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MARKET STRUCTURE AND DETERMINANTS OF FIRM PROFITABILITY ON GENERAL INSURANCE INDUSTRY IN INDONESIA

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Abstract:

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The purpose of this study is to analyze the market structure of the general insurance industry in Indonesia and the effect of market share, operating expenses to operating income (OEI), and debt ratio (DR) on profitability measured by return on assets (ROA). This study uses panel data regression analysis with the Chow and Hausman test to determine the best model. This analysis uses a combination of cross-section data, which consists of 11 companies, and time-series data, which consists of five years. The results showed that the Indonesian general insurance industry in 2014-2018 took the form of a tight oligopoly with a high concentration level after being analyzed through the four-firm concentration ratio (CR4) and Herfindahl-Hirschman Index (HHI). The average CR4 ratio is 84.77%, while the value of HHI is 3,374.19. Meanwhile, the results showed that based on panel data analysis the OEI variable has a significant negative effect on firm profitability. Also, the debt ratio variable has a significant negative effect on the profitability of general insurance firms in Indonesia. The firm efficiency can be able to increase profits rather than mastery of market share.

Key words: market structure, market share, four-firm concentration ratio, Herfindahl-Hirschman index, oligopoly

1. Introduction

The performance of companies, especially insurance companies, not only plays a role in increasing the market value of the firm but also contributes to the growth of all sectors which ultimately leads to economic prosperity due to an increase in national income. The development of the insurance industry in Indonesia is indicated by an increase in insurance industry assets accompanied by an increase in the number of insurance companies. Existing insurance companies comprise life, general, reinsurance,

social, and compulsory insurance. General insurance is engaged in the service of protection of assets from the occurrence of uncertain events. Based on a report from OJK (2018) the insurance sector had a share of 56.98% in the ownership of non-bank financial industry assets in Indonesia during 2014 - 2018. In 2018, of the types of insurance institutions, general insurance dominated the number of companies at 53.62%. This shows that the general insurance has the ⁵⁹best contribution to the insurance industry in Indonesia. Large investment support is ^{one of the factors} increasing ^{the general insurance industry}. In 2017, the general insurance investment value reached 50.95% of the value of its assets in line with the increase in assets and investments.

An increase in the value of assets and investments indicates that general insurance has increased in the firm's performance. Also, the investment that grew in general insurance companies showed an increase in its existence in the industry. Companies in the insurance industry generally have the same goals as companies in general, namely efforts to increase profits. However, the performance of each insurance firm is different. Most insurance companies listed on the Indonesia Stock Exchange are general insurance companies. By registering on the IDX, insurance companies have no difficulty in obtaining funding, business development, which in turn makes it easier for companies to increase profits.

The process of switching from a closed insurance company to a public company is the first step in the development of insurance company performance in increasing profits. However, in reality between public insurance companies, there are differences in performance so the benefits that can be generated are ³⁸different.

To find out how the company's performance, it is necessary ^{to analyze the market structure and behavior of the public general insurance industry}. The progress of the insurance industry, especially general insurance can encourage the development of the non-bank financial industry which shows the role and position of this industry in addition to the banking industry. Research support for the insurance industry is ^{needed}, which has relatively not been done much compared to research that has been done ^{on the topic of the banking industry}, especially ^{in Indonesia}. However, insurance companies are seen not only as an intermediary that functions to transfer risk but are also useful in providing funds used to support business activities in the economy. However, on this matter, research on insurance has not received much attention especially in developing countries (Mehari & Aemiro, ²²13).

Based on the Structure-Conduct-Performance (SCP) ^{paradigm} ⁴⁸structure and conduct analysis is important. Market structure can explain the market ^{concentration in the industry and the shape of the market}. Conduct will discuss how an industry behaves to achieve its goals. In turn, conduct ^{will affect} how ^{the performance of an industry}.

Market structure tends ^{to} influence conduct, and will further affect the performance of companies in the industry. The SCP paradigm also states there is a direct relationship between industry ^{concentration} and the level of competition between companies. This happens when ^{there is a positive relationship between market concentration and}

performance, regardless of company efficiency measured by market share. Companies in a highly concentrated industry will earn higher profits than companies operating in a less concentrated industry, regardless of efficiency (Shaik et al., 2009).

In analyzing the structure, behavior, and performance in general insurance companies, commonly used variables related to finance. However, research on the general insurance industry has not been sufficient to enrich the literature compared to studies of the banking industry and its efficiency with the SCP approach. Research on the banking industry has been carried out by Sinansari et al. (2017), Jumono et al. (2017), Al Arif and Awwaliyah (2019).

Research on the insurance industry already exists but is still limited, especially in Indonesia. Abidin and Cabanda (2011) conducted a study of non-life insurance in Indonesia using Data Envelopment Analysis (DEA). The results show that larger insurance companies are more efficient compared to smaller companies. But this study does not examine industry concentration and market share. Other research on market power and concentration ratios was conducted by Rokhim (2017). But this research is not specifically about insurance because it is also studied about banking. In contrast, this research does not link to company performance in the industry. Research on the insurance industry was also carried out by Sukpaiboonwat et al. (2014) using the Concentration Ratio and the Herfindahl-Hirschman Index. Also, this research does not relate it to the analysis of the performance of the insurance industry. Meanwhile, research on market concentration and the performance of the insurance industry is relatively widely carried out in developed countries, including research conducted by Çekrezi (2015), Kramaric et al. (2017), Dimić et al. (2018), Batool and Sahi (2019), and Kourtzidis (2020). Although not every research links the market concentration and company performance, there is relatively much attention to the insurance industry in the field of research.

The progress of the insurance industry, especially general insurance in the non-bank financial sector which is not accompanied by adequate research on general insurance, this study seeks to contribute to the literature from the findings obtained. To find out the performance of the industry, the structure-conduct-performance (SCP) paradigm can be applied, where the market structure will influence behavior, which in turn will affect the performance of the industry in increasing profitability. By knowing the structure, behavior, and performance of the general insurance industry, it can be analyzed how the performance of the company will be more efficient. The purpose of this study is to analyze how the market structure in the general insurance industry, and how the influence of market share variables that are elements of the market structure, as well as market behavior namely OEOI and debt ratio to profitability (represented by return on asset, ROA) as an element of public general insurance performance in Indonesia.

2. Literature Review

Based on the development of literature, the SCP paradigm can be the most relevant and widely used approach in the study of industrial structure (Lelissa and Kuhl,

2018). In general, this paradigm looks at the structure of industries and determines their behavior⁵⁸ and performance. The SCP model is a formulation of a framework used to conduct an empirical analysis of the effect of market structures on industrial performance. This model was developed by Mason (1939)¹⁶ and Bain (1956). This framework develops the hypothesis that the observable structural characteristics of the market determine the conduct of the firms,¹⁶ and their conduct affects the measured market¹⁶ performance (Bain, 1951). According to Lipczynski et al. (2013), the SCP paradigm is consistent with the neoclassical theory of the firm. This consistency is seen in the assumption that there is a direct relationship between market structure, firm behavior, and performance.

The market structure according to Trucker (2010) is a market classification system based on the main characteristics which include the number of firms, the similarity of products sold, and the ease of entry and exit from the market. Market structure, according to Salvatore (1998), is distinguished by four types, i.e. (a) perfect competition, (b) monopoly, (c) monopolistic competition, and (d) oligopoly. The concept of a dominant firm, according to Shepherd (1979), is a firm that has a 50-100% market and there are no close competitors. Besides, oligopolies are divided into two, namely tight oligopoly (four leading firms combine 60-100% market share) and loose oligopoly (four leading firms own 40% or less of the market). Furthermore, one of the basic criteria often used in distinguishing various forms of markets is a competitive power. However, in reality, the power of competition or monopoly determines the actual market power. This relative power determines the⁵² benefits for both the buyer and the seller.

The structural characteristics of the industry affect the behavior of firms in a market (Mohamed et al., 2013). Market behavior is the pattern of behavior followed by companies in adapting to the market where they conduct business activities of selling or buying. Furthermore, Scherer and Ross (1990) suggested that the behavior in the SCP paradigm are actions that include product strategy, innovation, and advertising by the firm. As a further elaboration, Ferguson and Ferguson (1994) suggests that behavior is aimed at focusing on how firms set prices, whether independently or with collusion with other firms in the market. Besides, behavior concerns about how firms decide on their advertisements, how much research budget and expenditure is devoted to firm activities. The merger is one of the factors that influence market concentration which in turn influences firm behavior (Shepherd & Wilcox, 1979). When market concentration increases due to firm mergers, competition in the market will decrease. Merged firms will have greater market power over prices.

¹¹ In the SCP model, market performance is related to market structure and firm behavior, which are related to pricing, product policies, and profitability (Bain, 1956), productive and allocation efficiency (Neuberger, 1997). Also, according to Lipczynski et al. (2013), the size of growth is considered as important performance indicators in the SCP model. Performance is measured by comparing the results of firms and industries concerning price, quantity, product quality, allocation of resources, production efficiency, etc. (Neuberger, 1997). In accounting concepts, performance measures are represented

by ratios such as ROA, ROE, NIM, etc. On the other hand, according to Hay and Morris (1991) market performance concerns price levels, profit margins, investment rates, return on investment, etc.

In the financial literature, the concept of profitability becomes very important for companies, especially since the emergence of the dividend irrelevance theory by Miller and Modigliani which states that the company's performance is based on its basic ability to generate profits and deal with the business risk (Susilo et al., 2020). Insurance market indicators, one of which is about market concentration, and profitability and income generation are used as the first indicators in a survey conducted in a study conducted by Kwon and Wolfram (2016) related to analytical tools for the insurance market and macro-prudential surveillance. This shows the importance of market concentration and the performance of companies in the insurance industry in research that is useful to assist government policy. This research is important for insurance regulators and supervisors for market and macro-prudential surveillance, along with the growth of the insurance sector in a country.

By using a variety of corporate financial variables from various aspects, the firm's performance that is affected generally uses the variable of ROA and ROE, especially in the financial institution sector. However, in a recent study the performance of financial firm is open to use the concept of efficiency as in research conducted by Ullah (2020). In the banking sector, the results of the study by Jumono et al. (2017) shows that market concentration has a significant effect on basic earning power (BEP) and return on equity (ROE), while market share has no significant effect. According to these results, the banking industry in Indonesia is in collusive and inefficient condition. Research by Al Arif and Awwaliyah (2019) found that market share and concentration ratio did not affect the profitability of the Islamic banking industry in Indonesia. In their findings, there is no indication of collusive behavior in the Islamic banking industry. Also, it was found that the variables of financing to deposit ratio, non-performing financing, and operational efficiency ratio negatively affected the performance of the Islamic banking industry.

In research related to the insurance industry sector, by using the Concentration Ratio and the Herfindahl-Hirschman Index, the results of a study conducted by Sukpaiboonwat et al. (2014) concluded that the life insurance industry is more concentrated than the non-life insurance industry. Furthermore, in both insurance market segments and also in the insurance sector as a whole, there is a tendency to decrease market concentration. This result implies that the competitive promotion process was successful which made it possible for customers to have wider and better choices. Other literature related to studies of concentrations in the insurance industry was conducted by Dimic et al. (2018). This study aims to determine the level of concentration in the insurance sector in eight countries including Southern and Eastern Europe. The results of the study show that the insurance sector in the countries analyzed is highly concentrated on average (according to CR4) and moderately concentrated (according to HHI). Another study by Jaloudi and Bakir (2019), which found that the insurance industry in Jordan is highly

concentrated, where several insurance companies that have a large market share to control insurance premiums.

A study by Kramaric (2017) analyzed the effect of specific variables of insurance companies, specific insurance industries, and macroeconomics on insurance market performance as represented by ROA and ROE variable. The results of the study using the static panel model showed that the age variable had a positive and significant effect on performance as measured by ROA and ROE. Besides, another variable that significantly influences performance measured by ROE is real GDP per capita growth which has a positive effect. The results of research conducted by Abidin and Cabanda (2011) show that the captive market, listed public companies, and government ownership do not affect the efficiency performance resulting from the measurement of the Data Envelopment Analysis (DEA) model. The large insurance companies are more efficient than smaller companies. Furthermore, there is a positive relationship between profitability and the value of DEA, except ROA. The results of this study provide insights on how to measure the efficiency of the insurance industry apart from traditional accounting methods, although it can still link with financial ratios, such as ROA and ROE.

In addition to market share variables, several studies have found evidence of the effect of operating costs and debt which harm company performance, particularly financial institutions such as banks and insurance. Several studies have provided evidence that operational cost factors negatively affect company performance. The study conducted by Mujiatun and Handayani (2018) obtained the results of the study that the variable of the ratio of operating cost and operating income harms ROA. Likewise, a study by Radhika and Satuluri (2019) found a negative effect on operational costs on the profitability of life insurance companies. The higher operational costs relative to operating income will result in reduced profits earned by the firm. The decline in profits earned indicates a decrease in profitability for the firm. Also, several empirical studies have proven that financial ratios involving debt negatively affect company performance. Research by Onaolapo and Kajola (2010) provides evidence that the debt ratio harms company performance as measured by ROA and ROE. Besides, a study conducted by Omondi and Muturi (2013) shows that the leverage variable (debt-equity ratio) has a significant negative effect on financial performance (as measured by ROA). Increasing the proportion of debt in firm financing based on this literature will reduce firm profitability.

3. Research Methodology

The analysis of the structure of the general insurance industry in this study uses a concentration ratio that is the ratio of the four largest asset ownership companies, and the Herfindahl Hirschman Index. The use of market share, OEI, and DR variables in regression analysis is based on structure conduct performance theory in analyzing factors that influence performance differences. Market share is used because it is an element of the industrial structure, where the market share in this study is market dominance by

comparing the total assets of each company against all company assets in the general insurance industry. Some previous studies that used market share variables are research conducted by Jumono et al. (2017), Al Arif and Awwaliyah (2019). Furthermore, operating expenses to operating income (OEI) and debt ratio (DR) variables are used as elements of industry behavior in influencing profitability. Variables involving elements of operational costs have been carried out among others in the research of Mujiati and Handayani (2018) and Radhika and Satuluri (2019). Meanwhile, variables related to debt for companies in this study were also carried out among others in studies by Onalapo and Kajola (2010) and Omondi and Muturi (2013). The OEI ratio analyzes how a company behaves efficiently by reducing operating costs and increasing operating income. Then, the debt ratio is analyzed to determine the company's behavior in the use of assets funded by debt will affect the level of profitability. Profitability in this study was measured by return on assets (ROA). The use of ROA in insurance company performance research is similar to studies conducted by Ekrezi (2015), Kramaric et al. (2017), and Batool and Sahi (2019). The definitions of the variables used in this study are presented in Table 1.

Table 1: Variables in the Research Model

Variables	Description
CR4	Four-firm concentration ratio (CR4) is the percentage of market share achievement of the four largest firms towards the achievement of the total industry
HHI	Herfindahl-Hirschman Index (HHI) is the sum of the squared market share results of each firm in an industry
ROA	Return on assets (ROA) measures the level of profitability in public general insurance companies, which is calculated as the ratio between profit before tax and total assets
MS	Market share (MS) is the market part that is controlled by a company, which is the percentage of total achievements of one public general insurance company from all sources of total achievements in the public general insurance industry
OEI	Operating expenses to operating income (OEI) used to measure the level of company efficiency, which is the ratio between operating costs and operating income
DR	The debt ratio (DR) used to measure the efficiency of a company in managing its solvency ratio, which is the ratio between total debt and total assets

Raw data obtained from www.idx.co.id and www.ojk.go.id, 2014 – 2018.

The concentration ratio can be expressed as a percent or ranging from zero to one. The closer to zero the value of concentration, the market share, and the role of some largest N companies, the smaller in the industry. Then, the value of concentration getting closer to one indicates that market share and the role of some N largest companies, the greater in the industry. Interpretations of concentration ratio values can be presented in Table 2, while interpretations of HHI values can be shown in Table 3.

Table 2: CR4 Classification

Value of CR4 (%)	Category	Interpretation of Market Structure
CR4 = 0	Minimum	Perfect Competition
0 < CR4 < 40	Low	Effective competition or monopolistic competition
40 ≤ CR4 < 60	Middle down	Monopolistic competition or loose oligopoly
60 ≤ CR4 < 90	Middle up	Tight oligopoly or dominant firm with a competitive fringe
90 ≤ CR4 < 100	High	The dominant firm with competitive fringe or effective monopoly (approaching monopoly)
CR4 = 100	Maximum	Perfect monopoly

Source: Gwin (2001)

Table 3: HHI Classification

Value of HHI	Category	Interpretation of Market Structure
HHI < 1500	Unconcentrated Markets	Effective competition
1500 ≤ HHI ≤ 2500	Moderately Concentrated Markets	Monopolistic competition
HHI > 2500	Highly Concentrated Markets	Oligopoly, dominant firm with competitive fringe, or monopoly

Source: Gwin (2001), U.S. Department of Justice and the Federal Trade Commission (2010)

This study uses a panel data regression model consisting of time series data and cross-section data. The panel data estimation technique includes heterogeneity of general insurance companies. This analysis uses a combination of cross-section data, which consists of 11 companies, and time-series data, which consists of five years. By combining time-series observations and cross-sections, panel data provides more informative data and greater variability, but low collinearity between variables has a greater and more efficient degree of freedom (Gujarati and Porter, 2009). In general, the panel data regression model in this study is:

$$ROA_{it} = \alpha_{0it} + \alpha_1 MS_{it} + \alpha_2 OEOL_{it} + \alpha_3 DR_{it} + \mu_{it}$$

With expected parameters:

$$\alpha_1 > 0; \alpha_2 < 0; \alpha_3 < 0$$

Where:

ROA_{it} = Profitability (*Return on Total Assets*)

α_{0it} = Constant

$\alpha_1, \alpha_2, \alpha_3$ = Parameters

MS_{it} = Market share

$OEOL_{it}$ = Operating expenses to operating income

DR_{it} = Debt ratio

μ_{it} = error term

Several models can be used to estimate the regression model with panel data. Three models that can generally be used are the common effect model (CEM), fixed effect

model (FEM), and the random effect model (REM). First, the common effect model is the simplest panel data estimation model, which is only by combining time-series data and cross-sections. The merging of data does not consider differences between time and individuals so that it can use the ordinary least squares (OLS) method to estimate panel data models. Second, the fixed effect model is a fixed effect regression model that controls all time-invariant variables. This model is also called the Least Square Dummy Variables. Finally, the random effect model is used to overcome the weaknesses of the fixed effect model that uses dummy variables that cause uncertainty. This model uses a composite error term consisting of two components, namely which is an error component of a cross-section, or individual-specific, and which is a component of a time series and cross-section error combination, and is sometimes called an idiosyncratic term because it varies in cross-section (subject) and time.

5 The selection of the fit regression model is determined by various techniques. The Chow test is used to test whether the common effect model data regression panel is better used than the fixed effect model. The test is based on the F-test with the degree of freedom $N - 1$, $N(T - 1) - K$, according to Baltagi (2005) where N = number of individuals and K = number of independent variables. This test is carried out on the following hypotheses:

H_0 : The model is a common effect

H_1 : The model is a fixed effect

The basis for accepting the hypothesis uses F-test. If the p-value is less than 0.05 then reject H_0 which means the fixed effect method is more appropriate than the common effect.

5 Next, the Lagrange multiplier (LM) test is used to decide whether the random effect model is more appropriate than the common effect model. The LM test is based on the residual value of the common effect (OLS) method. Hypothesis testing is carried out with the following hypotheses:

H_0 : The model is a common effect

H_1 : model is a random effect

The LM test is based on the distribution of χ^2 (Chi-Square) with degrees of freedom (df) of the number of independent variables. If the p-value is less than 0.05 then accept H_1 which means the random effect method is more appropriate than the common effect. If the previous Chow test rejects the null hypothesis then this LM test is not required and performs the Hausman test.

45 Finally, the Hausman test is used to test which is more appropriate between the fixed effect and random effect models. The Hausman test follows the statistical distribution of chi-squares with a degree of freedom of k , where k is the number of independent variables. This test can be done with the following hypothesis (Gujarati and Porter, 2009):

H_0 : the FEM and REM estimators do not differ substantially

H_1 : the FEM and REM estimators differ substantially

The test statistic developed by Hausman has an asymptotic χ^2 (Chi-Square) distribution. If the null hypothesis is rejected, the conclusion is that the REM is not appropriate because

the random effects are probably correlated with one or more regressors. In this case, FEM is preferred to REM.

4. Results and Discussion

The value of assets and investments of general insurance in Indonesia increases from year to year. The increase in both of them resulted in variations in the ratio of investment to assets in that period as shown in Figure 1. Decreased slightly in 2014, but in the next three years, there was an increase in the ratio of investment to assets. Although declining again in 2018, this ratio is still higher than in 2016. An increase in assets indicates that the general insurance company experienced an increase in the company's performance. On the other hand, increasing investment in general insurance companies shows an increase in existence in developing their business.

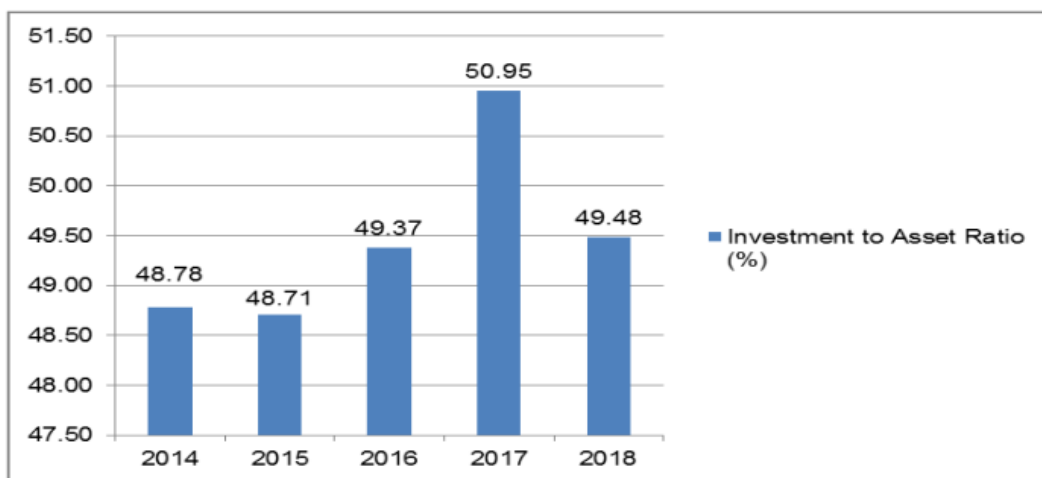


Figure 1: Investment to Asset Ratio of General Insurance Companies (%), 2014 – 2018

Source: Author's data analysis

Increasing the value of a company's investment will provide opportunities to obtain investment returns. Increased investment returns can encourage income levels for insurance companies. The increase in income will further increase the company's profitability. As a risk insurer, investment activities are vital in supporting the company's underwriting and solvency capabilities. Through investment, the premiums obtained by the company strive to provide optimal returns for the smooth company's operating cash flows in the future.

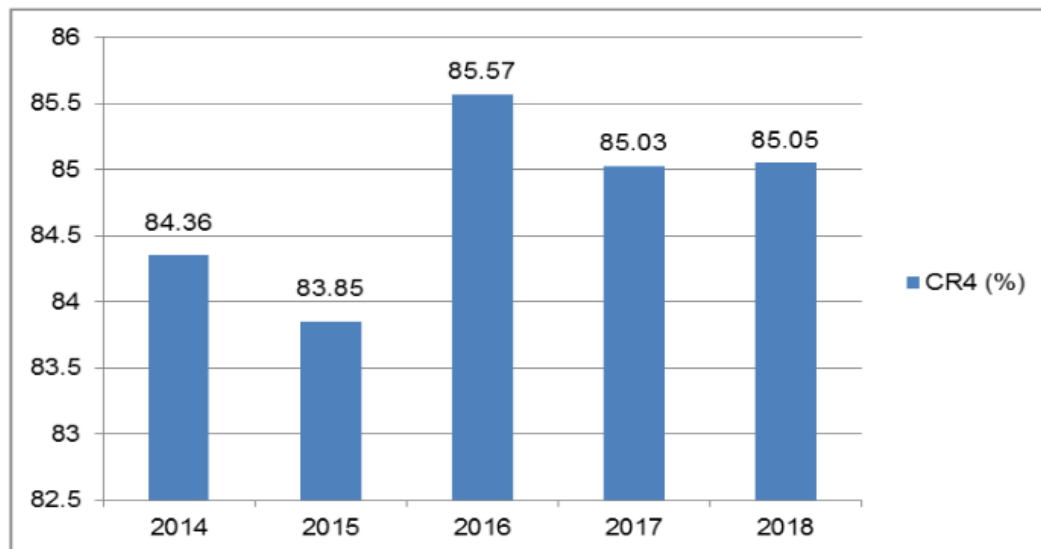


Figure 2: Four-Firm Concentration Ratio of General Insurance Industry (%), 2014 – 2018

Source: Author's data analysis

The results of the calculation of the market concentration for general insurance companies obtained the results shown in Figure 2 and Figure 3. Figure 2 shows the variations and changes in the value of CR4. Large variations occurred in the period 2014-2016 when the CR4 value fell and then rose. Indications of decline have occurred since 2016. However, variations and changes in CR4 values are quite small. From 2014 to 2018, the average CR4 was 84.77%. Based on the CR4 classification according to Gwin (2001), the average value of CR4 is included in the middle up category and means that the general insurance industry is included in a tight oligopoly.

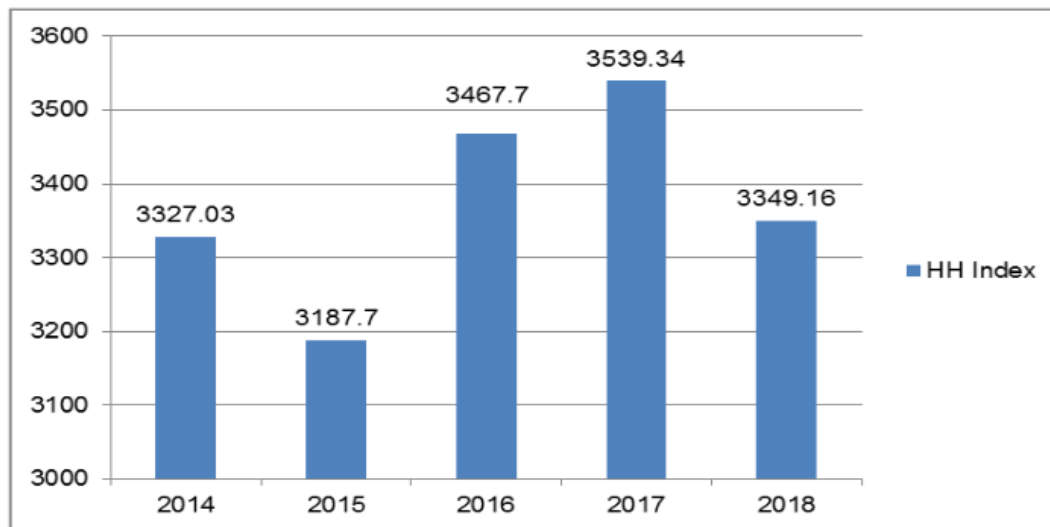


Figure 3: Herfindahl-Hirschman Index of General Insurance Industry (%), 2014 – 2018

Source: Author's data analysis

The results of calculations in the analysis of market concentrations according to HHI values of the public general insurance industry are shown in Figure 3. Variations and patterns of changes in HHI values in the period 2014 - 2018 show similarity to the results of the analysis using CR4 values. Differences only occur in 2017. But overall the pattern of changes in CR4 and HHI values tends to be similar. The average value of HHI in the period 2014 - 2018 is 3,374.19. Based on the classification according to Gwin (2001) and the U.S. Department of Justice and the Federal Trade Commission (2010), the average value of HHI is included in the category of highly concentrated markets, and its meaning is included in oligopoly. These results are similar to the results of a study conducted by Acosta (2014) in the insurance industry in Colombia during the 2007 - 2011 period with an average HHI value of 3,230. The difference is that the value of HHI from studies in Colombia is more varied. The results of this study are also in line with the results of research by Dimic et al. (2018) and Jaloudi and Bakir (2019). Research by Dimic et al. (2018) using CR4 and HHI found a highly concentrated market in the insurance industry in Southern and Eastern European countries. Meanwhile, research by Jaloudi and Bakir (2019) based on the concentration ratio of five large firms (CR5) and the Herfindahl Hirschman index of the insurance industry in Jordan found that the insurance industry market structure is an oligopoly with a high concentration level. In general, the level of market concentration for the insurance industry both in the results of this study and previous research shows a higher tendency compared to the banking industry, especially in Indonesia. This conclusion can be drawn based on comparison with the results of a study conducted by Jumono et al. (2017), Sinansari et al. (2017), and Rokhim (2017).

The results of the panel data regression model estimation as shown in Table 4 show that the fixed effect is the best estimation model. Based on the Chow test the fixed effect model is more appropriate than the common effect model, whereas based on the

Hausman test, the fixed effect model is more appropriate than the random effect model. The p-values in both Chow and Hausman tests reject the null hypothesis. So based on the Chow test and the Hausman Test, the fixed effect model is the most appropriate. Estimates of this model give results that the variables of OEOI and debt ratio have a significant negative effect on the profitability of general insurance companies and this relationship is following theoretical logic.

Table 4: Results of Panel Data Regression with ROA as a Dependent Variable

Variable	Common Effect		Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	12.8957	0.0000	23.6337	0.0000	18.7718	0.0000
MS	0.0310	0.1236	-0.1015	0.6102	0.0209	0.3823
OEOI	-0.0902*	0.0003	-0.1767*	0.0000	-0.1524*	0.0000
DR	-0.0130	0.4481	-0.0582*	0.0478	-0.0253	0.1619
R ²	0.3240		0.8084		0.5727	
Adjusted R ²	0.2842		0.7477		0.5475	
F-statistic	8.1483	0.0001	13.3084	0.0000	22.7827	0.0000
AIC	4.0971		3.1999			
SIC	4.2431		3.7109			
J-B	1.6869	0.4302	4.7741	0.0919	1.5357	0.4640
D-W stat	0.7510		1.6173		0.9179	

N = 11, T = 5

*significant at $\alpha = 5\%$

Source: Author's data analysis

The estimation of the fixed effect model shows that the variables of OEOI and the debt ratio are significant and pass the F-test and t-test. The normality test with J-B statistics proves that the fixed effect model meets the normality assumption. Through the Glejser test, the fixed effect model fulfills the homoscedastic assumption. Even only the fixed effect model fulfills the no autocorrelation assumption when the Durbin-Watson stat (DW-stat) value accepts a null hypothesis that there is no autocorrelation. Based on the Breusch-Godfrey serial correlation LM test, the fixed effect model also fulfills the assumption of no autocorrelation. The fixed effect model in particular is also better than the common model based on the lower Akaike's Information Criterion (AIC) and Schwarz's Information Criterion (SIC) values. This criterion is following the criteria stated in Gujarati and Porter (2009). In terms of the ability of the model to explain variations in ROA and goodness of fit of the model, the fixed effect model has the highest R² and adjusted R² values so that it becomes the most appropriate model.

The market share variable in this study did not significantly influence profitability as measured by ROA. The results of this study are similar to the findings of studies from the banking sector by Jumono et al. (2017) and Al Arif and Awwaliyah (2019). The insignificance of market share on firm profitability indicates that the SCP hypothesis is not proven. This conclusion is in line with the findings of a study by Mala et al. (2019). However, the results of this study are in line with the efficient structure hypothesis discussed in the study by Demsetz (1973). This theory assumes that market share and

market concentration are not elements of market power, but the efficiency that will bring the firm to power in an industry. As Van Hoose (2019) states that if profitability is not influenced by market power, then the industry tends not to experience collusion. Therefore, high concentration is not the result of collusion but the result of the efficient behavior of a firm that has a large market share. Thus, a firm has a high profit that results from its efficiency behavior.

In this study, the variables of the OEOI and debt ratio have a significant negative effect on ROA. The results of this study are in line with the results of the study by Mujiatun and Handayani (2018) and Radhika and Satuluri (2019). Therefore, the results of this study prove the logic of the theory that the greater the operational costs relative to its income, the less profit obtained by the general insurance company. Meanwhile, the significant negative effect of the debt ratio variable on ROA in this study is in line with the results of the study by Onaolapo and Kajola (2010) and Omondi and Muturi (2013). The greater the proportion of financing originating from debt, the more risky business activities carried out by the firm, including insurance firms, have an impact on profitability. Also, the use of debt at a firm that is used to finance less productive assets and has a low rate of return will reduce profits. Thus, an increase in the ratio of debt to total assets can be concluded negatively affecting the profitability of general insurance companies.

5. Conclusion and Policy Implication

The Indonesian general insurance industry in 2014-2018 took the form of a tight oligopoly after being analyzed through the CR4 and IHH ratios. The CR4 and HHI calculation results indicate that the market structure in the general insurance industry is a tight oligopoly with a high level of concentration. The market structure is evidenced by the control of assets by a few companies in an industry, resulting in the inequality of assets in the industry.

The results indicate that the profitability of general insurance companies is not influenced by the maturity of assets, but rather the efficiency factor in managing the company. Efficiency is a key factor in increasing the profitability of the general insurance industry. The greater the operational costs incurred by companies that are not accompanied by an increase in operating income, it will reduce the level of profit generated by the general insurance company. Besides, the increased debt ratio of general insurance companies affects the decline in profits generated. This is because the financing of assets comes from risky debt, thereby affecting the profits generated. Overall, the results of this study conclude that the SCP hypothesis is not supported in the insurance industry in Indonesia. Instead, these results make more sense concerning the efficient structure hypothesis.

Concerning the structure of the insurance industry which tends to be concentrated, the government through the Financial Services Authority (OJK) and the Business Competition Supervisory Commission (KPPU) can improve coordination in supervision, especially of the insurance industry. Optimization of supervision by the two

institutions is expected to prevent practices in the insurance industry leading to mastery and dominance that encourage unfair business competition. On the other hand, policy recommendations for business in public general insurance companies should continue to focus on efficient companies, choose the right investment, and optimize sources of financing by utilizing the capital market as a public company rather than using sources of debt.

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