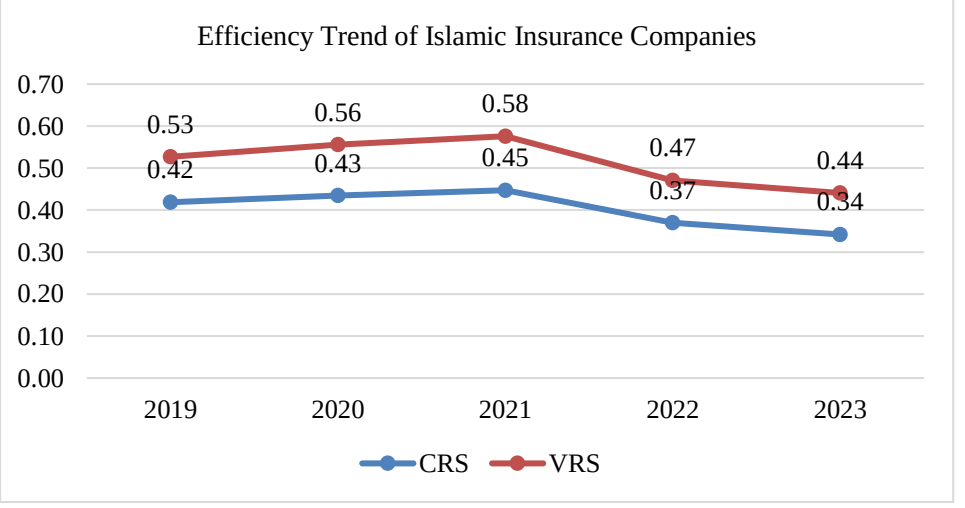
Furthermore, the table above also shows that the highest average efficiency score of the Islamic insurance companies in Indonesia and Malaysia was achieved in 2021 (0.58) and the lowest in 2023 (0.44). Overall, the average efficiency score of Islamic insurance Companies in Indonesia and Malaysia showed quite low results during the period 2019 to 2023. The results of this efficiency score also show that the average efficiency score of Islamic insurance companies in Indonesia and Malaysia is considered more efficient during the Covid-19 pandemic, compared to after the Covid-19 pandemic.

This finding is supported by the same findings in previous studies, namely Antonio et al. (2013), Benarda et al. (2016), Ningsih & Suprayogi (2017), Sabiti et al. (2017), Ghoni & Efendi (2021), and Razaly et al. (2024) which found similar results, namely that Islamic insurance companies in Indonesia and Malaysia are considered inefficient. However, this result contradicts Sunarsih & Fitriyani (2018) which found that only 2 Islamic insurance companies in Indonesia had achieved maximum efficiency (1.00), and Saad & Idris (2011) also found that there were 4 Islamic insurance companies in Malaysia that achieved the average maximum efficiency value (1,00).

5.4 Efficiency Trend

This study also provides the results of the efficiency trend of Islamic insurance companies in Indonesia and Malaysia in 2019-2023 which is presented in Figure 3.

Figure 3: Efficiency trend of Islamic insurance companies

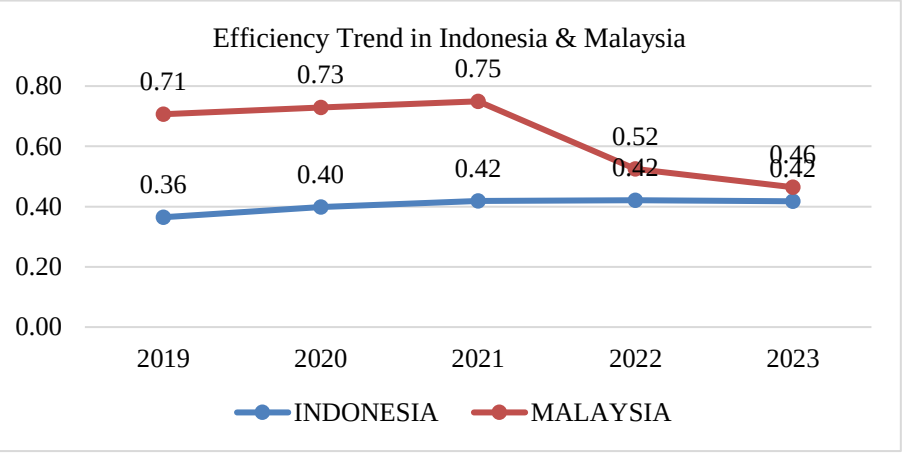


Based on the graph above, the efficiency scores according to the VRS and CRS assumptions show the same fluctuation trend. The highest efficiency score was achieved in 2021 and the lowest in 2023. This trend also shows that during the period from 2019 to 2021, the average efficiency score tended to increase. This captures the level of efficiency of Islamic insurance companies in Indonesia and Malaysia during the Covid-19 pandemic. Meanwhile, in the period after the Covid-19 pandemic, namely from 2022 to 2023, the average efficiency score was recorded to have decreased.

This result contradicts the findings of the research by Parizi & Riani (2024) which found that during the Covid-19 pandemic there was a decrease in the efficiency score of Islamic insurance companies in Indonesia. To overcome the same phenomenon in the future, Indonesia and Malaysia also need to pay more attention to the operations of the Islamic insurance industry, because this industry is also important so that access to health and lifestyle for the people of Indonesia and Malaysia can run well.

This study also compares the efficiency trends of Islamic insurance companies between Indonesia and Malaysia in the period 2019 to 2023 which is presented in Figure 4.

Figure 4: Efficiency trend in Indonesia & Malaysia



Based on the graph above, the efficiency level of the Malaysian Islamic insurance company is higher than that of the Indonesian Islamic insurance company. The efficiency trend of the Malaysian Islamic insurance company has changed from year to year. The highest efficiency level of the Malaysian Islamic insurance company was achieved in 2021, which was 0.75 and the lowest in 2023, which was 0.46.

In addition, the efficiency level of the Indonesian Islamic insurance company shows a trend that tends to increase and is quite stable. The highest efficiency level of the Indonesian Islamic insurance Company occurred in 2021 to 2023, which was constant at 0.42 and the lowest in 2019, which was 0.36. The efficiency level of the Indonesian Islamic insurance company is considered inefficient because it shows results close to 0.

Similar results were also found by Ardianto & Sukmaningrum (2020) who stated that this happened because of less-than-optimal input management for the Indonesian Islamic insurance company, which had an impact on its output results. For this reason, Islamic insurance companies, not only in Indonesia, but also in Malaysia, need to proportionally reduce Business Expenses and use capital optimally.

In the period before the Covid-19 pandemic, namely 2019 to 2021, the efficiency level of Malaysian Islamic insurance companies tended to be high and showed an increasing trend. However, it experienced a significant decline in 2022 (0.52) and decreased again the following year (0.46).

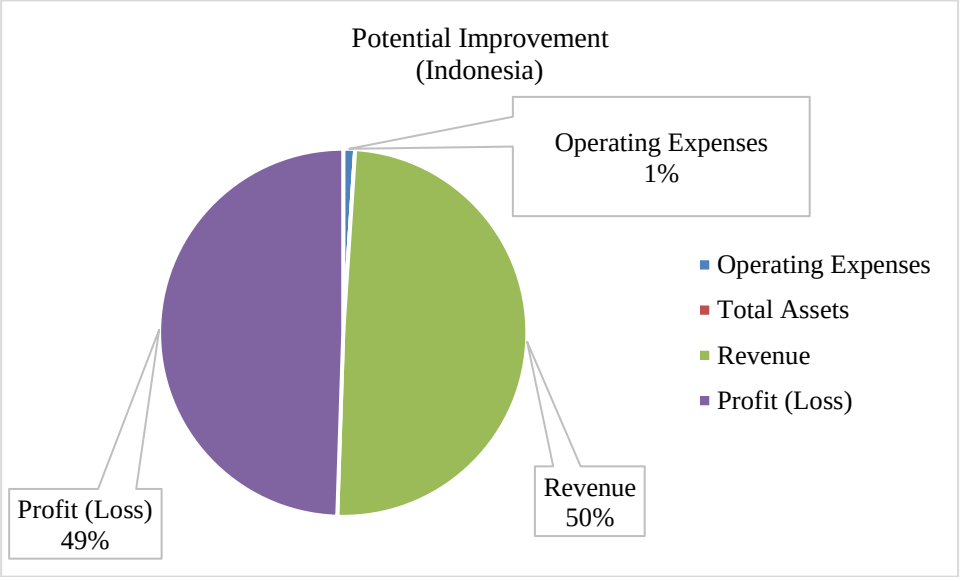
A similar thing happened to Indonesian Islamic insurance companies. During the Covid-19 pandemic, the efficiency trend of Indonesian Islamic insurance companies increased. After the Covid-19 pandemic, Indonesian Islamic insurance companies experienced a constant trend of 0.42.

5.5 Potential Improvement

This study also provides potential improvement results from the DEA method used. The potential for improvement is a value that needs to be adjusted by Islamic insurance companies in Indonesia and Malaysia to

achieve maximum efficiency levels. The potential for improvement is analyzed using observations from the last year of the research period, namely 2023. Figure 5 shows information on potential improvements in Islamic insurance companies in Indonesia. While Figure 6 shows information on potential improvements in Islamic insurance companies in Malaysia.

Figure 5: Potential improvement (Indonesia)



Based on the Figure 5 above, the variable that is the largest source of inefficiency in Islamic insurance companies in Indonesia is the revenue output variable. Other variables, namely the Profit (Loss) and Operating Expenses variables also contribute to the inefficiency of Islamic insurance companies in Indonesia. The Total Assets variable is not a source of inefficiency. The potential for improvement based on the image above can be seen that to achieve the maximum level of efficiency, Islamic insurance companies in Indonesia need to increase Revenue by 50% and Profit by 49%. And the Operating Expenses variable needs to be reduced by 1%.

Figure 6: Potential improvement (Malaysia)

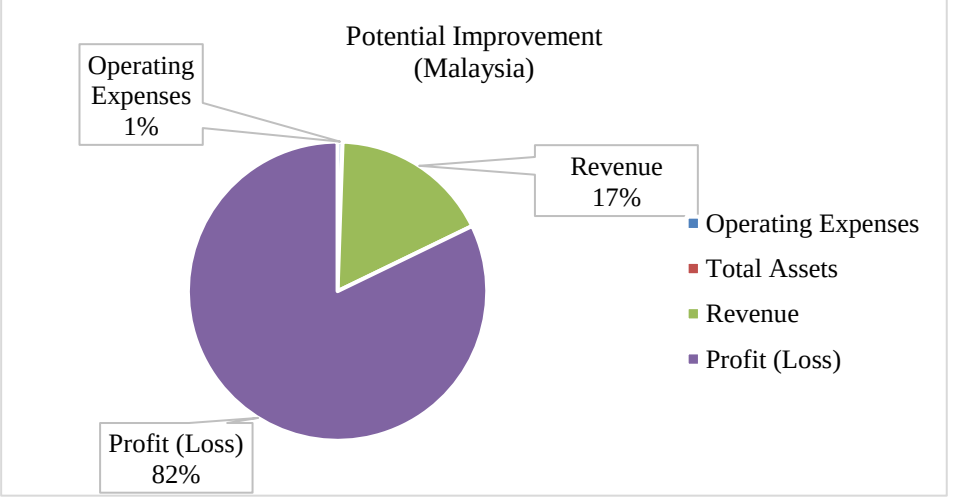


Figure 6 above shows that the largest source of inefficiency in Islamic insurance companies in Malaysia

is the Profit output variable. Other variables that are sources of inefficiency in Islamic insurance companies in Malaysia are the Income and Operating Expense variables. Similar to Islamic insurance companies in Indonesia, the Total Asset variable in Islamic insurance companies in Malaysia is also not a source of inefficiency.

To achieve the maximum level of efficiency, Islamic insurance companies in Malaysia can potentially improve the Profit output variable by 82% and Income by 17%. The Operating Expense variable can be reduced by 1% as a potential improvement.

Other results were found in the research of Ardianto & Sukmaningrum (2020) which found that the overall sources of inefficiency in Islamic insurance companies in Indonesia and Malaysia were Total Expense, Capital, and Total Investment. Total Expense is the largest source of inefficiency with the largest contribution from claim expenses and employee salary expenses of the company.

6. Conclusion

Based on the results of the analysis using the Data Envelopment Analysis (DEA) method, the conclusions regarding the level of efficiency of Islamic insurance companies in Indonesia and Malaysia in the period 2019 to 2023 obtained in this study are:

i. This study found that there is no Islamic insurance company in Indonesia and Malaysia has achieved the maximum average efficiency score (1.00) during the 2019-2023 research period. Among the 10 Islamic insurance companies in Indonesia in this research sample, the company that achieved the highest average efficiency score was PT Asuransi Sonwelis Takaful (0.93). Meanwhile, among the 9 Islamic insurance companies in Malaysia that were the research sample, Etiqa General Takaful Berhad was the company that achieved the highest average efficiency score (0.99) and almost reached the maximum efficiency level.
ii. Analysis of efficiency levels per country shows that the efficiency level of Islamic insurance companies in Malaysia tends to be higher than that of Islamic insurance companies in Indonesia.
iii. The efficiency trend in Islamic insurance companies in Indonesia and Malaysia tends to fluctuate. The increasing trend occurred from 2019 to 2021, while the decreasing trend was found from 2021 to 2023.
iv. This study also measures the potential for improvement so that Islamic insurance companies in Indonesia and Malaysia can achieve maximum efficiency levels. Based on the results of the analysis of potential improvements, the sources of inefficiency in Islamic insurance companies in Indonesia and Malaysia are the variables Profit, Revenue, and Operating Expenses. The Revenue variable is the largest source of inefficiency in Islamic insurance companies in Indonesia. While the Profit variable contributes greatly to the inefficiency of Islamic Insurance Companies in Malaysia.

This study found that the performance of Islamic insurance companies in Indonesia and Malaysia can be shown based on the efficiency level value. Therefore, measuring the efficiency level value of Islamic insurance companies is important to do. Increasing efficiency in Islamic insurance companies can ultimately also have an impact on increasing financial inclusiveness in the Islamic insurance companies industry. Operational efficiency of Islamic insurance companies can reduce transaction costs and premiums charged to customers, so that Islamic insurance companies' products in Indonesia and Malaysia can be more affordable for the lower and middle economic classes, thus the customer segment of Islamic insurance companies can also be wider. Good efficiency values can also increase trust in Islamic insurance companies as an initial step in the growth of this industry. In that way, public access to Islamic insurance companies can also increase. This also helps improve financial literacy for the community regarding available financial instruments and the importance of financial protection.

7. Recommendations

7.1 For Islamic Insurance Companies

This study provides recommendations for Islamic insurance companies, both in Indonesia and Malaysia, to be able to pay attention to financial performance, especially in terms of efficiency. Efficiency measurements also need to be carried out periodically to determine the projection of the company's performance development.

Islamic insurance companies also need to innovate products in order to reach a wider community. This

will have an impact on the inclusiveness of Islamic finance in Indonesia and Malaysia. The development of the Islamic insurance industry in Indonesia and Malaysia is increasingly being considered considering that this industry is an important instrument in Islamic finance globally.

7.2 For Regulator

This study recommends that regulators pay more attention to the operations of the Islamic insurance industry. This is related to the operations of the Islamic insurance industry so that it can be better. Furthermore, regulators can also evaluate the performance results of the Islamic insurance industry. So that they can identify the source of the problems in this industry and can provide concrete efforts in solving the problems. The hope is that the Islamic insurance industry can develop significantly and contribute to the stability of the national financial sector.

7.3 For Academics

This study recognizes that there are limitations to this study. Therefore, this study recommends that academics conduct research updates using different variables and research methods. In addition, the research year period can also be extended to be able to capture the efficiency assessment of Islamic insurance companies.

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