



EFFICIENCY ANALYSIS OF MALAYSIAN FAMILY TAKAFUL USING STOCHASTIC FRONTIER APPROACH

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Abstract

Malaysia has the most extensive family takaful market with a growth rate of 16 percent in 2015. Takaful development in Malaysia should be assessed to govern better improvement especially for the insurance industry. This research aims to examine the efficiency level of 11 family takaful in Malaysia from 2017 to 2020 using Stochastic Frontier Approach (SFA) involving management expenses as an input, net benefits & claims, and investment income as output. The result showed that Malaysian family takaful is considered less efficient from 2017 to 2020, with production efficiency level average at 56.83 percent. The author finds that management expenses negatively affect investment income, while net benefits & claims give positive impact. However, both variables are not significant enough to influence investment income.

Keywords: Malaysia, Efficiency Level, Stochastic Frontier Approach.

Abstrak

Malaysia merupakan negara yang memiliki perkembangan Takaful Family terbesar di dunia dengan pertumbuhan mencapai 16 persen di tahun 2015. Kinerja perusahaan takaful perlu dievaluasi guna peningkatan kemajuan industri asuransi secara global. Penelitian ini bertujuan untuk menguji tingkat efisiensi dari 11 family takaful di Malaysia tahun 2017 hingga 2020 menggunakan *Stochastic Frontier Approach* (SFA). Penelitian ini terdiri dari variabel input beban operasional, dan variabel output pembayaran klaim dan pendapatan investasi. Hasil penelitian menyimpulkan bahwa takaful family yang ada di Malaysia cenderung kurang efisien sejak 2017 hingga 2020 dengan rata-rata tingkat efisiensi sebesar 56,83 persen. Penulis juga menemukan bahwa beban operasional berpengaruh negatif dan pembayaran klaim berpengaruh positif terhadap pendapatan investasi. Namun, kedua variabel independen tidak memiliki dampak yang signifikan.

Keywords: Malaysia, Tingkat Efisiensi, *Stochastic Frontier Approach*



Introduction

Economic growth is driven by financial institutions such as banking, capital markets, and insurance (Otoritas Jasa Keuangan, 2017). Financial institutions, insurances, real estates, and business services are the second highest contributor to Malaysia Gross Domestic Products with 11 percent of total GDP in 2019 (Faber Consulting AG, 2021). Insurance facilitates domestic economic growth through securing business, industry, and financial activities. Insurance is a form of risk management in which participants transfer the cost of potential loss to firms by paying premiums periodically. Insurance can cover any damage of unexpected events including property destruction, protect personal accidents, and commercial liability (Nawi et al., 2012);(Amri, 2022).

Malaysian insurance firms use conventional and Islamic systems (*takaful*) (Central Bank of Malaysia, 2005). Conventional insurances use risk transfer principles, while *takaful* adopt cooperation principle (*ta'awun*), risk-sharing system (*tabarru'*), and cover each other risk (*takaful*) (Fauzi et al., 2016). The risk transfer in insurance means that participants transfer their risk to the company, and the company will be fully responsible when unexpected loss has occurred. A risk transfer system can harm the company once the risk coverage amount is bigger than the participants' contributions (premiums) (Wangi & Darwanto, 2020);(Amri & Gultom, 2022).

A better system is provided by *takaful* through a risk-sharing system. Risk sharing in *takaful* means that participants' risk will be shared among the group to help those who incur any loss. The risk-sharing principle in *takaful* is the form of participants' solidarity to help others in rough conditions as already mentioned in Al:Maida:2 below;

Based on Al-Maida:2, as social creatures we should help each other in a good or hard condition as long as it doesn't violate Islamic law (Zabidi, 2020). *Takaful* is one of the ways for Moslem to implement Al-Maidaa:2

وَتَعَاوَنُوا عَلَى الْبِرِّ وَالتَّقْوَىٰ

command without harming the company.

The first Malaysian *takaful* was built in 1984 called Syarikat *Takaful* Malaysia Berhad. Now there are 15 *takaful* registered in the Central Bank of Malaysia. Malaysia has the most extensive family *takaful* market with a growth rate of 16 percent in 2015 (Ismail et al., 2017). *Takaful* annual growth in 2020 is 13.2 percent, bigger than the conventional which is only 7.3 percent (Central Bank of Malaysia, 2020). Malaysia *takaful* total asset in



2019 is USD 10 Billion, contributing 19.6 percent to the global (Refinitiv Islamic Finance Development Indicator, 2020);(Amri & Ramadhi, 2021).

An efficient operation in a takaful company occurs when they use optimal and/or least inputs to achieve the maximum possible output (Jayamaha & Mula, 2011). Inefficient takaful will cause dissatisfaction among customers and lead to financial instability (Lee et al., 2019). Thus, it's important to analyze its current efficiency level and explore improvements needed especially in the biggest takaful market.

A research from Bao., et al (2018) has been done to investigate 16 insurance & 8 takaful families in Malaysia during 2014-2015 using Data Envelopment Analysis. The result shows that the average takaful efficiency score was 85% in 2015. However, prior research didn't show what factors that must be improved to maintain the efficiency. The novelty that this new research will bring is to investigate all 11 takaful families in 2017-2020 using Stochastic Frontier Approach (SFA) and provide the correlation between inputs and output. Researchers (Nawi et al., 2012) and (Alhassan & Biekpe, 2015) use SFA to analyze the competition an efficiency level of insurance in Malaysia and South Africa. Both researchers choose SFA as a technique method because the formula function is not limited to production, cost, or profit. SFA also can separate errors and inefficiency in the regression function, which is different to DEA (Hossain et.al., 2012). SFA requires input and output variables to examine company efficiency levels. This research will refer to (Alhassan & Biekpe, 2015) which use management expenses as input, net benefits and claims and investment income as output (Amri & Ramdani, 2020).

Investment funding is gained from participant's contribution and retained earnings (Malaysian Institute of Accountants, 2020). Retained earnings can be used to cover loss and expenses. Thus, retained earnings can be decreasing if expenses are bigger than revenue, and claims are bigger than participants' contributions. Based on this evidence, the author would like to prove whether management expenses and net benefits & claims are negatively affecting investment income. At the end of the summary, this research will be expected to provide suggestions on which factors that must be improved to maintain a takaful family's efficiency.

Research Method

This research utilized 44 samples from annual growth of management expense, net benefits and claim, and investment income from 11 Malaysian family takaful from 2017 to 2020. Below is the list of Malaysia takaful examined in this research.



Table 1. List of Malaysia Takaful Examined

No	Takaful Name
1	AIA Public Takaful Bhd
2	AmMetLife takaful Berhad
3	Etiqa Family Takaful Berhad
4	FWD Takaful Berhad
5	Great Eastern Takaful Berhad
6	Hong Leong MSIG Takaful Berhad
7	Prudential BSN Takaful Berhad
8	Sun Life Malaysia Takaful Berhad
9	Syarikat Takaful Malaysia Keluarga Berhad
10	Takaful Ikhlas Family Berhad
11	Zurich Takaful Malaysia Berhad

Sources: Bank Negara Malaysia (2021)

This research uses a quantitative method approach. Quantitative research has a systematic, planned, and structured process of designing hypotheses by collecting data (Anshori & Iswati, 2009). This study uses judgement sampling technique by assessing 11 Malaysian family takaful financial statement data from 2017 to 2020. Refer to SEOJK 1 2021, annual growth can be indicators for inherent quantitative measurement (Surat Edaran Otoritas Jasa Keuangan Republik Indonesia No 1 Tahun 2021, 2021). Thus, all the variables are in the form of annual growth.

Efficiency measurement using a stochastic frontier approach can be divided into production frontier or cost frontier. This research categorizes the production frontier since it focuses on output oriented. The production approach is used to examine company efficiency level as a service provider by utilizing capital, labor, or others (without expecting to have a minimum price) to gain a maximum number of goods or services produced as the output (Jayamaha & Mula, 2011). Below is the general form of production approach frontier according to (Ulansari & Septiarini, 2020);

$$Y_{it} = f(X_{it}, t, \beta) \exp \epsilon_{it}$$

Where Y_{it} is output value of company i in period t , X_{it} is input value of company i in period t , t is time trend, β coefficient is parameter to be estimated, and ϵ is error / random noise – inefficiency. This research uses the production frontier approach to examine efficiency level used management expense as input, net benefits and claim and investment income as output. According to (Coelli, 1996), SFA model in this research is shown as below:



$$\ln(CL_t, IV_t) = \beta_0 + \beta_{XP} \ln XP_t + (v_t - u_t) \ln Y_{it} = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + (\ln \ln v_{it} - \ln \ln u_{it})$$

Where CL_t is net benefits and claims, IV_t is investment income, β_0 is constant, β_{xp} is coefficient of management expense, XP_t is management expense, v_t is errors, and u_t is an inefficient company. This calculation will show the efficiency level of each firm. If the conclusion shows that the efficiency level in one specific takaful is 75 percent, it means that the operation has already achieved 75 percent of efficiency (Octrina & Mariam, 2021). This study also examines the influence of independents to dependents variable using SFA. Thus, this study will test whether management expense and net benefits and claim influence investment income

Result and Discussion

Efficiency Analysis

The main objectives of the research are to examine the efficiency level of Malaysia family takaful from 2017 to 2020, and to investigate the influence of management expense and net benefits and claim to investment income. Below are SFA results of Malaysia family takaful efficiency level with management expense as input, net benefits and claim and investment income as output.

Tabel 2. Malaysian Family Takaful Efficiency Level 2017-2020

No	Company	2017 (%)	2018 (%)	2019 (%)	2020 (%)
1	AIA Public Takaful Bhd	72.80	54.27	56.21	53.02
2	AmMetLife takaful Berhad	44.91	64.06	47.47	69.87
3	Etiqa Family Takaful Berhad	12.97	62.47	62.96	43.21
4	FWD Takaful Berhad	56.76	21.60	86.17	85.06
5	Great Eastern Takaful Berhad	58.68	53.37	71.25	62.87
6	Hong Leong MSIG Takaful Berhad	59.47	19.45	87.52	60.21
7	Prudential BSN Takaful Berhad	53.35	63.42	59.97	57.00
8	Sun Life Malaysia Takaful Berhad	56.23	58.44	43.26	57.88
9	Syarikat Takaful Malaysia Keluarga Berhad	55.65	57.35	61.67	41.36
10	Takaful Ikhlas Family Berhad	72.27	15.18	61.66	58.19



11	Zurich Takaful Berhad	Malaysia	82.91	52.78	66.94	58.16
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Source : processed data (2022)

In 2017 to 2020, the highest efficiency score is 87.52 percent belonging to Hong Leong MSIG Takaful Berhad in 2019, while the lowest score in 2017 at Etiqa Family Takaful Berhad is about 12.97 percent. During 2017 to 2020, the average Malaysian family's takaful efficiency score is 56.83 percent.

However, several Malaysian family takaful company experienced efficient operations with score above 70 percent, such as Zurich Takaful Malaysia Berhad, AIA Public Takaful Bhd, and Takaful Ikhlas Family Berhad in 2017; Hong Leong MSIG Takaful Berhad, FWD Takaful Berhad, and Great Eastern Takaful berhad in 2018; and FWD Takaful Berhad in 2020. This study also would like to know the influence of management expense and net benefits and claim to investment income. Thus, below is the regression analysis result.

Table 3. SFA Test Result

	Coefficient	T-Ratio
Constant	9.5253	9.5253
Management Expense	-0.2937×10^{-14}	-0.2937×10^{-14}
Claim Payment	0.3201	0.3201
Sigma Squared	88.7724	88.7724
Gamma	0.05	0.05
LR test of the one-sided error = 16.5579		

Source : data processed (2021)

Based on the SFA test result above, it can generate SFA model as written below.

$$\ln IV_t = 9.5253 - (0.2937 \times 10^{-14}) \ln XP_t + (0.3201) \ln CL_t + (88.7724 - 0.05)$$

According to the SFA equation above, there is inefficiency in family takaful examination. It is proven by the LR test that the one-sided error is bigger than the palm value (df/number of restrictions, α ; 1, 0.05 equal to 2.706). The equation shows that the efficiency is divergent. Divergence is a condition when the gamma is positive thus the inefficiency will happen in the future (Kumbhakar & Wang, 2005).

Management expenses regression coefficient is -0.2937×10^{-14} , which means that if management expense growth increases by 1 percent, thus



investment income growth will decrease by 0.2937E-14 percent. Management expenses give a negative insignificant impact to investment income. It is proven by t-ratio of management expense is between than t-table value. The T-table value of two tailed with α is 0,05 and degree of freedom 44 (total of samples) deducted by 3 (total of variables) equal to 41, has values of 2.0195 and -2.0195.

Net benefits and claims regression coefficient is 0.3201, which means that if net benefits and claims growth increase by 1 percent, thus investment income growth will increase by 0.3201 percent. Net benefits and claims give positive insignificant impact to investment income proven by t-ratio of net benefits and claims is between t-table value.

Stochastic frontier approach has objectives to measure the efficiency score of a company and show which firm is more and less efficient. High management expenses growth indicates there is inefficiency in the company (Surat Edaran Otoritas Jasa Keuangan Republik Indonesia No 1 Tahun 2021, 2021). However, this study proves differently. Even though a company experienced a high expenses growth, if it is followed by a high output growth as well, then it can make their efficiency score high. Thus, management expenses should be controlled and managed efficiently to achieve output targets such as gaining investment income and paying participant's claims.

The results showed that the most efficient takaful is Hong Leong MSIG Takaful Berhad 2019, and FWD Takaful Berhad in 2019 and 2020. Their efficiency level score is 87.52 percent, 86.17 percent, and 85.06 percent consecutively. (Bao et al., 2018) stated differently where Takaful Ikhlas Berhad has the highest efficiency level among four takaful examined in 2015 with a score of 98.14 percent. During the same year, Syarikat Takaful Malaysia Berhad, AmMetLife Takaful Bhd, and Hong Leong MSIG Takaful Berhad have efficiency score in the level of 83.22 percent, 55.84 percent, and 49.12 percent consecutively (Bao et al., 2018).

This research found that Hong Leong MSIG Takaful Berhad experienced the most efficient operation in 2019. During the year, they have the biggest expense growth in research and development cost, professional fee, campaign, and incentives cost. These expenses are incurred to support several development in 2019, such as new distribution channel partnership, HLMT Serv (online takaful portal), and CSR program (Graduan Bestari Program/scholarship, Charity Run, Blood Donation, and Initiatives for Cancer Survivor) (Hong Leong MSIG Takaful Berhad, 2019a). These programs successfully created brand-awareness and open easy-access for potential customers to join the company's products. Thus, their gross



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earned contribution and claim incurred is increased by RM 87.6 and RM 83.4 million consecutively in 2019. Hong Leong is also still able to maintain their investment income up to RM 16.9 million (grow by 31.1 percent compared to the previous year) (Hong Leong MSIG Takaful Berhad, 2019b).

Unlike Etiqa Family Takaful Berhad which experienced the lowest efficiency level in 2017, they had different focus during the year. Their highest expense growth was more internally, such as medical fees, auditor remuneration, and tax. This entity was just built in 2017 after changing their focus from General Takaful in 2016. So, they are only able to increase their family takaful gross earned contribution by 13.59 percent, but must pay participant's claims 28.6 percent bigger than the previous year. This evidence influences the declining of investments assets by 10.54 percent in 2017. Thus, Etiqa Family Takaful Berhad only generated investment income which grew by 9.6 percent compared to 2016 (Etiqa Family Takaful Berhad, 2020).

It proves that, if companies want to achieve efficiency, they should focus their management expenses on external activities to generate high earned contributions. The activity can be in the form of marketing campaigns, expanding distribution channels, developing information technology, and other brand activation which is more customer centric. If takaful gains a high amount of contribution, takaful will be able to pay benefits and claim during the year. However, takaful should ensure that the amount of contributions is bigger than the claim, so there is no significant decline to participant's funds as the primary source of investment income.

Investment platforms also can determine the amount of investment income. In 2017, Etiqa Family Takaful only invest in bonds (such as Malaysian Government Securities, Government Investment Issues, Government Guaranteed Bonds, and Khazanah Bonds) and deposits (such as Negotiable Islamic Certificates of Deposit), thus the investment income is limited to generate profit (Etiqa Family Takaful Berhad, 2020).

Hong Leong MSIG Takaful Berhad experienced the highest efficiency level in 2019 because they have more various investment pools than Etiqa Family Takaful Berhad. They invest in bonds (such as Government Investment Issues, Islamic Bonds), quoted equity, unit & property funds, and structured investments (Hong Leong MSIG Takaful Berhad, 2019b).

Influence of Management Expense to Investment Income

Management expense is incurred operational cost especially in management activities and funded whether by stakeholder or takaful funds. The result of this research proves that management expenses have an



insignificant negative effect on investment income, indicated by t-value is between t-table. The correlation between management expense and investment income is explained as below.

The negative influence occurs because takaful firms have less ability to optimize management expense in maximizing investment income. According to (Malaysian Institute of Accountants, 2020), a family takaful participant's fund account consists of Accumulated Surplus and AFS Reserves. Accumulated surplus is related to profit/loss recognized from underwriting operations in income statements. If management expenses are increasing during the year, then it will affect the declining of operating profit. Takaful operating profit will be shared among participants and shareholders based on company agreement. Thus, if a participant's surplus is decreasing, then the financial asset funding sources will be decreasing as well and affect the company's investment performance (Tandelilin, 2001).

Influence of Net Benefits and Claim to Investment Income

Net benefits and claim is an expense incurred to cover participant's risk. The results of this research prove that net benefits and claims have an insignificant positive effect to investment income proven by t-value is between t-table. This research finding is contradictory with (Malaysian Institute of Accountants, 2020) which stated that the decreasing of participant's funds after paying the claims will decrease investment income as well, since contribution is one of the investment funding sources (Malaysian Institute of Accountants, 2020).

The positive impact from net benefits and claims to investment income is caused by the ability of takaful firms to well-calculate the amount of contribution. Every takaful participant has their own calculation of contribution based on their demography and risk (Malaysian Institute of Accountants, 2020). This calculation is done before akad and conducted to avoid company loss especially after firm pay participant's claims. Insignificant impact happens because the amount of claim incurred in a certain year is replaced by a high amount of contribution recorded. It is proven by the average amount of gross contribution is higher than the claim incurred on most takaful firms from 2017 to 2020. Thus, investment funding from a participant's fund won't get affected by claim payment, since the new participant's fund is bigger than the claim paid.

Conclusions and Recommendations

The results showed that management expenses give a negative and insignificant impact to investment income. It happened because takaful



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have less ability to optimize management expenses in maximizing investment income. Higher management expenses also make operating profit declining and reduce the surplus share for participant's funds. Thus, if participant's surplus is decreasing, then the financial asset funding sources will be decreasing as well and affect their investment performance. However, management expense doesn't directly deduct investment income recorded, so it shows insignificant correlation.

This research also proved that net benefits and claims give positive and insignificant impact to investment income. It is shown that takaful can well-calculate the amount of contribution and gain bigger new participant's funds after paying claims. They are able to gain participant's funds to cover high claims incurred. Thus, the investment activities which are funded from the participant's fund are not affected and still able to gain high investment income.

Based on the result of this study, the recommendation is to allocate their management expenses on external activities to generate high earned contributions. The activity can be in the form of marketing campaigns, expanding distribution channels, developing information technology, and other brand activation which is more customer centric. Government and community should create awareness surrounding society about the importance of takaful.

This research has limitations which can't be solved by the author. Prior studies mentioned that there are many efficiency level's indicators. Yet, in this research, variables used are only management expenses as input, claim and investment income as output.

REFERENCES

- Alhassan, A. L., & Biekpe, N. (2015). Competition and Efficiency in the Non-Life Insurance Market in South Africa. *Journal of Economic Studies*, 43(6), 882–909. <https://doi.org/10.1108/JES-07-2015-0128>
- Amri, A. (2022). The influence of product quality, service quality and trust on customer loyalty in Honda Scoopy brand motorcycles PT. Hayati Pratama Mandiri. *Marketing Management Studies*, 2(1), 10.
- Amri, A., & Gultom, M. S. (2022). Gambaran harga saham ditinjau dari tingkat inflasi, nilai tukar rupiah, dan suku bunga: Studi kasus perusahaan yang terdaftar di indeks Iq45. *J-EBIS (Jurnal Ekonomi dan Bisnis Islam)*, 7(2), 22.
- Amri, A., & Ramadhi, R. (2021). Mediasi Kepuasan Kerja: Komunikasi, Komitmen Dan Disiplin Kerja Serta Dampaknya Pada Kinerja



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- Karyawan (Studi Kasus Pada Radio Republik Indonesia (RRI) Padang). *Strategic: Journal of Management Sciences*, 1(3), 94. <https://doi.org/10.37403/strategic.v1i3.21>
- Amri, A., & Ramdani, Z. (2020). Pengaruh nilai tukar, kebijakan dividen dan struktur modal terhadap return saham pada perusahaan yang terdaftar di Jakarta Islamic Index. *Jurnal Ilmu Keuangan dan Perbankan (JIKA)*, 10(1), 17–36. <https://doi.org/10.34010/jika.v10i1.3556>
- Anshori, M., & Iswati, S. (2009). *Metodologi Penelitian Kuantitatif Edisi 1*. Airlangga University Press.
- Bao, N. J., Ramlan, R., Mohamad, F., & Yassin, A. M. (2018). Performance of Malaysian Insurance Companies Using Data Envelopment Analysis. *Indonesian Journal of Electrical Engineering and Computer Science*, 11(3), 1147–1151. <https://doi.org/10.11591/ijeecs.v11.i3.pp1147-1151>
- Central Bank of Malaysia. (2005). General Takaful: A Conceptual Framework. In *Central Bank of Malaysia*.
- Central Bank of Malaysia. (2020). *Annual Report 2020*.
- Coelli, T. J. (1996). *Centre for Efficiency and Productivity Analysis (CEPA) Working Papers*.
- Etiqa Family Takaful Berhad. (2020). *Director's Report and Audited Financial Statements 31 December 2020* (Vol. 1993010115).
- Faber Consulting AG. (2021). *Malaysian Insurance Highlights 2020*.
- Fauzi, P. N. F. N. M., Rashid, K. A., Sharkawi, A. A., Hasan, S. F., Aripin, S., & Arifin, M. A. (2016). Takaful: A Review on Performance, Issues and Challenges in Malaysia. *Journal of Scientific Research and Development*, 3(4), 71–76.
- Hong Leong MSIG Takaful Berhad. (2019a). *Newsroom*. [https://www.hlmtakaful.com.my/News-and-Events/Press-Release-\(2\).aspx#](https://www.hlmtakaful.com.my/News-and-Events/Press-Release-(2).aspx#)
- Hong Leong MSIG Takaful Berhad. (2019b). *Reports and Financial Statements for The Financial Year Ended 30 June 2019*.
- Ismail, F., Jaffer, S., Unwin, L., & Jamil, S. (2017). *Global Takaful Report 2017: Market Trends in Family and General Takaful*.
- Jayamaha, A., & Mula, J. M. (2011). Productivity and Efficiency Measurement Models: Identifying the Efficacy of Techniques for Financial Institutions in Developing Countries. *Journal of Emerging Trends in Economics and Management Science*, 2(5), 454–460.
- Kumbhakar, S. C., & Wang, H.-J. (2005). Estimation of Growth Convergence Using a Stochastic Production Frontier Approach.



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- Economics Letters*, 88, 300–305.
<https://doi.org/10.1016/j.econlet.2005.01.023>
- Lee, H. S., Cheng, F. F., Har, W. M., Nassir, A. M., & Razak, N. H. A. (2019). Efficiency, Firm-Specific and Corporate Governance Factors of the Takaful Insurance. *International Journal of Islamic and Middle Eastern Finance and Management*, 12(3), 368–387.
<https://doi.org/10.1108/IMEFM-06-2018-0187>
- Malaysian Institute of Accountants. (2020). *Accounting for Islamic Finance*.
- Nawi, M. A. A., Ahmad, W. M. A. W., & Aleng, N. A. (2012). Efficiency of General Insurance in Malaysia Using Stochastic Frontier Analysis (SFA). *International Journal of Modern Engineering Research*, 2(5), 2886–3890. <https://doi.org/10.12988/ams.2013.13100>
- Octrina, F., & Mariam, A. G. S. (2021). Islamic Bank Efficiency in Indonesia: Stochastic Frontier Analysis. *Journal of Asian Finance, Economics and Business*, 8(1), 751–758.
<https://doi.org/10.13106/jafeb.2021.vol8.no1.751>
- Otoritas Jasa Keuangan. (2017). *Stabilitas Sistem Keuangan*. Otoritas Jasa Keuangan. <https://www.ojk.go.id/id/kanal/perbankan/stabilitas-sistem-keuangan/Pages/lkhtisar.aspx>
- Surat Edaran Otoritas Jasa Keuangan Republik Indonesia No 1 Tahun 2021, (2021).
- Refinitiv Islamic Finance Development Indicator. (2020). *Islamic Finance Development Report 2020: Progressing Through Adversity*. https://icd-ps.org/uploads/files/ICD-Refinitiv IFDI Report 20201607502893_2100.pdf
- Tandelilin, E. (2001). *Analisis Investasi dan Manajemen Portofolio*. BPFE.
- Ulansari, D. R., & Septiarini, D. F. (2020). A Comparative Study of The Efficiency of Conventional and Sharia Insurance in Indonesia. *Jurnal Keuangan Dan Perbankan*, 24(2), 202–213.
<https://doi.org/10.26905/jkdp.v24i2.3165>
- Wangi, D. M., & Darwanto. (2020). Analisis Efisiensi Asuransi Umum Syariah Dan Konvensional di Indonesia. *Human Falah*, 7(1), 85–102.
- Zabidi, A. (2020). Kelompok Sosial dalam Masyarakat Perspektif QS. Al-Maidah Ayat 2. *BORNEO: Journal of Islamic Studies*, 3(2), 42–58.

