Market Structure of Beef Cattle Business in Payakumbuh West Sumatera

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***Abstract*—The purpose of this study is to determine the market structure and the barriers to entry and exit of beef cattle market in Payakumbuh. Survey was conducted in Payakumbuh West Sumatra, with total of 106 respondents. The market structure was analyzed using concentration ratio. The results showed that cattle traded value of each actor is varies, the highest is Butcher, middlemen, breeder and trader respectively with total value of Rp 7,217,760,000. The results also showed that the concentration ratio of beef cattle market is less than 40%. This situation gives a strong bargaining position for the beef cattle market and market are identified as perfect competition market. The main barriers to entry are big investment value and marketing. Meanwhile, barriers to exit are, again big investment value and the fact that beef cattle business is as the community's main source of income.**

***Index Terms*—market structure, business cattle, market barriers, concentration ratio, investment value, bargaining position**

I. Introduction

The development of beef cattle in Indonesia is more to get the government's attention on areas that have a population level and high production, such as West Java, East Java and Central Java [1]. However, West Sumatra is quite important for the development of beef cattle. The main problem in Payakumbuh beef industry structure is still dominated by small breeders with holdings 2-4 heads, limited capital, less mastery of information technology to access the market and bad management [2]. The government's policy has not been able to resolve this problem. Small breeders are faced with the problem of availability of inputs and marketing as well as the absence of sufficient economic incentives for providers and fattening feeder. This results in low levels of productivity and business efficiency. This study aims to (1) determine the structure of the market of local beef cattle breeding business in West Sumatra, (2) analyze barriers to market entry and exit of beef cattle in Payakumbuh.

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A. Industrial Industry Concept

To analyze the market structure of beef cattle industry needs to understand economic concepts relating to the factors that influence the market structure, conduct and performance of markets [3]. The main focus in studying the industrial economy is the behavior of companies in the industry. Industrial economy studying the company's policy is to face of competition and consumers. Market power is the ability to influence market prices and or beat the competitor [4], it can also affect the size distribution and the number of sellers (as measured by market power). The number of sales influences the shape of the market: perfect competition, monopolistic competition, oligopoly or monopoly. While the number of sales distribution and the number of sellers affects the behavior of competitors. Market share is an indicator in determining the degree of market power of a company. The market share is the ratio between the sales of a company with total sales in an industry. Market share can be measured through a large ratio of assets to total assets of the company. The higher the market share of a company is the higher its market power. This raises the influence on the behavior of companies and competitors. Market power identifies the "degree of a control that has a single company or group of companies over the decision about output and prices in a given market" [5].

B. Structure-Conduct-Performance

Industrial structure is defined in terms of number and size distribution of companies that exist in the industry [6]. The industrial structure is a reflection of the market structure of an industry [7]. In empirical studies the structure of the industry, is used to measure the concentration measurement of the intensity of competition in the industry. The concentration of this industry informs the relative size of the existing companies on the market. There are some concentration measurement tools commonly used to describe the distribution of market share among companies that exist in the industry, namely: Concentration Ratio, Herfindhal index, and the Gini coefficient [8].

The concept of SCP (Structure, Conduct and Performance) is a theory used to view the condition of the

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market structure and competition occurred. This theory explains that the performance of the industry is strongly influenced by the market structure, behavior, strategy and corporate performance. Each company has its own position in an industry; a company with a small market share is under the pressure of competition, company with large share of relatively small competition. Performance of the entire market is the performance of each company in the aggregate, so that the performance of the market is a function of the ratio of the concentration of companies in the industry. Structure, is determined by the market concentration ratio, which measures the distribution of market share in the industry. Conduct, is the behavior of company in the industry. This behavior is the competition (competitive) or cooperation (collusive). Performance is a measure of social efficiency usually defined by the ratio of market power (the greater the market strength of the lower social efficiency).

C. Cattle Livestock Industry Performance

Performance livestock industry not only determines the availability of inputs and technology course, but also influences the aspects of the market. Market behavior and marketing processes will determine the share of the supply chain actors of beef to consumer. A market channel is simply the path of a commodity from its raw form to the finished product or the path of a product as it moves from the producers to the final consumers [9].

Beef cattle marketing efforts on marketing are more controlled by institutions that have large-scale businesses such as brokers, traders and butchers. Each marketing channel has its own role and function in the marketing process. Marketing channels are used directly or indirectly. Marketing chain of livestock in Indonesia, through several channels, is among others (1) directly sold to consumers, (2) through the collector (3) sold to a livestock market and (4) sold to slaughterhouses and to retailers of meat and then sold to the consumers.

D. Market Structure

The structure of the market can demonstrate the competitive environment between the seller and the buyer through the process of price formation and the number of products offered in the market [3]. Market structure becomes an important measure in observing variations of actors and industry performance, as strategically can affect the conditions of competition and the level of prices of goods and services. There are seven criteria of market structure according to [10] namely; 1) Pure Monopoly, company controls 100% of market share, 2) Dominant company, companies control 50% of market share and without a strong competitor, 3) Tight oligopoly, merger 4 leading companies that have a market share of 60-100%. Among them an opportunity to set prices more easily, 4) Medium oligopoly, merger 4 leading company which has a market share of 40-60%, 5) Loose oligopoly, merger 4 leading company which has a market share below 40%, 6) Monopolistic, many competitors are effective and none of whom has a marketshare of more than 10% and 7) Perfect competition, there are more than 50 competitors and none that has significant market share.

The structure of the industry (the market) is used to measure the intensity of competition in the industry and to provide information on the relative size of the companies currently in the market [10]. Table I, describes the structure of the market created by the main condition.

TABLE I. MARKET STRUCTURE BASED CRITERIA

No	Market Structure	Criteria
1	Pure Monopoly	Company controls 100 percent market share.
2	Dominant Company	Companies control 50% of market share and without a strong competitor.
3	Tight oligopoly	Merger 4 leading companies that have a market share of 60-100%. Among them an opportunity to set prices more easily
4	Medium oligopoly	Merger 4 leading company which has a market share of 40-60%
5	Loose oligopoly	Merger 4 leading company which has a market share below 40%
6	Monopolistic	Many competitors were effective and none of whom have a market share of more than 10%
7	Perfect competition	There are more than 50 competitors and none that have significant market share

Source: Jacobson (1996)

The market structure has some important elements, namely market shares, concentration, and barriers to market entry [11]. Market Share is the percentage of the company's revenues total industry revenue can be measured from 0 to 100 percent [3]. The higher the market share, the higher the market power owned by the company. If every company has a low market share, it will create effective competition. Market power identifies the “degree of a control that has a single company or group of companies over the decision about output and prices in a given market” Among the most commonly used indicators for measuring market power are concentration ratios [8].

Market concentration in an industry refers to the sales made by the largest firm [12]. The Number and Size of Firms is the most obvious structural measure of market power in the market. In this case the types of competition determine the degree of concentration of firms in an industry. A pure competition has many sellers, while monopoly has only one firm. In these two extremes we have the oligopoly and monopolistic competition which have few or some number of players in the industry which could mean anything from 2 to 52 firms [4].

Concentration Ratio is the combined market share of the oligopoly companies where they realize the interdependence [3]. Return on average concentrated industry will be higher than the income of the types of industries that are less concentrated. There are four indices of concentration, namely: 1) The concentration ratio of the standard requires the overall market size data and measures of market-leading companies. Hirschman-Herfindahl index is the sum of squared market shares of all companies in an industry. Rosenbluth index is based on the ratings of each company and its market share. The entropy index measures the market share of all companies. Concentration measurement tools are, among others, the

Concentration Ratio (CR), Herfindal index and the Gini coefficient. To determine the market structure or market structure, the market concentration level classification is based on the level of market concentration is measured using a Concentration Ratio formulation [13].

Concentration Ratio (CR) is used to measure the output market, turnover, added value, and number of employees or the value of the assets of an industry. Usually the number of companies which calculate the proportion is 4 known by the CR4 numbers. The concentration ratio ranges from 0 to 1, which is expressed as a percentage. CR4 value close to 0 indicates that the number of the company has a relatively small market share, and vice versa when approaching 1. CR4 figure will increase when the number of companies decreases and will decrease when the number of firms in the industry increased [14]. The most extreme figures are in a perfectly competitive market where many manufacturers with a market share of each producer are relatively small and the manufacturer can not control the price. Likewise in the monopoly market where the manufacturer has a market share of 100%, and can determine the price. CR4 high figures indicate that the market is dominated by a number of small producers, thus forming an oligopoly market. At the large manufacturer oligopoly market can affect prices, by regulating production output.

A barrier to entry is something that blocks or impedes the ability of a company (competitor) to enter an industry. A barrier to exit is something that blocks or impedes the ability of a company (competitor) to leave an industry. In general, industries that are difficult for new competitors to enter may enjoy periods of good profitability and limited rivalry among competitors. Conversely, industries that are easy to enter attract new companies into the industry during periods of profitability. So, rivalry among competitors can be intense. On the other end, industries that are difficult to exit have more rivalry than industries that are easy to leave [15].

Barriers to Market Entry can be seen with many competitors that have sprung up to race in achieving the desired profit target and capture market share. Barriers in entering the market, or barriers to entry in the industry of cattle can be divided into two types: 1) the reason the law or legal barriers to entry in the form of patents, franchise and activities other settings, 2) technical barriers is the availability of specific technology and specific knowledge [3], 3) the availability of and access to resources in the form of capital, access to market information, supply and demand conditions of the existing resources Stigler in [16]. According to [17] that the presence of barriers to entry would deter a potential competitor to enter the market and become a real competitor. Anything that reduces the likelihood of scale or speed of entry of the company is referred to as entry barriers. Entry barriers are divided into two types, namely barriers to exogenous and endogenous constraints. Exogenous barriers are barriers to entry the market that nature is beyond the control of leading companies and is an irreversible fundamental cause.

While endogenous barriers are barriers to entry sourced from within the company itself, such as the price to establish company policies, the creation of overcapacity, the image of a product brand loyalty, mastery of product strategy and raw materials strategy. Another factor of the barrier to entry is the Minimum Efficiency Scale (MES) [18]. Some of the common barriers to entry and exit are listed below. Typical barriers to entry are economies of size. The need for a large volume of production and sales to reach the cost level per unit of production for profitability Capital intensive, a large capital investment per unit of output in facilities. Intellectual property as patents and other types of proprietary intellectual. High switching costs to a new supplier. Established brand identity, are difficult to create a competing branded product. Permitting requirements and licenses, Government standards (SNI in Indonesia). Typical barriers to exit are investment in specialist equipment, highly specialized skills, and high fixed costs [15].

II. Material and Method

This research was conducted by method survey, 58 respondents were randomly selected from the 515 breeders. Respondents were selected by vendors with non-probability sampling method, i.e. with snow ball sampling method. Respondents of this study consisted of 58 breeders, 14 middlemen, 18 traders and 18 butchers with total of 106. As shown in Table II.

TABLE II. Detail of Research Respondents

No	Actors	Respondent
1.	Breeders	58
2.	Cattle Provider (cattle merchant)	14
3.	Cattle traders	18
4.	Butcher	16
	Total	106

Analysis method

- Descriptive analysis was used to describe the condition of local cattle business in West Sumatra.
- To determine the level of market concentration in any type of market (market input, intermediate and output) used the analysis of the concentration ratio with the formulation as follows:

$$CR = \sum_{i=1}^{r} Si \ldots\ldots \quad i = 1, 2, 3, \ldots, r \qquad (1)$$

CR = concentration ratio
Si = the percentage of market share from actor to-i
r = number of the most dominant actor

- The barriers to entry and exit points are identified using several indicators, namely:
  1) Legal barriers in the form of patents, franchise and other regulatory activities,
  2) Technical barriers, namely the availability of specific technologies and specific knowledge [19],
  3) Availability and access to resources in the form of capital, access to market information, supply and demand conditions existing resources.

III. Result and Discussion

A. Local Cattle Business in West Sumatra

In general, business conditions of beef cattle farms locally in Payakumbuh illustrated by the number of cattle population in 2013 reached 4,247 head spread over five (5) districts, namely East Payakumbuh as many as 1,297 head, District of West Payakumbuh of 825 head, District of South Payakumbuh of 602 head, subdistrict North Payakumbuh of 1124 head and subdistrict of Lamposi Tigo Nagari as many as 401 head. In general, breeders do traditional breeding system individually, with ownership of 2-5 head.

Markets are complex institutions encompassing hierarchies and interlinked transactions which may involve simultaneous considerations of various commodities [20] Cattle market in Payakumbuh control by middlemen, the existence of middlemen on the other hand help farmers in marketing their cattle and facilitate farmers to get cash when farmers need. Pricing of cattle has always been associated with the need for money by farmers. When breeders desperate for cash, they merely acts as a price taker, even often middlemen detrimental to farmers. The determination of the price of cattle is done through the estimates, not based on the cattle weight; they do not know the price and weight of lived beefs. This condition is very detrimental to breeders. According to [21] market conditions are very important for livestock keepers because they determine the level to which the livestock keepers will benefit from their produce. Many livestock keepers remain poor and earn relatively little income due to poor market conditions.

In analyzing market structure, market concentration and entry conditions are considered. Market concentration is defined as the number and size distribution of sellers and buyers in the market. Market concentrations play an important role in the determination of market behaviour within an industry because it affects the interdependence action among firms. These structural characteristics are therefore, used as a basis for classifying markets. Markets may be perfectly competetive, monopolistic or oligoplistic. The ideal market structure for optimal efficiency is pure competition. A market is said to be competitive when there are many buyers and sellers, free entry conditions, high degree of price competitions and perfect market knowledge [9].

Agricultural marketing can be assessed or measured to determine their efficiency in the areas of marketing structure and performance, market efficiency, marketing margin and market channels [22] In Payakumbuh cattle marketing channels through multiple channels are : (1) Breeders - Midlemen – Cattle traders - Butcher. (2) Breeders - Cattle Traders - Butcher, (3) Breeders – Middlemen - Butcher and (4) Breeders - Butcher. The most preferred channel is channel two, because of the direct payment at the time of the transaction.

Input and output of institutional markets have an important role in supporting the success of the cattle business. The existence of institutional market input and output emerges as an attempt to solve the problem going to need marketing input and output.

TABLE III. Average Business Volume Each Actor

No	Characteristics of the respondent's business	Breeder	Middlemen	Traders	Butcher
1	Ownership of cattle	1-5	-	-	-
2	Purchase of cattle /week	-	7-10	10-15	-
3	Slaughter cattle/week	-	-	-	5
4	Average operating scale	5	10	15	5
5	Actor with principal businesses (person)	10	7	4	5
6	Actor with sideline businesses (person)	40	1	-	-

Source: Research Findings, 2014

Based on Table III, it shows the average of each actor involved in the institutional input and output of beef cattle. Traders in buying and selling cattle carry out an average of 7-10 head per week. Traders and Butcher are still productive to pursue his profession. Cattle Traders transactions on the market in Payakumbuh exist only on Sundays. They transact an average of 10-15 head/week, and they already have their own cattle marketing network. Butcher is slaughter of 5 cattle per week to meet the maximum demand. According to [23] the institutional socio-economic phenomena relating to a relation-ship between two or more actors.

Buying and selling process did run perfectly due to the lack of market information, and imperfect com-petition between traders. Thus it is difficult to set a standard price. In general, breeders receive a low price because it is through the channel length.

TABLE IV. Average Business Volume Each Actor

Chanel	Breeder	Middlemen	Traders	Butcher	Total
Chanel 1	466,900	522,050	546,900	584,300	2.120,150
Chanel 2	1,264,800	0	1,331,100	1,434,410	4,030,310
Chanel 3	238,650	254,900	0	274,600	768,150
Chanel 4	141,850	0	0	157,300	299,150
Transaction value	2,112,200	776,950	1,878,000	2,450,610	7,217,760

Source: Research Findings, 2014

As shown in Table IV each channel through which always involves costs, marketing costs depends on the size of the number of middlemen and the functions performed. The longer the greater the marketing channel marketing costs is, the greater the cost of marketing middlemen tends to depress prices on the part of farmers and end consumers must pay a higher price. Offering the livestock held in private, the price is set based on the estimated weight of the meat which is determined based on the experience of traders. Farmers received no cash payments. Transactions are carried out without the written evidence, based only on mutual trust. Such marketing system raises the risk of loss for farmers, and the unfair distribution conditions. This condition is caused by lack of market information and the weak bargaining position of farmers. This condition occurs in many developing countries such as Ethiopia, the marketing of beef cattle almost all market structure of cattle in the area shows the noncompetitive nature. The

market concentration ratio for top four cattle trader is ranged between 43.03 and 95.02 [17]. Theoretically, market structure relates primarily to factors found in every market that are significant internal features of the market setting and that affect the conduct of firms. The characteristics mostly emphasized as strategic aspects of market structure include the relative sizes and number of buyers and sellers, freedom of entry and exit, degree of produce differentiation, market knowledge and the degree of seller or buyer concentration [24].

B. Market Concentration Ratio Analysis

The result of Market concentration ratio is presented in Table V. Market concentration ratio calculated based on the value of local beef cattle traded in the market. Transactions of the four largest players in the cattle markets in Payakumbuh are a breeder, middlemen, traders and butcher.

TABLE V. MARKET CONSENTRATION OF BEEF CATTLE IN PAYAKUMBUH

Description	Breeder	Middlemen	Traders	Butcher	Total
Amount Actor	58	8	4	7	
Cattle traded value of each actor (in billion IDR)	2,112.2	776.95	1,878.00	2,450.61	
Total Cattle traded value (in billion IRD)					7,217.76
CR4 (%)	29,26	10,76	26,03	33,95	

Source: Research Findings, 2014

Based on Table V, it can be seen that the concentration of breeder cattle market is at 29.26 percent. This shows that the concentration of market cattle are in a perfectly competitive market, in accordance with the opinion [14] that the concentration of the market with the CR4 value<0.4 then are perfectly competitive market structure (competitive) or monopolistic competition (to be seen whether there is product differentiation or not). When 0.4 <CR4<0.8 then are oligopolistic market structure/oligosopni. While CR4>0.8 then the market structure tends to monopoly or monopsony.

Breeders dominate the market by 29.26% smaller than 40%, this value indicates that the market in the beef industry is un-concentrated and has a perfectly competitive market structure, since the business scale is still small, about 7-10 heads per week. Thus there is sharp competition cattle market. Thus Likewise, the market concentration of Middlemen of 10.76% indicates that the type of market formed is un-concentrated. Likewise butcher has concentration ratio of 33.95% less than 40%. No actors have dominant market power. The cause is the bargaining position of breeders who do not coordinate each other. Similarly, the market concentration of traders is also stood at below 40 percent, amounted to 26.03 percent, it also shows that competitive market happenes among traders. This happens because they usually operate in areas they already know and breeders also are familiar with these merchants, so that farmers have more confidence surrender their animals to traders who come from the local area. These conditions lead to a lack of competition between them. Number of butchers who operate in the cattle markets of Payakumbuh is 7 people; this causes somewhat higher concentrations in the amount of 33.95 percent that below 40 percent, so that operating at sufficient competition in cattle market in Payakumbuh city. In accordance with the opinion of [12], if the four biggest actors have a concentration ratio less than 33% shows that the industry is not concentrated. In developed countries with a high level of technology, such as agro-industry in the US, the market concentration is above 50%, while for livestock industries, the 2010 CR4 exceeded 85% for steers and heifers and 65% for hog slaughter [9]. The same result occurred in research conducted by [25], has revealed that the marketing of cattle in Nigeria are in a perfectly competitive market structure. The study also revealed a marketing efficiency ratio of 2.20 depicting a well performing market. this condition occurred because the government intervention in livestock marketing through providing more infrastructural needs of the beef marketers as roads, storage and credit facilities to better up the situations of the beef marketers in ways that improve viable competitions between the actors within the beef market.

C. Market Entry Barrier and the Level of Knowledge of the Market

There are several factors as a barrier to market entry, namely beef cattle production technology, investment value, low selling price of beef cattle, marketing issues, price information and economies of scale. Each actor has different factors to entry the market. At the breeder level factors, that are barriers to market namely technology of production, limited capital, low price of beef cattle, the scale of which is still very small holdings and pricing information are not valid and varied. Traders have barriers to market entry with high investment value and high levels of competition. Butchers face the same obstacles to traders, only a factor fluctuation request at any time that is also a major limiting factor in the activities traders pieces. While the factors that become an obstacle for the exit of the small-scale beef cattle industry is a great investment value, chances demand, a contract, the respondent's main job, source of income and the availability of forage feed source (land). All actors face similar constraints to exit the beef cattle business namely the magnitude of the potential demand for beef causing in them reluctant to exit the market. The barriers to entry market in beef cattle marketing in Payakumbuh livestock market are as shown in Table VI.

Based on Table VI, market knowledge regarding pricing information of cattle prices received by farmers is relatively small. However, these conditions must be faced by farmers since most farmers sell livestock because they need money, so it is in an inferior position. Lack of knowledge of farmers against price information for breeders only want to sell their animals at home, this is because they want to reduce the cost of transportation when it should be taken to the cattle market, which has implications for the decline in sales revenue.

TABLE VI. SOME BARRIERS IN BEEF CATTLE MARKETING IN PAYAKUMBUH

Description	Kinds of Barriers	Problem	Freedom to entry
Commodity	Quality and Performance (tin)	Varies	Tough
Breeders	Lack of capital, production technology and marketing	Slight	Tough
	Land ownership	Slight	Tough
	Relationships	Limited	Tough
	Experience and knowledge of the market	Less	Tough
Middlemen	Lack of capital, relationships, experience, market knowledge, tools and technologies	Limited	Tough
Traders	Lack of capital, infrastructure and technology	Limited	Tough
Butcher	Fluctuating demand	Always	Tough

Source: Research Findings, 2014

The results of interviews with farmers about how they obtain information about cattle prices prevailing in the market are presented in Table VII.

TABLE VII. SOURCE INFORMATION OBTAIN PRICE OF BEEF CATTLE BY BREEDERS

No	Source of Price Information	Number of breeder (man)	%
1	News newspapers, radio and TV	2	3.45
2	Middlemen, traders	49	84.48
3	Breeders	7	12.07
4	Total	58	100.00

Source: Research Findings, 2014

Based on Table VII, price information receives mostly beef cattle breeders from traders, as many as 84.48 percent. Information obtained from a fellow breeder is 12.07 percent. While the rest is received from either the mass media of newspapers, radio and television. This phenomenon indicates that traders are still in control in providing price information to farmers. The same thing also happened in others developing country such as Ethiopia, livestock market price information are poor and uneven access to market information remains a major constraint for livestock market actors, producers in particular. Observations at market sites in Borana zone point to an imbalance in the bargaining power of traders and producers. Traders collude and jointly determine prices ahead of market day, and producers have very little or no ability to negotiate prices. [26]

IV. CONCLUSION

The concentration ratio of all Market players is less than 40%. This indicates that traders have their strong bargaining position. Beef cattle market has a perfect competition. The main barriers to enter the market are huge investment value, and marketing issues and market exit barriers are high investment value. This effort is the main source of income.

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D. Yuzaria, *Implementation of Beef Import Policy in Indonesia*, Padjadjaran University Press, 2010.

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