Characteristics of business and income in broiler partnership system in Yogyakarta Indonesia

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Abstract. This study aimed to identify the characteristics of the business, measure the income, and analyze the factors that influence the farmers’ income. The research was conducted in Sleman and Bantul Regencies, Special Region of Yogyakarta. Census sampling was performed with 150 farmers. The analysis was carried out in quantitative descriptive and continued with Multiple Regression Analysis. The results of business characteristic showed that the average scale of business ranged from 3604 to 6340 birds, 35 days maintenance time, business experience was 7-10 years, 97% of farmers used the open house system, livestock mortality rate was 4-7%, average selling weight 1.91-1.96 kg/bird, and feed conversion 1.43-2.40. The farmer's income in Sleman was greater than Bantul because the scale of business, selling weight was higher and the mortality rate was smaller than Bantul. Multiple regression analysis showed the determination coefficient ($R^2$) of 44.55%. The scale of business as well as the capital and sanitation have a significant and negative effect on income ($P <0.01$). As a whole, to increase farmers' income, there needs to be an effort to assist businesses from the core, agencies and educational institutions to improve livestock management.

1. Introduction

The development of the livestock sector is an integral part of agricultural development and national development which has a goal to increase the income and welfare of farmers and their families, through livestock business systems that are labor intensive, capital intensive and technology intensive. The poultry sector has shown strong growth at a rate of 8-10% per year, which reflects the potential that is in it [1]. Broiler chickens are the source of protein and nutrients that are important for health and growth [2].

Broiler business partnerships have developed rapidly in Indonesia, this provides a fairly high profit for farmers. The business partnership model of the plasma-core company includes three main activities: (a) supply of production facilities in the form of DOC, feed, and medicine; (b) broiler maintenance and (c) marketing [3]. The core-plasma partnership mechanism basically has to bring together the interests of plasma farmers with the core company. Farmers are willing to cooperate with companies and plant mutual trust in the partners of the partners [4].

Business cooperation with a partnership system is realized in a contract that binds the parties to an agreement. The contract contains a number of clauses that must be adhered to by the parties but still must pay attention to a number of applicable ethics and regulations [5]. The factors that affect income are the volume of product sales and product selling prices. In general, the main goal to be achieved by a company is to earn income. Sales volume is a very important factor affecting the size of
income that farmers will get for their efforts in carrying out maintenance of broiler-type chickens [6]. Factors that have a significant effect on age, income, education, access to credit, farm size and length of time being a member of the group [7]. Therefore, this research evaluated the business partnership by measuring how much the farmers’ income and the factors that affect income.

2. Material and method
The study was conducted in Sleman and Bantul Regencies through survey method. The preliminary stage was done to find information related to the research and also to determine the respondents to be sampled. The respondents comprised 150 farmers consisted of 69 samples in Sleman Regency and 81 samples in Bantul Regency with purposive sampling method, based on more than 1 year business experience and have a different partnership system. Primary data was obtained by direct interview with the farmers that have been determined by using questionnaires.

To identify factors influencing income, the research used multiple regression with Ordinary Least Square model as follow [8]:

$$Y_{pr} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + D_1 + D_2 + \mu$$

Where:
- $Y_{pr}$ = income (IDR / farmer/period)
- $\beta_0$ = intercept
- $\beta_1,...,\beta_4$ = regression coefficient
- $X_1$ = initial capital of business (IDR/period)
- $X_2$ = experience (year)
- $X_3$ = scale (head)
- $X_4$ = mortality (head)
- $X_5$ = sanitation costs (IDR/period)
- $D_1$ = dummy capital maintenance of system
  - 1 = farmer’s group
  - 0 = independent
- $D_2$ = dummy of location
  - 1 = Sleman district
  - 0 = Bantul district
- $\mu$ = stochastic disturbance term

Regression coefficient was estimated with Ordinary Least Square (OLS) methods. Then it was tested using the value of R-squared, F-test and t-test. To treat classic deviation assumption in the OLS method normality testing was done including linearity, multicollinearity, heteroscedastis, and autocorrelation [9].

3. Result and discussion
Research showed that the farmers have productive age range 43-44 years old (Table 1). Age describes the maturity level of each individual from a broiler entrepreneur. Age affects the way of thinking and the physical ability of a person to work. Usually younger entrepreneurs are stronger and more active when compared to older broiler entrepreneurs, besides that they are also more receptive to innovation and more dynamic [10]. The highest formal education of respondents was Senior High School (53-54%). The higher level of education of farmers has greater opportunities to increase income [11]. Education level has a positive effect on business improvement meaning that the higher the level of education the better the perception of plasma farmers about the contract agreement [12].

Most farmers do not take non-formal education such as courses or training. Informal education can make it easier for farmers to receive information to improve competence [13]. Farmers having experience more than 7 years and has a family 3 to 5 person. Generally, the experience of raising is positively correlated with a critical and careful attitude. There was a positive relationship between the number of family dependents and the farmer's perception of partnership implementation [4].
The results of business characteristic research (Table 2) showed that the average scale of business ranged from 3,604 to 6,340 birds. Broiler farmers in Indonesia are generally small-scale, ranging from 4,000 to 6,000 birds [6]. 35 days maintenance time, 97% of farmers used the open house system, livestock mortality rate was 4.00-7.00%. Average selling weight ranged from 1.91 to 1.96 kg/bird. Broilers are generally harvested at 4-5 weeks of age with a body weight between 1.2 and 1.9 kg/bird [14]. The feed conversion ratio (FCR) of broiler chickens in this location ranged from 1.43 to 2.40. The high altitude had a significant effect on FCR, where in the highlands was 1.50 while in the temperate plain was 1.48 and lowland was 1.36 [15,16]. The contents of the cooperation contract regarding livestock sales in live weight ranged from 1.1-2.3 kg/bird, thus the value of 1.91-1.96 kg/bird was included in the medium category. Broiler chicken farms have several advantages compared to other meat-producing farms with a body weight of 1.5-1.56 kg/bird. The quality of broiler chickens is determined by the DOC weight about 37-45 grams and the guaranteed of death DOC at admission of at least 2.00% [17].

**Table 1. Characteristics of respondents**

| Component                      | Sleman Regency | Bantul Regency |
|--------------------------------|----------------|----------------|
|                                | Frequency (n=69) | Frequency (n=81) | %   | %   |
| Age (year)                     | 44.01±11.66     | 43.79±12.09     |     |     |
| Formal Education               |                |                |     |     |
| Elementary School              | 1              | 19             | 1.45| 19.79|
| Junior High School             | 2              | 8              | 2.90| 8.33 |
| Senior High School             | 37             | 42             | 53.62| 53.13|
| Diploma                        | 4              | 6              | 5.80| 6.25 |
| Bachelor                       | 25             | 11             | 36.23| 11.46|
| Magister                       |                |                |     | 1.04 |
| Non-Formal Education           |                |                |     |     |
| Follow the training            | 13             | 5              | 18.84| 6.17 |
| Do not follow                  | 56             | 76             | 81.16| 93.83|
| Experience (year)              | 10.63±7.97     | 7.34±6.82     |     |     |
| Family members (person)        | 4.04±1.13      | 3.49±1.41     |     |     |
| Main Job                       |                |                |     |     |
| Farmer                         | 45             | 55             | 65.22| 67.90|
| Laborer                        | 1              | 7              | 1.45| 8.64 |
| Other                          | 23             | 19             | 35.33| 23.46|

**Table 2. Characteristic of business**

| Component                      | Sleman Regency | Bantul Regency |
|--------------------------------|----------------|----------------|
|                                | Frequency (n=69) | Frequency (n=81) | %   | %   |
| Business scale (birds)         | 6340.58±3627.24 | 3604.94±2015.00 |     |     |
| Maintenance (days)             | 35.64±1.41     | 35.30±1.81     |     |     |
| Maintenance system             |                |                |     |     |
| Closed house                   | 2              | 0              | 2.90| 0    |
| Open house                     | 67             | 80             | 97.10| 98.76|
| Semi closed house              | 1              |                |     | 1.24 |
| Group participation            |                |                |     |     |
| Farmer’s group                 | 28             | 11             | 40.58| 13.58|
| Independent                    | 41             | 70             | 59.42| 86.42|
| Mortality rate (%)             | 4.36±1.83     | 7.30±6.25     |     |     |
| Selling weight (kg)            | 1.96±0.16     | 1.91±0.39     |     |     |
| Feed conversion ratio          | 2.40           | 1.43           |     |     |

The income obtained by broiler farmer partnerships in Bantul district on a business scale of 3475 birds was lower than farmers in Sleman of 6340 birds (Table 3). The farmer’s income in Sleman was IDR 18,533,352.00/period while Bantul was IDR 2,674,127/period. Differences in income by farmers
in two these districts were caused by differences in scale and bonus from FCR, index of performance, mortality, and market value. Production costs incurred such as DOC and feed costs are highest cost production. In addition, differences in production costs and the difference in income earned by farmers caused by different investor [18].

The results of testing the hypothesis with the classic assumption of Ordinary Least Square with the software Eviews version 5.0 met the normal distribution (probability value Jarque-Bera 0.149> 0.05). The results of the Ramsey Reset Test showed that data were linear (probability Obs * R-square of 0.28> 0.05). Breusch-Godfrey Serial Correlation LM Test showed that the data was not auto correlated (probability Chi-square was 0.23> 0.05). Data was not multicollinear (Correlation Matrix value <0.70). The White Heteroskedasticity test showed that the data was not heteroscedastic (probability Obs * R-square was 0.22> 0.05).

Scale of business, initial capital and sanitation cost simultaneously have significant effect on broiler chicken income. The F test was 15.95 indicated that the hypothesis was accepted. Variables of initial capital and sanitation cost have a negative and significant effect on the income of broiler chickens, while the scale have a positive significant. The number of livestock and initial capital have a significant effect on farmer income [7,19,20].

Table 3. Income of farmer

| Component                       | Sleman Regency (n= 69) | Bantul Regency (n =81) |
|---------------------------------|------------------------|------------------------|
|                                 | Unit Total (IDR)       | unit Total (IDR)       |
| Revenue                         |                        |                        |
| Chicken (IDR/kg)                | 11540 × 16,996         | 196,133,840            |
| Sack (IDR/sack)                 | 357 × 1,555            | 555,135                |
| Waste (IDR/period)              |                        | 196,020                |
| Bonus (IDR/period)              | 3,857,628              |                        |
| Total Revenue                   | 200,742,623            | 106,039,111            |
| Cost of production              |                        |                        |
| DOC ( IDR/bird)                 | 6341 × 5,777           | 36,631,957             |
| Feed (IDR/kg)                  | 18414 × 7,373          | 135,766,422            |
| Medicine (IDR/period)           | 2,451,595              | 10424 × 7,482          |
| Employee (IDR/period)           | 2,483,868              | 2,350,855              |
| other (electricity, litter, gas, transportation) | 4,518,502 | 1,360,006 |
| Environment sanitation          | 356,927                | 102,636                |
| Total cost of production        | 182,209,271            | 103,364,984            |
| Income (IDR/period)             | 18,533,352             | 2,674,127              |
Table 4. Multiple regression analysis of factors that influence farmer income

| Variable                  | Coefficient | Std. Error | t-Statistic | Prob. |
|---------------------------|-------------|------------|-------------|-------|
| Constant                  | 7.647       | 1.031      | 7.415       | 0.000 |
| Initial capital of business| -0.021      | 0.009      | -2.393      | 0.018**|
| Experience                | 0.045       | 0.066      | 0.681       | 0.497 |
| Scale                     | 1.127       | 0.124      | 9.105       | 0.000***|
| Mortality                 | -0.041      | 0.089      | -0.466      | 0.642 |
| Dummy participation       | 0.008       | 0.143      | 0.056       | 0.955 |
| Dummy of location         | -0.186      | 0.158      | -1.175      | 0.242 |
| Sanitation cost           | -0.019      | 0.005      | -3.476      | 0.001***|
| R-squared                 | 0.445       |            |             |       |
| Adjusted R-squared        | 0.417       |            |             |       |
| F-statistic               | 15.952      |            |             |       |

*** = significant (P<0.01), ** = significant (P<0.05)

4. Conclusion

Fluctuation in the price of DOC, feed, and selling prices of chicken cause differences in income between farmers. Participation of farmers in some core also influences. As a whole, to increase farmers’ income, there needs to be an effort to assist businesses from the core, agencies, and educational institutions to improve livestock management. In addition, increasing environmental sanitation was also needed in order to reduce the high mortality rate.

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