Analysis of Food and Beverage Industry in Indonesia using Structure, Conduct and Performance (SCP) Paradigm

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Abstract: One of the "Nawacita Programs" Indonesian government is to realize economic independence by moving the strategic sectors of the domestic economy and sustainability resilience of the food and beverage industry. This paper attempt to illuminate of Indonesia's food and beverage industry using structure, conduct and peforrmance (SCP) paradigm.

We employed Concentration Ratios (CR4), Minimum Efficiency of Scale (MES), Efficiency - X (XEF) and Output Growth to Price Cost Margin (PCM) with analysis data panel. We used value added and wages data on ten food and beverage industry where listed in Indonesia's Stock Effect on year 2010 until 2015.

The structure of food and beverage industry suggested that an oligopoly with high concentration has been found, albeit declined slightly over period 2010 – 2015. It is also with the Minimum Efficiency of Scale (MES) showed a decrease barriers to entry. It's mean the food and beverage industry in Indonesia not competitive.
Based on analysis market performance; the highest value of Price Cost Margin during the past 15 years for food and beverage industry in Indonesia's are the PT. Multi Bintang Indonesia Tbk, PT. Prashida Aneka Niaga Tbk and PT. Light Wilmar Indonesia Tbk with the output value is higher than the other companies.

In S-C-P theory, if CR4, MES and Growth decreased then the Efficiency-X will increase, it's causing Price Cost Margin increased. Variable Price Cost Margin (PCM) is positively and significantly influenced by Efficiency-X (XEF). While variable CR4 and MES as a proxy of market structure and, Growth as a proxy on performance the food and beverage industry in Indonesia does not affect to the PCM. This means that food and beverage industry in Indonesia is not influential as a competitive.

Keywords: SCP, PCM, Oligopoly, Industry

Introduction

Sustainable development is development that emphasizes the optimal economic activity and keep the preservation of natural resources wisely; sustainabilty and improving the quality of life for generations. Sustainable development is development that trying to meet the needs of today without reducing the ability of future generations to meet their own needs. (WCED, 1987). In line with the objectives of sustainable development, Indonesia within the framework of SDGs supporting of sustained industrialization as contained in the pillars of its economy. Because of that, Indonesia has the potential of natural resources sizeable derived from agriculture, fishing/marine, livestock, crops and forestry, which can be utilized in producing food and industry processing. The target of industry growth in 2016 reached 5.7 percent. That target is above the target of economic growth is 5.3 percent (Ministry of Industry, 2015). Until the third quarter of 2015, the growth of non-oil and gas processing industry amounted to 5.21 per cent, higher than in a similar period of economic growth in 2014 by 4.73 percent. Meanwhile, the contribution of non-oil and gas industries to the national GDP is expected at 18.5 percent.

One of subsector non-oil processing industry has an important role in sustaining the economy in Indonesia throughout 2014 is the food and beverage industry (Suryamin, 2015). Export data for food and beverage industry from the Ministry of Industry, in the years 2012 - 2015 are increased as noted in table 1. The data shows that the food and beverage industry provides a stable increase in numbers during the period 2012 - 2015.

This makes the food and beverage industry was ranked 6th out of 10 groups the largest export of non-oil processing industry in Indonesia's.

Table 1
Export of data per sub-sector in 2012 - 2015

(in US$)

Kelompok Hasil Industri	2012	2013	2014	2015	Peran Th. 2015 (%)
1. Pengolahan Kelapa/Kelapa Sawit	23.396.998.187	20.660.402.210	23.711.550.465	20.746.988.848	19,45%
2. Besi Baja, Mesin-mesin dan Otomotif	15.029.612.806	14.684.401.500	15.813.518.294	14.455.370.329	13,55%
3. Tekstil	12.446.506.596	12.661.681.508	12.720.312.060	12.262.652.678	11,50%
4. Elektronika	9.444.056.939	8.520.124.647	8.066.889.542	6.913.161.552	6,48%
5. Pengolahan Karet	10.818.624.881	9.724.133.106	7.497.549.404	6.171.408.596	5,79%
6. Makanan dan Minuman	4.652.902.475	5.379.821.652	5.554.396.593	5.597.294.145	5,25%
7. Pulp dan Kertas	5.517.965.818	5.643.997.372	5.498.591.201	5.332.165.164	5,00%
8. Pengolahan Kayu	4.539.877.317	4.727.650.015	5.202.156.290	5.188.507.332	4,86%
9. Peng. Emas, Perak, Logam Mulia, Perhiasan dll.	2.185.993.514	2.031.240.428	3.671.788.964	4.721.732.433	4,43%
10. Kulit, Barang Kulit dan sepatu/Alas Kaki	3.561.683.101	3.933.060.116	4.090.311.532	4.615.452.060	4,33%

Sumber: www.kemenperin.go.id, 2016

The contribution of food and beverage industry to the economy of the nation are continues to increase through productivity exports from 2012 - 2015. In other hand, the barriers of the food and beverage industry in Indonesia is foreign manufacturers from abroad, that can produce more good, because it has some advantages over domestic producers.

The implementation of the Asean Economic Community, also affect to barriers on food and beverage industry in Indonesia to continue to grow. In order not to merely be a market of neighboring countries in the implementation of the Asean Economic Community, the Ministry of Industry seeks to improve the performance of the food and beverage industry in Indonesia through the concept of improved standards of products through the application of SNI, improving the quality of human resources through the implementation of SKKNI, acceleration of infrastructure development, as well as R & D. Meanwhile, for medium and large industries, the contribution of food and beverages industry on national income has accomodate from the power of labor. Therefore, the position of the food and beverage industry is very important for Indonesia. Based on Setyawan et. al (2012), there are simultaneous between industrial concentration, price rigidity, technical efficiency, and price-cost margin on food and beverage Industrial

This paper attempts to analyze of food and beverage industry using structure-conduct –performance (SCP) and influence to PCM. It will address to following fundamental questions: to what extent structure, conduct and permance of food and beverage industry in Indonesia and the influence of SCP from Concentration Ratios (CR4), Minimum Efficiency of Scale (MES), Efficiency - X (XEF) and Productiviy to Price Cost Margin (PCM)

Research Limitations

The authors difficult to obtain data from each of the food and beverage companies that have not been listed in the Indonesia Stock Exchange due to the food and beverage companies that have not registered are not willing to provide the data required for this study on the grounds that data can only be viewed by a company official. Therefore, the author can only use data that has been published by the Indonesia Stock Exchange.

Literature Review

Central Bureau Stratistik of Indonesia (2015) define of industry is a production unit or entity that is located at a particular place which conducts change of goods - goods mechanically or chemically so that it becomes the object or goods and products - products that are closer to the end consumer.

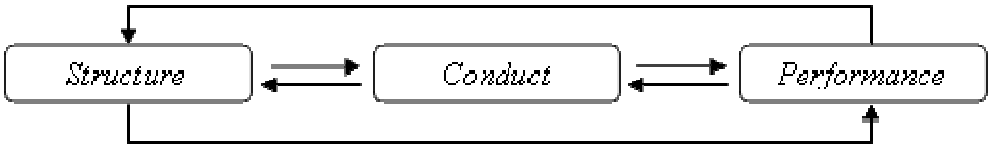
Based on Law No. 3 in 2014, industry is all forms of economic activity that processes raw materials and/or take advantage of industry resources to produce goods that have added value or higher benefits, including industrial services.

Structure – Conduct – Performance (SCP)

The performance of an industry is basically very influenced by the structure of the market. The structure of the market showed that the market attributes affect the nature of the competition process. Elements of market structure include: concentration, product differentiation, barriers to entry into the market, cost structure and the

level of government regulation. The market structure is important, because it determines the behavior and strategy of the company in an industry and then the behavior will affect the performance (Jaya, 2008).
Furthermore, the performance has an influence on the formation of structure. Relations between Structure - Conduct - Performances as quoted from Talattov (2010) are illustrated in the following figure 1.

Figure. 1: The Relations of Structure - Conduct - Performance (SCP)



Sources: Talattov, 2010

Harre and Pirscher (2009 : p 24) said, the SCP method allows systematic data analysis and assessment of causal links between important variabel in food industry. The term of market structure donates the features of a market that may affect the behavior and performance of the firm in the market see figure 2 below:

Figure 2: Overview of the Indicators used for SCP variabels

Market Structure	Conduct	Performance
• Firm size and development • Concentration in large enterprises • Cost Structure	• Investment • FDI • R & D	• Growth • Employment • Productivity Stability of Price • Profitability

Source: Harre and Pirscher (2009; p 24)

Lun (1983) in Lun and Martin (1986 : p 33) argues that one should expect a positif relationship between index market power and R & D; under an attenuated property rights system with positives monitoring cost, firms with market power maybe better able to monitor the use of innovation than firm in competitive industries. So that, market share and market concentrations to have positive affects on R & D intensity.

Structure

The market structure is a variable to determine the behavior of firms and the interaction between behavior and determines of market performance. Furthermore, the performance has an influence on the formation of structure.

The market structure showed the competitive environment between the demand and supply through the process of price formation in the market. The market structure has some important elements ie market share, market concentration and barriers to entry. These elements describe the measures companies-firms that compete to the market (Jaya, 2008).

Elements of market structure

1. *Market Share*, Each company has its own market share, than amount of rank from 0 to 100% of the total sellers across the market.
2. *Concentration Levels*. Industry concentration is used to determine the degree of oligopoly structures that occur. At the time of the industrial market is concentrated, the relative market that industry can create greater revenues and faster growth. So that the relationship between the concentration ratio and the company's growth is positive.

Conduct.

Conduct defined as a pattern of response and adjustment of an industry in the market to achieve its objectives (Hasibuan, 1993). According to Martin (2002) the conduct of the company in industry will be attractive to observed if the company has imperfect structure. The structure of industry perfect competition make the companies do not have the power to determine the market price.

Market conduct can be influenced by market structure affecting internal organization the company's (labor policies, working conditions, factors that influence the allocation of corporate resources and products manufactured for later offered by the company). Market conduct can be seen from the design and product

differentiation owned, how to determine of pricing, and strategies. Policy will be taken by a company then it will affect a lot of things. In an oligopoly market, the conduct each company are difficult for estimated.
In general, the companies that dominate the market have similar behavior to the monopolist, it's increasing the prices to make a profit. Unlike the case with a perfectly competitive market conditions in which the company is a price taker (Jaya, 2008).

Performance.

The structure and conduct could lead to the emergence of specific performance. Some aspects included in this performance measure is the rate of profit, efficiency and progress that can be achieved by companies in the industrial market. Performance an industry can be defined as an idea of how far the economic returns can be achieved the industry. As a whole, performance in the economy is an assessment of how an industry has reached the objectives to be achieved, among others, is an efficient economy, full employment and equitable economy.

Previews studies

The previous study that discusses the approach to analysis Structure - Conduct - Performance of industry or related to this study are:
Citra (2006), analyzing Instant Noodle Industry in Indonesia. The results of this study indicate that the market structure of the instant noodle industry in Indonesia is a tight oligopoly. From the result of regression is that CR5 negative impact and no significant effect on PCM. While the X-efficiency variable significant to PCM. Sarifah (2007), analyzing the Industry of bottled water in Indonesia shows the market structure of bottled water industry in Indonesia is a loose oligopoly. From the analysis of the relationship between the structure and other factors that affect performance. The variables that influence on PCM is the X-Eff variable and CR5, while the growth has no effect on PCM. Sunengcih (2009), analyzing the Soft Drinks Industry in Indonesia. The result of regression, is the CR5 and Growth did not have a significant effect to PCM. While the variable X-efficiency has significant efforts to PCM. Putra (2009). analyze Structure, Conduct and Performance Pulp and Paper Industry in Indonesia. The results of this study indicate the structure of market pulp and paper industry in Indonesia is a tight oligopoly. From the analysis of the relationship between the structure and other factors that affect performance, X-Eff, MES, the growth rate of production and export, while the CR4 and economic crisis has no effect. Yolanda (2015) with analyis of Structure - Conduct - Performance Food Industry in Indonesia. The results showed the food industry market structure in Indonesia is a loose oligopoly. From the analysis of the relationship between the structure and other factors that affect to performance is X-Eff and growth variable, while CR5 no effect.

Hypothesis

The hypothesis of this study as follows:
H1: CR4 has positive effect to PCM
H2: MES haspositive effect to PCM
H3: Efficiency-X has positive effect to PCM
H4: Productivity has positive effect to PCM

Data and Models

This paper attempts to analyze the structure, conduct and performance of the food and beverages industry in Indonesia from 2010 – 2015. We used secondary and panel data (time series and cross section) on period 2010 – 2015. The data were taken from Indonesia Stock Exchange's website. The analytical tools that to analyzise S-C-P is Concentration Ratio (CR4), Minimum Efficiency of Scale (MES), Efficiency (XEF), and Productivity to Price Cost Margin (PCM). The limitation of this research are scope of food and beverages industry in Indonesia in order to understand the Concentration Ratio. While to count the efficiency rate of food and beverages companies, 4 companies with the biggest concentration ratio will be selected.

The Models

$$\mathbf{PCM_{it} = \alpha_0 + \beta_1 CR_{4it} + \beta_2 MES_{it} + \beta_3 XEF_{it} + \beta_4 Productivy_{it} + E_{it}}$$

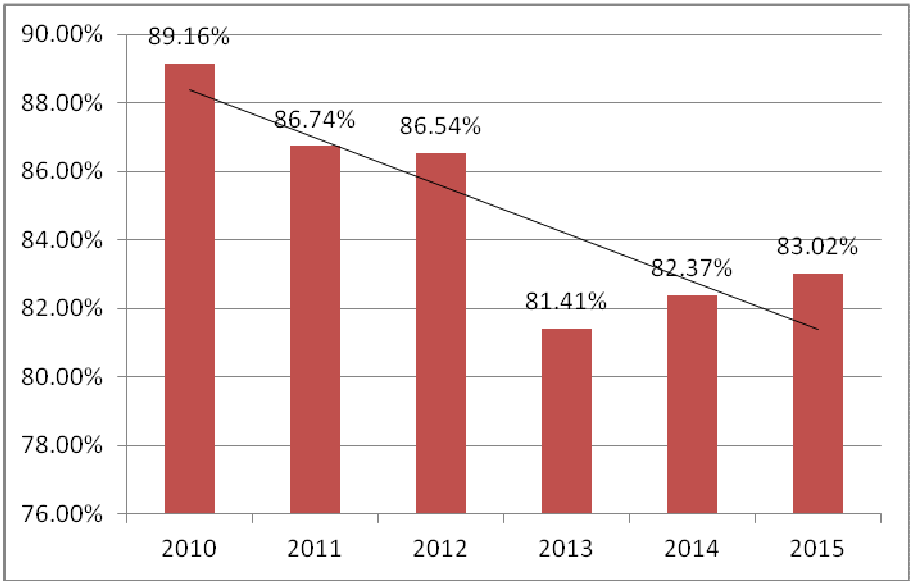
Which are:
PCMit: The ratio of the industry's profit on i^{th} industry unit on t^{th} year (%)
CR4it : Industry's concentration ratio taken from the 4 biggest companies on i^{th} industry unit on t^{th} year (%)
MESit : Minimum Efficiency Scale on i^{th} industry unit on t^{th} year (%)
XEFit: Efficiency on i^{th} industry unit on t^{th} year (%)
$Productivity_{it}$: Output/Input Value of labor (the comparison of output/input value of labor o t^{th} year(%)

α_0 : intercept
βn : slope of each independent variables
Eit : deviation on i^{th} industry unit on t^{th} year

Analysis

Market Structure
According to the result of the market's structure CR4 for food and beverages industry between 2010 – 2015 have the tendency to go down as shown on following graph 1.

Graph 1. *Concentration Ratio* 4 (CR_4) on Food and Beverage Industry in Indonesia



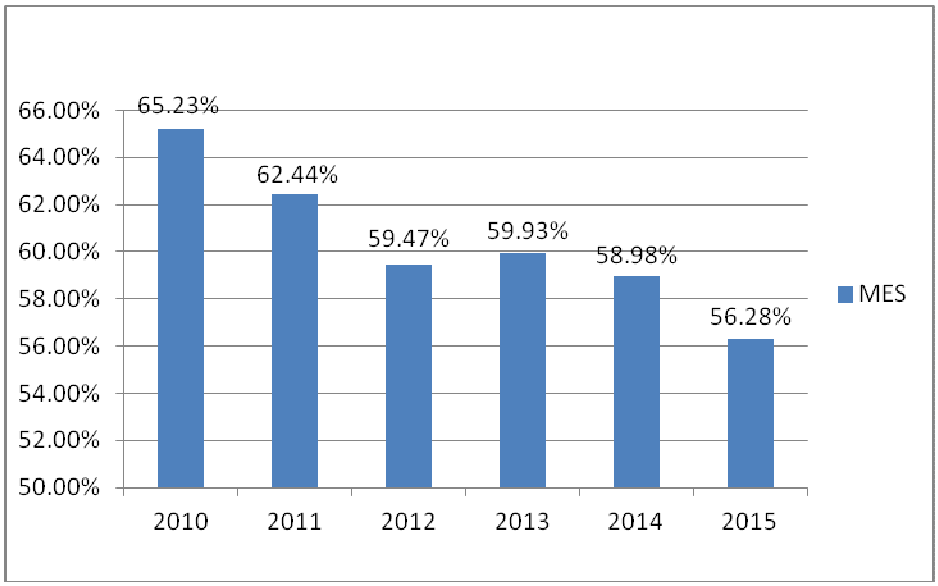
Source: on processed, food and beverages industry statistics, 2016

The value concentration ratio (CR4) of food and beverages industry in Indonesia on 2010 is 89.16% which means it's a strict oligopoly industry and it shows that food and beverages industry is concentrated. The CR4 results keep decreasing until 2013 and it's increasing again in 2014 and 2015 amounting 0.65% which makes it 83.02% in total. This shows that food and beverages industry in Indonesia on 2015 is a very strict oligopoly industry which gets more concentrated and getting less competitive.

The value of Minimum Efficiency of Scale (MES) on food and beverages industry in Indonesia on 2010 is 65.23% which means the enter restriction of food and beverages industry in Indonesia is quite big, which shows that food and beverages industry tends to be not competitive. But, the MES value keeps declining until 2015, with 2.7% decline which makes the MES value stands at 56.28%. These shows a decrease in enter restriction of food and beverages industry in Indonesia. The form of entry restrictions on 2015 shows that the industry is experiencing a decrese in entry restriction which makes the industry more competitive.

Next page

Graph 2. Minimum Efficiency of Scale on Food and Beverage Industry in Indonesia



Source: on processed, food and beverages industry statistics, 2016

According to the result analysis, the market structure of food and beverages industry in Indonesia is a very strict oligopoly which tends to be monopolistic. This will cause some conducts which are done by food and beverages industry doers. These conducts includes product strategy, market conduct analysis, price and promotion. This industry also introduce differentiation strategy and product innovation which results in increase of profit as the increase in producer's ability to widen its market segments through the advantages of their products. But, if the strategy's not viable anymore, then the industry risks itself towards loss.

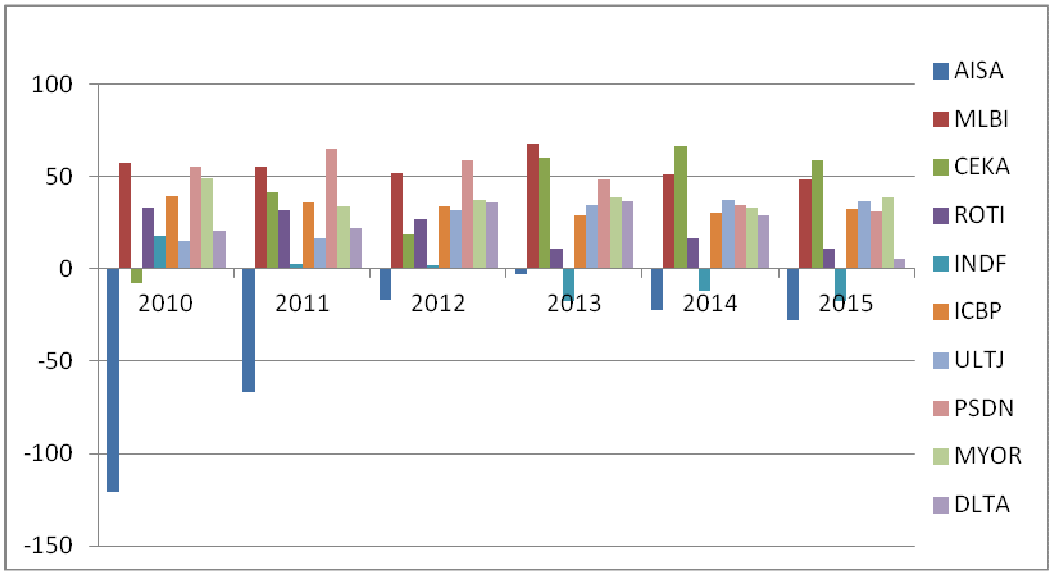
In food and beverages industry, producers act as the price taker, which means the price they set for their products will be heavily influenced by the price their competitors set. If one competitor decrease their product's price, it's almost guaranteed that other companies will follow so they can remain competitive in the market. Because the food and beverages industry's structure is moderately oligopoly and tends to be loose, consumer's behavior still affects the pricing. The existence of pricing force the producers to compete healthy. This causes food and beverages companies to less likely doing collusion. While the best promotion strategy remains via media, display product is also a viable in promoting snack products. Currently, the common promotion method done in food and beverages industry is price discounting. For example, the purchase of 2 bottles of X drink will give the customer a price cut of Rp. xxx or a free snack produced by the same company.

Market Performance

Price Cost Margin (PCM) is used to analyze market performance. The highest PCM value occurred in 2010 is 57.35% achieved by PT. Multi Bintang Indonesia Tbk. The highest PCM value occurred in 2011 and 2012 is 65.217% and 59.00% respectively achieved by PT. Prashida Aneka Niaga Tbk. The highest PCM value occurred in 2013 is 67.56% achieved by PT. Multi Bintang Indonesia Tbk. The highest PCM value occurred in 2014 and 2015 is 66.529% and 58.99% respectively achieved by PT. Wilmar Cahaya Indonesia Tbk. What caused the high PCM value achieved by PT. Multi Bintang Jaya Tbk., PT. Prashida Aneka Niaga Tbk. and PT. Wilmar Cahaya Indonesia Tbk. is their high output value compared to other companies' output as shown by the graph below:

Next page

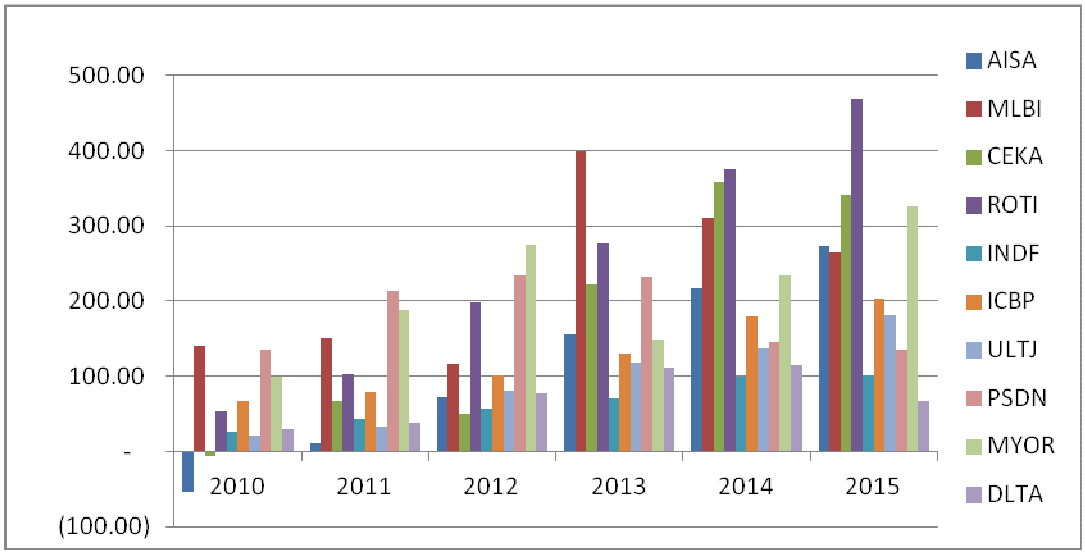
Graph. 3: Price Cost Margin on Food and Beverage Industry in Indonesia



Source: on processed, food and beverages industry statistics, 2016

The value X-Efficiency (XEF) on food and beverages industry are considered very high, with average 56.93%. This illustrates good market performance achieved by the industry. The highest XEF value occurred in 2010 is 140.99% achieved by PT. Multi Bintang Indonesia Tbk. In 2011 and 2012 is 205.44% and 157.77% respectively achieved by PT. Prashida Aneka Niaga Tbk. The highest XEF value occurred in 2013 is 217.83% achieved by PT. Multi Bintang Indonesia Tbk. The highest XEF value occurred in 2014 and 2015 is 202.19% and 148.94% respectively achieved by PT. Wilmar Cahaya Indonesia Tbk. What caused the high XEF value achieved by PT. Multi Bintang Indonesia Tbk. PT. Prashida Aneka Niaga Tbk. and PT. Wilmar Cahaya Indonesia Tbk. is the big company added value of those companies compared to others', as shown by the graph below.

Graph. 4: Efficiency - X on Food and Beverage Industry in Indonesia

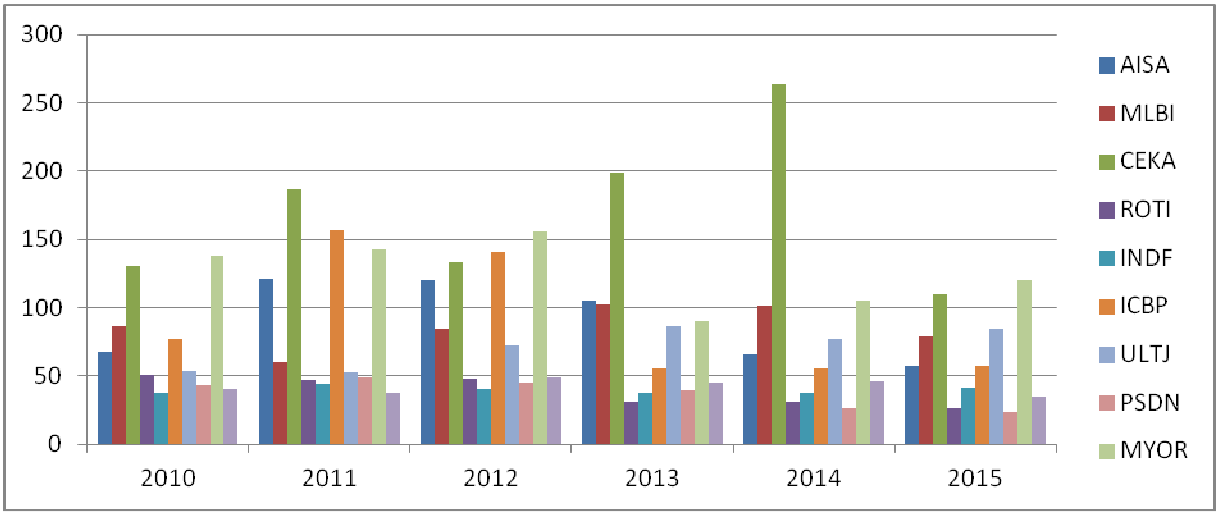


Source: on processed, food and beverages industry statistics, 2016

The highest value of productivity on food and beverages industry in Indonesia occurred in 2010 is 137.81% achieved by PT. Mayora Indah Tbk. The highest productivity in 2011 is 186.56% achieved by PT. Wilmar

Cahaya Indonesia Tbk. In 2012 is 156.18% achieved by PT Mayora Indah Tbk. The highest productivity value occurred in 2013 and 2014 is 199.18% and 263.47% respectively achieved by PT. Wilmar Cahaya Indonesia, in 2015 is 120.05% achieved by PT. Mayora Indah Tbk. What caused the high productivity value achieved by PT. Mayora Indah Tbk., PT. Tiga Pilar Sejahtera Food Tbk. and PT. Wilmar Cahaya Indonesia Tbk. is their high output value compared to other companies' output value as shown by the figure below:

Graph. 5: Productivity on Food and Beverage Industry in Indonesia



Source: on processed, food and beverages industry statistics, 2016

Analysis of Econometric ansd Statistic

The result Estimation on panel data are common effect model, fixed effect model, and random effect model. With those 3 models existed, there needs to be a test to choose which model that is more accurate and relevant in testing the result of the test. Chow test is the first test that will be done. Chow test is used to choose between common effect and fixed effect. The value of Chow test is seen from the value of F probability that is in the estimation of fixed effect,

Chow test result

Method	Probability	Conclusion	Result
Chow Test	0.0000	Ho is rejected, Ha is accepted	*Fixed Effect*

Sumber : on process, (2016)

Because the result of F probability is 0.0000 < 0.05, then it is stated that the more accurate and relevant model is fixed effect model. After fixed effect model is chosen, Hausman test is done to choose between fixed effect model and random effect model.

Hausman Test Result

Method	Probability	Conclusion	Result
Hausman Test	1.0000	Ho is accepted, Ha is rejected	*Random Effect*

Sources: on process, (2016)

According to the Hausman test, the value of chi-square probability is 1.0000. That value is larger than 0.05 which means Ho is accepted. Thus, the best model to be used in this paper is random effect model.

Next page

Random Effect Model Estimation Result

Independent Variable	Coefficient		Probability
C	51.7098		0.3370
CR	0.166521		0.8639
MES	-1.060724		0.2683
XEF	0.405851		0,0000
Productivity	-0.006153		0.9218
Adjusted R-squared		0.580898	
F-prob stat		21.44430	

Sources: on process, (2016)

Statistic test

The model appropriateness by variable criteria is decided by 3 tests which are simultaneous test (F test), partial test (T test) and koeficient determination (R^2 test). T test is used to estimate the significance of each independent variable toward each dependent variable. According to the hypotheses, it is expected that the independent variables partially affects the dependent variables on alpha 0.05. Independent variables are partially significant if each t-probability of the independent variables < 0.05.

According to the result of the t test, X-efficiency (XEF) variable significantly affects Price Cost Margin (PCM). The XEF probability value is 0.0000 < 0.05 and the sign of regression coefficient resulted by XEF variable is in accordance to the theory which is having the same positive sign as the hypotheses. Meanwhile, Concentration Ratio (CR_4) variable, Minimum Efficiency of Scale (MES) variable and productivity variable do not significantly affects PCM because their probability values are 0.8639 > 0.05, 0.2683 > 0.05 and 0.9218 > 0.5 respectively. Those values did not go in accordance to the theory because they have negative sign, unlike the hypotheses. This is caused by the market structure variables in food and beverages industry which is proxies by CR4, MES, and Productivity does not affect a company's profitability. The one that affects the companies in creating projected restriction of entry is the MES variable. And also company growth which is proxies by Productivity. It can be concluded that out of 4 independent variables there's only 1 that significantly affects PCM which is X-Efficiency variable, while the rest does not significantly affects PCM.

F test is used to see if the independent variables might affects together with the dependent variables. According to that hypothesis, it is expected that the independent variables together will affect the dependent variables significantly. According to the regression's result, the independent variables which are CR4, MES, XEF, and Productivity together affects PCM of food and beverages companies that are registered in Indonesian Stock Exchange with a real impact.

Model variable criteria must also fulfill the Goodness of fit (R^2 test) criteria which often called as determination coefficient. According to data processing result with random effect method, the value of adjusted R^2 is 0.620949. This shows that all independent variables which are CR_4, MES, XEF and Productivity explain the changes of the dependent variable which is PCM as big as 58.08%. While the remaining 42.92% are explained by other independent variables which are not included in the model, which means the model is fulfilling the Goodness of fit criteria.

Conclusion

According to structure, conduct and performance of food and beverages companies which are Go Public in Indonesia from 2010 – 2015, it can be concluded that, the competition in go-public food and beverages companies is a very strict oligopoly with CR_4 above 80% (which amounts 81.41% - 89.16%) each year. This CR_4 result is also showing that food and beverages industry is well concentrated and tends to be monopolistic.

According the market performance analysis, the value of PCM, Growth and XEF that are illustrated on previous chapters show shows that the average value of these 3 variables are pretty high. Aside from that, the trend of XEF value fluctuation tends to see an increase each year. While the trend of Productivity value fluctuation also tends to see an increase each year. From those 2 factors, it can be concluded that the performance of food and beverages industry in Indonesia can be categorized as good.

The result of the econometrics analysis, the most accurate and relevant choosing estimation model is the random effect model. While the result of the T test shows that PCM is only significantly affected by XEF. While the other variables which are CR_4, MES as the proxy of market structure and Productivity as the proxy of performance does not affected the PDM of food and beverages industry in Indonesia. Technological obstacles in food processing industry, especially on distribution and competitiveness against foreign producer inside and outside the country are also an issue that needs to be concerned. A lot of Indonesian food products were

damaged on shipping because of the poor storage technology and infrastructure. According to Yolanda (2015), an improvement in infrastructure is a possible solution in order to retain the quality of the product until it reaches the consumer is a problem that Indonesia still faces.

The goodness of fit test, the value of adjusted R^2 is 0.5808 which shows that $CR_{4,}$ MES, XEF and Productivity variables can explain the 58.08% changes of PCM variables. While the rest can be explained by other independent variables that are not included in the model, which means the model fulfill the goodness of fit criteria.

Policy recommendation which is: Food and beverages industry and stakeholders should improve the targeted market of each industry so the industry can increase their output value. Other economic activities doers whether it is developers, investors and the society in general should choose the best food and beverages company to invest.

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