Letter

Date

2021-03-18

From

Myoung-Kil Youn < retail@eulji.ac.kr >

To

Ayus Ahmad Yusuf < ayusahmadyusuf@gmail.com >

CC

BCC

Subject

JAFEB-Mar-14-2021-231 to request a review of the manuscript.

Body

Dear Dr Ayus Ahmad Yusuf,

It was announced in The Journal of Asian Finance, Economics and Business

We would like to ask you to review the manuscript because you are the qualified reviewer. In the vortex of busy work, thank you for your reviewing it.

- Manuscript No: JAFEB-Mar-14-2021-231

- Title: COMPARATIVE ANALYSIS OF TAKAFUL BUSINESS UNITS AND THEIR PARENT COMPANIES IN INDONESIA THROUGHOUT 2015-2018 USING TWO-STAGE DATA ENVELOPMENT ANALYSIS (DEA) APPROACH

- Corresponding Author: Emilia Fitriana Dewi; Dematria Pringgabayu; Kurnia Fajar Afgani; Anggito Krisnandhanda Zainul; Oktofa Yudha Sudrajad; Raden Aswin Rahadi

- Date Reviewer Invited: 2021-03-18

- Date Invitation Response Due : 7 (2021-03-25)

- Date Review Due : 2021-03-31

- Manuscript Fast Track :

If You want to check the review invitation, please proceed with the next process.

1. Login in the service

- URL : http://acoms.kisti.re.kr/journal/intro.do?journalSeq=J000171

- Your Email(ID) : ayusahmadyusuf@gmail.com

- Your Password : ****

2. Choose a role of the reviewer.

3. Press the link 'New Reviewer Invitations'

Please refer to the above URL with regard to the information related to reviewing this manuscript

- Reviewer/Editor Guide: http://acoms.kisti.re.kr/...

If you do not create the user account in ACOMS directly, refer to the above information.

ACOMS is the system which integrates only one user account unified to manage it with the writing / submission / review of several scientific journals.

Check the list of journals you use through the URL in ACOMS.

- http://acoms.kisti.re.kr/

We announce the unwanted user of the ACOMS.

ACOMS does not collect personal information .

The information the editor requested review from the manuscript is as follows in the future :

- Title, Name, Gender, Country, Institute, Email

If you want to discard the user account, let us know it at acoms@kisti.re.kr.

The personal information policy of ACOMS refers to the above URL.

- http://acoms.kisti.re.kr/privacy_policy.html

Thank you.

Letter

Date

2021-03-18

From

Ayus Ahmad Yusuf < ayusahmadyusuf@gmail.com >

To

Myoung-Kil Youn < retail@eulji.ac.kr >

CC

BCC

Subject

JAFEB: MS #JAFEB-Mar-14-2021-231 Acceptance for Reviewer Invitation

Body

Dear Prof. Myoung-Kil Youn:

I have accepted the review request for the manuscript below.

MS #JAFEB-Mar-14-2021-231
'COMPARATIVE ANALYSIS OF TAKAFUL BUSINESS UNITS AND THEIR PARENT COMPANIES IN INDONESIA THROUGHOUT 2015-2018 USING TWO-STAGE DATA ENVELOPMENT ANALYSIS (DEA) APPROACH.'

Sincerely yours,

Ayus Ahmad Yusuf

Close Resend

COMPARATIVE ANALYSIS OF TAKAFUL BUSINESS UNITS AND THEIR PARENT COMPANIES IN INDONESIA THROUGHOUT 2015-2018 USING TWO-STAGE DATA ENVELOPMENT ANALYSIS (DEA) APPROACH

ABSTRACT

This research measured the efficiency of 15 insurance companies and each of their Takaful business units. Multiple linear regression is then conducted to determine what variables are significantly correlated to the firms' efficiency. The variables tested in the multiple linear regression are the total asset, liquidity ratio, the expense to net premium ratio, and board size.

The DEA calculation is the first stage showing that the Takaful business units' average efficiency score is higher than the efficiency of their parent companies. The second stage of this research showed that total asset and expense to net premium ratio are negatively correlated to the efficiency of the parent companies, while liquidity and board size are found to be positively correlated.

Keywords:*Takaful Business Unit, Financial Efficiency, Data Envelopment Analysis, Indonesia, Comparative Analysis.*

JEL Classifications: *G10, G15, G20, G21, G32*

1. INTRODUCTION

Takaful or Islamic insurance is an alternative to conventional insurance that adheres to Islamic law or sharia. Sharia prohibits *riba*(usury), which means the prohibition of any form of interest (Iqbal &Mirakhor, 2011). Islamic scholars believe that *riba*exists in conventional insurance because the firms' premiums are invested into an interest-bearing asset. Additionally, sharia also forbids gambling. The conventional insurance system is considered a form of *maisir*(gambling) (White, 2009) because insurance policy owners can profit based on chance. Lastly, sharia forbids *gharar* (excessive risk), and Islamic scholars deem a high level of uncertainty in conventional insurance contracts (White, 2009). Therefore, the concept of Takaful is developed to create an insurance system that complies with Islamic laws.

Takaful can be considered an infant industry, with the first Takaful company ever started only in 1979. However, the industry has grown considerably since its inception, with $14.9 Billion gross contributions worldwide based on Milliman Consulting's Global Takaful Report in 2017. The report also showed that the Takaful industry experienced a considerable annual growth of around 13-14% from 2013 to 2015. The data indicates that the Takaful industry is becoming a formidable global industry with a very high potential to grow even more in the future.

Milliman Consulting's Global Takaful Report 2017 shows that South East Asia contributes 15% to the overall GWC of Takaful Globally, second only to the GCC (Gulf Cooperation Council) region with 77%. In South-East Asia, Malaysia has the highest market share, with 62%, followed by Indonesia at 33%. Indonesia is an attractive market for the Takaful industry because of the country large number of Muslim populations. This is illustrated by the fact that the Takaful industry experienced higher asset growth than conventional insurance from 2015 to 2017. The Takaful industry means that there is an excellent opportunity for the Takaful industry to grow in Indonesia.

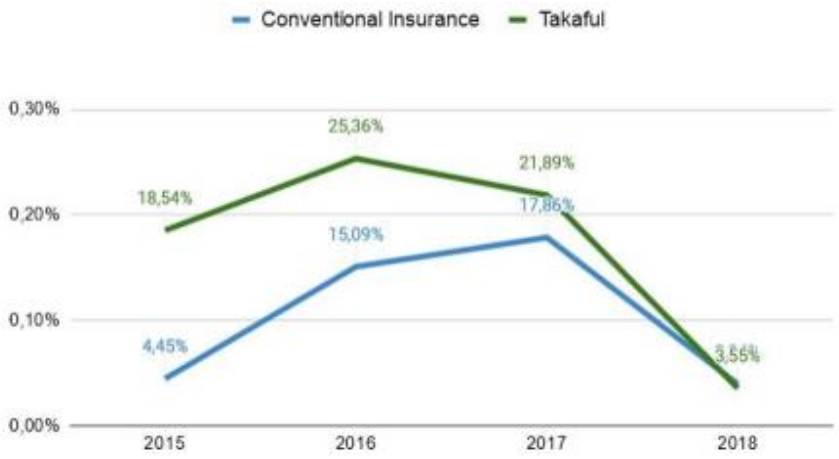

Figure 1. Annual Industry Growth in Indonesia (2015-2018)

The conventional insurance firms still dominate the majority of the market share, despite the fast growth of Takaful in Indonesia. Based on the financial statistics published by OJK in 2018, the conventional insurance industry has an asset of 729,057 Trillion Rupiahs, while Takaful's asset is 41,959 Trillion Rupiahs or 5,76% of the market share. The Takaful firms face stiff competition with conventional insurance firms that largely dominate the market. Therefore, Takaful firms need to perform at their most efficient level to fight against conventional firms.

Numerous Takaful firms emerged to capitalize on the market potential in Indonesia. Even conventional insurance companies established their Takaful business units to increase their market share. The Takaful business units need to perform well to justify their existence. Therefore, this research wants to evaluate Takaful business units' efficiency and compare them to the efficiency of their parent companies. The goal is to assess their competitiveness with conventional insurance firms and their feasibility based on financial efficiency. The financial efficiency is measured using the Data Envelopment Analysis (DEA), which will be further explained in the next chapter.

There are generally three broad categories of insurance: life insurance, general insurance, and reinsurance. This research focuses on life insurance companies with Takaful business units in Indonesia. The variables used in the DEA method are financial data retrieved from each firms' financial report from 2015 to 2018. The DEA cannot consider qualitative data, such as the quality of the management or marketing strategy.

2. DATA AND METHODOLOGY

2.1Data Set

Data Envelopment Analysis (DEA) is used to calculate Takaful business units' efficiency and parent companies. DEA is a non-parametric approach to measure the efficiency popularized by Charnes, Cooper, and Rhodes in 1978. DEA uses linear programming to construct an efficiency frontier used to determine whether a Decision-Making Unit (DMU) is considered efficient or not (Coelli et al., 2005). In the context of this research, the DMUs will be the Takaful business units and their parent companies. A DMU is considered efficient if its efficiency is on the frontier line and inefficient if the score is under the frontier. One of DEA's advantages is that it can take multiple outputs and inputs into the calculation of efficiency, thus making it a preferred method to measure efficiency.

The initial DEA model proposed by Charnes, Cooper, and Rhodes is also known as the Constant Return to Scale (CRS) model. It assumes that the change in input will equal the change in output (Sari, 2015). For example, a 1% increase in the input will also result in a 1%

increase in output. Additionally, the CRS model assumes that all the DMUs are operating under similar conditions. It is safe to assume that the Takaful business units have a similar internal condition with the business operation of their parent companies; therefore, the CRS model is used. The result of the CRS DEA model is called the technical efficiency (TE).

This research uses adapted the input and output variables used by Sabiti et al. (2017) to evaluate the efficiency of Takaful firms in Indonesia. The variables used in their research are also an expansion of another research by Tufahati et al. (2016) that also measured Takaful firms' efficiency. Sabiti et al. (2017) added claim payments as input variables and gross contributions as an output because both were deemed as an essential variable to the business activity of Takaful firms. This research uses the same variables because the researcher deemed the variables used by Sabiti et al. (2017) are able to provide an accurate evaluation of insurance firms' efficiency.

The total asset encapsulates the overall resources owned by the firm. All spending from the company is combined into one variable: the total asset, to simplify the calculation. However, claim payments are separated into its variable because it is related to insurance firms' main activity. The output variables used are total revenue and the gross premiums/contributions. The total variable revenue represents all earnings gained by the insurance firms from various sources. Gross Premiums/Contributions is separated into its variable because it is the primary income source for insurance companies. Below is a further description of the input and output variables that are going to be used to calculate the efficiency of the sample firms through DEA:

Table 1. DEA Input and Output Variables

Input		
No	**Variable**	**Description**
1	Total Asset	The total amount of Current Asset and Non-Current Asset that the firm has. (Cash, Securities, and Bonds)
2	Total Expense	The total amount of expenses paid by the firm, excluding Claim Payments. (Underwriting Expense and Operational Expense).
3	Claim Payment	The total amount of claims paid by the firm to the client.
Output		
1	Revenue	The total amount of revenue gained from the firm's activities. (Investment Revenue and Underwriting Revenue)
2	Gross Premiums or Contribution	The total amount of contribution or premiums gained by the firm from its clients.

After retrieving the efficiency score through the DEA, this research conducted a multiple linear regression to determine what variables are significantly correlated to the firms' efficiency. The multiple linear regression model is chosen because it allows the usage of multiple explanatory or independent variables. The regression measures the correlation between the dependent variable, the efficiency score, with the independent or explanatory variables.

The independent variables tested in this research are total asset, liquidity ratio, expense to net premium ratio, and board size. The total asset represents the firm's size, and it is the main control variable used in the multiple linear regression. The variable is positively correlated to efficiency (Saad et al., 2006). It is included in this research's multiple linear regression to reduce bias in the regression. The liquidity ratio represents the ratio of current assets to the firm's liabilities, and it has been found to not correlated to efficiency, according to Purwanti (2016). However, the researcher decided to retest the variables because this research uses recent data, and liquidity is one of the main ratios used to measure a company's health.

The expense to net premium ratio and board size are the variables that this research wants to test. The expense to net premium ratio is the only financial health ratio stated in both the parent company and the Takaful business units' financial statements. The ratio illustrates the amount of expense incurred by the firm to the number of premiums they earned. It is chosen to determine the significance of earnings from premiums to the firms' overall efficiency. The board size represents the number of members that are on the board of directors and commissioners.

2.2 Methodology

This research uses purposive sampling to select a sample of insurance companies that operate conventional insurance and Takaful business units. The purposive sampling is done to compare the performance of conventional and Takaful units under the same parent company. Therefore, the comparison will be fairer because it will compare firms with similar internal conditions. This research collects financial data from 15 conventional insurance business units and 15 Takaful units. This research uses secondary data retrieved from the sample firms' financial statements from the year 2015 to 2018.

Table 2. List of Sample Companies

No	Company Name	No	Company Name	No	Company Name
1	PT AIA Financial	7	PT Avrist Assurance	13	PT Sun Life Financial Indonesia
2	PT Asuransi Allianz Life	8	PT AXA Financial Indonesia	14	PT Tokio Marine Life Indonesia
3	PT Asuransi BRI Life	9	PT BNI Life Insurance	15	PT FWD Life Indonesia
4	PT AJ Central Asia Raya	10	PT Great Eastern Life Indonesia		
5	PT Asuransi Jiwa Manulife	11	PT Panin Dai-chi Life		
6	PT Asuransi Jiwa Sinar Mas MSIG	12	PT Prudential Life Assurance		

Table 3. Parent Company Data Statistics

Parent Companies				
Variables	**Mean**	**Std Deviation**	**Max**	**Min**
Total Asset	Rp8.058.775	Rp15.914.836	Rp71.758.702	Rp136.664
Total Expenses	Rp800.522	Rp1.578.517	Rp7.918.521	Rp643
Claim Payments	Rp1.333.588	Rp2.817.162	Rp12.260.492	Rp5.623
Total Revenue	Rp547.934	Rp1.576.092	Rp11.304.640	Rp0
Gross Contributions	Rp2.725.235	Rp6.212.962	Rp26.883.390	Rp6.118

Table 4. Takaful Business Units Data Statistics

Takaful				
Variables	**Mean**	**Std Deviation**	**Max**	**Min**
Total Asset	Rp1.414.975	Rp2.708.197	Rp9.920.534	Rp25.826
Total Expenses	Rp120.504	Rp238.273	Rp1.118.064	Rp1
Claim Payments	Rp53.104	Rp91.595	Rp361.092	Rp0
Total Revenue	Rp230.057	Rp490.701	Rp1.962.998	Rp1.034
Gross Contributions	Rp277.112	Rp573.367	Rp2.367.135	Rp0

3. MAIN FINDINGS

The Two-Stage DEA Approach starts with measuring the efficiency score of the samplefirms. There are four DEA calculations done in this research, one for each research period from 2015 to 2018. The result of the DEA is presented in three different parts. The first part presents the overall average efficiency score of the parent companies and Takaful units separately. Hence, a graph shows the annual average efficiency score of the sample firms from 2015 to 2018. The last part pairs the overall average efficiency score of each Takaful business units with their parent companies.

The second stage of the Two-Stage DEA Approach is to determine the variablescorrelated to the efficiency score that have been calculated. The correlation is determinedusing multiple linear regression. In this regression, the efficiency score becomes the dependentvariables while total asset, liquidity ratio, expense to net premium, and board size becomes the independent variables. This stage of the research will provide insights into what factors should the firms pay attention to improve their overall efficiency.

Table 5 shows the result from the Data Envelopment Analysis (DEA) result, the technical efficiency (TE) score. The score represents how well the DMUs manage their inputs (total asset, total expense, and claim payment) to gain outputs (revenue and gross contribution) compared to their peers. A DMU is considered efficient if it can achieve a score of 1, and it means that the DMU is more efficient than all the other DMUs. For the conventional insurance units, the average efficiency score is 0,80, with a standard deviation of 0,17. The maximum score a parent company achieves is 1.00, with the lowest efficiency score being 0,41.

The average technical efficiency score of the Takaful business units is 0,87, with a standard deviation of 0,20. The maximum efficiency score achieved by the Takaful business units is 1.00, while the lowest score is 0,29. After obtaining the efficiency scores, an unequal variance paired t-test is conducted to determine whether there is a significant mean difference between the Takaful business unit group and the parent companies' efficiency. This research used Yuen-Welch's-test because the sample data have unequal variance and does not have a standard distribution. The t-test produced a P-value of 0,0279. Using a confidence level of 95% or ($\alpha = 0,05$), it is determined that there is a significant mean difference between the two groups.

Table 5. DEA Result Statistics

Parent Company		Takaful		Total	
Mean	0.80	Mean	0.87	Mean	0.84
Max	1	Max	1	Max	1
Min	0.41	Min	0.29	Min	0.29
Standard Deviation	0.17	Standard Deviation	0.20	Standard Deviation	0.19
Observation	60	Observation	60	Observation	120

Mean Differences Comparison	DEA
Diff Parent Company - Takaful Efficiency	.0744833**

The Yuen-Welch's t-test determined that there is a difference between the mean efficiency score of the parent companies and Takaful business units. (**) indicate the significance at 5% level.

The average efficiency score of the Takaful business units is higher than the parent companies, and the test showed that the difference is significant. Therefore, it can be concluded that the Takaful business units are more efficient than their parent companies, and the first hypothesis (H1) is rejected. The previous research concluded that the efficiency of conventional insurance firms is better than the Takaful firms, for example, the research by Safrina (2016), Astuti&Suprayogi (2017), and Flodesa (2019).This research's finding is contradictory because the Takaful business units are found to be more efficient than their parent companies, which practice conventional insurance business.

It is important to note that Safrina (2016) and Astuti&Suprayogi (2017) found no significant difference between the mean efficiency of Takaful and conventional firms; therefore, theconclusion that conventional insurance firms are more efficient than Takaful firms is questionable. However, Flodesa (2019) found a significant difference between, and it is conventional insurance firms are generally more efficient than the Takaful firms. The discrepancy of results could be caused by various factors, such as the difference in variables used in the DEA or the difference in sample companies.

However, the researcher wants to point out that previous research uses financial data from below 2015. The researcher argues that these research findings are different. It is shown that it uses more recent financial data than previous research. This research provides an updated evaluation of Takaful firms' efficiency in Indonesia, and it indicates that Takaful business units are competitive with their parent companies, which applies the conventional insurance principle. Also, the Takaful business units are a worthy addition to the parent companies because they have better financial efficiency than the main business operation.

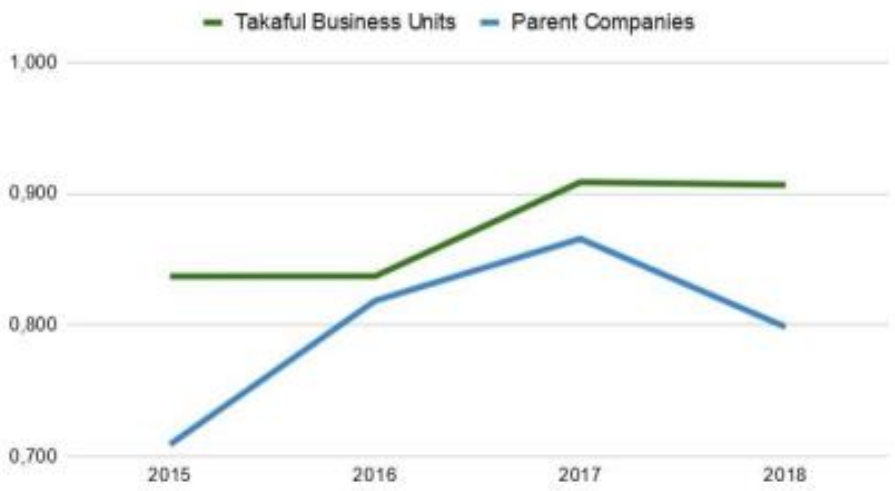

Figure 2. Tafakul Business Units vs Parent Companies

The annual average efficiency of the Takaful business units is consistently higher than the parent companies throughout the research period. At its highest, the Takaful units managed to achieve an average efficiency above 0.90 in 2017 and 2018, while the parent companies' highest average was 0.866 in 2017. This finding reinforces the conclusion in the previous part that Takaful firms in Indonesia can compete with conventional insurance firms in terms of financial efficiency.

The graph also shows how the efficiency of Takaful units is more stable compared to their parent companies. Takaful business units' average efficiency only experienced a significant change from 2016 to 2017, while the parent companies' efficiency continuously changes throughout the research period. Abidi et al. (2020) measured the stability of various Takaful and conventional insurance firms globally, so we can see that Takaful firms are generally more stable. They observed that conventional insurance firms are riskier and experienced more asset loss than Takaful firms in the span of their research period (Abidi et al., 2020). Their findings and the finding from this research indicate that the Takaful firms are indeed more stable than conventional insurance firms.

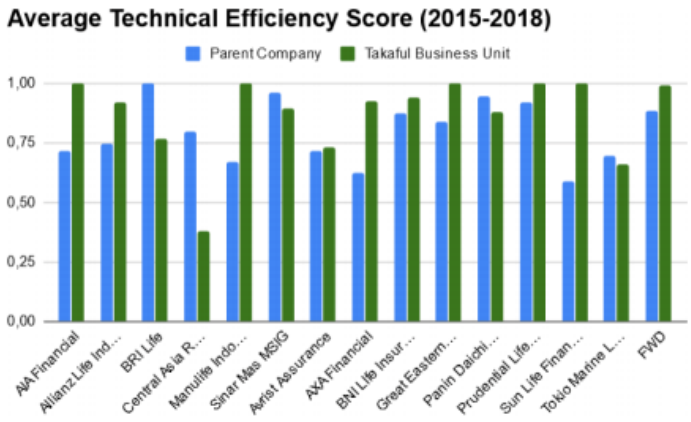

Figure 3. Average Technical Efficiency Score (2015-2018)

The comparison of Takaful units' efficiency with their parent companies to minimize the effect of different internal conditions that affects the overall efficiency of a firm. The

graph shows that there are more efficient Takaful units than the parent companies. There are five efficient Takaful units: AIA Financial, Manulife Indonesia, Great Eastern Life Indonesia, Prudential Life Assurance, and Sun Life Financial. On the other hand, there is only one efficient parent company, which is BRI Life.

This finding further expands the finding that Takaful business units are generally more efficient than their parent companies. From the overall 15 parent companies, there are ten companies with a Takaful unit that performs more efficiently than their conventional counterparts: AIA Financial, Allianz Life, Manulife, Avrist, AXA Financial, BNI Life, Great Eastern, Prudential, Sun Life, and FWD. This finding suggests that Takaful business units can perform more efficiently even under similar internal conditions than conventional insurance firms. Additionally, Prudential Life has the best overall performance. It should be a benchmark for all the other companies to improve their efficiency. Their Takaful business units managed to be technically efficient from 2015 to 2018. The parent company performs more efficiently compared to other companies with efficient Takaful units.

Total asset is significantly correlated to the efficiency of the Takaful units and their parent companies. Overall, the asset size is negatively correlated to the efficiency score. Specifically, the asset is also negatively correlated to efficiency in the regression exclusively for the parent companies. This finding means that smaller parent companies tend to be more efficient than larger conventional firms. On the other hand, asset size is positively correlated based on Takaful business units, which means larger Takaful units achieve better efficiency than their peers with smaller assets. The asset is only positively correlated to the parent companies' efficiency, so the second hypothesis (H2) is also rejected.

Contrary to the findings of Purwanti (2016), the firm's size or the total asset owned by the company is significantly correlated with efficiency. However, it is in line with Saad et al. (2006) that states the larger Takaful firms have a higher probability of being more efficient than their peers. Saad et al. (2006) argue that larger firms are more efficient because they have more inputs that can potentially be turned into outputs. Therefore, Takaful managers need to prioritize increasing their firms' size to achieve better efficiency. The Takaful business units' parent companies can allocate more financial resources into the unit to increase the overall efficiency.

However, large firm size is crippling for the efficiency of the parent companies; therefore, managers should perhaps consider downsizing to improve their efficiency. Liquidity is found to be positively and significantly correlated only to the parent companies' efficiency with a 90% confidence level. Liquidity refers to the availability of liquidassets such as cash or other securities that could easily be cash for the company. The result implies that conventional insurance firms need to have a considerable amount of liquid assets at the ready to improve their efficiency. However, the liquidity ratio is not significant for the efficiency of Takaful business units.

The expense to net premium ratio is negatively correlated to the parent companies' efficiency with a 95% confidence level and Takaful business units' efficiency with a 99% confidence level. The expense to net premium ratio is a ratio that divides the expenses (operational, claim, and commission expense) incurred by the company to the net premiums the company earns. It indicates how much expense is needed for the company to gain net premiums. This finding illustrates the significance of earnings from premiums to firms' overall efficiency.

Therefore, both the Takaful units and their parent companies' main concern should be implementing business strategies to increase their premiums ultimately. The last variable correlated to efficiency is the number of members on the board of directors and commissioners. It is significantly correlated for the parent companies with a 99% confidence level and the Takaful business units with a 90% confidence level. Members of the board are

professionals and industry experts that have been entrusted top-level management responsibilities by the firm.

The finding suggests that the amount of high-quality human resources on the board is related to firms' overall efficiency. The importance of the board's role in Takaful firms is emphasized in a Deloitte report titled "The global Takaful insurance market: Charting the road to mass market." Insurance companies are businesses that deal with risk; therefore, the firms have greater importance to have a company-wide risk strategy and management. The effective implementation of risk management at a large scale requires the corporate board's support and oversight. Therefore, both the Takaful units and their parent companies should consider increasing their board's size because it is positively correlated to efficiency, and it could also improve their risk management. However, it is essential to note that this research does not indicate that an additional board member would hurt the firm because hiring an additional employee will incur additional costs, such as salary. Therefore, managers should still conduct the proper preparation and analysis before hiring a new board member.

4. CONCLUSION

The previous chapter has shown the result of this research's data computation, and the writer has also analyzed and discussed the findings from the data results. Finally, several conclusions and essential findings from this overall academic research are: 1. The first stage of this research is to measure the efficiency score of the sample firms using DEA. The result shows that the Takaful business units have an overall average efficiency score higher than the average efficiency score of their parent companies.

Furthermore, Yuen-Welch's t-test determined that the difference between the average is statistically significant. Therefore, the researchers concluded that Takaful business units' efficiency is generally better than their parent companies. This conclusion indicates that it is reasonable for the parent companies to maintain their Takaful business units. The fact that this research used updated financial data might be why the conclusion is different from the previous research that concluded that conventional insurance firms are generally more efficient than Takaful firms.

A side-by-side comparison between Takaful business units' efficiency score with their parent companies showed that there are more efficient Takaful units than there are efficient parent companies. This finding further reinforces the previous conclusion that the Takaful units are generally more efficient. Additionally, the comparison showed that PT Prudential Life Assurance the most efficient company overall. The Takaful business unit of Prudential achieved an efficiency score of 1.00. The parent company is the most efficient out of all the other companies with efficient Takaful units. Therefore, PT Prudential Life Assurance should be the benchmark for all the other companies to increase their efficiency.

Throughout the research period from 2015 to 2018, the Takaful business units consistently achieve a higher average annual efficiency than their parent companies. The graph also shows that Takaful business units' efficiency is more stable than the efficiency of the parent companies.

The second stage of this research determined the variables that are correlated to the efficiency score. The result found that liquidity and board size are positively correlated to parent companies' efficiency. In contrast, total assets and expense to net premium ratio are negatively correlated. The parent companies are recommended to increase their liquidity level and consider adding more members to their corporate board to improve their efficiency. They also might want to consider downsizing their companies because it was detrimental to their financial efficiency.

Total assets and board size are found to be positively correlated to the efficiency of Takaful business units. In contrast, the net to premium ratio is found to be negatively correlated. The parent companies recommended investing more resources into the Takaful business units because larger Takaful units are more efficient. It is also recommended to increase the corporate board's size that oversees the business units to improve their financial efficiency.

REFERENCES

Barr, D.G. and Campbell, J.Y., (1997). Inflation, Real Interest Rates, and the Bond Market:A Study of UK Nominal and Index-Linked Government Bond Prices. *Journal of Monetary Economics*, 39, 361–383.

Berg, T., and Henzel, S. (2015). Point and density forecasts for the Euro Area using Bayesian VARs.*International Journal of Forecasting*, 31, 1067–1095.

Caggiano, G., Kapetanios, G., Labhard, V., (2011). Are more data always better for factor analysis? Results for the Euro Area, the six largest Euro Area countries and the UK. *Journal of Forecasting*, 30, 736–752.

Clark, T., Ravazzolo, F. (2015). Macroeconomic forecasting performance under alternative specifications of time-varying volatility. *Journal of Applied Econometrics*, 30, 551–575.

D'Agostino, A., Gambetti, L., Giannone, D., (2013). Macroeconomic forecasting and structural change. *Journal of Applied Econometrics*, 28, 82–101.

Devpura, N., Narayan, P.K., and Sharma, S.S., (2018). Is stock return predictability time-varying? *Journal of International Financial Markets, Institutions&Money*, 52, 152–172.

Duasa, J., Ahmad, N., Ibrahim, M. H., Zainal, M., (2010). Forecasting inflation in Malaysia. *Journal of Forecasting*, 29, 573–594.

Forni, M., Hallin, M., Lippi, M., Reichlin, L., (2003). Do financial variables help to forecast inflation and real activity in the euro area. Journal of Monetary Economics 50, 1243-1255.

Giannone, D., Lenza, M., Momferatou, D., Onorante, L., (2014). Short-term inflation projections: A Bayesian vector autoregressive approach. *International Journal of Forecasting*, 30, 635–644.

Goodhart, C., and Hofmann, B., (2000). Asset Prices and the Conduct of Monetary Policy," manuscript, London School of Economics.

Groen, J., Kapetanios, G., Price, S., (2009). Are al-time evaluation of Bank of England forecasts of inflation and growth. *International Journal of Forecasting*, 25,74–80.

Gupta, R., Kabundi, A. (2011). A large factor model for forecasting macroeconomic variables in South Africa. *International Journal of Forecasting*, 27,1076–1088.

Hossain, A. (2005). The sources and dynamics of inflation in Indonesia: An ECM model estimation for 1952-2002. *Applied Econometrics and International Development*, 5-4, 93-116.

Mandalinci, Z. (2017). Forecasting Inflation in Emerging Markets: An Evaluation of Alternative Models. International *Journal of Forecasting*, 33, 1082-1104.

Öğünç, F., Akdoğan, K., Başer, S., Chadwick, M., Ertuğ, D., Hülagü, T., (2013). Short-term inflation forecasting models for Turkey and a forecast combination analysis. *Economic Modelling*, 33, 312–325.

Phan, D.H.B., Sharma, S.S., Tran, V.T., (2018). Can economic policy uncertainty predict stock returns? Global evidence. *Journal of International Financial Markets, Institutions and Money*, 55, 134-150.

Ramakrishnan, U., and Vamvakidis, A. (2002). Forecasting Inflation in Indonesia. *IMF Working Paper*, No. 02/111.

Salisu, A.A., Isah, K.O. (2018). Predicting US inflation: evidence from a new approach. *Economic Modelling*, 71, 134-158.

Sari, N. R., Mahmudy, W. F., Wibawa, A. P., (2016). Backpropagation on neural network method for inflation rate forecasting in Indonesia. *International Journal of Advances in Soft Computing and its Applications*, 8, 70–87.

Sharma, S. S. (2016). Can consumer price index predict gold price returns? *Economic modelling*,55, 269-278.

Sharma, S.S., Tobing, L., Azwar, P., (2018). Understanding Indonesia's macroeconomic data: what do we know and what are the implications? *Bulletin of Monetary Economics and Banking*, 21, 229-264.

Siregar, R., and Rajaguru, G., (2005a). Base Money and Exchange Rate: Sources of Inflation in Indonesia during the Post-1997 Financial Crisis. *Journal of Economic Integration*,20, 185-215.

Siregar, R., and Rajaguru, G., (2005b). Sources of variations between the inflation rates of Korea, Thailand, and Indonesia during the post-1997 crisis. *Journal of Policy Modeling*, 27, 867-884.

Stock, J.H., Watson, M.W., 2001. Forecasting output and inflation: the role of asset prices. Mimeo.

Westerlund, J., and Narayan, P.K., (2012). Does the choice of estimator matter when forecasting returns? *Journal of Banking and Finance*, 36, 2632-2640.

Westerlund, J., and Narayan, P.K., (2015). Testing for predictability in conditionally heteroskedastic stock returns. *Journal of Financial Econometrics*, 13, 342-375.

Wimanda, R. E., Turner., P. M., Hall, M. J. B., (2011). Expectations and the inertia of inflation: the case of Indonesia. *Journal of Policy Modelling*, 33, 426-438.

Appendix 1: Data description

This table provides a detail data description of all variables considered in this study.

Variables	Description	Date	No. of obs.
BY1Y	One-year government bond yield	2009M05-2018M06	110
BY5Y	Five-year government bond yield	2009M05-2018M06	110
BY10Y	Ten-year government bond yield	2009M05-2018M06	110
JIBOR1	One-month JIBOR	1990M01-2018M06	342
JIBOR3	Three-month JIBOR	1993M12-2018M06	295
JIBOR6	Six-month JIBOR	1991M01-2018M06	330
JIBOR12	Twelve-month JIBOR	1997M03-2018M06	256
LM2	M2 money supply in natural logarithm	2003M12-2018M04	173
M1	M1 money supply	2008M01-2018M04	124
LCCI	Indonesia consumer confidence index in natural logarithm	2001M04-2017M12	201
LCIC	Indonesia currency in circulation in natural logarithm	2002M01-2018M05	197
TD3M	Three-month time deposits	1974M04-2016M07	508
LEXP	Export of goods in natural logarithm	1967M02-2018M05	616
LER	Indonesian rupiah per USD in natural logarithm	1967M02-2018M06	617
IMPPI	Import price index	1991M01-2018M05	329
EXPPI	Export price index	1991M01-2018M05	329
LIMP	Imports of good in natural logarithm	1967M02-2018M05	616
LIP	Industrial production in natural logarithm	1991M12-2018M04	317
LR	Average lending rate for working capital	1986M03-2016M08	366
PP	Producer prices (excludes oil)	1971M01-2016M04	544
FER	Total foreign exchange reserves (excludes gold)	1971M01-2018M06	570
LBCI	Business confidence index in natural logarithm	2002M03-2017M12	190
LCAP	Jakarta stock exchange capitalization (value traded, USD) in natural logarithm	1990M01-2018M05	341
LCRI	Indonesia cash return index in natural logarithm	1989M12-2018M06	343
LCI	Jakarta stock exchange composite index in natural logarithm	1983M03-2018M06	424
LDJSI	Dow Jones Indonesia stock index in natural logarithm	1992M01-2018M06	318
DY	Dividend yield	1990M11-2018M06	332
LISI	Jakarta stock exchange Islamic index in natural logarithm	2000M07-2018M06	216
MCAP	Market capitalizationmeasured as a percentage of GDP	1995M01-2018M05	281
PER	Price-to-earnings ratio	1990M01-2018M06	342
INF	Change in consumer price index	1967M02-2018M06	617

Appendix2: Unit root test results

This table reports the first-order autoregressive (AR (1)) coefficient of all variables and results for the ADF unit root test in columns 2 and 3, respectively. The ADF unit root test examines the null hypothesis of "unit root." We examine the ADF test using a maximum of 14 lags. We then use the Schwartz Information Criterion to determine the optimal lag length.

Group	Variables	AR (1)	ADF unit root test		
			***t*-statistic**	**lag length**	***p*-value**
1	*BY1Y*	0.8207	-3.019	0	0.1318
1	*BY5Y*	0.9161	-2.2925	0	0.4341
1	*BY10Y*	0.9172	-2.2831	0	0.4392
2	*JIBOR1*	0.9539	-3.2797	0	0.0714
2	*JIBOR3*	0.9638	-2.992	0	0.1361
2	*JIBOR6*	0.9754	-2.3724	0	0.3934
2	*JIBOR12*	0.9789	-3.5075	11	0.0408
3	*LM2*	1.0009	0.6157	12	0.9995
3	*M1*	0.9952	1.6489	12	0.7670
4	*LCCI*	0.9104	-4.1508	1	0.0063
4	*LCIC*	0.9932	-1.3751	14	0.8651
4	*TD3M*	0.9886	-2.9195	1	0.1571
4	*LEXP*	0.9968	-2.5676	14	0.2955
4	*LER*	0.9971	-2.5483	9	0.3046
4	*IMPPI*	0.9891	-1.825	0	0.6905
4	*EXPPI*	0.9949	-2.4495	2	0.3533
4	*LIMP*	0.9973	-2.7882	17	0.2022
4	*LIP*	1.0028	-3.5392	3	0.0370
4	*LR*	0.9949	-3.0923	2	0.1097
4	*PP*	1.0063	1.2217	1	1.0000
4	*FER*	0.9942	-4.6199	7	0.0010
5	*LBCI*	0.9526	-3.3006	9	0.0694
5	*LCAP*	0.9895	-3.0235	1	0.1273
5	*LCRI*	0.9968	-1.3173	1	0.8819
5	*LCI*	0.9985	-2.5475	1	0.3050
5	*LDJSI*	0.9941	-2.3923	0	0.3828
5	*DY*	0.9259	-4.1745	0	0.0054
5	*LISI*	0.9928	-1.5065	1	0.8247
5	*MCAP*	0.9777	-1.5738	0	0.801
5	*PER*	0.8878	-5.8958	2	0.0000
	INF	0.1538	-7.9886	14	0.0000

Appendix 3: Endogeneity and Heteroskedasticity test results

This table reports test results for endogeneity and heteroskedasticity in columns 3 and 4, respectively. The endogeneity test is conducted by regressing the error term from the predictor regression model on the error term from the AR(1) model of the predictor variable. The heteroskedasticity test is performed based on the Lagrange multiplier test, which examines the null hypothesis of "no ARCH" at the lag of 6. We do this by estimating an AR(1) model of all predictor variables. Finally, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Group	Variables	Endogeneity Test		Heteroskedasticity Test	
		coefficient	*p*-value	ARCH (6)	*p*-value
1	*BY1Y*	0.133	0.1692	6.6628	0.3532
1	*BY5Y*	0.2461**	0.0230	6.5449	0.3650
1	*BY10Y*	0.2069*	0.0618	4.1442	0.6572
2	*JIBOR1*	0.6786***	0.0000	64.033***	0.0000
2	*JIBOR3*	0.7755***	0.0000	61.404***	0.0000
2	*JIBOR6*	0.6729***	0.0000	62.412***	0.0000
2	*JIBOR12*	0.6350***	0.0000	57.3967***	0.0000
3	*LM2*	-4.0095	0.1985	22.041***	0.0012
3	*M1*	0.5398	0.7541	8.9027	0.1791
4	*LCCI*	-18.745	0.1344	0.0299	1.0000
4	*LCIC*	3.0560***	0.0002	38.976***	0.0000
4	*TD3M*	0.6821***	0.0004	35.610***	0.0000
4	*LEXP*	4.4346	0.2453	245,36***	0.0000
4	*LER*	-0.1984	0.9260	85.652***	0.0000
4	*IMPPI*	-6.4749***	0.0009	0.0399	1.0000
4	*EXPPI*	-3.954	0.1631	11.183*	0.0829
4	*LIMP*	0.1624	0.9503	120.80***	0.0000
4	*LIP*	-17.3765	0.2650	189.34***	0.0000
4	*LR*	1.3571***	0.0000	2.9878	0.8104
4	*PP*	0.2058***	0.0000	38.135***	0.0000
4	*FER*	0.5883	0.7422	206.8***	0.0000
5	*LBCI*	-15.079	0.4199	42.126***	0.0000
5	*LCAP*	-1.0106	0.1661	58.717***	0.0000
5	*LCRI*	44.492	0.1821	287.77***	0.0000
5	*LCI*	-1.5887*	0.0904	1.6178	0.9513
5	*LDJSI*	-1.5424*	0.0550	35.873***	0.0000
5	*DY*	0.3377	0.1272	57.041***	0.0000
5	*LISI*	-1.3788	0.1184	13.978**	0.0299
5	*MCAP*	-6.8376	0.5240	0.0177	1.0000
5	*PER*	-0.0253	0.4762	6.9016	0.3300

Appendix4: In-sample predictability test results

This table reports in-sample predictability test results obtained using the WN (2012, 2015) predictability model when $h = 1$. More specifically, we report the WN-FGLS estimator with its corresponding *p*-value, which determines the null hypothesis of "no predictability." Finally, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Group	Variables	Coefficient	*p*-value	Group	Variables	Coefficient	*p*-value
1	*BY1Y*	0.0192	0.8485	4	*EXPPI*	-0.2369***	0.0000
1	*BY5Y*	0.0503	0.6063	4	*LIMP*	-0.2173***	0.0000
1	*BY10Y*	0.0501	0.6105	4	*LIP*	-0.0916*	0.0795
2	*JIBOR1*	0.5129***	0.0000	4	*LR*	0.2787***	0.0000
2	*JIBOR3*	0.4787***	0.0000	4	*PP*	-0.2229***	0.0000
2	*JIBOR6*	0.4523***	0.0000	4	*FER*	-0.1644***	0.0001
2	*JIBOR12*	0.4546***	0.0000	5	*LBCI*	-0.1292*	0.0807
3	*LM2*	-0.2174**	0.0394	5	*LCAP*	-0.2421***	0.0000
3	*M1*	-0.1118	0.2143	5	*LCRI*	0.0845*	0.0980
4	*LCCI*	-0.0777	0.2861	5	*LCI*	-0.1028**	0.0346
4	*LCIC*	-0.1262*	0.0685	5	*LDJSI*	-0.2063***	0.0002
4	*TD3M*	0.1885***	0.0000	5	*DY*	0.044	0.4347
4	*LEXP*	-0.2084***	0.0000	5	*LISI*	-0.1821*	0.0077
4	*LER*	-0.1541***	0.0001	5	*MCAP*	-0.0789	0.2070
4	*IMPPI*	-0.2897***	0.0000	5	*PER*	-0.0481	0.4006

Appendix5: Out-of-sample evaluations

This table reports results for two out-of-sample predictability measures,namely relative Theil U (RTU) and out-of-sample R-squared (OOSR2) statistics. The RTU and OOSR2 statistics measuretheperformance ofour predictive regression model vis-à-vis the constant-only model.Theout-of-sampleperiod considered is 50% of the sample. Theresults are reported fora one-period forecasting horizon, $h = 1$.

Group	Variables	RTU	OOSR2	Group	Variables	RTU	OOSR2
1	*BY1Y*	0.9760	-0.0036	4	*EXPPI*	1.8857	-3.4133
1	*BY5Y*	0.9777	-0.0083	4	*LIMP*	1.5891	-0.1416
1	*BY10Y*	0.9817	-0.0019	4	*LIP*	1.1211	-0.5181
2	*JIBOR1*	1.4368	0.0906	4	*LR*	1.6994	-0.1262
2	*JIBOR3*	1.1155	0.3331	4	*PP*	1.5407	-3.3524
2	*JIBOR6*	1.3138	0.1146	4	*FER*	1.2298	0.0081
2	*JIBOR12*	1.0090	0.3666	5	*LBCI*	1.0011	0.0286
3	*LM2*	1.0620	0.1093	5	*LCAP*	1.3150	0.0894
3	*M1*	1.2589	-0.0310	5	*LCRI*	1.6383	0.0121
4	*LCCI*	1.1700	-0.2408	5	*LCI*	1.0526	-0.2757
4	*LCIC*	0.9682	-0.0457	5	*LDJSI*	1.5348	0.0266
4	*TD3M*	1.0691	-0.0902	5	*DY*	0.9963	-0.0851
4	*LEXP*	1.6553	-0.0896	5	*LISI*	0.9925	0.0366
4	*LER*	1.6011	-0.7833	5	*MCAP*	2.0929	-17.2207
4	*IMPPI*	1.4012	-0.0914	5	*PER*	0.9984	-0.0050

Appendix6: Robustness check for in-sample predictability test results

This table reports the WN (2012, 2015) in-sample predictability test results when $h = 3$ and $h = 6$. and, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Group	Variables	$h = 3$		$h = 6$	
		Coefficient	***p*-value**	**Coefficient**	***p*-value**
1	*BY1Y*	-0.0432	0.6632	-0.0268	0.7888
1	*BY5Y*	-0.0186	0.8499	0.0027	0.9787
1	*BY10Y*	-0.0184	0.8527	0.0142	0.8889
2	*JIBOR1*	0.3641***	0.0000	0.9409***	0.0000
2	*JIBOR3*	0.3409***	0.0000	0.0553***	0.0000
2	*JIBOR6*	0.3444***	0.0000	0.2979***	0.0000
2	*JIBOR12*	0.3513***	0.0000	0.3291***	0.0000
3	*LM2*	-0.2207**	0.0342	-0.1837*	0.0748
3	*M1*	-0.1372	0.1362	-0.0373	0.6775
4	*LCCI*	0.0574	0.4430	-0.0099	0.8881
4	*LCIC*	-0.1598**	0.0219	-0.1747**	0.0142
4	*TD3M*	0.1559***	0.0004	0.0873*	0.0523
4	*LEXP*	-0.2089***	0.0000	-0.2102	0.0000
4	*LER*	-0.1702***	0.0000	-0.1801***	0.0000
4	*IMPPI*	-0.2022***	0.0002	-0.1509***	0.0065
4	*EXPPI*	-0.2105***	0.0001	-0.1916***	0.0006
4	*LIMP*	-0.2175***	0.0000	-0.2206***	0.0000
4	*LIP*	-0.0968*	0.0671	-0.1169**	0.0302
4	*LR*	0.2561***	0.0000	0.1923***	0.0002
4	*PP*	-0.2327***	0.0000	-0.2509***	0.0000
4	*FER*	-0.1621***	0.0001	-0.1919***	0.0000
5	*LBCI*	-0.0361	0.6310	0.0313	0.6859
5	*LCAP*	-0.2029***	0.0002	-0.1487***	0.0071
5	*LCRI*	0.0899*	0.0831	0.0939*	0.0768
5	*LCI*	-0.0952*	0.0518	-0.0807	0.1035
5	*LDJSI*	-0.2148***	0.0001	-0.1899***	0.0010
5	*DY*	0.0527	0.3453	0.0012	0.9829
5	*LISI*	-0.1874***	0.0067	-0.1763**	0.0116
5	*MCAP*	-0.0708	0.3090	-0.0931	0.3044
5	*PER*	-0.0583	0.2962	-0.0425	0.4435

Appendix7: Robustness test for out-of-sample evaluation

This table reports robustness test results for two out-of-sample evaluation measures, namely theRTU and the OOSR2. We decrease the out-of-sample period from 50% to 30% of the data sample for robustness checks.

Group	Variables	RTU	OOSR2	Group	Variables	RTU	OOSR2
1	*BY1Y*	0.9829	0.0102	4	*EXPPI*	1.2326	0.1929
1	*BY5Y*	1.0018	-0.0030	4	*LIMP*	1.3631	0.2097
1	*BY10Y*	1.0116	-0.0117	4	*LIP*	1.0261	-0.0146
2	*JIBOR1*	1.2393	0.2527	4	*LR*	1.3855	0.1144
2	*JIBOR3*	1.1057	0.3045	4	*PP*	1.1486	-0.6427
2	*JIBOR6*	1.1887	0.2557	4	*FER*	1.0058	0.1001
2	*JIBOR12*	1.0253	0.3093	5	*LBCI*	1.0088	0.0181
3	*LM2*	0.7591	0.4202	5	*LCAP*	1.0898	0.2837
3	*M1*	1.0065	-0.0154	5	*LCRI*	1.1205	0.2674
4	*LCCI*	1.2208	-0.3587	5	*LCI*	1.0484	-0.1724
4	*LCIC*	1.0095	0.0743	5	*LDJSI*	1.0239	0.2781
4	*TD3M*	1.0243	0.0775	5	*DY*	1.0182	-0.0527
4	*LEXP*	1.2246	0.2752	5	*LISI*	1.0534	0.0704
4	*LER*	1.0536	0.2686	5	*MCAP*	2.0713	-19.4317
4	*IMPPI*	1.5455	0.0900	5	*PER*	0.9988	0.0030

Catatan reviewer:

1. Judul terlalu panjang, tidak efektif dan efisien.
2. Teknik penulisan dalam bahasa inggris perlu diperbaiki, sebaiknya gunakan froopreading.
3. Referensi yang digunakan banyak yang kurang relevan dan belum sesuai dengan kebijakan jurnal.
4. Tulisan ini menarik untuk dikembangkan tetapi masih memerlukan analisis yang mendalam (the manuscript is lack of in-depth analysis) dan kebaruannya masih kurang (novelty required by our journal).

JAFEB Peer Review System
THE JOURNAL OF ASIAN FINANCE, ECONOMICS AND BUSINESS

Ayus Ahmad Yusuf Logout
Change Role REVIEWER

About Submission Archive Search

View Review Status

Manuscript ID Title
Author Area All
Status All Last Decision All
Check-in Date ~
Sort Manuscript ID Sort By ○ Asc ◉ Desc Search Excel Down

Total : 1 * [Excel Down] may take a long time.

Title : COMPARATIVE ANALYSIS OF TAKAFUL BUSINESS UNITS AND THEIR PARENT COMPANIES IN INDONESIA THROUGHOUT 2015-2018 USING TWO-STAGE DATA ENVELOPMENT ANALYSIS (DEA) APPROACH
Status : Under Review

Manuscript ID	Submitted	Checked-in	Editor	Reviewer (Invited, Agreed)	Date Review Due	Review Result (Date)	Editor's Recommendation	Decision
JAFEB-Mar-14-2021-231	21/03/12	Jung Wan Lee (21/03/14)	Myoung-Kil Youn (21/03/14)	1. Ayus Ahmad Yusuf (21/03/18, 21/03/18)	21/03/31	Acceptable with Major Revision (21/03/30)		

1

· Authors Guide · Editor's & Reviewer's Guide · Publication Ethics · Privacy Policy

Recommendation

Summary

Manuscript ID

JAFEB-Mar-14-2021-231

Title

COMPARATIVE ANALYSIS OF TAKAFUL BUSINESS UNITS AND THEIR PARENT COMPANIES IN INDONESIA THROUGHOUT 2015-2018 USING TWO-STAGE DATA ENVELOPMENT ANALYSIS (DEA) APPROACH

Comments to Author

1. Please use a short title.
2. Please provide abstract to reach about 200 (197-203) words in total.
3. A maximum of six (6) tables/figures/appendixes in total.
4. Please correct the Table, not IMAGE style
5. The manuscript is lack of in-depth analysis and novelty required.
6. Writing techniques in English need to be improved.
7. You should include at least 3 - 5 relevant references in JAFEB.
8. Please provide full information of publications complying with the APA citation and reference styles with DOI.
9. In text citations DO NOT match their references list.

Confidential Comments to Editor

In text citations do not match their references list. If the author does not correct this, it is better to reject.

Confidential File Attachment to Editor

review JAFEB-Mar-14-2021-231_JAFEB-Mar-14-2021-231_JAFEB_Manuscript..docx

Recommendation

Major Revision

Close