MARKET STRUCTURE AND PERFORMANCE ANALYSIS OF TRADITIONAL JAMU INDUSTRY IN INDONESIA

by Suhel Suhel

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ABSTRACT

The purpose of this research is to analyze market structure and the performance of traditional jamu industry in Indonesia. The variables of market structure are market concentration, the number of firms, and barrirer to entry. The variables of market performance are profit margin, growth value added and efficiency. The data source of Large and Medium Manufacturing Statistic 1990-2014 is from BPS. This analysis using the measurment of structure, performance and multiple regression. The result of this research shows that the market structure of traditional jamu manufacture industry 1990-2014 is oligopoly with high concentration. Each avarage value of CR4 and CR8 is 0,78 and 0,86, and HHI value is 2366. The performance of traditional jamu manufacture industry is a good classified based on profit margin; 20,12 percent, the growth of value added is 47 percent, and efficiency (EFI) is 81,96 percent. The performance does influence market structure, the relation of performance variables of profit margin and growth value added is positive to concentration, meanwhile effiency variable is negative to structure. Growth value added variable is one percent siginificant to increase the concentration equal to 0,04 percent and also increasing the barrier to entry equal to 0,03 percent.

Keyword: structure, performance, Indonesian jamu traditional manufacturing

INTRODUCTION

According to Ministry of Health Republic Indonesia regulation Number 006 Year 2012 (Kementrian Kesehatan, 2012) about Herbal medicine Industry explain that the herbal medicine is the materials or the ingredients of materials contain plant material, animal material, mineral material, galenik, or mixture from all of teh material that have been used for medicines since long day ago, and can be applied in appropriate with the society norm. The herbal medicine industry known as IOT (*industri obat tradisional*) is the industry that makes all of the herbal medicine stock.

Jamu as a herbal medicine*(herbal remedy)* has several advantages not only for consumers but also for producers. The consumer is more interest on herbal medicine because it has cheap price, with no effect, and easy to get beacuse herbal medicine can be sell to all region. Further, for producers the raw materials of jamu is easy to get with cheap price, so this bussines will get more gain.

Jamu industry of Indonesia can be developed not only in Indonesia but also can developed in International markets (Kementrian Koordinator Perekonomian, 2011). Indonesia as known as the country with endowment factors and also known has rich farm. The endowment factor is has so much biodivirsity include the herbal medicine. Herbal medicine as the raw material of jamu has more potential in herbal medicine and fitofarmaka market.

In the other side, economy crisis that happened in ASEAN region, including Indonesia 1998 caused this country almost collaps, but it doesn't give big impact for jamu industry. Jamu industry prove still stable face the economy crisis bubble. This phenomenon because of almost every raw material of jamu ndustry is from domestic production, so the weakness of rupiah exchange rate will not much give the impact for production cost.

Small of raw material still imported from foreign, but it is not because the raw material is availabe in Indonesia but the number of demand can not be full filled just by domestic production, so Indonesia must do import. The raw material that import are red chili, pasak bumi, kumis kucing, beras biasa pecah, black tea, *Eurycoma longifolia* (akar pasak bumi), *Curcuma xanthorrhiza rhizoma* (temulawak), simplisia (*fructus*) etc, *green tea 50%*, *green tea 90%*, *green coffee*, dry green tea, and simplisia others.

According to data on *Statistical Manufacturing Book (BPS, 2014)*, raw material produced by domestic production such as, onion, thamarin, white lada, kapulaga, kencur, kunyit, lempuyang, kedaung, kemukus, pulosari, buah pala kering, milk, rice, gula merah aren, merica powder (lada), alcohol, fatty alcohol, simplisia from flowers daun beletus, daun lempuyung pulasari, manis jangan, root simplisia, rimpang alang-alang, temulawak, rimpang of simplisia, minyak dari rempah-rempah, minyak kayu putih, minyak akar wangi, perekat alam, etc. Not all raw material ar from domestic product, but several material must be imported. The imported raw material are red chili, pasak bumi, kumis kucing, beras biasa pecah, black tea, *Eurycoma longifolia* (akar pasak bumi), *Curcuma xanthorrhiza rhizoma* (temulawak), Simplisia from fruits (*fructus*), *green tea 50%*, *green tea 90%*, *green coffee*, teh hijau keringan, andand the other simplisia (Wimona, 2015: 6).

Figure 1
Output Value, Input Value, and Value Added of Jamu Industry
(Hundred Rupiah)
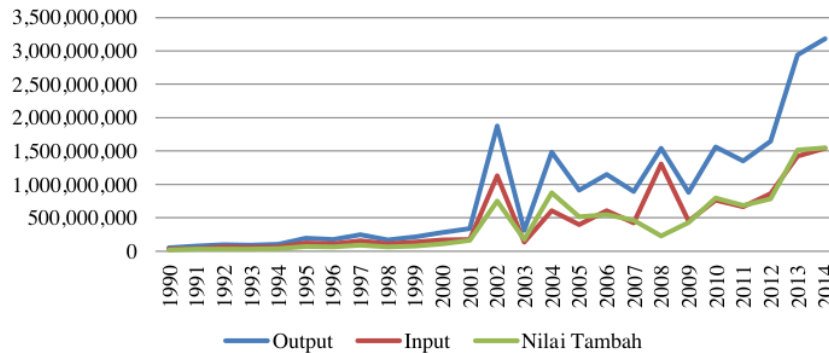
Source: Large and Medium Manufacturing Statistics, Central of Bureau Statistic
(BPS) Jakarta, 1990-2014 (proccessed by Wimona, 2015: 6).

Figure 1. shows output value, input value, and value added jamu industry year 1990 until 2014. This three values have fluctuated from year to year. When input value raise, so output value and value added also raise. But, there is such an interest phenomenon in 2008. In that year, the increase of ouput value and input value is higher than a year before, it is 58,02 percent for output value and 32,57 percent for input value. According to the last year condition, value added should have been increased as well, but the real condition is far from that. Value added has had decreased 49,36 percent. Hipothetically, it happens because there is problem on efficiency.

Product standarization problem makes some firms of jamu has barrier to entry the world market. Product standarization in side of material using, the procedure, and also benefit factor and product safety. Although, there is several firm of jamu that proved their existance in world market, such as PT Sidomuncul, has be succed entry Singapore market and Australia; Nyonya Meneer, has been done expansion effort to Malaysia and Vietnam; Borobudur Herbal produced by PT Industri Jamu Borobudur has been done export to Malaysia, Singapore, Brunei, Philipine, Middle East, China, Ngeria, Russia, etc. (Evrinasp.com, 2015)

In Economy side, the development of jamu industry in Indonesia has shown the signifcant growth with number of sale value reach Rp 6 trillion, has been created three million labor employeement, with the biggest market share is in Java Island reached 60 percent (Mujanah, et.all, 2014: 72; Kemenperin, 2015). This industry has comparative advantage because this based on endowment factor, KADIN on vision 2030 and Road Map National Industry (KADIN, 2007) recommend to voice of jamu as a industrial cluster with advantage, movement, create the labor employeement and decrease number of poverty and based on natural culture and the potential of jamu product, The Ministry of Economic Coordinate has planned an action "Jamu Brand Indonesia" as an action to united jamu brand on one roof become Brand Indonesia (Kemendag, 2009)

According to Indonesian Economic Outlook year 2008-2013 (Bank Indonesia, 2008:46), pharmacy industry concentration (ISIC 24232) increase from 0,4 in 2001 to

0,97 in 2006. Means, market structure is tight oligopoly with the concentration ratio of the fourth biggest firm 0,97. Market strucutre of pharmacy material industry is also tight oligopoly which is concentration ratio of the fourth biggest firm (CR4) from pharmacy material industry (ISIC 24231) is 0,88 (Bank Indonesia, 2008:39). So, need to do the research about market strucutre and performance of jamu manufacturing industry in Indonesia.

LITERATURE REVIEW

Industrial Economic theory said on empirical study from the determining factors of market structure, conduct, and performance so that the efficiency rate reached for firms, industries and also national economic aggregate. This concept and theory known as *Structure-Conduct-Performance* theory (SCP).

Structure of industry will be define industry counduct and in the end will be define performance industry itself.So, market conduct will define market structure condition and then structure will define market performance.

Market is define as one group of seller and buyer who exchange good that can be subtitued. Market structure shows competitive environment between seller and buyer in the way of process price determination and number of supply product on market. Figure 2.2 shows that market share of firm has been decreased. The firm are classified in pure monopoly, dominant firms, oligopoly firm with big market share or firms with small market share so it impossible to apply monopoly power. Market concentration can be seen from market share combination from fourth biggest firms (Jaya, 2008:44).

According to Sraffa (1926) in Hasibuan (1993:46), on incompetitive market, firm eqluibirum is not on minimum point of average cost (AC) curve anymore, because competitive market is not suitable with the accourance value theory. The upper down of LAC curve is for the point that , has not have limitation, so this is the condition which is always happen in value theory ot on minimum point. This condition is suitable with economics reality. It caused by industry concentration, product differentiation, undercapacity industry, competitive by advertising, and the others factor from institution (Hasibuan 1993:47).

Price on monopoly condition is usually decided by one side of firm. The price always more expensive. It can be seen from elasticity coefficient become inelasticity. Marshall stated that for individual firm, the price usually determine by supply side, not general demand side from maarket. So, the price will be set by monopoly firm and they will get higher profit (Hasibuan, 1993:48)

Oligopoly firm that produce differentiation good and services, market structure can be monopoly competitive, just like chamberline stated in 1927. In the other hand, there is other characteristic that named as collusion, so it makes collusive monopoly structure happen, furhter, others (firms on oligopoly industry) can do harder competition with non-collusion (Hasibuan, 193:106).

Clustering is combination of market share from oligopoly firms where they realize that there is a dependence between each other. Group of firms contain by 2 until 8 firms. The combination of their market sharemade a cluster on the market (Jaya, 2008:48).

According to Martin, concentration ratio is use to measure the fewness supplier on the market when the fourth biggest firms will pay more attention to the other firms. This firms, known as oligopoly and this industry will get some attention from the economists (Martin, 1994:113).

First, group of oligopoly where eightth biggest firms at least dominating one kind of industry. But, it also can use 20 firm that domianting 75 percent as the alternative measurement. The second one, oligopoly where the eightth firms can dominate market at least 33 percent, or some firm dominating an industry at least 75 percent on the market. And then, the eightth biggest that dominateless han 33 percent named as nconcentration industry (Hasibuan, 1993: 107-108).

Secondly, Stigler said that if the firm can dominate 60 percent of a goods market, the market structure is oligopoly. So, there will be higher role of the fourth biggest firm on the market. (Hasibuan, 1993:109)

Bain (1951, 1956) stated between concentration ratio and production have low correlation. The concentration industry will get higher revenue than the unconcentration industry. In the other side, Leonard Weiss in 1963 used a multiple regression to get positive relationship between margin and high concentration products. Positive relationship between margin and concentration ratio is a barrier to entry for new entrance. Because, firms will improve their concentration by using the profit (Jaya, 2008:48).

Clustering is an oligopoly ratio. Oligopolists can do a tight coordination as if they are a monopolistst; competition can happen between them or maybe follow the condition. Market power combination quitely decrease the influence of the biggest firms on the market (Jaya, 2008:48).

But, because oligopoly is a complex thing, so thedecrease of influence degree is depends on several things. There are three causes that contain in it compexiticy (Jaya, 2008, 48-49). Firts, there is a gadient that have no limitation in oliogopoly degreee. Oligopoly can be classified between tight ololigopoly and loose oligopoly. The market should be in the middle of both oligopoly, sometimes oligopoly have no differences with group that dominate oligopoly market is only dominating the small market.

Second, dependence effect and degree has no relationship. Oligopolist might be will fight or coorperate or ignore each other and applied the price regulation, or with no strategies at all. If there is no limitation in dependence between them, so the role of oligoploly in market structure will decrease or nothing at all. (Jaya, 2008:49).

Third, the result is influenced by internal structure. The action of simetrical group (all members are same) maybe will different with other onr, unsimetrical group (that dominated by one firm). There are several variance on internal structure, in theoritical side and in the real amrket (Jaya, 2008:49). So, there wl be a relationship between profit and clustering. Clusterig can describe variance of internal structure and degree of dependence. This relation can be a long straight line. With that influnece,the the increasing of profit is caused by improvement of clustering. Or maybe there is a step of increasing because clustering improve from the lose oligopoly to high degree of oligopoly.

There are several measurement that can be used to meausre concentration ratio. First, with concentration ratio. Second, by using graphic or curve. Thirs by using some index. The curve that use to measure concentration ratio such as Lorenz curve and by using Gini Index, Herischman Herfindhal Index, Lernerm and Bain. The concentration ratio method is the most method that be used to market structure research (Teguh, 2010: 86-92).

In 1984 Douglas F. Greer (see Hasibuan, 1993: 123) expalined that there are four causes that can cause the concentration, the first is lucky: the second is technique, the next is government regulation, and the last one is bussines necessary so there is a firm regulation to make some decsion. The second determining factor that have been

explained is technique factor. Several things that include in this factor are market area, economic scale, scarcity, and market gowth. The third factor, high concentration happened based on government regulation. In developed country, governement regulation such as limitation, anti-monopoli regulation, patent, licenssion, and others regulation.This regulation based on the goal of each countries for society welfare, so that caused monopoly and oligopoly (Hasibuan, 1993:123).

Study about market structure and performance of jamu manufacturing is rarely do by people, but in manufactre industry like pharmacy industry has done. Matraves (1999) exmanies about Market Structure, R&D, and Advertising in the Pharmaceutical Industry stated the current developing on literature about market structure is able to examine by several predicted of strategies conduct the. The elasticity model assume that there is only one simple relation, but generally between market structure and market size focused on the competition role from sunk cost on advertising and Research and Development (R&D). The implementation in this case is raise the work of econometrics before, shows that sunk cost have an important contribution to market structure in global pharmaceutical industry.

Danzon (2001) said that pharmaceutical industry raises the economic problem identification because of these three this. First, R & D levels are too high, technique changing and the importance of patenrating to sturcture of industry, price, profit, and public regulation. Secondly, this industry is regulated in all majors functions. Regulatory requirments is focused on safety and efficacy. Recently, price, promotion and spending are more regulated, there is a regulation fears to controll the programm that in socail insurance. The optimal policy should consider trade off between control and moral hazard, ensure the acces to medical care and precerve incentive for innovation. Third, main medicine is a global product with R&D cost that costed together. This is create incentive for national free strategies, further the optimal policy in social perspective should consider the impact of national circulation and the different of ooptimal price.This literature has framework and several empirical evidences on some issues, but there are still many question that can not be answered.

Sweeny (2007) has research about market structure on farmautical industry in Australia. The measure of market concentration by using *four firm concentration ratio* (CR₄) *and Herfindahl Hirschman Index (HHI). The* result of this research is CR₄ above 90 percen and HHI reached as 2721, that mean the market structure of farmacy industry in Australia as *highly degree of oligopol.*

Jiangkang (2014) on his research about SCP Analysis of Biopharmaceutical Industry in China stated if the concentration ratio of biopharmaceutical is always increase several year ago: In 2009 CR4 and CR10 from BPI is 7,03% and 10,70% and increase to 8,47% and 13,43% in 2010. Jiangkang suggest governement to do accelerate the resturcturisation of inidustry to market structure optimalization, pushing the inovation, and to optimalize the aggreement of biologic herbal generic.

Concentration ratio CR4, CR8 and Heriscman Herfindhal Index are used to measure market structure of ciggerates industry(Sumarno and Kuncoro, 2002) conclud that market structure of ciggerates industry is oligoply with high concentration ratio from 1996 until 1999. Barrier to entry on this industry is big enough, so it is not easy for new entrance to entry he market. And then, Wulandari (2007) is used concentration ratio CR4, CR8 and OLS to measure the concentration of pulp and paper industry, this research shows that the economy crisis caused the increasing concentration ratio and output of this industry. There is a negative relationship betweem capital cost and value added. The firm will have bigger value added if the have small capital cost.

Maulidah (2010) is also research about market structure, market concentration and barrier to entry of cajuputih oil *(Melaleuca Leucadendron Oil)* in Namlea, Buru Region, Maluku Province is using several quantitative approaches, such as: Market Share, Herischamn Herfindhal Index, CR4, Rosenbluth Inidex, figure out that cajuputih market is classified perfect competition market.

Research about market structure and performance is also done by Sitorus in 2012 by using CR4, MES, X-Efficiency and OLS method, figure out that cacao industry is an oligopoly. Determining factors that influence performance of industry is described by dependen variabel that explained by Price Cost Margin variable, further the independent variable is CR4, MES, Productivity (PROD), X-Efficiency, and the number of firms (JLP). There is only X-Efficency which have significant influnce to dependen variable, PCM.

In 2013, Khavidhurrohmaningrum examine market structure, conduct and barrier to entry of Manufacture Industry in Semarang by using concentration ratio methid, such as, CR4, CR8, Herischman Herfindhal Index and Minimum Efficiency Scale (MES) found that labor concentration, raw material concentration, and concentration of value added are increasing based on CR4 and CR8. Menas market structure manufacture industry in Semarang can be classified in to full oligopoly where average value of CR4 and CR8 are 87%-99%. Heriscma 4 Herfindhal Index value of the fourth or eightth biggest firm have dominate market structure. The result of this research is shows that the value of barrier to entry of manufacture industry in Semarang is big enough with average value of MES 30,18 percent.

In 2014, Bhakti Made and Fachry analyze the market structure, condust and performance of sea weed industry *Gracilia Sp* in Luwu Region by using Concentration ratio CR4 and Minimum Efficiency Scale (MES) method, shows that the concentration of sea weed industry *Gracilaria Sp* is oligopsony with value of CR4 more than 60 percent, further value of MES is more than 10 percent.

Vlachvei dan Oustapassidis (1998) on their resarch about concentration and profitability of food industry in Yunani. To predict the dermining of performance, concentration, and advertising model on 38 industries in 1994 they using 3SLS method. The result of this research are profitiability is determined by advertising that influenced by concentration and profitailit, further the other one is determined by economic scale.

In other side, Nevita Sari (2013) was a research about concentration ratio from labor investment and value added on Manufacture Industry sector in Central Java, by using CR4 and CR8 method. Theresult of this research shows: first, based on CR4 and CR8 method, investment concenration of industry in Central Java 2005 until 2009 is market structure type 2. Second, in 2005 until 2009 based on CR4 and CR8 labor concentration of industry sector is Central Java, the market structure is oligopoly type 2. Third, according to calculation of CR4 value added concentration on industry sector in central Java 2005-2008 is full oligopoly, and in 2009 is oligopoly type 2, with calculation of CR8 value added concentration of industry sector in Central Java 2005-2009 is oligopoly type 2.

Wimona (2015), examine market structure and efficiency of Jamu Manufacturing in Indonesia. Based on scrip result, Wimona has found oligopoly a hightly concentrate during 1990-2014, and inefficient.

MODEL SPESIFICATION AND DATA

This research was conducted on herbal medicine industry in Indonesia (ISIC 24234). Making the topic of this study is based on the abundance of natural resources which shoud be used well in order to create value-added industry. Many companies get into the herbal medicine industry is not followed by formation of a good market structure. This industry is dominated by large firms. The purpose of this research is to determine the correlation and influence of market structure and performance, and the influence of performance and market structure herbal medicine manufacture industry in Indonesia. The periode of this research is year 1990 till 2014.

This study using secondary data provided by Industrial Medium and Small Statitstics published by Central Bureau of Statistics (BPS), Classification of Business Book Field Indonesia (KBLI), Industrial Ministry (Kemenperin), and the other literatur. This research is using time series data year 1990 till 2014.

MARKET STRUCTURE

The market structure is analyzed using the concentration level and the number of firms. By using the concentration level and the number of firms it can be seen the type of market faced by the industry. The methods used to measure the level of concentration in this research is by using the ratio.

The concentration ratio is a percentage of the total industrial output or sales revenue. The concentration ratio of several large firms measures the relative share of the total industrial output generated by the firms. Concentration ratios commonly used form of CR2, CR4 and CR8. The ratio of the concentrations used in this study is CR4 (concentration ratio-4) and CR8 (concentration ratio-8).

This study, according to Church and Ware, 2000; Clarke, 1994; Hasibuan, 1993; is:

$$CR_m = \sum_{i=1}^{m} ms_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

The large the percentage (close to 100 percent), the greater industry concentration of products. If the concentration ratio of an industry reaches 100 percent, it means the market product is monopoly.

According to concentratio ratio of Bain (1956), Gwin (2001) danAsngari (2016), then the classification of structure in the market can be grouped into several classsification. Shown on the Tabel 1.

Tabel 1
Type of Market Structure Based On Concentration Ratio

No.	CR₄	CR₈	Number of Firms	Type of Market Structure
1	100	100	1	Monopoly
2	0.72-0.99	0.88-0.99	3-5	Fully Oligopoly/Dominat Firm
3	0.61-0.71	0.77-0.87	3-50	Tight Oligopoly
4	0.56-0.60	0.70-0.76	10-50	Lose oligopoly
4	0.30-0.55	0.40-0.69	50-500	Monopolistic Competition
5	0.05-0.29	0.01-0.39	500-1000	Effective Competitive (Atomistic)
6	< 0.05	< 0.01	> 1000	Perfect Competitive

Suorce: processed from *Gwin 2001 and Asngari (2016)*

In addition to the concentration ratio, Herfindahl-Hirschman Index (HHI) is also often used as an indicator in the measurement of market structure. This measurement is based on the total number and size distribution of firms in the industry. HHI is calculated by the sum of squares of the market share of firms in an industry.

$$HHI = \sum_{i=1}^{n} ms_i^2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

The limitation according to the US Department of Justice and Federal Trade Commission (2010) in the "Horizontal Merger Guidelines" which divides the measurement of HHI into three parts, they are: a less concentrated industry (HHI of less than 1000), a medium concentration (HHI between 1000 to 1800), and a high concentration (HHI over 1800).

Market entry barriers are measured with a minimum efficiency scale (MES) as follows;

$$MES = \frac{Rata-rataOutputPerusahaanTerbesaryangmenghasilkan\ 50\%\ OutputIndustri}{TotalOutputIndustri} \dots\dots\dots$$
(3)

INDUSTRIAL PERFORMANCE
The company's performance can be seen from the growth of profit margin and the growth of industrial output. Growth in profit margins and high output illustrate the good performance of the firm. Variables are generally used to measure the profit margin is the ratio of net income to total income, in this study uses the ratio of net income to total income (Manurung and Rahardja, 2004: 155).

$$PM_i = \frac{Profit}{Total\ Revenue} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

The net profit is calculated from total sales minus production costs and taxes. The production costs are calculated from fixed costs and variable costs of inputs. While the value added is created by industry is equal to number of output value, the input minus madia. This value added is calculated on the gross madia input prices, known as value added of all factors of production (value added at factor price). The value added of the net can also be calculated on the market price (value added at market price), the gross value added by subtracting the depreciation of production equipment and indirect taxes (Asngari, 2003: 52).

Growth in value added is calculated from the ratio of the difference in value added period t (VAT) with the added value of period t-1 (Vat-1) divided by the value-added period t-1. The formula is as follows;

$$GVA = \frac{VA_t - VA_{t-1}}{VA_{t-1}} x100\%$$
$$\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$
Where; GVA = Growth Value Added

The growth of high value added indicates a company's ability to develop well, because it can create a value added.

In addition to the profit margin and value added, the level of efficiency can also be used as an indicator to see the performance of an industry. The level of

efficiency is calculated by comparing the value added to the value of inputs, which is mathematically expressed as follows:

$$EF = \frac{Value\ added}{Intermediate\ Cost} \times 100\% \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

The efficiency rate lower when efficiency is worth 1.00 to 1.49, medium efficiency when efficiency is betweenn 1.50 to 1.99 and a high efficiency is when the value of efficiency greater than or equal to 2.00, or value added generated twice as large of the costs incurred madia (Asngari, 2006: 3).

RELATION AND INFLUENCE PERFORMANCE ON MARKET STRUCTURE

The relationship between market structure (concentration number of firms) and growth (profit and value added) were analyzed using multiple linear regression analysis or ordinary least squares (OLS). This method is used because it is much simpler than other methods as well as their ease of use, as well as the description on the results of the regression.

$$CR_4 = \beta_o + \beta_1 PM + \beta_2 GVA + \beta_3 EF + \hat{e} \dots\dots\dots\dots\dots\dots\dots\dots (7)$$

$$MES = \beta_o + \beta_1 PM + \beta_2 GVA + \beta_3 EF + \hat{e} \dots\dots\dots\dots\dots\dots\dots (8)$$

where   :
CR$_4$: the fourth largest firm concentration ratio (%)
PM   : Profit margin (%)
GVA   : Growth Value Added (%)
MES   : Minimum Efficiency of Scale (%)
$\beta 0$: intercept
$\beta 1, \beta 2$: coefficient estimates

EMPIRICAL RESULT

MARKET SHARE of JAMU TRADITIONAL MANUFACTURE INDUSTRY

According to Indonesian Economic Outlook (Bank Indonesia, 2013), said in 2008 until 2013 market structure of pharmaceutical industry of Indonesia classified on tight oligopoly with average concentration value on fourth largest firm is 0,97. Altought jamu manufacturing has a good basic potential, it will not cause market structure to be enjoyed by new entrants. Oligopoly market structure will encourage producers to compete in lowering prices. Competitors who has limited capital and has not credibility from consumers yet will be hard to compete with the old competitor in the market.

Tabel 2
Output Number of 4th Biggest Firm and Output Number of 8th Biggest Firm
Jamu Industry in Indonesia 1990-2014

Year	CR_4	CR_8	Market Structure
1990	0,7816	0,8790	Full Oligopoly
1991	0,8004	0,8891	Full Oligopoly
1992	0,7507	0,9137	Full Oligopoly
1993	0,8452	0,9289	Full Oligopoly
1994	0,7814	0,8922	Full Oligopoly
1995	0,7463	0,9071	Full Oligopoly
1996	0,7539	0,8664	Full Oligopoly
1997	0,7951	0,9108	Full Oligopoly
1998	0,7031	0,8376	Tight Oligopoly
1999	0,6927	0,7998	Tight Oligopoly
2000	0,6390	0,8187	Tight Oligopoly
2001	0,5922	0,7844	Lose oligopoly
2002	0,8866	0,9507	Full Oligopoly
2003	0,7140	0,8271	Tight Oligopoly
2004	0,8622	0,9245	Full Oligopoly
2005	0,7781	0,8901	Full Oligopoly
2006	0,7193	0,8277	Tight Oligopoly
2007	0,6070	0,7541	Lose oligopoly
2008	0,7564	0,8299	Full Oligopoly
2009	0,8044	0,8811	Full Oligopoly
2010	0,7502	0,8382	Full Oligopoly
2011	0,6700	0,8055	Tight Oligopoly
2012	0,7632	0,8631	Full Oligopoly
2013	0,8146	0,9038	Full Oligopoly
2014	0,7816	0,8635	Full Oligopoly
Average	0,7503	0,8790	Full Oligopoly

Source: Large and Medium Manufacturing Statistics, Central Bureau of Statistics
    (BPS) Jakarta, *1990-2014 (proccessed).*

In oligopoly market there are several dominant firms who has power to sale, but also there are several medium and small firms. Dominant firms are influencing each other. Generally, this dominant firms behavior will be followed by the other firm. Small or new firms in oligopoly market can not be compete at once with the old competitor. The new firm is hard to enter an oligopoly market because the old firm has already have brand image, and it is known by the consumers, such as Jamu Iboe, Jamu Jago, Nyonya Meneer, Sido Muncul, and Jamu Air Mancur. Brands and quality of those products has already known well in Indonesia and International market.

According to the avarage value on data analysis, concentration ratio fourth largest firm and concentration ratio eighth largest firm shows classified in different class. According to concentration ratio fourth largest firm, jamu industri classified in the third class category, means that it is oligopoly with high concentration with the avarage value 75,03 percent. Meanwhile, concentration ratio eighth largest firm

shows that jamu industry classified in the second class category, means that it is full oligopoly with presentation ratio 87,90 percent.

Tabel 3
Hirschman-Herfindahl Index

Year	HHI	Year	HHI
1990	0,2112	2003	0,1578
1991	0,2087	2004	0,3283
1992	0,1690	2005	0,3534
1993	0,2103	2006	0,1878
1994	0,1865	2007	0,1410
1995	0,1567	2008	0,4230
1996	0,1953	2009	0,3654
1997	0,2239	2010	0,2240
1998	0,1706	2011	0,1381
1999	0,1464	2012	0,2745
2000	0,1258	2013	0,3986
2001	0,1060	2003	0,1578
2002	0,5772	2014	0.2068
Average			0,2366

Source: Large and Medium Manufacturing Statistics, Central Bureau of Statistics
(BPS) Jakarta, *1990-2014 (proccessed by Wimona, 2015: 54).*

Tabel 2 shows, concentration ratio has fluctuated ups and downs eventhough the highest concentration ratio or the lowest concentration ratio, both are still classified as oligopoly structure. The highest concentration ratio using CR4 or CR8 is in 2002, at 88,66 percent and 95,07 percent classified as full oligopoly. Meanwhile, the lowest concentration ratio using CR4 is in 2001 at 59, 22 percent and CR8 is in 2007, at 72,41 percent classified as lose oligopoly. The avarage value of CR4 is 0,7503 and CR8 is 0,8790, and it is classified as full oligopoly. Full oligopoly structure happened until 2014, the biggest number of CR4 is 9,76 and CR8 is 0,86. Concentration value of CR4 and CR8 is consistent with market structure that shows full oligopoly or oligopoly with highest concentration.

Tabel 4
Barrier to Entry

Year	Minimum Efficiency Scale
1990	0,2941
1991	0,2832
1992	0,2300
1993	0,2895
1994	0,2694
1995	0,2313
1996	0,2828
1997	0,2787
1998	0,2629
1999	0,2443
2000	0,2146
2001	0,1866
2002	0,4025
2003	0,2560
2004	0,3950
2005	0,3269
2006	0,2954
2007	0,2523
2008	0,3447
2009	0,3558
2010	0,2915
2011	0,2183
2012	0,3104
2013	0,3490
2014	0,2378
Average	0,2861

Source: Large and Medium Manufacturing Statistics, Central Bureau of Statistics (BPS) Jakarta, *1990-2014 (proccessed).*

The concentration ratio is not the only way to analyze the market structure, Hirschman-Herfindahl Index (HHI) is also can be used to analzye the market structure.This index shows more value from 0 to 1 or scale less than 1,000 to 10,000. Result number from HHI measurement is very sensitive to some large firms, because the smaller contribution from a firm, so market share will be decreased on this index. Based on data in Table 3, the average value of HHI is 2366. One of the references used in the determination HHI industry classifications are restrictions according to the US Department of Justice and Federal Trade Commission in the "Horizontal Merger Guidelines" which divides the size of the HHI into three section the industry is not concentrated (HHI of less than 1000), medium concentration (HHI between 1000 to 1800), and a high concentration (HHI over 1800). During the analysis year, the market structure of herbal industry classified in oligopoly with medium concentration and oligopoly with high concentration. HHI calculation results is accurate with the CR4 and CR8. Lowest index values happen in 2001 and the highest happen in 2005. HHI and CR both show that the herbal medicine industry is classified as concentrated oligopoly structure.

Herbal industry does have a great opportunity for those who want to invest on this industry, shown from its ability to obtain raw materials and the trust that has

existed from consumers, and then with the trend banck to nature which is now being interested by the society in order to implement healthy lifestyle be a important factor for consumers to prefer consuming traditional medicine. However, these advantages are not followed by the good market structure, because either fully oligopoly or oligopoly with high concentration, both of which will create a gap between firms with a large scale, medium scale and small scale. As a result, these companies will be difficult to develop and market structures control also tend to be fixed or stabilized because the power is still held by largest firms. This condition will also be a limiting factor for new firm to enter the market, because the industry with great concentration ratios will usually be followed by a large barrier to entry.

The main thing that a barrier for potential competitors to enter the market of herbal medicine industry is the existence of a dominant firms that already dominate the market. At least, to maintain the existence of the herbal industry, the potential competitor must have a minimum efficiency scale similar to that of the largest firms. This scale analysis is done by comparing the output of the largest firms that produce 50 percent of industrial output with total industrial output.

Based on Table 4, if the competitor wants to compete in the market for herbal industry, the minimum output to be produced by an average of 28.61 percent of the total output of the herbal medicine industry in Indonesia. These barriers are quite high. New competitors who want to enter the market would doubt if viewed MES value are so high. If a new competitor enter the market, then he will bear the greater cost of production. In order to produce on a large scale, the firm must be supported with a large capacity manufacturer or advanced technologies and adequate facilities.

PERFORMANCE OF TRADITIONAL JAMU MANUFACTURE INDUSTRY

Industry performance can be seen from the growth of profit margin and the growth of industry output. The higher the growth of profit margin and output described the good industry performance.

Figure2. Profit Margin
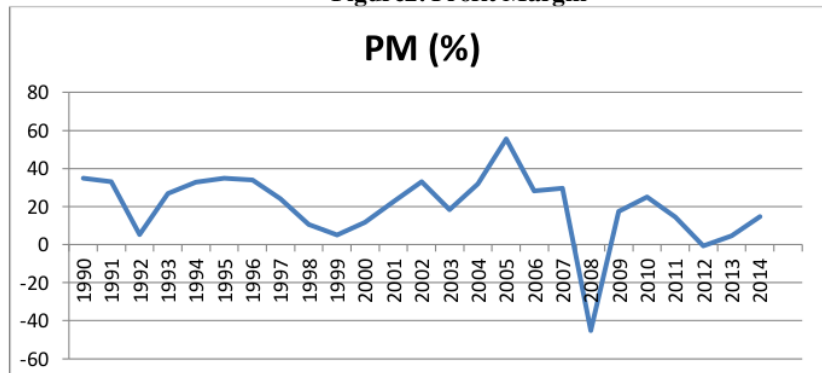
Source: Large and Medium Manufacturing Statistics, Central Bureau of Statistics (BPS) Jakarta, *1990-2014 (proccessed).*

Calculation of Profit Margin jamu industry in Indonesia 1990-2014 is 27,92 percent, means every Rp. 1,00 of total seller will bring in Rp. 0,27 profit. Can be seen from figure 4.4 in 2008 jamu industry get the lower profit margin in that year, 5,89 percent. In that year, there is an global crisis that give effect to Indonesia economic

situation, but this is not the main factor that caused the decreasing of profit margin, however this is caused by external factor.

Not only profit margin, value added also can be a industry performance measurement. In 10 years ago, based on the data, the highest value added of jamu industry is in 2013. In that year, value added increase as 93,13 percent from a year before, where in a year ago value added increase as 13,90 percent. The higher the value added will improve the ability of firms to producing output. In the other words, the profit will increase.

Profit margin and value added of jamu industry in Indonesia are fluctuaed in research period. But, the average growth shows the positive value, 24,34 percent for profit margin and 5,13 percent for value added. In the other words, profit margin and value added are predicted will increase with the producer should keep their quality of product so they will not lose the society trusting.

Figure 3. Value added
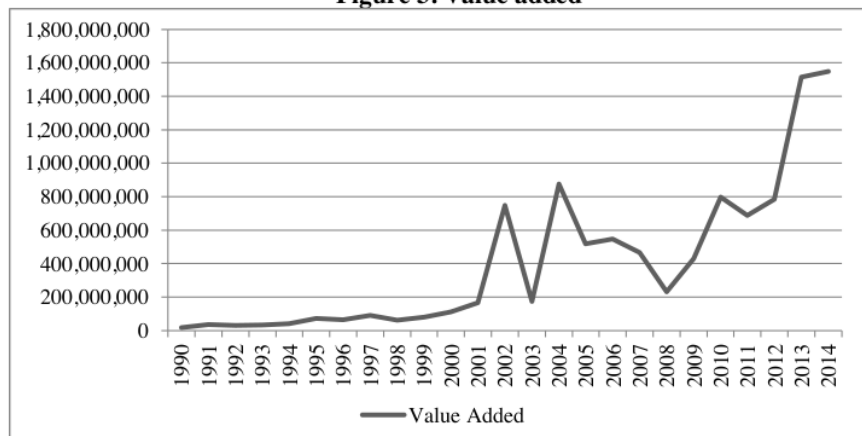
Source: Large and Medium Manufacturing Statistics, Central Bureau of Statistics (BPS) Jakarta, 1990-2014 (proccessed).

Study about efficiency is also important things to examine industry performance. The ability to maximization production factor so we will get the result as known as efficiency. Industry efficiency calculated by value added of industry divided with madya cost which is using labor, raw material, capital, etc. According to Hasibuan (1993:24) about economic cost, if the economic cost of industry is high, the industry efficiency is become inefficient, then will influence the labor productivity, etc. The higher value added, so the ability to producing output will increasing. In the other words, the profit margin is will increasing.

In the middle year 1997 until 1998 manufacture industry performance in Indonesia is decreased it caused by monetary crisis that happened in that year. In Asia countires, included Indnesia prove their power to face economic shocks, jamu industry is a industry that can recovery from collaps condition. Efficiency value is stable in every condition, before, and pasca crisis. Average value of efficiency growth in 1996 until 199 is 0,31 percent. This is prove that the weakness of exhange rate is doesn't give big impact for jamu industry efficiency. In the beginning of Asia economic crisis 1997, the efficiency growth is still move to positive side 0,26 percent. Although, in next year efficiency is decrease 1,85 percent, this condition can be imporved in 1999 with the higher value from a year ago before economic crisis

happen 58,71 percent or increase 4,49 percent. This is happen bevcause almost input is from domestic producion. Based on average value in 1990 until 2014 this industry only use 96,38 percent raw material from domestic production.

From the performance indicators that have been explained, these all three are decreased in 2008. The decreasing is caused by several factors. First, producer and distributor arrest stock of good while seeing the condition during election. This is make the circulation of jamu in the market is fall. Second, jamu industry have problem with raw material. Besides the bad weather, and the export of raw material is too high. As a result, price of raw material in domestic market is raises. Third, there is a supply of ilegal jamu. In 2008 domestic and foreign market of jamu faced the problem about jamu contain with chemical ingredients that makes society questioning about quality of jamu. And then, there is an issue if jamu is dangerous for human body. Domestic producer of jamu is still face this problemtill semester I of 2009. All variance of chemical medicine which use in ilegal jamu classified as dangerous medicines that have negative impact for healthy, such as swelling face, kidney failure and deatf of human. The number of ilegal jamu reached around hundred brands. Jamu industry is harmed by Jamu that contain with chemical ingredients. Many consumer believe with the issue about jamu, so they decrease the number of sales. At the end it will influence the proft of jamu industry.

Figure 4. Efficiency of Jamu Industry in Indonesia
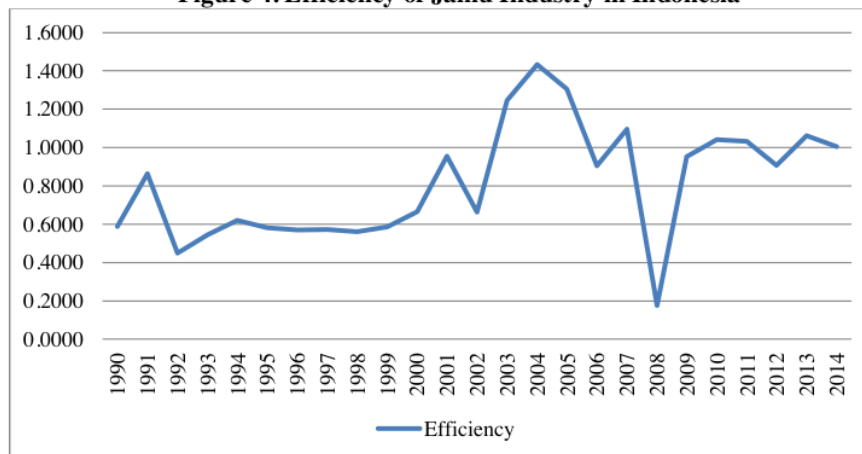
Source: Large and Medium Manufacturing Statistics, Centre of Bureau Statistics 1990-2014 (proccessed by Wimona, 2015: 60).

The explaination shows the society trusting has big influence to economic activities in jamu market. In the beginning of 2010 governement declare Ministry of Health regulation Number 003/2010 about reasearch about scientific of jamu based on healthy services. The purpose of scientific of jamu are first, to give evidence base of using jamu with research based on services. Second, to make a network between doctor or denistry and healthy servant as a researcher for preventive, promotive, curative, and rehabilitative effort. Third, to increase efficacy and the safety supply of jamu for has been tested in scientific way, for self-meditation or for public helathy facilities. Scientific of jamu product is Jamu Saintific (Aurina, 2015).

THE IMPACT OF MARKET PERFORMANCE ON MARKE STRUCTURE

$$CR_4 = 0{,}7598 + 0{,}0004\, PM + 0{,}0004\, GVA - 0{,}046\, EF \ldots\ldots\ldots\ldots (8)$$
$$(0{,}03679)^{***} \quad (0{,}0007) \quad (0{,}0001)^{**} \quad (0{,}04728)$$

$R^2 = 0{,}36$
F-stat = 3,95 Prob$_{16}$ = 0,02
DW-stat= 1,37 Prob. Breusch-Godfrey Serial Correlation LM Test =0,08
Prob. Breusch-Pagan-Godfrey= 0,75
** = significant at 5%, ***=significant at 1%.

Market performance variable that examine in this research are profit margin (PM), Growth Value Added (GVA), and Efficiency (EF). These three variables as a indpendent variables and market structure as a dependen variable. Based on value of F-statistic is 0.02 < α=0,05, means all the independent variables are have impact to market strucutre. Regression estimation also shows model 8 is good, because fulfill the OLS assumption test. The result shows that model have no autocorrelation, heterescedasticity, and multicolinearity (Attachment-1). Regression constanta of model 4.1 is 0,758 menas if all performance variables are fixed or zero, so the value of ratio concentration is 0,76, or market structure of jamu industry can be categorized as full oligopoly.

Value of $R^2 = 0{,}36$ means all variance of performance variable can explain the market structure variabel as 36 percent, and other 67 percent is explained by other variable from performance, conduct, or market structure itself. Variable coefficien of profit margin is positive, 0,04 percent, and efficiency is negative equal to 4,6 percent but both of them have insignificantly impact to market structure. Growth value added have positive coefficient 0,0004 or 0,04 percent and have significant impact to market structure.

THE IMPACT OF MARKET PERFORMANCE ON BARRIER TO ENTRY

$$MES = 0{,}2648 - 0{,}005\, PM + 0{,}0003\, GVA + 0{,}0196\, EF \ldots\ldots\ldots (9)$$
$$(0{,}02797)^{***} \quad (0{,}0005) \quad (0{,}000008)^{**} \quad (0{,}0359)$$

$R^2 = 0{,}387$
F-stat = 4,43 Prob$_{16}$ = 0,01
DW-stat= 1,66 Prob. Breusch-Godfrey Serial Correlation LM Test =0,41
Prob. Breusch-Pagan-Godfrey= 0,86
** = significant at 5%, ***=significant at 1%.

Variable of barrier to entry (MES) as a measurement of structure is examine as variable that is formed by performance variable such as profit margin (PM), growth value added (GVA) and efficiency (EF). These three variables as a independent variable and barrier to entry (MES) as a dependent variable. Based on the value of F-statistic 0,01<α=0,05, means all independent variables have mpact to barrier to entry. Regression estimation shows if the model 9 is good. Where the OLS assumption test shows that model is have no autocorrelation, heteroscedasticity, and multicolinearity (Attachment-2). Regression constanta in model 4.2 is 0,265, means if all performance

variables are fixed or zero, so the value of Minimum Efficiency Scale (MES) is 26,5 percent or the barrier to entry of jamu industry market is high enough is close to average of MES during this observation is 28,61 percent.

Value of R^2= 0,387 menasmeans all variance of performance variable can explain the market structure variabel as 38 percent, and other 61 percen is explained by other variable from performance, conduct, or market structure itself. Variable coefficien of profit margin is negative, 0,5 percent, and efficiency is positive equal to 1,96 percent but both of them have insignificantly impact barrier to entry. Growth value added have positive coefficient 0,0003 or 0,03 percent and have significant impact to barrier to entry.

CONCLUSION

According to concentration ratio, average value of CR4 is 0,78, CR8 is 0,86 and HHI value 2366 so market structure of jamu manufacture industry can be classified as tight oligopoly , means oligopoly with highests concentration.

The performance of Jamu tratditional industry based on profit margin is 20,12 percent, it means the firm can get profit margin around 20 percent. Growth of performance on value added is 47 percent, and efficiency (EFI) 81,96 percent. Based on three measurements the performance of jamu industry can be classified good enough.

Market structure is influenced by performance, there is a positive relationship between profit margin and growth value added to market structure, further efficiency has negative impact to market structure. Growth value added is significant in5 percent degree of freedom, where the 1 percent of increasing GVA will increase the concentration as 0,04 percent.

The government need to encourage performance of jamu industry by improving the standart and quality of the product that will be selled in domestic and world market. This research is not put the variable conduct of jamu industry and the government regulation that can inhibit developing jamu industry. Varibel conduct and regulation can be used for the next research, especially in structure, conduct and performance aspect of jamu traditional industry in Indonesia.

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