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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

LIMITATIONS

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APPENDIX/ANNEXURE

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.

- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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EFFICIENCY INSURANCE COMPANIES IN INDONESIA, MALAYSIA AND SINGAPORE

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ABSTRACT

The insurance sector as part of the financial services sector has a strategic role in the establishment of a country's economic stability through risk management aspects. Efficiency in the insurance industry is a benchmark in assessing the performance of insurance companies. This study aims to determine how the efficiency of insurance companies in Indonesia, Malaysia, and Singapore during period 2013-2015 based on the concept and all empirical studies. Analysis technique used to explain this research is Data Envelopment Analysis (DEA) by using claim and premium as output indicators. Operating expenses, commission fees and share capital as input indicators. The population in this study is the insurance companies listed on Stock Exchange in Indonesia, Malaysia, and Singapore. The sample measurement technique used in this research is census technique with total sample of 20 companies. The results showed that the level of technical efficiency of insurance companies in Indonesia, Malaysia and Singapore using Data Envelopment Analysis (DEA) of Constant Returns to Scale (CRS) model is 4 companies from 20 sample companies, while Variable Returns to Scale (VRS) model is 8 companies from 20 sample companies. The scale efficiency of existing insurance companies in Indonesia, Malaysia and Singapore in 2013, 2014 and 2015 respectively are 12, 12 and 10 companies. The results of data analysis as a whole based on anova tests show that there are efficiency differences in insurance companies in Indonesia, Malaysia and Singapore.

KEYWORDS
technical efficiency, scale efficiency, data envelopment analysis.

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G22

INTRODUCTION

The Commission on Insurance Terminology of the American Risk and Insurance Association defines insurance as the collection of unintended losses by transferring the risk of loss to the insurance company, in which the company is willing to provide insurance of financial loss to the insured party through the payment of a sum of money or fulfil certain services related to the recognized risk of loss.

TABLE 1: REAL GROSS DOMESTIC PRODUCT (GDP) GROWTH OF ASEAN COUNTRIES-6 (% per year)

Country	2010	2011	2012	2013	2014	2015	Average of 2011-2015
Indonesia	6.1	6.5	6.2	5.8	5.0	4.8	7.40
Malaysia	7.4	5.1	5.6	4.7	6.0	5.0	7.20
Filipina	7.6	3.9	6.8	7.1	6.2	6.1	7.90
Singapore	2.8	5.2	4.6	5.9	4.1	1.3	5.56
Thailand	7.5	0.1	6.5	2.9	0.9	2.9	4.48
Average	6.3	4.2	5.9	5.3	4.4	4.0	6.53

Source: The Organisation for Economic Co-operation and Development (OECD), 2016

Table 1 shows that in 2010 the growth of ASEAN's five major economies, namely Indonesia, Malaysia, Philippines, Singapore and Thailand rebounded at 6.3%. According to the OECD, during 2011-2015 the ASEAN economic growth expanded an average of 6.53 %, slightly above the 2008 pre-crisis growth rate of 6.1%. Global Insurance Outlook (2015) revealed that Indonesia is included in the emerging category, Malaysia in developing category, while Singapore is involved in the mature category. The three countries do have different developments in the insurance sector, but the country which has a good development in the insurance sector that is shown by the performance of a good company is not necessarily have better efficiency. This study will analyse insurance companies listed on the stock exchanges in Indonesia, Malaysia and Singapore in terms of technical and scale efficiency.

TABLE 2: GROSS PREMIUMS, GDP, POPULATION, PENETRATION AND INSURANCE DENSITY IN INDONESIA, MALAYSIA AND SINGAPORE

No	Country	Year	Gross Premiums	GDP	Population	Penetration	Insurance Density
1	Indonesia	2013	193.060.000	9.084.000.000	248,80	2,13%	775.964,63
		2014	247.290.000	10.542.000.000	252,00	2,35%	981.309,52
		2015	295.560.000	11.540.000.000	255,00	2,56%	1.159.058,82
2	Malaysia	2013	46.473	1.018.821	30,20	4,56%	1.538,84
		2014	49.964	1.106.580	30,60	4,52%	1.632,81
		2015	52.445	1.156.881	31,00	4,53%	1.691,77
3	Singapore	2013	19.626	373.471	5,39	5,26%	3.641,21
		2014	22.056	386.812	5,46	5,70%	4.039,67
		2015	25.261	394.288	5,53	6,38%	4.550,00

Source: Data Analysed, 2016

Indonesia's insurance industry must be recognized encountering variety of problems and challenges which are complicated, both in national and global coverage. The development of statistics confirm that the insurance industry is challenging a critical stage. Regulation and market situations are still relatively unfavourable amid the threat of distrust of society to industry players. Indonesia's position in the "world of global insurance" is quite worrying (Rahim, 2013). In terms of premiums, Indonesia ranked 37th in the world for life insurance and 44th for the value of general insurance premiums from 88 countries, which are analysed in the World Insurance Outlook. The rankings, which are based on the rate of insurance penetration (percentage of premiums to GDP) and the insurance density (per capita premiums) are getting worse, which are 74th and 78th position for the insurance industry as a whole.

Efficiency is the most important topic in many sectors. Efficiency of a company means accomplishing the best use of available resources. Efficient companies establish better performance with input utilization (Janjua and Akmal, 2015). Technical efficiency is one of the components of overall economic efficiency. In order to achieve economic efficiency, a company must be technically efficient. To achieve maximum profitability, a company must be able to produce an optimum level of output with a certain amount of input (technical efficiency) and produce output with the right combination at a specific price level (allocative efficiency) (Kumbhakar, 2000). For the entire Indonesian insurance industry, the asset growth rate reaches 36% per year, with total assets equaling US $ 33.9 billion or comparable to Rp 319 Trillion (exchange rate of US $ 1 = Rp 9,404). This high growth figure demonstrates the potential of domestic insurance market, which is still

very big. The development of the insurance industry is believed to continue to expand positively with a population of 240 million, which is the largest population in Southeast Asia.

Efficiency is a measure of how well an organization manages inputs into outputs or the amount of output achieved from one input used. According to Huri and Indah (2004), the companies can be said to be efficient when applying fewer input units compared to the number of input units used by other companies by producing the same output units and using the same number of inputs but can create larger amount of outputs. Inefficient companies are generally initiated by three conditions: the presence of prolonged bureaucratic chain, misallocation in the use of existing resources and the absence of economics of scale (Permono and Darmawan, 2000).

As stated by Sexton, et al. (1986) the frontier approach in measuring efficiency is divided into two types, which are parametric and non-parametric approaches. The parametric frontier approach can be determined by parametric statistical tests such as using the Stochastic Frontier Approach (SFA) and Distribution Free Approach (DFA) methods. The non-parametric frontier approach is calculated by non-parametric statistic tests using Data Envelopment Analysis (DEA) method. Based on all the methods characterised above, there are two most commonly used methods of measuring efficiency in the insurance industry, SFA and DEA. The SFA also known as the Frontier Econometric Approach specifies a functional form of cost, profit or production relationship with input, output and environmental factors and tolerates random error (Berger and David, 1997). While DEA is a non-parametric analysis which is the development of linear mathematical programming. Even though adopting the same input and output variables, there is a difference between DEA and SFA because the SFA approach includes random error on the frontier, while the DEA approach does not include it. The consequence of this would lead to the DEA approach is not being able to take into account macro variable factors such as the difference in the size of DMU (Decision Making Unit) asset or the rules that affect the efficient level of DMU.

Occasionally, the distinction in outcomes between the SFA and DEA methods lead to different results, but some experts claim that the results of the study either by practicing SFA or DEA methods are relatively consistent. The favour of DEA is able to identify the input or output used by the bank as reference that can help to find the dispute and solution from the source of the inefficiency of the bank. Hadad (2003) concluded that DEA can measure the overall efficiency of DMU.

Several prior empirical studies have examined the efficiency of insurance firms using different analytical approaches, for example utilising econometrics, stochastic frontiers, thick frontier and Data Envelopment Analysis (DEA) as performed by Nektarios and Carlos (2010), Zhi and Jin (2011), Lin, et al. (2011), Al Amri and Said (2012), Sun and Chen (2012), Ansah (2012), Chakraborty (2013), Rahman (2013), Kweh, et al. (2014), Dalkilici and Aysen (2014), Janjua and Akmal (2015) and Malhotra, et al. (2017). The empirical study is a gap in this study to conduct research on the efficiency of insurance companies in Indonesia and analyse it with Malaysia and Singapore.

This study will scrutinise the performance of insurance companies in Indonesia, Malaysia and Singapore in terms of efficiency that refers to research organised by Mandal (2014) who has been researching the efficiency of non-life insurance companies in India during the recession using Data Envelopment Analysis (DEA). Meanwhile, this study applies cases in Indonesia, Malaysia and Singapore from different sides (primal) with some developments that match the characteristics of insurance companies in each country. This study also evaluates the insurance companies listed on the Indonesia, Malaysia and Singapore Stock Exchange.

REVIEW OF LITERATURE
CONCEPT OF INSURANCE
Insurance business organise many benefits for the community, the development of the country and the company itself. The insurance benefits according to Darmawi (2001:4) are: 1) insurance to protect investment risk, 2) insurance as a source of investment funds, 3) insurance to complete credit terms, 4) insurance can reduce concerns, 5) insurance reduces capital costs, 6) insurance guarantees the stability of the company, 7) insurance can flatten profits, 8) insurance can provide professional services; 8) insurance encourages prevention of loss and 9) insurance helps health care. The basic principle of insurance as stated by Danarti (2008:18) consists of six principles, namely: insurable interest, utmost good faith, proximate cause, indemnity, suborgation and contribution.

COMPANY PERFORMANCE
Company performance demonstrate the company's ability to generate profits or return on the resources invested in it. Performance is one of the major business operations of all companies. Performance includes a variety of definition of efficiency and effectiveness. Return on capital investment is an important indicator of the company's long-term strength (Subramanyam and Wild, 2010). Financial performance is an information of the company's financial condition at certain position concerning the aspect of funds collection and distribution which is usually assessed by capital adequacy indicator, liquidity and profitability of the company (Jumingan, 2011). The financial performance of insurance companies is measured using risk based capital (RBC) ratio.

CONCEPT OF EFFICIENCY ECASUREECNT
Measurement of efficiency can help an entity to assess and evaluate its performance and competitiveness in an industry. How big the entity can overcome challenges in its industry and be able to compete and survive and even develop its entities in the future. Measurement of efficiency can be done by considering the competitiveness of the output and input or expense and return (Shafique, et al., 2015).

DATA ENVELOPMENT ANALYSIS
Data Envelopment Analysis (DEA) is a mathematical program optimization method that calculates the technical efficiency of a Decision Making Unit (DMU) and compares relatively to other DMUs. DMU is a terminology accepted alongside units to be measured for efficiency. DEA analysis techniques are designed specifically to evaluate the relative efficiency of DMU in many input and output conditions. The relative efficiency of DMU is the efficiency of DMU associated to other DMUs in sample utilizing the same type of input and output. DEA formulates DMU as a fractional linear program to find a solution, if the model is transformed into a linear program with weighted value of input and output (Sutawijaya and Etty, 2009).

A DMU is revealed to be relatively efficient if its dual value is equal to 1 (100 percent efficiency value), otherwise if its dual value is less than 1 then the DMU is considered inefficient or disorganised (Huri and Indah 2004). In this circumstance, the study concerning DEA will analyse the relative efficiency of DMU in one group of observation to another DMUs with the best performance in the observation group.

CONSTANT RETURN TO SCALE (CRS) MODEL
The model of constant return to scale was developed by Charnes, Cooper and Rhodes (CCR Model) in 1978. This model assumes that the ratio between input and output additions is identical. In other words, if there is an additional input of x times, then the output will increase by x times as well. Another assumption used in this model is that every company or Decision Making Unit (DMU) organise on an optimum scale. The formula of constant return to scale can be written as follows.

Max Ө (Efficiency of DMU with CRS Model)

$$\sum_{j=1}^{n} x_{ij}\,'_{ij} \geq \theta_{i0} \tag{1}$$

$$\sum_{j=1}^{n} y_{rj}\,'_{j} \geq y_{i0}$$

$$\sum_{j=1}^{n} '_{j} \geq 0$$

Notation:

Ө   = technical efficiency (CRS)
n   = number of DMU
m   = number of input
s   = number of output
x_{ij} = number of input of the i type of the j DMU
y_{rj} = number of output of the r type of the j DMU
$'_{j}$ = weight of j DMU for the calculated DMU

DMU of less than 1 means inefficiency, while DMU whose efficiency value equals to 1 implies that the DMU is efficient. Optimization of CCR modeling can be oriented on input and output. The input-oriented of CCR intends to minimize the input to obtain a certain level of output. The results of the CCR-Input modeling will contribute recommendations for inefficient DMUs, how much input should be reduced in order to achieve efficient stages of the output, while the output-oriented CRS modeling attempts to maximize output with certain level of input. The results of CCR-Output modeling will provide judgements for inefficient DMUs, how much output needs to be improved with existing inputs to reach efficient phases.

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VARIABEL RETURN TO SCALE (VRS) MODEL

This model was developed by Banker, Charnes and Cooper (BCC model) in 1984 and is an improvement of the CCR model. This model believes that the company is not or not yet organised on an optimum scale. The assumption of this model is that the ratio between input and output additions is not the same. Specifically, the addition of input x times will not cause the output to increase by x times, can be smaller or bigger than x times. Increased proportion can be Increasing Return to Scale (IRS) or it can also Decreasing Return to Scale (DRS). The results of this model adds convexity conditions to weight values, by including in the following boundary model.

$$\sum_{j=1}^{n} xj = 1 \tag{2}$$

Furthermore, BCC model can be written with the following equation.

Max (Efisiensi DMU Model VRS)

$$\sum_{j}^{n} = 1 xij \, 'ij \geq xi0 \tag{3}$$
$$\sum_{j}^{n} = 1 yrj \, 'j \geq yi0$$
$$\sum_{j}^{n} = 1 \, 'j \geq 1$$
$$\sum_{j}^{n} = 1 \, 'j \geq 0$$

Notation:

Ө = technical efficiency (VRS)
n = number of DMU
m = number of input
s = number of output
x_{ij} = number of i input of the j DMU
y_{rj} = number of r output of the j DMU
'j = weight of j DMU for the calculated DMU

The value of the efficiency is always less than or equal to 1. DMU whose efficiency value is less than 1 means inefficiency, while DMU whose value is equal to 1 indicates efficient. The optimization of BCC modeling can be oriented on input and output. Input-oriented BCC aims to minimize the input to obtain certain level of output. The results of the BCC-Input modeling will provide recommendations for inefficient DMUs, how many inputs should be reduced in order to achieve the efficient stage of output, while the output-oriented BCC modeling intends to maximize output. The results of the BCC-Output modeling will provide recommendations for inefficient DMUs, how much output needs to be improved with existing inputs to reach efficient phases.

This research applying comparative and descriptive approaches that conceptually cannot be defined but will be described, concerning how the efficiency of insurance companies in Indonesia, Malaysia and Singapore using Data Envelopment Analysis (DEA) method.

NEED/IMPORTANCE OF THE STUDY

This study contributes theoretical implications for the development of empirical studies. This research provides that Data Envelopment Analysis method is applicable to measure the efficiency of insurance companies, considering that DEA method can use some input and output indicators. The indicators can also have different measurement units. The results of this study lead to the development of prior research, especially the findings on efficiency comparisons between countries.

For the government, because the sector of insurance industry is very promising, lots of new companies are entering this industry sector, both loss and life insurance companies. For company's management, this study offers some basic managerial guidelines.

HYPOTHESIS

EFFICIENCY OF INSURANCE COMPANIES IN INDONESIA, MALAYSIA, AND SINGAPORE

Efficiency is a measure of how well an organization arranges input into output or the number of outputs generated from one input used. Abidin and Endri (2010) in Bernada, et al. (2016) explained that one of the most important aspects to a company's success is efficiency. According to Global Insurance Outlook (2015), insurance companies in Indonesia, Malaysia and Singapore have different developments and performances. Singapore is already in the mature category, Malaysia in the category of developing, while Indonesia is included in the category of emerging. Generally, companies that have good developments and performances do not necessarily have good level of efficiency as well. Research conducted by Mahmoud (2008) denied this, because the results reveal that there is a relationship between efficiency and performance of insurance companies in Greece. Based on the results of these empirical studies, the research hypothesis can be developed as follows.

H_1: There is difference between the efficiency of insurance companies in Indonesia, Malaysia and Singapore.

RESEARCH METHODOLOGY

This research is performed to know the efficiency of insurance companies listed on Indonesia, Malaysia and Singapore Stock Exchange during period of 2013-2015 by applying Data Envelopment Analysis. This study implementing comparative and descriptive approaches for exploration and clarification of phenomenon or social reality through describing variety of variables concerning the problems and units under study.

TABLE 3: INSURANCE COMPANIES REGISTERED ON MALAYSIA STOCK EXCHANGE

No	Stock Code	Name of Issuer	Date of IPO
1	1058	Manulife Insurance Berhad	1981
2	6009	Pacific & Orient Insurance Co. Berhad	1995
3	5230	Tune Insurance Malaysia Berhad	2013
4	6459	MNRB RetakafulBerhad	09/02/1973

Source: www.bursamalaysia.com, 2017

TABLE 4: INSURANCE COMPANIES REGISTERED ON INDONESIA STOCK EXCHANGE

No	Stock Code	Name of Issuer	Date of IPO
1	ABDA	Asuransi Bina Daya Arta Tbk	06/07/1989
2	AHAP	Asuransi Harta Aman Pratama Tbk	14/09/1990
3	AMAG	Asuransi Multi Artha GunaTbk	23/12/ 2005
4	ASBI	Asuransi Bintang Tbk	29/11/1989
5	ASDM	Asuransi Dayin Mitra Tbk	15/12/1989
6	ASJT	Asuransi Jaya Tania Tbk	23/12/2003
7	ASMI	Asuransi Mitra Maparya Tbk	16/01/2014
8	ASRM	Asuransi Ramayana Tbk	19/03/1990
9	LPGI	Lippo General Insurance Tbk	06/09/2005
10	MREI	Maskapai Reasuransi Indonesia Tbk	04/09/1989
11	PNIN	Paninvest Tbkd.h Panin Insurance Tbk	20/09/1983
12	VINS	Victorian Insurance Tbk	28/09/2015

Source: www.idx.co.id, 2017

TABLE 5: INSURANCE COMPANIES REGISTERED ON SINGAPORE STOCK EXCHANGE

No	Stock Code	Name of Issuer	Date of IPO
1	I805G	United Overseas Insurance Ltd	02/10/1978
2	I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	11/04/1997
3	I527C	Prudential Assurance Co. Singapore (PTE) Ltd	25/05/2010
4	R900G	Singapore Reinsurance Corporation Ltd	26/10/1987

Source: www.sgx.com, 2017

The object of this study focused on the efficiency of insurance companies listed on the Indonesia, Malaysia and Singapore Stock Exchange. The financial statements of the company will provide information about the condition of the insurance company which is of course very important to know for the stakeholders who are the customers and investors relating to choose the right insurance companies to cover the risks and also to invest capital for the investors.

Based on the descriptions, the variables in this study are technical and scale efficiency. Companies that perform technical efficiency will maximize output by utilising input in a certain amount. Scale efficiency is associated with achieving the economies of scale of the unit in carrying out the operations.

The operational definition of a variable is an explanation given to each variable in order to specify that variable. This study will measure technical and scale efficiency using output orientation with CRS and VRS models during 2013-2015 observation period. Hadad, et al. (2003) suggested that the concepts used in defining input and output relationships in the financial activities of financial institution on parametric and non-parametric methods are approach of asset, production and intermediation. Berger and Humphrey (1992) recommended three approaches for determining the variables of output and input for estimating the efficiency of banks and financial institutions, namely approach of asset, cost and value added.

This research utilises three input indicators, which consist of operating cost, commission fee and equity capital. The adoption of these three variables is also consistent with previous related research. Operating cost is cost that is not directly related to the company's products, but affects to day-to-day operations of the company. Operating cost applying the unit of Indonesian Rupiah, Malaysian Ringgit and Singapore Dollar, which are taken from the income statement of each insurance company in the period of observation 2013-2015. Commission fee is fee charged by insurance companies in paying agency commissions based on existing policies. Commission fee implementing unit of Indonesian Rupiah, Malaysian Ringgit and Singapore Dollar, which are acquired from the income statement of each insurance company in the period of observation 2013-2015. Equity capital shows the amount of money that the investors deposit for the company's activities with the ownership of the company's shares. Equity capital operating unit of Indonesian Rupiah, Malaysian Ringgit and Singapore Dollar which are conducted from the statement of financial position of each insurance company in the period of observation 2013-2015.

Data analysis techniques used to solve the problems in this study are Data Envelopment Analysis (DEA) and Anova Test. DEA is a mathematical program optimization method that measures the technical efficiency of Decision Making Unit (DMU) and compares relatively to other DMUs. DMU is said to be relatively efficient if its dual value is equal to 1 (100 percent efficiency value), otherwise if its dual value is less than 1 then the DMU is considered inefficient or disorganised (Huri and Indah 2004).

Further analysis technique that will be used to compare the efficiency of existing insurance companies in Indonesia, Malaysia and Singapore is anova test. Anova test is commonly referred as One Way Analysis of Variance, which is a parametric statistical technique used to examine the differences between three or more groups of interval or ratio data derived from one independent variable (Winarsunu, 2006).

RESULTS AND DISCUSSIONS
RESULTS AND DISCUSSIONS OF TECHNICAL EFFICIENCY MEASUREMENT WITH DATA ENVELOPMENT ANALYSIS (DEA) APPROACH

Measurement of efficiency for insurance companies in Indonesia, Malaysia and Singapore is accomplished first before testing the hypotheses. This efficiency value is calculated using Data Envelopment Analysis (DEA) to compare several unit of economic activities utilising three input indicators and two output indicators. The unit of economic activities in this study are 20 insurance companies in Indonesia, Malaysia and Singapore with three years observation period. The assessment of the efficiency of this insurance company using operating cost, commission fee, and equity capital as input indicators, while claim and premium are used as output indicators.

The results of these measurements indicate that different levels of efficiency of each insurance company are the sample of the study. The maximum value is 1.00 which means that the insurance company is efficient. The results on efficiency adopting Constant Return to Scale (CRS) model found that from total of 20 samples, only four insurance companies have perfect efficiency as shown in Table 6.

TABLE 6: AVERAGE EFFICIENCY VALUE TEST RESULTS OF CRS

Stock Code	Name of Issuer	Year			Average Efficiency
		2013	2014	2015	
ABDA	Asuransi Bina Daya Arta Tbk	1	0.5500	0.5160	0.6887
AHAP	Asuransi Harta Aman Pratama Tbk	1	0.9290	0.8070	0.9120
AMAG	Asuransi Multi Artha Guna Tbk	0.9990	0	1	0.6663
ASBI	Asuransi Bintang Tbk	0.5110	0.8490	0.5030	0.6210
ASDM	Asuransi Dayin Mitra Tbk	1	0	1	0.6667
ASJT	Asuransi Jaya Tania Tbk	0.5110	0.3830	0.3610	0.4183
ASMI	Asuransi Mitra Maparya Tbk	1	0.5620	0.6950	0.7523
ASRM	Asuransi Ramayana Tbk	0.8350	0.5920	0.5420	0.6563
LPGI	Lippo General Insurance Tbk	1	1	1	1
MREI	Maskapai Reasuransi Indonesia Tbk	1	0.9000	0.9340	0.9447
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	1	1	1	1
VINS	Victorian Insurance Tbk	0	0.3310	0.5240	0.2850
1058	Manulife Insurance Berhad	1	0.8510	0.9220	0.9243
6009	Pacific & Orient Insurance Co. Berhad	0.8920	1	1	0.9640
5230	Tune Insurance Malaysia Berhad	0.5300	0.4250	0.4610	0.4720
6459	MNRB RetakafulBerhad	0.9740	1	0.7790	0.9177
I805G	United Overseas Insurance Ltd	1	1	1	1
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	0	0	0	0.0000
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	1	1	0.960	0.9867
R900G	Singapore Reinsurance Corporation Ltd	1	1	1	1

Source: Data Analysed, 2017

According to table 6, the insurance companies have perfect efficiency value are Asuransi Multi Artha Guna Tbk, Asuransi Dayin Mitra Tbk, Lippo General Insurance Tbk, Maskapai Reasuransi Indonesia Tbk, Paninvest Tbkd.h Panin Insurance Tbk, Manulife Insurance Berhad, United Overseas Insurance Ltd and Singapore Reinsurance Corporation Ltd. These insurance companies have used their resources properly in order to have good performance and are relatively appropriate for reference development of various other insurance companies. Other insurance companies that have value of technical efficiency lower than 1 should be able to apply their resources proficiently.

TABLE 7: AVERAGE EFFICIENCY VALUE TEST RESULTS OF VRS

Stock Code	Name of Issuer	Year			Average Efficiency
		2013	2014	2015	
ABDA	Asuransi Bina Daya Arta Tbk	1	0.8880	0.8350	0.9077
AHAP	Asuransi Harta Aman Pratama Tbk	1	0.9290	0.8080	0.9123
AMAG	Asuransi Multi Artha GunaTbk	1	1	1	1
ASBI	Asuransi Bintang Tbk	0.5110	0.8490	0.5030	0.6210
ASDM	Asuransi Dayin Mitra Tbk	1	1	1	1
ASJT	Asuransi Jaya Tania Tbk	0.5110	0.3830	0.3610	0.4183
ASMI	Asuransi Mitra Maparya Tbk	1	0.5620	0.7020	0.7547
ASRM	Asuransi Ramayana Tbk	0.8390	0.8000	0.7060	0.7817
LPGI	Lippo General Insurance Tbk	1	1	1	1
MREI	Maskapai Reasuransi Indonesia Tbk	1	1	1	1
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	1	1	1	1
VINS	Victorian Insurance Tbk	0	0.3700	0.5330	0.3010
1058	Manulife Insurance Berhad	1	1	1	1
6009	Pacific & Orient Insurance Co. Berhad	0.8920	1	1	0.9640
5230	Tune Insurance Malaysia Berhad	0.5300	1	1	0.8433
6459	MNRB RetakafulBerhad	0.9740	1	0.8680	0.9473
I805G	United Overseas Insurance Ltd	1	1	1	1
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	0	0	0	0
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	1	1	0.9740	0.9913
R900G	Singapore Reinsurance Corporation Ltd	1	1	1	1

Source: Data Analysed, 2017

Variable Return to Scale (VRS) model reveals that from total of 20 company samples, there are 8 insurance companies that have efficient value as shown in Table 7. The companies consist of 5 insurance companies in Indonesia, 1 in Malaysia and 2 in Singapore. According to the research findings, the average value of the technical efficiency of the insurance industry is 0.82, which indicates that there are insufficient resources and inefficiencies.

RESULTS AND DISCUSSIONS OF SCALE EFFICIENCY ECASUREECNT WITH DATA ENVELOPMENT ANALYSIS (DEA) APPROACH

Scale efficiency is associated with accomplishing the economic scale of a unit in realising its operations over a period of time. Inefficient on a scale can only be overcome by adopting technology or service procedures. The results of the study for the scale efficiency of the insurance companies are shown in Table 8, Table 9 and Table 10 below. The average scale efficiency for the insurance industry in the period of 2013-2015 shows stagnant trend and then declines, from 60% to 50%.

TABLE 8: SCALE EFFICIENCY TEST RESULTS IN 2013

Stock Code	Name of Issuer	CRS	VRS	Scale Efficiency
ABDA	Asuransi Bina Daya Arta Tbk	1	1	1
AHAP	Asuransi Harta Aman Pratama Tbk	1	1	1
AMAG	Asuransi Multi Artha GunaTbk	0.999	1	1
ASBI	Asuransi Bintang Tbk	0.511	0.511	0.511
ASDM	Asuransi Dayin Mitra Tbk	1	1	1
ASJT	Asuransi Jaya Tania Tbk	0.511	0.511	0.511
ASMI	Asuransi Mitra Maparya Tbk	1	1	1
ASRM	Asuransi Ramayana Tbk	0.835	0.839	0.839
LPGI	Lippo General Insurance Tbk	1	1	1
MREI	Maskapai Reasuransi Indonesia Tbk	1	1	1
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	1	1	1
VINS	Victorian Insurance Tbk	0	0	0
1058	Manulife Insurance Berhad	1	1	1
6009	Pacific & Orient Insurance Co. Berhad	0.892	0.892	0.892
5230	Tune Insurance Malaysia Berhad	0.530	0.530	0.530
6459	MNRB RetakafulBerhad	0.974	0.974	0.974
I805G	United Overseas Insurance Ltd	1	1	1
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	0	0	0
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	1	1	1
R900G	Singapore Reinsurance Corporation Ltd	1	1	1

Source: Data Analysed, 2017

Table 8 confirms that from 20 samples of insurance companies, there are 12 companies that have perfect efficient value. The company consist of 8 insurance companies in Indonesia, 1 in Malaysia and 3 in Singapore. The efficient companies are Asuransi Bina Daya Arta Tbk, Asuransi Multi Artha Guna Tbk, Asuransi Dayin Mitra Maparya Tbk, Lippo General Insuranse Tbk, Manulife Insurance Berhad, United Overseas Insurance Ltd, Prudential Assurance Co. Singapore (PTE) Ltd, Singapore Reinsurance Corporation Ltd.

TABLE 9: SCALE EFFICIENCY TEST RESULTS IN 2014

Stock Code	Name of Issuer	CRS	VRS	Scale Efficiency
ABDA	Asuransi Bina Daya Arta Tbk	0.550	0.888	0.888
AHAP	Asuransi Harta Aman Pratama Tbk	0.929	0.929	0.929
AMAG	Asuransi Multi Artha GunaTbk	0	1	1
ASBI	Asuransi Bintang Tbk	0.849	0.849	0.849
ASDM	Asuransi Dayin Mitra Tbk	0	1	1
ASJT	Asuransi Jaya Tania Tbk	0.383	0.383	0.383
ASMI	Asuransi Mitra Maparya Tbk	0.562	0.562	0.562
ASRM	Asuransi Ramayana Tbk	0.592	0.800	0.800
LPGI	Lippo General Insurance Tbk	1	1	1
MREI	Maskapai Reasuransi Indonesia Tbk	0.900	1	1
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	1	1	1
VINS	Victorian Insurance Tbk	0.331	0.370	0.370
1058	Manulife Insurance Berhad	0.851	1	1
6009	Pacific & Orient Insurance Co. Berhad	1	1	1
6459	MNRB RetakafulBerhad	1	1	1
I805G	United Overseas Insurance Ltd	1	1	1
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	0	0	0
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	1	1	1
R900G	Singapore Reinsurance Corporation Ltd	1	1	1

Source: Data Analysed, 2017

Table 9 explains that from 20 samples of insurance companies, there are 12 companies that have perfect efficient value. The company consists of 5 insurance companies in Indonesia, 4 in Malaysia, and 3 in Singapore. The efficient companies are Asuransi Multi Artha Guna Tbk, Asuransi Dayin Mitra Tbk, Lippo General Insurance Tbk, Maskapai Reasuransi Indonesia Tbk, Paninvest Tbkd.h Panin Insurance Tbk, Manulife Insurance Berhad, Pacific & Orient Insurance, Tune Insurance Malaysia Berhad, MNRB Retakaful Berhad, United Overseas Insurance Ltd, Prudential Assurance Co. Singapore (PTE) Ltd, dan Singapore Reinsurance Corporation Ltd.

TABLE 10: SCALE EFFICIENCY TEST RESULTS IN 2014

Stock Code	Name of Issuer	CRS	VRS	Scale Efficiency
ABDA	Asuransi Bina Daya Arta Tbk	0.516	0.835	0.835
AMAG	Asuransi Multi Artha GunaTbk	1	1	1
ASBI	Asuransi Bintang Tbk	0.503	0.503	0.503
ASDM	Asuransi Dayin Mitra Tbk	1	1	1
ASJT	Asuransi Jaya Tania Tbk	0.361	0.361	0.361
ASMI	Asuransi Mitra Maparya Tbk	0.695	0.702	0.702
ASRM	Asuransi Ramayana Tbk	0.542	0.706	0.706
LPGI	Lippo General Insurance Tbk	1	1	1.0
MREI	Maskapai Reasuransi Indonesia Tbk	0.934	1	1.0
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	1	1	1.0
VINS	Victorian Insurance Tbk	0.524	0.533	0.533
6009	Pacific & Orient Insurance Co. Berhad	1	1	1
5230	Tune Insurance Malaysia Berhad	0.461	1	1
6459	MNRB RetakafulBerhad	0.779	0.868	0.868
I805G	United Overseas Insurance Ltd	1	1	1
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	0	0	0.000
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	0.960	0.974	0.974
R900G	Singapore Reinsurance Corporation Ltd	1	1	1

Source: Data Analysed, 2017

Table 10 indicates that from 20 samples of insurance companies, there are 10 companies that have perfect efficient value. The company consists of 5 insurance companies in Indonesia, 3 in Malaysia, and 2 in Singapore. The efficient companies are Asuransi Multi Artha Guna Tbk, Asuransi Dayin Mitra Tbk, Lippo General Insurance Tbk, Maskapai Reasuransi Indonesia, Paninvest Tbkd.h Panin Insurance Tbk, Manulife Insurance Berhad, Pacific & Orient Co. Berhad, Tune Insurance Malaysia Berhad, United Overseas Insurance Ltd, Singapore Reinsurance Corporation Ltd.

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TABLE 11: INEFFICIENT INDICATORS

Stock Code	Name of Issuer	Year		
		2013	2014	2015
ABDA	Asuransi Bina Daya Arta Tbk	-	OC/CF/C	OC/CF/EC/C
AHAP	Asuransi Harta Aman Pratama Tbk	-	OC/CF	OC/CF/EC/C
AMAG	Asuransi Multi Artha GunaTbk	-	-	-
ASBI	Asuransi Bintang Tbk	OC/CF/EC/C	OC/C	OC/CF/EC/C
ASDM	Asuransi Dayin Mitra Tbk	-	-	-
ASJT	Asuransi Jaya Tania Tbk	OC/CF/EC/C	OC	OC/CF/EC/C
ASMI	Asuransi Mitra Maparya Tbk	-	OC	OC/CF/EC/C
ASRM	Asuransi Ramayana Tbk	OC/CF/EC/C	OC/C	OC/CF/EC/C
LPGI	Lippo General Insurance Tbk	-	-	-
MREI	Maskapai Reasuransi Indonesia Tbk	-	-	-
PNIN	Paninvest Tbkd.h Panin Insurance Tbk	-	-	-
VINS	Victorian Insurance Tbk	-	OC/CF/EC/C	OC/CF/EC/C
1058	Manulife Insurance Berhad	-	-	-
6009	Pacific & Orient Insurance Co. Berhad	OC/CF/EC/C	-	OC/CF/EC/C
5230	Tune Insurance Malaysia Berhad	CF/EC	-	-
6459	MNRB RetakafulBerhad	CF/EC	-	OC/CF/EC
I805G	United Overseas Insurance Ltd	-	-	-
I557L	Raffles Health Insurance PTE. Ltd. / Rafles Medical Group	-	-	-
I527C	Prudential Assurance Co. Singapore (PTE) Ltd	-	-	OC/CF/EC/P
R900G	Singapore Reinsurance Corporation Ltd	-	-	-

Source: Data Analysed, 2017

Notation:
OC   = Operating Cost
CF   = Commission Fee
EC   = Equity Capital
C   = Claim
P   = Premium

Table 11 shows the indicators that generate the company to be inefficient. The test results reveal that there are some companies have inefficiency. In 2013 the indicators that led to inefficiency are operating cost of 20%, commission fee of 30%, equity capital of 30% and claim of 20%. While inefficient companies in 2014 are caused by operating cost of 47%, commission fee of 20%, equity capital of 7% and claim of 26%. Finally, efficient companies in 2015 experienced a decrease in the number coming from inefficiency of operating cost by 26%, commission fee by 26%, equity capital by 26%, claim by 20% and premium by 2%.

TABLE 12: SIGNIFICANCE RESULTS OF ANOVA TEST

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.391	2	.195	4.371	.017
Within Groups	2.547	57	.045		
Total	2.937	59			

Source: Data Analysed, 2017

Table 12 displays the significance value of 0.017, less than 0.05, which means that there are significant differences in efficiency (VRS) among 3 countries, namely Indonesia, Malaysia and Singapore. Hypothesis 1 (H$_1$) which states that there is a difference between the efficiency of insurance companies in Indonesia, Malaysia and Singapore is confirmed. This implies that efficiency is directly proportional to company's performance. A company that has good performance is certainly a company that has value of efficiency. The statement is supported by research organised by Mahmoud (2008) which concluded that there is relationship between efficiency and performance of insurance companies in Greece.

TABLE 13: DESCRIPTIVE RESULTS OF ANOVA TEST

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Indonesia	36	.8081	.25859	.04310	.7206	.8955	.00	1.00
Malaysia	12	.9387	.13669	.03946	.8518	1.0255	.53	1.00
Singapore	12	.9978	.00751	.00217	.9931	1.0026	.97	1.00
Total	60	.8721	.22312	.02880	.8145	.9298	.00	1.00

Source: Data Analysed, 2017

Based on table 13, Singapore become the country with the highest efficiency (VRS) from the period of 2013-2015, which is on average of 0.9978, closest to 1 compared to Malaysia and Indonesia. The descriptive table also indicates that the average value of efficiency in Indonesia is 0.8081, which is lower than the average efficiency in Malaysia about 0.9387. This determines that Malaysian insurance companies are more efficient than insurance companies in Indonesia. The average value of efficiency in Indonesia is 0.8081, which is lower than the average efficiency in Singapore of 0.9978. This means that insurance companies in Singapore are more efficient than insurance companies in Indonesia. The average value of efficiency in Malaysia is 0.9387, which is lower than the average efficiency in Singapore around 0.9978. This implies that insurance companies in Singapore are more efficient than insurance companies in Malaysia.

CONCLUSIONS

The level of technical efficiency of insurance companies in Indonesia, Malaysia and Singapore during the observation period of 2013-2015 shows that there are 4 out of 20 companies which achieve optimum efficiency level or 20% using Constant Return to Scale (CRS) model, this is in accordance with the results research. Efficient insurance companies in Indonesia are 2 companies, Singapore are 2 companies and no efficient insurance companies in Malaysia. The results of the research applying Variable Return to Scale (VRS) model discovers that there are 8 out of 20 companies that accomplish the optimal level of efficiency or by 40%. The number of efficient insurance companies in Indonesia are 5 companies, Singapore as many as 2 companies, and Malaysia just 1 company.

The level of scale efficiency of existing insurance companies in Indonesia, Malaysia and Singapore in 2013 are 60% or 12 companies, which consist of 8 insurance companies in Indonesia, 1 in Malaysia and 3 in Singapore. In 2014, the efficient insurance companies are 60% or as many as 12 companies involving of 5 insurance companies in Indonesia, 4 in Malaysia and 3 in Singapore. In 2015, the efficient insurance companies are 50% or as many as 10 companies consisting of 5 insurance companies in Indonesia, 3 in Malaysia and 2 in Singapore.

The results of data analysis based on anova test reveal that there are differences in technical efficiency (VRS) in insurance companies in Indonesia, Malaysia and Singapore. The average value of efficiency in Indonesia is lower than the average value of efficiency in Malaysia, which means that Malaysian insurance companies

are more efficient than insurance companies in Indonesia. The average value of efficiency in Indonesia is lower than the average value of efficiency in Singapore, which implies that insurance companies in Singapore are more efficient than insurance companies in Indonesia. The average value of efficiency in Malaysia is lower than the average value of efficiency in Singapore, which indicates that insurance companies in Singapore are more efficient than insurance companies in Malaysia.

LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

This research is expected to be beneficial for the company and further research. Company that has not optimal level of efficiency should know the factors that cause the inefficiency. Company's managers can make policies to anticipate the factors that lead to inefficiency in the company, namely operating cost, commission fee, equity capital and claim. Efficient insurance companies can be used as benchmarks in formulating company's strategies or policies to be more efficient as the development of existing potential improvements and also as one of the basic considerations of decision making. Company management should be able to reduce operating cost and commission fee which are the main cause of inefficiency in insurance companies.

The study has limitations using only 3 input and 2 output indicators. Therefore, suggestions for future research are able to use more input and output indicators such as number of policies and total assets. Further research are also expected to be able to add wider sample objects. The sample used in this study only amounted to 20 insurance companies consisting of 12 insurance companies listed on Indonesia Stock Exchange, 4 insurance companies listed on the Malaysian stock exchange and 4 insurance companies listed on the Singapore Stock Exchange. As the results, the next researchers should be able to examine not only listed insurance companies in stock exchange, but also the closed ones. The next researchers also should pay attention to the scale of the company, because the larger company will have higher corporate scale.

REFERENCES

1. Al-Amri, Khalid and Said, Gattoufi. (2012), "Analyzing the Technical Efficiency of Insurance Companies in GCC," The Journal of Risk Finance Emerald Group Publishing Limited, Vol. 13, No. 4, pp. 362-380.
2. Al-Amri and Khalid. (2015), "Takaful Insurance Efficiency in the GCC Countries," Journal Sultan Qaboos University, Vol. 31. No. 3, pp. 344-353.
3. Ansah, Kwadjo, Andoh, Charles and Abor, Joshua. (2012), "Evaluating the Cost Efficiency of Insurance Companies in Ghana," Journal of Risk Finance Emerald Group Publishing Limited, Vol. 13, No. 1, pp 61-76.
4. Banker, R., Charnes, A., and Cooper, W. (1984), "Some Methods for Estimating Technical and Scale Inefficiency in Data Envelopment Analysis," Journal Management Science, Vol. 30, No. 9.
5. Beck, T. and Levine, R. (2004), "Stock Markets, Banks, and Growth: Panel Evidence," Journal of Banking and Finance, Vol. 28, pp. 423–442.
6. Benarda, Sumarwan, Ujang, Muhamad and Nadratuzzaman Hosen. (2016), "Tingkat Efisiensi Industri Asuransi Jiwa Syariah Menggunakan Pendekatan Two Stage Data Envelopment Analysis," (Level of Efficiency Sharia Life Insurance Industry Using Two Stage Data Envelopment Analysis Approach) Jurnal Aplikasi Bisnis dan Manjemen, Vol. 2, No. 1, pp. 64-72.
7. Berger, Allen N. and Humprey, David B. (1992), "Measurement and Efficiency Issues in Commercial Banking in Griliches, Output Measurement in the Service Sector, 56 National Bureau of Economic Research, Studies in Income and Wealth," Chicago: University of Chicago Press.
8. _____ (1997), "Efficiency of Financial Institutions: International Survey and Directions for Future Research," European Journal of Operation Research, Vol. 98, No. 2, pp. 175-212.
9. Chakraborty, Kalyan, Anirban, Dutta and Partha, Pratim S. (2013), "Efficrenc and Productivity of Indian Life Insurance Industry," Journal Asia Pacific Risk and Insurance Association, Vol. 7, No. 1, pp. 1-26.
10. Charnes, A., Cooper, W. and Rhodes, E. (1978), "Measuring the Efficiency of Decision Making Units," European Journal of Operation Research, Vol. 2.
11. Chu, Fen Li (2007), "Problem in Bank Branch Inefficiency: Management, Scale and Location," Asian Journal of Management and Humanity Sciences, Vol. 1, No. 4, pp. 523-538.
12. Coelli, T. J., Rao, D. S., O'Donnel, C. J. and Battese, G. E. (2005), "Introduction to Efficiency and Productivity Analysis (Second Edition ed)," Boston: Springer.
13. Dalkilic, Nilufer and Aysen, Altun A. (2014), "Efficiencies of Life/Pension Insurance Industry in Turkey: An Application of Data Envelopment Analysis," Journal of Applied Finance & Banking, Vol. 4, No. 1, pp. 181-191.
14. Farrell, M. (1957), "The Measurement of Productive Efficiency," Journal of the Royal Statistical Society, Vol. 120, No. 3.
15. Feyen, Erik, Lester, Rodney, and Rocha, R. (2011), "What Drives The Development of The Insurance Sectors?: An Empirical Analysis Based on a Panel of Developed and Developing Countries," Policy Research Working Paper, The World Bank Financial and Private Sector Development, Finance and Policy Units, No. 5572.
16. Hadad, M. D., Santoso, Wimboh, Ilyas, Daniel and Mardanugraha, Eugenia (2003), "Analisis Efisiensi Industri Perbankan Indonesia: Penggunaan Metode Non-parametrik Data Envelopment Analysis (DEA)," (Analysis of the Efficiency of Indonesian Banking Industry: The Use of Non-parametric Methods of Data Envelopment Analysis (DEA)) Penelitian dan Pengembangan Manajemen (PPM) Fakultas Ekonomi Universitas Gajah Mada, Kertas Kerja Bank Indonesia, Yogyakarta.
17. Hasibuan, Malayu S. P. (2005), "Manajemen Sumber Daya Manusia." (Human Resource Management) Jakarta: Edisi Bumi Aksara.
18. Huang, Li-Ying, G. C., Lai and Wen, M. M. (2008), "The Effect of Corporate Governance and Auditor Independence on the Efficiency Performance of the US Life Insurance Industry," Journal of Risk and Insurance, Vol. 78, pp. 519-550.
19. Huri, Mumu Daman and Indah, Susilowati (2004), "Pengukuran Efisiensi Relatif Emiten Perbankan dengan Metode Data Envelopment Analysis: Studi Kasus Bank-Bank yang Terdaftar di Bursa Efek Jakarta Tahun 2002," (Relative Efficiency Measurement of Banking Issuer with Data Envelopment Analysis Method: Case Study of Banks Listed in Jakarta Stock Exchange 2002) Jurnal Dinamika Pembangunan, Vol. 1, No. 2, pp. 95-110.
20. Hwang, T. and Gao (2003), "The Determinants of Demand for Life Insurance in an Emerging Economy the Case of China," Managerial Finance, Vol. 29, No. 5, pp. 82-96.
21. Janjua, P. Z. (2015), "A Comparative Analysis of Economic Efficiency of Conventional and Islamic insurance industry in Pakistan," Journal of Global Business and Economics, Vol. 3, No. 1, pp. 122-137.
22. Julius, Latumaerissa (2011), "Bank dan Lembaga Keuangan Lain," (Banks and Other Financial Institutions) Jakarta: Salemba Empat.
23. Jumingan (2011), "Analisis Laporan Keuangan (Edisi Keempat)." (Financial Statement Analysis (Fourth Edition)) Jakarta: Bumi Aksara.
24. Karim, A. (2007), "Ekonomi Mikro Islam," (Microeconomics of Islam) Jakarta: Raja Grafindo Persada.
25. Kumbhakar, S C. and Knox, Lovell (2000), "The Effect of Deregulation on Performance of Financial Institutions: The Case of Spanish Saving Banks," Journal Department of Economic University of Texas.
26. Kweh, Qian L., Wen, Min Lu and Wei, Kang Wang (2014), "Dynamic Efficiency: Intellectual Capital in the Chinese Non-Life Insurance Firms," Journal of Knowledge Management Emerald Group Publishing Limited, Vol. 18, No. 5, pp. 937-951.
27. Lin, Hsein Da., Ya-Hui, Lee and Meng-Long, Shih (2011), "A Study on Technical Efficiency and Productivity Changes of Taiwan's Life Insurance Industry," Journal National Taitung University Taiwan.
28. Mahmoud, Osama Hanafy (2008), "A Multivariate Model for Predicting the Efficiency of Financial Performance for Property and Liability Egyptian Insurance Companies," Discussion Paper Program, pp. 53-78.
29. Malhotra, Rashmi, Malhotra, D. K. and Akash, Dania (2017), "Evaluating the Health of Life and Health Insurance Companies," Journal Applications of Management Science Emerald Publishing Limited, Vol. 18, pp. 93-108.
30. Mandal, Santanu (2014), "A DEA Investigation of Efficiency of the Indian General Insurance during Recession," Journal of Advances in Management Emerald Group Publishing Limited, Vol. 11, No. 1, pp. 115-136.

31. Muharam, Harjum and Rizki, Puspitasari (2007), "Analisis Perbandingan Efisiensi Bank Syariah di Indonesia dengan Metode Data Envelopment Analysis Periode Tahun 2005," (Comparative Analysis of Sharia Bank Efficiency in Indonesia with Data Envelopment Analysis Method Period Year 2005) Jurnal Fakultas Ekonomi Universitas Diponegoro Semarang, Vol. 2, No. 3, pp. 80-116.

32. Nektarios, Milton and Carlos, Pestana Barros (2011), "A Malmquist Index for the Greek Insurance Industry," The Geneva Papers on Risk and Insurance, No. 35, pp. 309-324.

33. Otoritas Jasa Keuangan (Indonesian Financial Services Authority) (2015), "Statistik Perasuransian, Industri Keuangan Non-Bank," (Insurance Statistics, Non-Bank Financial Industry) pp 1-323.

34. Ozcan, Yasar A. (2008), "Health Care Benchmarking and Performance Evaluation," Springerz: New York.

35. Permono, Iswardono S. and Darmawan (2000), "Analisis Efisiensi Industri Perbankan di Indonesia (Studi Kasus Bank-Bank Devisa di Indonesia Tahun 1991-1996)," (Analysis of Banking Industry Efficiency in Indonesia (Case Study of Foreign Exchange Banks in Indonesia in 1991-1996)) Jurnal Ekonomi dan Bisnis, Vol. 35, No. 1.

36. Purwanti, Anih (2016), "Analisis Perbandingan Efisiensi pada Industri Asuransi Umum Syariah dan Konvensional di Indonesia dengan Pendekatan Two Stage Data Envelopment Analysis," (Comparative Analysis of Efficiency in Sharia and Conventional General Insurance Industry in Indonesia with Two Stage Data Envelopment Analysis Approach) Jurnal Fakultas Ekonomi dan Bisnis Universitas Diponegoro.

37. Rahim, Hendrisman (2013), "Optimisme Pertumbuhan Asuransi Indonesia Proyeksi Perkembangan Lima Tahun (2014-2018)." (Optimism of Indonesia Insurance Growth Projection of Five Year Development (2014-2018)) Jurnal Asuransi dan Manajemen Resiko, Vol. 1, No. 2, pp. 1-21.

38. Rahman, Azizur (2013), "Comparative Study on the Efficiency of Bangladeshi Conventional and Islamic Life Insurance Industry: A Non-Parametric Approach," Journal Asian Business Review, Vol. 2, No. 3, pp. 88-99.

39. Ramanathan, R. (2003), "An Introduction to Data Envelopment Analysis: A Tool for Performance Measurement," New Delhi: Sage Publications.

40. Sedarmayanti (2009), "Manajemen Sumber Daya Manusia, Reformasi Birokrasi dan Manajemen Pegawai Negeri Sipil," (Human Resource Management, Bureaucratic Reform and Civil Servant Management) Badung: PT Refika Aditama.

41. Setiawan, Sigit (2012), "Analisis Sektor Pasar Modal Indonesia Menghadapi Liberalisasi dan Integrasi ASEAN," (Analysis of Indonesia Capital Market Sector Facing Liberalization and ASEAN Integration) Policy Paper Pusat Kebijakan Regional dan Bilateral, No. 2.

42. Sexton, Thomas R., Richard, H. Silkman and Andrew, J. Hogan (1986), "Data Envelopment Analysis: Critique and Extensions In Measuring Efficiency: An Analysis of Data Envelopment Analysis," San Francisco: Jossey-Bass Inc., Publishers.

43. Shafique, M, N., Ahmad, N., Ahmad, H. and Adil, M. Y. (2015), "A Comparative Study of the Efficiency of Takaful and Conventional Insurance in Pakistan," International Journal of Accounting Research, Vol. 2, No. 5.

44. Sun, Wujun and Chen, Zhong (2012), "Cost X-efficiency in China's Insurance Companies: A Stochastic Frontier Approach," African Journal of Business Management, Vol. 5, No. 30, pp. 11916-11924.

45. Sutawijaya, Adrian and Etty, Puji Lestari (2009), "Efisiensi Teknik Perbankan Indonesia Pasca Krisis Ekonomi: Sebuah Studi Empiris Penerapan Model DEA," (Efficiency of Indonesian Banking Techniques Post Economic Crisis: An Empirical Study of the Application of DEA Model) Jurnal Ekonomi Pembangunan, Vol. 1, No. 10, pp. 49-67.

46. Syamsi, Ibunu (2004), "Efisiensi, Sistem dan Prosedur Kerja," (Efficiency, Working System and Procedures) Jakarta: PT. Bumi Aksara.

47. Triandaru, Sigit and Totok, Budisantoso (2006), "Bank dan Lembaga Keuangan Lain, Edisi Dua," (Banks and Other Financial Institutions, Second Edition) Jakarta: Salemba Empat.

48. Umri, Nazmil (2009), "Kinerja Efisiensi Biaya Dengan Metode Data Envelopment Analysis," (Cost Efficiency Performance with Data Envelopment Analysis Method) Jurnal Teknik Industri, Jurnal Teknik Industri Universitas Diponegoro, pp. 1411-6340.

49. Wibowo, S. and Supriadi, D. (2013), "Ekonomi Mikro Islam," (Microeconomics of Islam) Bandung: CV Pustaka Ceria.

50. www.bnm.gov.my (accessed on July 17, 2017)

51. www.bursamalaysia.com (accessed on July 17, 2017)

52. www.dosm.gov.my (accessed on July 17, 2017)

53. www.idx.co.id (accessed on July 17, 2017)

54. www.mas.gov.sg (accessed on July 17, 2017)

55. www.sgx.com (accessed on July 17, 2017)

56. www.singstat.gov.sg (accessed on July 17, 2017)

57. Zhi, Yan and Jin, Li Hu (2011), "A Cross-Strait Comparative Study of Efficiency of Life Insurance Companies: An Application of the Input Slack Adjustment Approach," African Journal of Business Management, Vol. 5, No. 14, pp. 5746-5752.

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