

RESPONSE OF FEEDLOT BUSINESS TO THE BEEF MARKET MECHANISM CHANGED IN WEST JAVA INDONESIA

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Abstract

Population growth, incomes increasing and the awareness upon nutritious food resulted in creating a gap between beef demand and its supply. After economic crisis, market mechanism on beef trade was changed as well as supporting regional resources and the government policies. The objective of this study was to analyze the response of cattle feedlot business toward the changes of beef market mechanism in West Java Indonesia. The study was carried out in the districts of Ciamis, Tasikmalaya, Garut, Sumedang, Bandung and Sukabumi of West Java. A survey was applied to 180 small holder feedlot farmers as respondents, which had been sorted out through a simple random sampling, and three other feedlot companies (50% from the member of Indonesian Beef Producer and Feedlot Association in West Java) which were purposively selected. The data were analyzed using McNemar, Logistic Regression, Cobb-Douglas and Policy Analysis Matrix (PAM). The results of this study indicated that: (1) the changes in beef market mechanism generated response from the feedlot companies through the development of their business scale; however, the small holder feedlot business has comparative as well as competitive advantages upon the existing companies business had not been efficient, but as the financial analysis it's efficient.

Key words: response, cattle feedlot, government policy

INTRODUCTION

Population growth, incomes increasing and the awareness upon nutritious food resulted in creating a gap between beef demand and its supply. After economic crisis, market mechanism on beef trade was changed as well as supporting regional resources and the government policies. Yusdja and Ilham (2004) said, that average increasing of the beef prices around 24 % to 37% per year. Based on these, increasing beef price should be impact of second contribute to inflation of food sector.

For the stabilized supply demand of the beef, and impact of decreasing local cattle the government policy are open beef and live cattle imported from another country. Especially from free disease according to FAO rule. Beef import value increasing year by year. Pasca economic crisis in 1998, the volume of beef import reach 8,813.8 metric ton, in 2007 increase to 64,410 metric ton, beside that live cattle import in 1998 only 42,400 heads and on 2007 reach 570,000

heads (Directorate General of Livestock Service, 2008). As the Livestock Department West Java Government (2007) to fulfill beef for West Java population in year not less than 319,336 heads must be slaughtered. Today domestic production can provide contribution 13.71% from small holder beef cattle farmers and remainder imported out of West Java namely from Australia, central Java, Yogyakarta, East Java, Lampung, Bali, Lombok, and generally these beef cattle comes from feedlot companies.

The purpose of this research is to analyze the response of feedlot business to changed in the beef market mechanism and government policies in West Java

Based on this phenomenon was presumed that the difference response through company and small farm to the beef market mechanism changed. Therefore, required to be deeply studied.

MATERIAL AND METHOD

This research was carried out in West Java such as Ciamis district, Tasikmalaya, Garut, Sumedang, Bandung and Sukabumi. Research time was implemented since February 18, 2008 until May 17, 2008. This research used survey method through 180 respondent's are small beef cattle farmer that selected by simple random sampling and three feedlot companies that selected purposively from six as the members of feedlot association.

To analysis of feedlot business production response used the Cobb-Douglass Production Function with model, as follow;

$$Y = a \cdot X_0^{b_0} \cdot X_1^{b_1} \cdot X_2^{b_2} \dots X_6^{b_6} \cdot d^b$$

- Y : output (product)
- X₀, X₁, X₆ : Input (production factors)
- d: Variable Dummy (market mechanism)
- a, b, b₀, b₁... b₆ : Constanta

To Analysis market mechanism changed to small business feedlot used "logistic regression model".

$$\text{logit}(\pi(x)) = a + bX_2 + cX_3 + dX_4 + eD_1 \dots \dots jX_9 + \epsilon$$

Logit (π(x)) : changed the scale of business

X₂, X₉ : production factors

D₁, D₄ : Dummy (payment, transaction by body weight system, killing system and target market)

a, b, c, j : Constanta

E : anathor factors

So, the analysis of corelation between scale of business to change of beef market mechanism after and befor 2001 used matrix McNemar test (Siegel, 1992).

Table 1. Matrix Corelation between business scale to beef market mechanism on small Feedlot Farm

| | | | | |
|-------------|-------|------------|-----|------------------|
| before 2001 | scale | After 2001 | | Total Respondent |
| | | Small | Big | |
| | Big | A | B | A+B |
| Small | C | D | C+D | |

Note :

Cell A and D ; indicate changed of business scale

Cell B and C ; indicate not changed of business scale

Significances McNemar test :

$$\chi^2 = \frac{(A - D)^2}{A + D}$$

db = 1

The Policy Analysis Matrix (PAM) method used to analyze various government policies through feedlot business. The matrix model according to Monke and Pearson (1989) as follow as:

Table 2. Matrix of the Policy Analysis Matrix

| items | Revenue | Input Tradable | Domestic factors | Profit |
|--------------|---------|----------------|------------------|--------|
| Market price | A | B | C | D (1) |
| Social Price | E | F | G | H (2) |
| Divergens | I (3) | J (4) | K (5) | L (6) |

Note:

- 1. Profit Individual(D) = A-B-C
- 2. Social Profit(H) = E-F-G
- 3. Transfer Output(I) = A-E
- 4. Transfer Factors (J) = B-F
- 5. Transfer Input (K) = C-G
- 6. Transfer bersih(L) = I-J-K= D-H

RESULT AND DISCUSSION

Response Scale of business to Change of Beef Market Mechanism

To determine the response given by the small farm, and conducted the analysis with the model "logistic regression and McNemar analysis matrix. Furthermore, to know that

"logistic regression" is the best model in testing the hypothesis, according to Agresti (1996), Hosmer and Lemeshow (1989) test statistic for "logistic regression" is the likelihood ratio test statistic (omnibus test), this test will following the Chi-Square distribution with degrees of freedom is *p*.

Table 3. Omnibus Test for Logistic Regression Model Coefficient

| Item | Chi-square | Df | Sig. |
|---------|------------|----|------|
| step -1 | 203.525 | 10 | 0,00 |
| Block | 203.525 | 10 | 0,00 |
| Model | 203.525 | 10 | 0,00 |

Based on the analysis (see the Table 3), in the aggregate of all predictor variables have a significant impact on the scale of change in the small farmers, it can be seen from the significance of the Chi Square value of zero is smaller than 0.05. This means that this predictor model can be used to determine the extent predictor variable that gives effect to

changes in the scale beef cattle fattening business small farm

To determine the extent to which the predictor variable (X) is influential and has closeness relation to changes in its business scale (Y) can be seen in Table 4 below,

Table 4. Logistic Regression Model Summary, Determination and Correlation Coefficient

| No | Item | -2 Log likelihood | Cox & Snell r ² | Nagelkerke R ² |
|----|---------|-------------------|----------------------------|---------------------------|
| 1 | Step -1 | 25.997 | 0.707 | 0.945 |

Based on the results of logistic regression analysis could be identified that influence the value of all predictor variables (X) consisting of capital, labor, electricity, equipment, investments, feed, changes in beef market mechanisms (dummy) has an influence of

94.5 % to changes in business scale (Y), with the closeness of the relationship 70.7%.

Furthermore, to find out details predictor variables are most influential to the change in scale, can be partially seen in Table 5.

Table 5. Logistic Regression Analysis to Changes scale of business in the small farmer

| No. | Variabel | B | SE | Wald | Df | Sig. | Exp. (B) |
|-----|-------------|----------|-----------|--------|----|-------|----------|
| 1 | Capital | 2.828 | 8.141 | 0.121 | 1 | 0.728 | 16.915 |
| 2 | Labor | -18.550 | 7.130 | 6.769 | 1 | 0.009 | 0.000 |
| 3 | electricity | 8.986 | 6.352 | 2.001 | 1 | 0.157 | 7991.778 |
| 4 | Equipment | 0.055 | 4.298 | 0.000 | 1 | 0.990 | 1,057 |
| 5 | Investment | 35.758 | 10.424 | 11.768 | 1 | 0.001 | 3.4E+15 |
| 6 | Feed | -0.802 | 4.130 | 0.038 | 1 | 0.846 | 0.448 |
| 7 | Concentrate | 0.962 | 2.038 | 0.223 | 1 | 0.637 | 2.616 |
| 8 | Dummy-1 | 42.794 | 22289.840 | 0.000 | 1 | 0.998 | 3.8E+18 |
| 9 | Dummy-2 | -32.132 | 22289.869 | 0.000 | 1 | 0.999 | 0.000 |
| 10 | Dummy-3 | 7.466 | 36.354 | 0.042 | 1 | 0.837 | 1748.220 |
| 11 | Constanta | -143.394 | 88.612 | 2.619 | 1 | 0.106 | 0.000 |

Note : Y : scale of business changes

Based on Table 5, had variable labor (0.009 significant value <0.05) and investment (significant value of 0.001 <0.05),

these variables mean the most to give effect to changes in scale. This is due to labor availability associated with the ability to

provide feed for livestock; increased labor farmer will increase the scale of their business. While the investment costs were very hard to get farmers in their business development efforts compared to other working capital. This is an obstacle for change scale.

The other variables, especially the dummy variable (beef market mechanism) did not have a significant effect (significance value > 0.05). This means that the market mechanism predictor variables did not

provide significant effect on the change scale of business. Because in general, small farmers are not directly related to the beef market, the sales transactions made by the middlemen. Therefore, changes in beef market mechanism that occur are not perceived by the small farmer.

To find out more about the relationship change based on beef market mechanism, by the McNemar analysis can be seen following matrix on table 6.

Table 6. Matrix of Relationship Beef Market Mechanism Changes to scale of business Small Farm

| Before year 2001 | Scale of Business | After year 2001 | | Number Respondent |
|------------------|---|-----------------|-----|-------------------|
| | | small | big | |
| | Big (Production > 12 heads/year) | 43 | 36 | 79 |
| | small (Production Maximal 12 heads/year) | 63 | 38 | 101 |

In the Table 6, it appears that the people of 180 respondent's farmers that are grouped into large scale production capability at least 12 heads per year are 79 respondents. Of this number has changed to smaller scale are 43 respondent, unchanged are 36 respondents. In the small-scale groups of respondents, amounting to 101 farmers, has turned into a large scale are 38 respondents and 63 respondents did not change.

To find out more about the relationship change based on market mechanism by McNemar analysis of the results obtained; $X^2 = 0.197$. If $\alpha = 0.05$ then the X^2 in the region of acceptance of H_0 , which means that after the year 2001, the small farmers had not changed or tended to remain (PA = PD).

Furthermore, the business scale response to beef market mechanism on feedlot companies can be seen in Table 7 below.

Table 7. The Stables Capacity of Feedlot Companies, before and after Beef Market Mechanism Changed and Feeder Cattle Import Realize

| No. | Companies | Before (heads) | After (heads) | Import Realize (heads/year) 2007 |
|-------|-----------|----------------|---------------|----------------------------------|
| 1 | PT. X | 2,400 | 5,500 | 18,000 |
| 2 | PT. Y | 2,400 | 10,000 | 22,850 |
| 3 | PT. Z | 2,400 | 10,000 | 35,656 |
| Total | | 7,200 | 25,500 | 76,506 |

Source : Respondent and Apfindo, 2008

Note : PT (Perseroan Terbatas mean Company)

Based on Table 7. All respondents found, that the companies at the time before the economic crisis have a stable with a capacity of 2,400 heads. This is a requirement for every member of Feedlot Association who

must have stable with a minimum capacity for two shipments of about 2,400 heads. Post-economic crisis proved all respondents have the capacity to change their business stable between 5,000 to 10,000 heads.

The Production Response to changes Beef Market Mechanism

The Model Cobb-Douglas was could be used as a tool of analysis, because the $F_{analysis}$ greater than the F_{table} , the value of significance greater than 0.05 with the relationship 74.7%, while the coefficient of determination of 54.2%. Equation of Cobb-Douglas is obtained:

$$Y = 5,1 X_3^{-0,99} \cdot X_4^{0,04} \cdot X_5^{0,18} \cdot X_6^{0,01} \cdot X_8^{0,91} \cdot X_9^{0,48}$$

The results of the analysis of the Cobb-Douglas is shown that changes in the beef market mechanism does not provide a significant effect on weight gain in the small farmers business, because the significance value greater than 0.05.

Response to Supporting Regional Resources

Based on the analysis that proved the value of the Domestic Resource Cost (DRC) for the small farm and companies are 0.95 and 1.39. This means, that the small farm have a comparative advantage, because the economic activity in the efficient use of domestic resources as of feeder cattle, feed

(roughage) and concentrates, infrastructure and other supporting institutions. So, for the fulfillment of domestic demand will be more profitable by increasing domestic production from the production of small farms. For feedlot companies has an economic loss. This means that economic activity feedlot companies are inefficient in utilizing domestic resources.

Furthermore, base on the private cost ratio (PCR) analysis showed the value of 0.90 for small farmers is smaller than the 1.36 value for the companies. This value indicates that the small farmers have been economically efficient or competitive advantage of domestic resources. While the feedlot companies are in business conditions that are not competitive. This analysis concluded, that the small farmers is economically or its have comparative and competitive advantage.

Response to Government Policy

To know feedlot business response through various government policies was carried out *Policy Analysis Matrix* (PAM). Table 8, is analysis input-output in feedlot business and company.

Table 8. Input-output analysis Policy Analysis Matrix Feedlot Business in West Java (Rp/kg live weight)

| Item | Revenue | Tradable Input | | | Domestic Factors | | | | Total Cost | Profit |
|-------------------|---------|----------------|-------|--------|------------------|------|--------|--------|------------|--------|
| | | feeder | other | labour | capital | land | others | Total | | |
| Small Farm | | | | | | | | | | |
| Private | 21,859 | 0 | 77 | 98 | 9,056 | 8 | 10,454 | 19,616 | 19,693 | 2,166 |
| Social | 18,800 | 0 | 77 | 98 | 7,183 | 8 | 10,454 | 17,743 | 17,820 | 980 |
| Divergence | 3,059 | 0 | 0 | 0 | 1,873 | 0 | 0 | 1,873 | 1,873 | 1,186 |
| Companies | | | | | | | | | | |
| Private | 19,000 | 0 | 9,807 | 5 | 2,471 | 2 | 201 | 2,679 | 12,486 | 6,514 |
| Social | 18,800 | 0 | 9,807 | 5 | 2,471 | 2 | 201 | 2,679 | 12,486 | 6,314 |
| Divergence | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200 |

In Table 8, it appears that revenue small farm obtain positive divergences Rp. 3,059.00 / kg of live weight greater than the company is Rp. 200.00 / kg of live weight. This is due to consumer preferences for local beef is higher; resulting in the price per kg of

live weight of local beef is more expensive than beef cattle ex-import.

On the domestic factors in the small-farm capital, also the divergences value of Rp. 1,873.00 / kg of live weight, while in fatten the company may not find all the divergences in domestic production factors and tradable

inputs. This is due to the small farm business, there is government policy to provide interest subsidy of about six percent of the commercial interest. While the companies have no protection to the all factors of production and tradable inputs.

However, when viewed from the aspect of private profits, the companies profit reaches Rp. 6,514.00 / kg of live weight is higher than small farm is Rp. 2,166.00/kg live weight. The main thing, that caused the productivity of cattle production on companies shown by the increase in average daily gain around 1.35 kg /head/day is much higher compared to small farm, newly able to achieve 0.33 kg/head/day. Furthermore, the use of production factors to obtain one kilogram of body weight per day in small farm as much as Rp. 19,693.00/kg of body weight was greater than company around USD 12,486.00/kg of body weight. The amount of production costs are not balanced with high body weight produced shows inefficiency of input usage. The main causal factors of inefficiency at the small farm especially in the use of production factors labor, capital and land. Low productivity as a result of the lack of skilled labor for fattening technological innovation. When associated with the ability to increase body weight per day, was the contribution of feed costs on small farm only 52.93% while in fatten efforts to reach 79.57% of total production costs beside feeder cattle.

Output Response to Government Policy

The Analysis result shows that Nominal Protection Coefficient Output (NPCO) value for feedlot business is 1.16 and company 1.01. It means no government policy that impedes commodity export for farmer or company. The analysis result also shows that various government policies provided subsidiary populace farmer through output 16% and company 1%.

Input Tradable Response to Government Policy

Based on the results of this analysis there was no government protection policies of commodity inputs for the small farm and companies. The whole process of

determination of commodity prices of production inputs delivered to the market mechanism. In this case, it would be difficult to fatten the company compete to get a good price and compete in the global market with world prices.

Response to Government Incentive Policy

In this case, the value derived Effective Protection Coefficient (EPC) for small farm is 1.16 and the company is 1.02. This means that effective incentives have been given government directly related to small farm in the form of beef import ban policy and beef from countries that have not been freed FMD and BSE and bank interest, have been enjoyed by small farmer is 16% and companies only 2%.

Based on the results of Profit Coefficient (PC) analysis for the small farm and the company of 2.21 and 1.03. Value of small farm received incentives from the Government of the small farm as a whole among other subsidies, like; fuel, electricity, roads, bank interest, and infrastructure was much larger than the company.

Production Cost Response to Government Policy

The results of analysis of the small farm Subsidies Ratio Producent (SRP) is 0.06 while the company's 0.01. Figures show the results of this analysis that the major influence government policy on increasing farm production costs for the people compared with beef cattle fattening enterprise.

CONCLUSION

The changes in beef market mechanism generated response from the feedlot companies to the development of their business scale; however, the small holder feedlot business has comparative as well as competitive advantages upon the existing companies business had not been efficient, but as the financial analysis it's efficient.

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