

Poultry Restructuring and Policy Alternatives in Increasing the Income of Farmer Households in Indonesia

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Abstract – This study aims to analyze the policy alternatives that could increase the income of small scale commercial-breed broiler farmer households. This study employs primary and secondary data, namely data of (1) prices, (2) production, input use, consumption, and income, and (3) elasticity. The results of the analysis demonstrated that the resultant of a combination between an increase in chicken meat price and maize import tariff abolishment policy were the best policy alternatives. These policies increased the income of small scale commercial-breed broiler farmer households from rice planting, broiler-raising, and commercial-breed layer-raising. Increasing the income of small scale commercial-breed broiler farmer households could be done through: (1) better application of maize production, harvest, and post-harvest technology, (2) improving the efficiency of production costs, especially in commercial broiler farm businesses and socialization of the importance of a balanced diet to encourage the growth of the demand for chicken meat, and (3) the maize import tariff abolishment policy.

Keywords – Restructuring, Income, Household, Commercial-Breed Broiler.

I. INTRODUCTION

Commercial breed broiler-raising in Indonesia is a business in the agricultural sector which is very dynamic in its development. This business began as small scale businesses by individuals until the 1970s when the government applied the foreign investment loan policy for commercial-breed chicken farms. The purpose of this policy was to accelerate the development of the poultry industry through foreign investment and technology transfer from developed countries. However, in their development, foreign investment companies expanded their business by building cultivation businesses, resulting in negative impacts on small-scale farm businesses. The production share which was initially dominated by small-scale farms started to shift and is now dominated by large livestock companies.

In 2005, the production share of livestock companies reached 60 percent, and had continued to grow to 85 percent in 2011. This situation demonstrates that government intervention in structuring the small-scale commercial-breed broiler farm is ineffective, and the set of policies has instead led to an oligopoly. At present, most of the small-scale farmers have ceased production because they are unable to compete with livestock companies (Yusdja and Agustian, 2003, Tegua and Beynen, 2004, Ilham and Yusdja, 2010, Umboh et al., 2014).

In relation with government policies to improve the

performance of the broiler farm business, the government faces a dilemma because on the one hand it desires to improve the performance of commercial broiler farm businesses through policies that could reduce the price of maize, and on the other hand, it must face the maize farmers who respond to the policies negatively.

The results of the studies by Kariyasa and Sinaga (2007), Edward (2008), Umboh et al (2014) demonstrate that when the abolishment of maize import tariff policy is applied, increasing the amount of maize imported and lowering the domestic maize price, it is responded by the maize farmers by reducing the size of the maize planting area and the use of fertilizer, leading to a decline in maize productivity and production. On the other hand, the application of this policy had a positive impact on the performance of commercial broiler farming through an increase in feed demand, increasing the production of commercial breed broiler. However, if a policy that increases the maize import tariff is applied, it causes the domestic maize price to increase, and this is responded by the maize farmers by increasing both the size of land planted with maize and the use of fertilizer, leading to an increase in maize productivity and production. This condition is responded negatively by commercial-breed broiler farmers, leading to a decrease in commercial breed broiler.

Based on the description above, this study aimed to formulate a policy that could improve the performance of commercial-breed broiler farming and maize farming.

II. METHODOLOGY

This study employs primary and secondary data, namely data of (1) prices, (2) production, input use, consumption, and income, and (3) elasticity. The data were analyzed using the General Algebraic Modeling System (GAMS) software (Umboh et al., 2014).

In relation with the characteristic of livestock farmer households in Indonesia which are not a monoculture, but is accompanied by other businesses, both agricultural and non-agricultural, this study assumes that small scale commercial-breed broiler farmer households in Indonesia have 4 (four) types of businesses: maize planting, rice planting, broiler-raising, and commercial-breed layer-raising. This situation was confirmed by data from the Central Bureau of Statistics-Directorate General of Livestock (2008), Ilham & Yusdja (2010), Sugema and Roy (2010), and the Directorate General of Livestock and Animal Health (2012). From the total maize, rice, commercial broiler breed meat, and commercial breed

layer egg production in 2011, the production of commercial-breed broiler farmer households for the four commodities was 1107.53, 2598.32, 181.83, and 0.100 (thousand tons), respectively. To analyze the relationship between the maize, rice, commercial breed broiler, and commercial breed layer, this study used the multimarket model analysis.

III. RESULTS AND DISCUSSION

A. The Relationship between the Maize and Commercial Breed Broiler Markets

An increase in maize demand caused the price of maize to increase (A). The increase in the price of maize had a positive impact on the performance of maize farming, but had a negative impact on the performance of broiler-raising. For maize farmers, the increase in the price of maize was responded by increasing maize production. In this case, the farmers tried to increase production through increased use of fertilizer according to the suggested dose (B). For broiler farming actors, the increase in the price of maize (A) caused the production of commercial breed broiler to decrease (C) and the marginal product value of chicken meat to increase (D). This study proxied the commercial broiler farm actors' demand for commercial-breed broiler feed with maize demand. This was done with the consideration that the composition of maize in feed reached 55 percent and feed cost in the commercial broiler farm cost structure was 70 percent. The relationship between markets gave an overview of the presence of a derived demand in the commercial-breed broiler industry which is summarized in Figure 1.

B. The Restructuring of the Commercial-Breed Broiler Industry

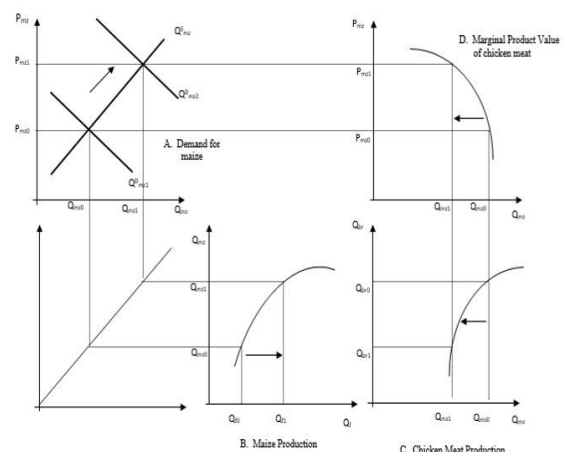
The development of the livestock-farming subsector in Indonesia aims to create job opportunities and increase the income of small-scale farmers as described in Law number 1 Year 1967 pertaining to foreign investment. The implications were the various government regulations aimed to the development of small-scale farm businesses. This is important because Indonesia is faced with unemployment and poverty issues (Yusdja and Pasandaran, 1998; Pakage et al., 2015).

The issuing of Law number 1 Year 1967 pertaining to foreign investment, followed by Law number 6 Year 1968 pertaining to domestic investment, gave an opportunity to investors both foreign and domestic to be involved in the broiler farm production chain, even though they were initially just providers of stock and feed. This means that the policy's purpose to provide employment opportunities for the people with support from Law number 1 Year 1967 was ineffective, and had even accelerated the development of large-scale businesses, making the situation not conducive for small-scale commercial-breed broiler farming. This condition developed as shifts in the regulations in effect happened.

The next development in 1981 was that the government issued the Presidential Decree number 50 Year 1981 about chicken farming business supervision in order to conduct poultry restructuring in Indonesia through limitation of the

business scale. Presidential Decree number 50 Year 1981 established the maximum scale for commercial-breed broiler-raising to be 750 chickens per period. This meant that large scale businesses had to close down their businesses. This Presidential Decree was basically meant to encourage the development of small-scale farms and give an opportunity to people with limited capital to become involved in production because it was thought to be profitable and could increase income. However, this policy did not perform as expected and had even back-fired, causing small-scale farmers to lose the opportunity to develop their businesses. Yusdja and Agustian (2003) stated that the cause of the failure of this policy was because the government did not exert effective control over the market and the business scale limitation enforced by the Presidential Decree was unprofitable for small-scale farmers.

Because of the failure of this policy, the government issued a poultry industry restructuring policy, creating the Small-holder Core Company (PIR-Perusahaan Inti Rakyat) scheme. The PIR pattern was a collaborative structure between livestock companies (the core) and small-scale farms (plasma). Livestock companies functioned as the marketing institution that had a responsibility to provide input, especially stock and feed, through credit and purchase the small-scale farms' production. Small-scale farmers had to pay for the input they purchased using their production. Conceptually, the small-scale farmers received a guarantee in marketing and were under the protection of livestock companies through profitable prices. Sadly, this was not what happened. The PIR pattern was unsuccessful because most of the small-scale farmers incurred losses and had to close down their businesses.



where:
 Q_{ma} = maize quantity, P_{ma} = maize price, Q_f = fertilizer quantity, Q_{cm} = chicken meat quantity, P_{cm} = chicken meat price

Fig. 1. The relationship between maize market, production maize and chicken meat production.

The government then issued another set of regulations in Presidential Decree number 22 Year 1990 pertaining to the supervision of commercial chicken-breed farms. Livestock companies were permitted to raise commercial-breed broilers as long as they collaborated with small-scale farms and the scale was increased in the form of Livestock Business Area (kawasan industri peternakan-

KINAK) as stated in the Minister of Agriculture's Decree number 362/ Kpts/ TN.120/ 5/ 1990. The forms of collaboration were: (1) KINAK - PRA (Small - scale Agribusiness KINAK), (2) KINAK - PIR (Small - scale Core Company - PIR), and KINAK - SUPER (Export Livestock Business Center KINAK). Then these partnership patterns were regulated through the Minister of Agriculture's Decree number 472/ Kpts/ Tn.330/ 6/ 1996 by introducing the PIR pattern and management pattern. In these collaboration patterns, livestock companies functioned as providers of production input, working capital, and investment capital and marketed the small-scale farms' products.

The limitation of small-scale farms to 15,000 chickens per production period was exploited by livestock companies by dividing their businesses and putting them under different names, causing the livestock companies' market share to grow even larger. In addition, Presidential Decree number 22 Year 1990 created an opportunity for livestock companies to own breeding farms and feed mills. This was a violation of Law number 6 Year 1967 which caused the small-scale farms' market share to shrink further.

In 2000, the government retracted Presidential Decree number 22 Year 1990 and this was the end of government intervention in scale regulation (Yusdja and Pasandaran 1998, Umboh et al. 2014). The government failed in its intervention to direct the structuring the commercial-breed broiler industry in the form of small-scale businesses. The government policy encouraged the creation of an oligopoly (Daryanto and Saptana 2010). Pressure on commercial-breed broiler small-scale farm businesses still exists to this moment due to Law number 18 Year 2009. Commercial-breed broiler farms are an industry and the small-scale farmers' production share is the minority (Umboh et al., 2014; Pakage et al., 2015).

C. Policy Alternatives to Increase Commercial-breed Broiler Farmer Households' Income

The alternative simulation scenarios were created to observe the patterns in the changes in livestock farmer households' input demand, production and income in Indonesia. This study was conducted on small scale commercial-breed broiler farmer households and the assumption was that small scale commercial-breed broiler farmer households also had maize planting, rice planting and commercial-breed layer-raising businesses. This assumption was based on the data from the Central Bureau of Statistics - Directorate General of Animal Husbandry (2008) and the Directorate General of Animal Husbandry and Animal Health (2012) and the results of the empirical study by Ilham & Yusdja (2010) and Sugema and Roy (2010).

This study did not analyze the businesses run by each small scale commercial-breed broiler farmer household, but assumed in aggregate that small scale commercial-breed broiler farmer households had broiler raising, maize and rice planting, and commercial-breed layer raising businesses. In reality, not all households had the four types of businesses, and some even had other businesses aside from the 4 (four) types of businesses mentioned above. In

addition, this study assumed in aggregate that the land possessed was used for maize and rice plants which are competitive in land utilization. As a consequence, the land allocated for other crops were not included in this model.

In relation with input use, this study only included the cost for Urea and TSP fertilizers as the cost of maize and rice cultivation. Based on the food crop cost structure, the cost for fertilizers in maize planting was only 16.64 percent. This cost was low compared to the cost for labor which reached 45.01 percent and the cost for renting land which was 19.43 percent. The was also true in rice crops, only 14.13 percent of the cost was for fertilizers and up to 38.29 and 25.64 percent, respectively, were allocated for labor cost and the cost for renting land (BPS 2011). The commercial broiler and layer raising business did not use feed as a direct input; it was instead proxied by maize demand. This was possible due to the consideration that the composition of maize in feed reached 65 percent and the cost of feed in the commercial-breed broiler cost structure reached 70 percent. Moreover, the results of the studies by Kariyasa and Sinaga (2004), Edward (2008), stated that the main consideration of feed mills in determining the amount of feed they produce is the price of maize. Maize demand is also determined by the price of maize itself and not feed price. Based on the available data, the trend for commercial-breed broiler feed demand was similar to the trend for maize demand for feed (Swastika et al., 2011).

The simulation scenarios were: (1) a 10 percent increase in the price of maize, (2) a 10 percent increase in the price of commercial breed chicken meat, (3) a maize import tariff abolishment policy, (4) a combination between a 10 percent increase in both the price of maize and commercial breed chicken meat, and (5) a combination of an increase in the price of commercial breed chicken meat and a maize import tariff abolishment policy (Table 1). From the 5 (five) simulation scenarios tested, the simulation scenarios which gave a positive impact on maize production were scenarios 1, 2, and 4. However, out of the three simulation scenarios, the best impact was demonstrated by simulation 4, the simulation combination between a 10 percent increase in both the price of maize and chicken meat. The results of this simulation demonstrated that this combination increased maize production by 5.3461 percent.

For the production of commercial breed broiler, besides simulation 1, which was a 10 percent increase in the price of maize, the other four simulations also had a positive impact on the production of chicken meat. From the 4 simulation scenarios, simulation 5, which was a combination of an increase in the price of chicken meat and a maize import tariff abolishment policy, had the best impact on the production of chicken meat. The results of the simulation demonstrated that this combination simulation increased the production of chicken meat by 2.7498 percent.

The increase in production affected the income of small scale commercial-breed broiler farmer households. In this case, simulation 5 had the best effect on the income small scale commercial-breed broiler farmer households. This

simulation combination increased the income of small scale commercial-breed broiler farmer households from rice planting, commercial-breed broiler-raising and layer-raising, and increased the overall income of commercial-breed broiler farmer households. This percentage of increase was the highest of all the simulation tested.

Table 1. Policy Alternatives to Increase Commercial-Breed Broiler Farmer Households' Income

No.	Variable	Simulation				
		1	2	3	4	5
Broiler Farming						
1.	Demand for maize	-0.476	2.51	0.264	2.02	0.264
2.	Chicken meat production	-0.477	2.507	0.243	2.022	2.749
3.	Broiler farming income	-2.961	15.32	1.429	12.22	3.196
Laying Hens Farming						
4.	Demand for maize	-0.475	0	0.244	-0.475	0.244
5.	Egg production	-0.476	0	3.30	-0.99	0.244
6.	Laying hens farming income	-4.92	0	3.547	-5.346	2.655
Maize Farming						
7.	Land share	2.84	0	-1.44	3.48	-1.6
8.	Demand for Urea	5.371	0	-2.616	6.249	-2.616
9.	Demand for TSP	5.383	0.0014	-2.612	6.25	-2.612
10.	Productivity	2.39	0.00006	-1.198	2.686	-1.197
11.	Production	5.346	0.00012	-2.616	5.35	-2.616
12.	Maize farming income	5.385	0.00012	-2.617	5.349	-2.617
Rice Farming						
13.	Land Share	-0.872	0	0.487	-2.5640	0.2424
14.	Productivity	-0.419	0	0.241	-1.8890	0.2424
15.	Production	-1.42	-0.00023	0.726	-1.297	0.7257
16.	Rice farming income	-1.419	-0.00023	0.726	-1.297	0.726
Total Income		-0.69	2.2	0.36	1.574	2.655

Simulation 1: 10 percent increase in the price of maize.

Simulation 2: 10 percent increase in the price of chicken meat.

Simulation 3: maize import tariff abolishment policy.

Simulation 4: combination between a 10 percent increase in both the price of maize and chicken meat.

Simulation 5: combination of an increase in the price of chicken meat and a maize import tariff abolishment policy.

Another simulation scenario was simulation 4, a combination between a 10 percent increase in both the price of maize and chicken meat. This simulation had a positive impact on the income of small scale commercial-breed broiler farmer households, but had a negative impact on the other household incomes. This simulation still had a positive impact on the overall total income simulation. The negative impact this simulation had on the other household incomes was because the other household did not have broiler raising businesses; therefore, the combination simulation only had a positive impact on the maize raising agribusiness. In this case, the farmers reallocated part of their rice fields for planting maize, increasing the size of land planted with maize and increasing maize production, and reducing rice production. In addition, the increased price of maize also had a negative impact on the commercial-breed layer raising business. The increased price of maize stimulated an increase in feed price, causing commercial breed layer farmers to respond by reducing the demand for feed which resulted in a decrease in commercial breed layer egg production. In order to increase the income of small scale commercial-breed broiler farmer households, policy need to be done simultaneously. This instrument could be studied through both the input and the output points of view. From the

input point of view, the decrease in the price of maize stimulates the decrease in feed price. Feed price becomes lower and is responded by commercial-breed broiler and layer farmers by purchasing more feed, leading to an increase in production. In the output point of view, the increase in the price of chicken meat is an incentive for the commercial-breed broiler farmers to increase production. The end result of this combination is an increase in the total income of small scale commercial-breed broiler farmer households.

IV. CONCLUSION AND POLICY IMPLICATIONS

The increased price of chicken meat and import tariff abolishment policy at the same time is the best policy alternative in increasing the income of commercial-breed broiler farmer households. The resultant impact of this policy would cause the income of commercial breed broiler farmer households to become better. The income increase is caused by the increase in commercial breed broiler production and the increased income from rice agribusiness which would compensate for the loss of income due to the reduced income from maize agribusiness which is the effect of the drop in the price of maize. Improving the performance of maize cultivation and broiler-raising agribusiness and increasing the income of small scale commercial-breed broiler farmer households could be done through: (1) better application of production, harvest, and post-harvest technology, (2) improving the efficiency of production costs, especially in the commercial broiler raising business and socializing the importance of a balanced diet to encourage the growth of the demand for chicken meat, and (3) the maize import tariff abolishment policy.

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