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# Comparative Analysis of the Efficiency of Sharia and Conventional Life Insurance Industries in Indonesia

Jannara Dewaji[1*], Khusnudin[2]
Universitas Islam Negeri Maulana Malik Ibrahim, Malang
**Corresponding Author:** Jannara Dewaji: jandewaji@gmail.com

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A B S T R A C T

This study compares the efficiency of sharia and conventional life insurance in Indonesia using data envelopment analysis (DEA). Annual financial data from 24 sharia life insurance companies and 17 conventional life insurance companies for the period 2019–2023 were analyzed using the CRS, VRS, and SE approaches using MAX DEA 8 and Microsoft Excel. The results showed that based on the CRS and SE methods, 14 sharia life insurance companies and 6 conventional life insurance companies were efficient for five consecutive years. Meanwhile, based on the VRS method, there were 15 sharia life insurance companies and 9 conventional life insurance companies that were efficient in the same period. The main factors causing inefficiency are liabilities and operational expenses. This study emphasizes the importance of efficiency analysis in the life insurance industry to improve sustainability, support economic growth, and community welfare.



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## INTRODUCTION

In Indonesia, the insurance industry is also growing. Based on data from the Financial Services Authority (OJK) as of December 31, 2023, there are 364 insurance companies, both sharia and conventional, that have licenses to operate in Indonesia. This number includes 147 insurance and reinsurance companies, and 217 insurance support companies.

The number of companies in the Indonesian insurance sector decrease from 380 companies in 2019 to 364 in 2023, mainly due to a decline in life insurance companies, national private general insurance companies, and insurance brokers. In 2023, three insurance companies had their licenses revoked by the OJK due to their unhealthy financial position. In addition, the companies were unable to achieve the minimum solvency level and there was no commitment to increase capital. The three companies are PT Asuransi Jiwa Kresna, PT Asuransi Jiwa Prolife Indonesia, and PT Asuransi Purna Artanugraha.

As one of the main pillars in the insurance sector, life insurance not only has a large economic role, but also has a profound social impact in protecting individuals and families from unexpected financial risks such as death. This makes life insurance a relevant and valuable product, although perceptions of it still vary in society (Rao et al., 2023). Some people see life insurance as a valuable investment that provides peace of mind and security for their loved ones in the event of their sudden death. On the other hand, there are also those who see life insurance as an unnecessary and exclusive commodity for the rich. A person's view of life insurance is also influenced by things such as age, income, education, and culture (Rao et al., 2023).

Conventional and sharia life insurance are the two main categories available in the market. Sharia life insurance is based on the principles of mutual aid (ta'awun) and risk sharing (risk-sharing), guided by sharia values (Utama, 2022). On the other hand, conventional life insurance is based on the principle of risk transfer, where the insurance company assumes the risks transferred by the policyholder in exchange for premiums (Darmawan, 2024).

Measuring the level of life insurance efficiency has a very important role. Efficiency reflects the company's managerial ability to optimize its resources. In addition, evaluating this efficiency is also necessary to face competition with other life insurance companies. Insurance participants also have an interest in knowing the efficiency performance of life insurance companies, so that they can place trust in these companies, especially in long-term agreements (Rismayanti, 2020).

The efficiency of a financial institution can be measured by parametric and non-parametric approaches, which depend on its activities. The three main approaches to the financial institution sector include production, intermediation, and assets. The classical approach looks at financial activities from the production and intermediation side, while the modern approach emphasizes the asset aspect, including risk management and information processes that can trigger conflicts of interest (Freixas & Parigi, 1998). A financial institution can be said to be efficient if it uses less or the same input to produce the same or greater output (Daat, 2007). For example, financial institution A is said to be more

efficient than financial institution B if it uses less input than B, but produces the same output or obtains greater results with the same input (Daat, 2007).

Research related to the efficiency of sharia and conventional life insurance shows varying results depending on the method, variables, and objects used. Astuti et al. (2017) and Zahara et al. (2020) compared sharia and conventional efficiency using the data envelopment analysis (DEA) method, with the result that sharia life insurance has an efficiency close to conventional even though it has a smaller market share. However, Zahara's research shows that conventionals tend to be more efficient. Hasanatina et al. (2021) found that the average life insurance is not yet efficient due to less than optimal input-output management, while Prijanto & Indrayani (2023) noted that 13 out of 17 Islamic business units or around 76.47% of Islamic business units in Indonesia are classified as inefficient.

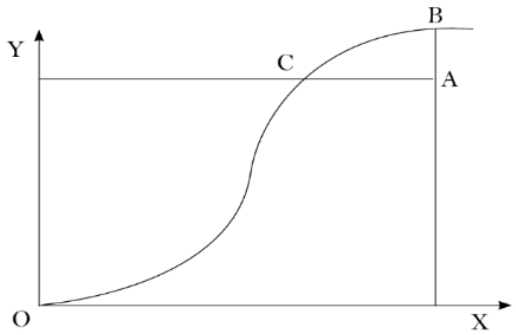
Research by Lee et al. (2019) highlights that corporate governance plays a role in efficiency, while Alhassan & Boakye (2020) note that the independent governance structure in conventional insurance tends to cause inefficiency. Outside of Indonesia, sharia insurance in Malaysia (Ardianto & Sukmaningrum, 2020) and the GCC (Al-Amri, 2015) shows better performance, with the UAE and Qatar excelling in technical-cost efficiency. Meanwhile, analysis in Saudi Arabia (Akhtar, 2018), India (Ilyas & Rajasekaran, 2019), and Jordan (Jaloudi, 2019) underlines the role of corporate governance, size, and market competition in driving efficiency.

## LITERATUR REVIEW

The concept of efficiency comes from microeconomic theory, which consists of two main components: producer theory and consumer theory. In producer theory, the main focus is on how producers try to maximize profits while keeping costs to a minimum. Meanwhile, consumer theory focuses on how consumers strive to achieve maximum satisfaction or utility (Huda & Nasution, 2014).

In production theory, there is the term production frontier, which is a curve that illustrates the relationship between input and output in the production process. This frontier line shows the maximum output that can be achieved from the use of certain inputs, taking into account the level of technology available to the company or industry (Huda & Nasution, 2014).

**Picture 1: Production Frontier Curve And Technical Efficiency**




Source: Huda & Nasution (2014)

A company operating at point A is considered inefficient because technically it still has the opportunity to increase output (y) until it reaches point B without the need to increase input (x). Alternatively, the company can continue to produce the same output but with less input, i.e. at point C on the frontier line. A company is said to be economically efficient if it is able to minimize production costs in producing a certain output (Desiana, 2017).

Efficiency refers to the company's ability to complete tasks properly. In a mathematical perspective, efficiency is expressed as the ratio between output and input, which is the amount of output produced from the input used. A company is considered optimal in its efficiency if it is able to maximize output with fixed input or reduce input usage to achieve equivalent output (Bastian, 2009). Efficiency is the ratio between input and output that shows the achievement of maximum output with a certain amount of input. This means that the greater the ratio of output to input, the higher the level of efficiency. In other words, efficiency is the optimal use of input to produce output (Komaryatin, 2006).

According to Hulwah, et al (2016) in Sulistiani (2022), there are three approaches to determining efficiency:

1. Ratio approach, this approach compares the inputs and outputs used. An organization is considered efficient if it has the ability to produce the maximum amount of output with minimal input.

$$Efficiency = \frac{Output}{Input}$$

2. Regression approach, a method that produces a certain level of output as a function of different levels of input. This method only produces efficiency when the output is greater than projected. However, with this method, only one output can be measured.

$$Y = f\ (X_1, X_2, X_3 \dots \dots, X_n)$$

Where Y = output, X = input

The Decision Making Unit (DMU) is considered efficient if it is able to produce more output than the estimated output.

Frontier approach: This method determines the efficiency of an entity in comparison with other entities that are considered the most optimal. There are

two types of approaches: parametric and nonparametric. Parametric approaches use parametric statistical measurements such as the Stochastic Frontier Approach (SFA) and the Distribution Free Approach (DFA). In contrast, nonparametric approaches use nonparametric statistical measurements such as the Free Disposal Hull (FDH).

## METHODOLOGY

The type of research used in this study is quantitative research. The population in this study are sharia life insurance companies and conventional life insurance companies registered with the OJK during the 2019-2023 period. The sampling in this study used the purposive sampling method, where the sample is determined by selecting subjects based on specific research objectives, without using random methods, stratification, or division of regions (Ferdinand & Khusnudin, 2023). The samples used in this study were 7 *full-fledged* sharia life insurance companies, 17 sharia business units, and 17 conventional life insurance companies. The sample criteria for this study were as follows: (1) Sharia life insurance incorporated into the Indonesian Sharia Insurance Association (AASI), (2) Conventional life insurance incorporated into the Indonesian Life Insurance Association (AAJI), and (3) Sharia and conventional life insurance that publish financial reports from 2019 to 2023. The data used in this study is secondary data obtained from the financial reports of each life insurance company for the period 2019-2023. The samples used in this study are shown in table below.

**Table 1. List of Sharia and Conventional Life Insurance Samples**

| No. | Samples | Type of Insurance |
|---|---|---|
| 1. | Sharia Life Insurance Al-Amin | Full-Fledge Sharia |
| 2. | Sharia Life Insurance Bumiputera | Full-Fledge Sharia |
| 3. | Sharia Life Insurance Jasa Mitra Abadi Tbk | Full-Fledge Sharia |
| 4. | Sharia Life Insurance Kitabisa | Full-Fledge Sharia |
| 5. | Sharia Life Insurance Keluarga Indonesia (Asyki) | Full-Fledge Sharia |
| 6. | Sharia Life Insurance Takaful Keluarga | Full-Fledge Sharia |
| 7. | Sharia Life Insurance Capital Life | Full-Fledge Sharia |
| 8. | AIA Financial | Sharia Business Unit & Conventional |
| 9. | Allianz Life Indonesia | Sharia Business Unit & Conventional |
| 10. | Astra Life | Sharia Business Unit & Conventional |
| 11. | Avrist Assurance | Sharia Business Unit & Conventional |
| 12. | Axa Mandiri Financial Service | Conventional |
| 13. | BNI Life Insurance | Sharia Business Unit & Conventional |

| | | |
|---|---|---|
| 14. | BRI Life | Sharia Business Unit & Conventional |
| 15. | Central Asia Raya (CAR) Life Insurance | Sharia Business Unit & Conventional |
| 16. | Chubb Life Insurance Indonesia | Sharia Business Unit |
| 17. | Generali Indonesia | Sharia Business Unit & Conventional |
| 18. | Great Eastern Life Indonesia | Sharia Business Unit & Conventional |
| 19. | Manulife Indonesia | Sharia Business Unit & Conventional |
| 20. | Panin Dai-Ichi Life | Sharia Business Unit & Conventional |
| 21. | PFI Mega Life | Sharia Business Unit & Conventional |
| 22. | Reliance Life | Sharia Business Unit & Conventional |
| 23. | Simas Jiwa | Sharia Business Unit & Conventional |
| 24. | Sinarmas MSIG Life | Sharia Business Unit & Conventional |

Source: Processed by Authors (2025)

The input variables used used are Liabilities, Equity, Assets, Operating Expenses, and Claims. Meanwhile, the output variables are Premium Income, Investment Income, Profit and Loss, and Tabarru' Funds specifically for sharia life insurance. The population in this study consisted of 57 insurance companies. Using the purposive sampling method, 41 samples were obtained, including sharia and conventional life insurance companies. The research period used was from 2019 to 2023.

## RESULT AND ANALYSIS

This study analyzes the financial report data of sharia and conventional life insurance companies from 2018 to 2022, with a total of 120 observations for sharia life insurance and 85 for conventional life insurance. The descriptive statistical analysis presented includes the number of samples, minimum, maximum, and average (mean) values of each research variable. Details of the descriptive statistical data can be seen in the table below.

**Table 2. Descriptive Statistics for Sharia Life Insurance (in millions of rupiah)**

| Variable | N | Minimum | Maximum | Mean |
|---|---|---|---|---|
| Liabilities (I1) | 120 | 605 | 2,463,738 | 242,558 |
| Equity (I2) | 120 | 29,185 | 2,828,916 | 226,142 |
| Assets (I3) | 120 | 42,667 | 10,127,303 | 981,425 |
| Operating Expenses (I4) | 120 | 193 | 1,044,574 | 63,383 |
| Claims (I5) | 120 | 0 | 545,150 | 50,417 |
| Premium Income (O1) | 120 | 0 | 425,456 | 42,847 |

| | | | | |
|---|---|---|---|---|
| Investment Income (O2) | 120 | 37 | 734,417 | 18,560 |
| Profit (O3) | 120 | 53 | 609,269 | 33,682 |
| Tabarru' Funds (O4) | 120 | 0 | 672,723 | 42,035 |

Source: Processed by Authors (2025)

The minimum values for the variables of liabilities, operating expenses, claims, premium income, and tabarru' funds were recorded at Astra Life Syariah in 2019. Meanwhile, the minimum value for equity was held by PFI Mega Life in the same year, assets by Allianz Life in 2023, investment income by Avrist Assurance in 2019, and profit by Jasa Mitra Abadi Tbk in 2020. As for the maximum value, the highest liabilities were recorded by Capital Life Syariah in 2019. AIA Financial recorded the highest values in equity, assets, profit, and tabarru' funds in 2019, as well as investment income in 2020. Allianz Life recorded the highest operating expenses and claims in 2023, while the highest premium income was achieved by Al Amin in the same year.

**Table 3. Descriptive Statistics for Conventional Life Insurance (in millions of rupiah)**

| Variable | N | Minimum | Maximum | Mean |
|---|---|---|---|---|
| Liabilities (I1) | 85 | 22,046 | 47,176,200 | 14,717,236 |
| Equity (I2) | 85 | 126,164 | 15,574,135 | 4,024,805 |
| Assets (I3) | 85 | 148,210 | 62,274,577 | 18,742,041 |
| Operating Expenses (I4) | 85 | 9,542 | 7,138,138 | 650,583 |
| Claims (I5) | 85 | 15,190 | 20,749,803 | 4,529,070 |
| Premium Income (O1) | 85 | 15,028 | 20,228,421 | 5,332,050 |
| Investment Income (O2) | 85 | 4,904 | 4,490,224 | 857,169 |
| Profit (O3) | 85 | 959 | 1,885,072 | 325,589 |

Source: Processed by Authors (2025)

Victoria Alife recorded the minimum value for liabilities, equity, assets, claims, and premium income variables in 2023, while the minimum operating expenses occurred in 2019. Reliance Life recorded the lowest investment income in 2020, while Generali had the lowest profit in 2023. On the other hand, Manulife recorded the maximum value for liabilities and assets in 2023, as well as equity in 2020. BRI Life had the highest operating expenses in 2021, while Simas Jiwa recorded the highest values for claims and investment income in 2019 and premium income in 2020. The highest profit was achieved by AIA Financial in 2022.

**Efficiency with the Constant Return to Scale (CRS) Model**

Constant Return to Scale (CRS) refers to a condition in which proportional changes in the amount of input result in the same proportional changes in output (Zahara & Saputra, 2020). In other words, if the input increases by 1%, the output will also increase by the same amount, which is 1%. The results of the CRS calculation during the 2019 to 2023 study period on 41 life insurance companies, consisting of 24 sharia life insurance and 17 conventional life insurance, can be seen in Tables below.

**Table 4. Result of the Constant Return to Scale (CRS) of Sharia Life Insurance**

| Sharia Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA Financial | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Al Amin | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Asyki | 1.00 | 1.00 | 1.00 | 0.70 | 0.79 |
| Bumi Putera | 0.62 | 0.95 | 0.97 | 1.00 | 1.00 |
| Capital Life | 0.97 | 1.00 | 0.60 | 0.23 | 0.52 |
| Jasa Mitra Abadi | 1.00 | 1.00 | 1.00 | 1.00 | 0.72 |
| Kitabisa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Takaful Keluarga | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Allianz Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Astra Life | 1.00 | 1.00 | 0.89 | 1.00 | 0.94 |
| Avrist Assurance | 0.80 | 0.89 | 0.61 | 0.49 | 1.00 |
| BNI Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BRI Life | 0.92 | 1.00 | 1.00 | 0.83 | 1.00 |
| CAR Life | 1.00 | 1.00 | 1.00 | 1.00 | 0.93 |
| Chubb Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Generali | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Great Eastern | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 0.88 | 0.72 | 0.90 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 0.33 | 0.34 | 1.00 | 1.00 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Tokio Marine Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculations using the *Constant Return to Scale* (CRS) model show that the efficiency level of sharia life insurance varies. Based on Table 4.3, the average efficiency score of sharia life insurance during the period 2019 to 2023 is 0.95, with the lowest efficiency value of 0.23, which occurred at Capital Life Syariah in 2022. In addition, there are 14 sharia life insurance companies that have succeeded in achieving optimal efficiency levels for five consecutive years, namely: AIA Financial, Al-Amin, Kitabisa, Takaful Keluarga, Allianz Life, BNI Life, Chubb Life, Generali, Great Eastern, Panin Dai-Ichi, PFI Mega Life, Simas Jiwa, Sinarmas MSIG Life, and Tokio Marine Life.

**Table 5. Result of the Constant Return to Scale (CRS) of Conventional Life Insurance**

| Conventional Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA | 0.59 | 0.74 | 0.88 | 1.00 | 1.00 |
| Allianz | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Avrist | 0.71 | 1.00 | 1.00 | 1.00 | 1.00 |
| Axa Mandiri | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

| | | | | | |
|---|---|---|---|---|---|
| BNI Life | 1.00 | 0.88 | 0.77 | 0.84 | 0.98 |
| BRI Life | 0.90 | 0.93 | 0.90 | 1.00 | 1.00 |
| CAR Life | 1.00 | 0.97 | 1.00 | 1.00 | 0.99 |
| Generali | 0.90 | 0.77 | 0.69 | 1.00 | 0.88 |
| Great Eastern | 0.89 | 0.73 | 0.76 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 0.62 | 0.71 | 0.98 | 0.97 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG | 0.85 | 0.89 | 1.00 | 0.83 | 0.79 |
| Taspen Life | 0.66 | 1.00 | 1.00 | 0.83 | 1.00 |
| Victoria Alife | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculations using the *Constant Return to Scale* (CRS) model show that the level of efficiency of conventional life insurance varies. Based on Table 4.3, the average efficiency score for conventional life insurance during the period 2019 to 2023 is 0.94, with the lowest efficiency value of 0.59, which occurred at AIA in 2019. In addition, there are 6 conventional life insurance companies that can achieve efficiency for 5 consecutive years, namely: Allianz, Axa Mandiri Financial Service, Panin Dai-Ichi, PFI Mega Life, Simas Jiwa, and Victoria Alife.

**Efficiency with the Variable Return to Scale (VRS) Model**

Variable Return to Scale (VRS) is the assumption that the relationship between changes in *inputs* and *outputs* is not always proportional (Zahara & Saputra, 2020). This means that if the *input* increases by 1%, the *output* may not increase by 1%, it could be smaller or larger than that. The results of the VRS calculation during the research period from 2019 to 2023 on 24 sampled sharia life insurance and 17 conventional life insurance companies are shown in tables below.

**Table 6. Result of the Variable Return to Scale (VRS) of Sharia Life Insurance**

| Sharia Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA Financial | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Al Amin | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Asyki | 1.00 | 1.00 | 1.00 | 0.70 | 0.82 |
| Bumi Putera | 0.64 | 1.00 | 1.00 | 1.00 | 1.00 |
| Capital Life | 1.00 | 1.00 | 1.00 | 0.54 | 1.00 |
| Jasa Mitra Abadi | 1.00 | 1.00 | 1.00 | 1.00 | 0.74 |
| Kitabisa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Takaful Keluarga | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Allianz Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Astra Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Avrist Assurance | 0.83 | 0.89 | 0.68 | 0.57 | 1.00 |

| | | | | | |
|---|---|---|---|---|---|
| BNI Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BRI Life | 0.94 | 1.00 | 1.00 | 0.92 | 1.00 |
| CAR Life | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 |
| Chubb Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Generali | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Great Eastern | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 1.00 | 0.89 | 1.00 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 0.36 | 0.38 | 1.00 | 1.00 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Tokio Marine Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculation using the Variable Return to Scale (VRS) model show that the efficiency level of sharia life insurance varies. Based on Table 4.5, the average efficiency score of sharia life insurance during the period 2019 to 2023 is 0.97, with the lowest efficiency value of 0.36, which occurred at Capital Life Syariah in 2022. In addition, there are 15 sharia life insurance companies that have succeeded in achieving optimal efficiency levels for five consecutive years, namely: AIA Financial, Al-Amin, Kitabisa, Takaful Keluarga, Allianz Life, Astra Life, Chubb Life, Generali, Great Eastern, Panin Dai-Ichi, PFI Mega Life, Simas Jiwa, Sinarmas MSIG Life, and Tokio Marine Life.

**Table 7. Result of the Variable Return to Scale (VRS) of Conventional Life Insurance**

| Conventional Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA | 0.81 | 0.85 | 1.00 | 1.00 | 1.00 |
| Allianz | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Avrist | 0.72 | 1.00 | 1.00 | 1.00 | 1.00 |
| Axa Mandiri | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BNI Life | 1.00 | 0.89 | 0.82 | 1.00 | 0.98 |
| BRI Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| CAR Life | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 |
| Generali | 0.92 | 0.81 | 0.70 | 1.00 | 0.89 |
| Great Eastern | 0.90 | 0.73 | 0.80 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG | 0.86 | 0.98 | 1.00 | 1.00 | 1.00 |
| Taspen Life | 0.67 | 1.00 | 1.00 | 0.90 | 1.00 |
| Victoria Alife | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculations using the Variable Return to Scale (VRS) model show that the level of efficiency of conventional life insurance varies. Based on Table 4.6, the average efficiency score of conventional life insurance during the period 2019 to 2023 is 0.97, with the lowest efficiency value of 0.67, which occurred at Taspen Life in 2019. In addition, there are 9 conventional life insurance companies that have managed to achieve optimal efficiency levels for five consecutive years, namely: Allianz, Axa Mandiri Financial Service, BRI Life, Manulife, Panin Dai-Ichi, PFI Mega Life, Reliance Life, Simas Jiwa, and Victoria Alife.

**Efficiency with the Scale Efficiency (SE) Model**

Scale Efficiency (SE) is used to analyze the level of efficiency of a bank in achieving a scale of production with constant results (Putri, 2023). The results of the scale efficiency calculation during the research period from 2019 to 2023 on 24 sampled sharia life insurance and 17 conventional life insurance companies are shown in tables below.

**Table 8. Result of the Scale Efficiency (SE) of Sharia Life Insurance**

| Sharia Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA Financial | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Al Amin | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Asyki | 1.00 | 1.00 | 1.00 | 0.99 | 0.96 |
| Bumi Putera | 0.97 | 0.95 | 0.97 | 1.00 | 1.00 |
| Capital Life | 0.97 | 1.00 | 0.60 | 0.43 | 0.52 |
| Jasa Mitra Abadi | 1.00 | 1.00 | 1.00 | 1.00 | 0.96 |
| Kitabisa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Takaful Keluarga | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Allianz Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Astra Life | 1.00 | 1.00 | 0.89 | 1.00 | 0.94 |
| Avrist Assurance | 0.97 | 1.00 | 0.90 | 0.86 | 1.00 |
| BNI Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BRI Life | 0.97 | 1.00 | 1.00 | 0.91 | 1.00 |
| CAR Life | 1.00 | 1.00 | 1.00 | 1.00 | 0.98 |
| Chubb Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Generali | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Great Eastern | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 0.88 | 0.81 | 0.90 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 0.92 | 0.88 | 1.00 | 1.00 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Tokio Marine Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculations using the Scale Efficiency (SE) model show that the level of efficiency of conventional life insurance varies. Based on Table 9, the average efficiency score for conventional life insurance during the period 2019 to 2023 is 0.98, with the lowest efficiency value of 0.43, which occurred at Capital Life in 2022. In addition, there are 14 sharia life insurance companies that have succeeded in achieving optimal efficiency levels for five consecutive years, namely: AIA Financial, Al-Amin, Kitabisa, Takaful Keluarga, Allianz Life, BNI Life, Chubb Life, Generali, Great Eastern, Panin Dai-Ichi, PFI Mega Life, Simas Jiwa, Sinarmas MSIG Life, and Tokio Marine Life.

**Table 9. Result of the Scale Efficiency (SE) of Conventional Life Insurance**

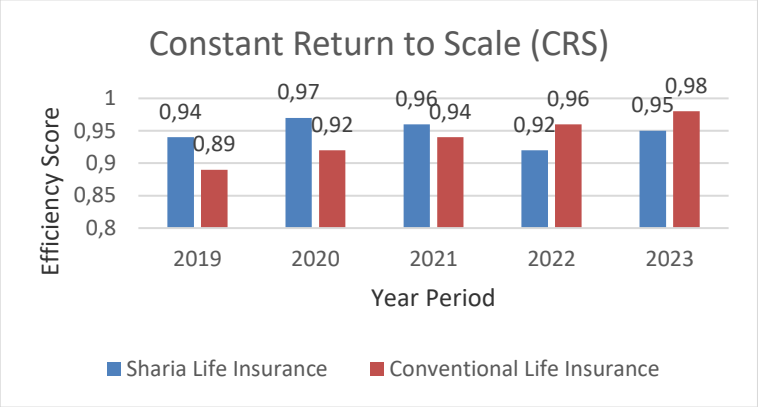
| Conventional Life Insurance | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| AIA | 0.73 | 0.88 | 0.88 | 1.00 | 1.00 |
| Allianz | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Avrist | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 |
| Axa Mandiri | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BNI Life | 1.00 | 0.99 | 0.94 | 0.84 | 1.00 |
| BRI Life | 0.90 | 0.93 | 0.90 | 1.00 | 1.00 |
| CAR Life | 1.00 | 0.97 | 1.00 | 1.00 | 0.99 |
| Generali | 0.98 | 0.94 | 0.99 | 1.00 | 0.99 |
| Great Eastern | 0.99 | 0.99 | 0.96 | 1.00 | 1.00 |
| Manulife | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 |
| Panin Dai-Ichi | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PFI Mega Life | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Reliance Life | 0.62 | 0.71 | 0.98 | 0.97 | 1.00 |
| Simas Jiwa | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sinarmas MSIG | 0.99 | 0.91 | 1.00 | 0.83 | 0.79 |
| Taspen Life | 0.99 | 1.00 | 1.00 | 0.92 | 1.00 |
| Victoria Alife | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Source: Processed by Authors (2025)

The results of data calculations using the Scale Efficiency (SE) model show that the level of efficiency of conventional life insurance varies. Based on Table 10, the average efficiency score for conventional life insurance during the period 2019 to 2023 is 0.97, with the lowest efficiency value of 0.62, which occurred at Reliance Life in 2019. In addition, there are 6 sharia life insurance companies that have succeeded in achieving optimal efficiency levels for five consecutive years, namely: Allianz, Axa Mandiri Financial Service, Panin Dai-Ichi, PFI Mega Life, Simas Jiwa, and Victoria Alife.

**Comparison of the Efficiency of Sharia and Conventional Life Insurance**

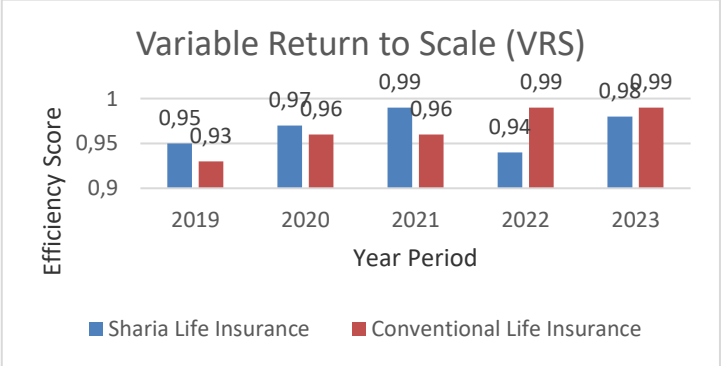
**Picture 2: Average Constant Return to Scale (CRS) Test Score**




Source: Processed by Authors (2025)

Based on Figure 2, the results of the efficiency test using the Constant Return to Scale (CRS) model reveal that the efficiency of sharia life insurance is generally higher than that of conventional life insurance during most of the study period. In 2019, the efficiency score for sharia life insurance reached 0.94, while conventional life insurance was at a lower figure of 0.89. In 2020, the efficiency of sharia life insurance increased to 0.97, while conventional life insurance also increased to 0.92. In 2021, the efficiency of sharia life insurance fell slightly to 0.96, but was still higher than conventional life insurance, which stood at 0.94. In 2022, the efficiency score for sharia life insurance remained stable at 0.96, while conventional life insurance experienced a slight decrease to 0.92. However, in 2023, conventional life insurance recorded a significant increase in efficiency to 0.98, surpassing the efficiency of sharia life insurance which was at 0.95. From these results, it can be concluded that although sharia life insurance showed a higher level of efficiency in the early years, conventional life insurance managed to achieve a higher level of efficiency in 2023. This indicates an improvement in the performance and operational effectiveness of conventional life insurance during the study period.

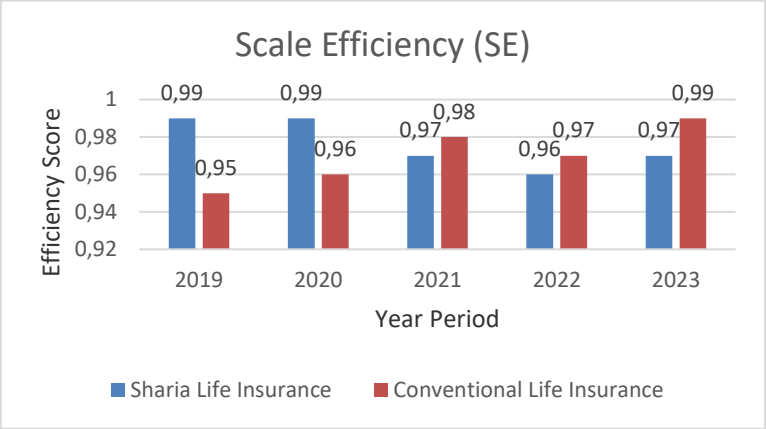
**Picture 3: Average Variable Return to Scale (VRS) Test Score**




Source: Processed by Authors (2025)

Based on Figure 3, an efficiency test using the Variable Return to Scale (VRS) model shows fluctuations in the efficiency of sharia and conventional life insurance from 2019 to 2023. In 2019, the efficiency of sharia life insurance was higher with a score of 0.95 compared to conventional life insurance which was 0.93. In 2020, the efficiency of sharia life insurance increased to 0.97, while conventional life insurance also increased to 0.96. In 2021, the efficiency of sharia life insurance reached its highest point with a score of 0.99, while conventional life insurance actually decreased to 0.94. In 2022, conventional life insurance managed to match the efficiency of sharia life insurance with a score of 0.99, while the efficiency of sharia life insurance decreased to 0.94. In 2023, the efficiency of sharia life insurance increased again to 0.98, but it was still lower than conventional life insurance which reached 0.99. From these results, it can be concluded that sharia life insurance tends to have higher efficiency at the beginning of the period, but in recent years conventional life insurance has shown a more significant increase and finally reached higher efficiency than sharia life insurance.

**Picture 4: Average Variable Return to Scale (VRS) Test Score**




Source: Processed by Authors (2025)

Based on Figure 4.3, the results of the Scale Efficiency (SE) test show that the scale efficiency of sharia and conventional life insurance is relatively stable during the study period from 2019 to 2023. Both types of insurance show a high efficiency score, with little fluctuation. In 2019 and 2020, the scale efficiency of sharia life insurance reached 0.99, higher than conventional life insurance. However, in 2021 to 2023, the two types of life insurance show almost the same efficiency score, where in 2021 and 2022 the efficiency score of sharia life insurance differs only 0.01 compared to conventional life insurance. However, in 2023, conventional life insurance showed a slight increase to 0.99 compared to sharia life insurance, which was only 0.97. Overall, this graph indicates that both types of insurance have managed their scale of operations well, with consistent and high efficiency during the study period.

In the efficiency calculation with the CRS and SE models, it was found that 14 sharia life insurance companies and 6 conventional life insurance companies consistently achieved efficiency in both models for five consecutive years. Meanwhile, in the efficiency calculation with the VRS model, 15 sharia life insurance companies and 9 conventional life insurance companies were found to consistently achieve efficiency for five consecutive years. The average efficiency performance of sharia and conventional life insurance in Indonesia for the 2019-2023 period is relatively higher in the VRS model compared to the CRS model (VRS > CRS). So it can be concluded that the cause of the lack of efficiency in sharia and conventional life insurance is more due to scale factors than technical factors. In other words, sharia and conventional life insurance have not been operating at an optimal scale in improving efficiency. This means that the VRS calculation method is more accurate for determining the efficiency of an entity because it is assumed in the VRS calculation that not all entities operate under optimal conditions.

## CONCLUSION

This study aims to analyze the efficiency of sharia and conventional life insurance companies using the CRS, SE, and VRS methods. The results show that 14 sharia life insurance companies achieved full efficiency for five consecutive years based on the CRS and SE methods, while the VRS method added one more efficient company. On the other hand, six conventional life insurance companies showed full efficiency with the CRS and SE methods, while the VRS method increased the number to nine companies. Overall, sharia life insurance showed higher efficiency at the beginning of the study period, but conventional life insurance has improved significantly in recent years. The practical implication of these findings is that companies that have not yet reached optimal efficiency levels must make improvements by referring to efficient companies, such as Allianz Life, and adjusting the use of inputs and outputs to be more effective. For further research, it is advisable to apply other approaches such as Stochastic Frontier Approach (SFA) and Distribution Free Approach (DFA), expand the variables analyzed, extend the research period, and consider the VRS method which is more realistic in assuming conditions of companies that are not always optimal.

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