Analysis of the competitiveness of cocoa commodity 
(Theobroma cacao L.) in Kolaka Regency

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Abstract. This study aimed to analyze the level of comparative and competitive advantage of cocoa commodities at the farm level in Kolaka regency, and to analyze the impact of government’s policy on the comparative and competitive advantage of cocoa commodities in Kolaka regency. The study used the Policy Analysis Matrix (PAM) to analyze data. The results of the study showed that the private benefit of cocoa farm level in Kolaka regency was IDR 8,579,759, whereas the social benefit was IDR 10,169,805. Cocoa commodity in Kolaka regency has a high level of competitiveness as shown by the DRCR value of 0,69 and PCR value of 0,67. Regarding the government’s policy on output, it was revealed that farmers do not gain benefits from the government’s policy on the output as shown by the NPCO value of 0,9597. The government’s on input (tradable input) has created an efficiency cocoa farming in Kolaka regency as indicated by the NPCI value of 0,4434. The government’s policy of input-output showed that there is a government policy which reduces the benefits of the cocoa producer in Kolaka regency as indicated by the PC value of 0,8436.

1. Introduction
Indonesia is the world's largest producer of cocoa. The area of cocoa plantations in Indonesia has continued to increase over the last five years. Thus, the potential to increase broadly-based production includes the addition of value-added cocoa products [1]. According to [2], the area under Indonesian cocoa trees was 1.4 million hectares with a production of about 500,000 tonnes per year. Indonesia is the second largest cocoa producer after Côte d'Ivoire. Côte d'Ivoire, the world's largest cocoa producer, has 1.6 million hectares of cocoa and produces 1.3 million tonnes a year, while Ghana produces 900,000 [3].

The province of South-East Sulawesi, in various references, is described as an agricultural zone where the agricultural sector is one of the main sectors. In 2014, the share of the agricultural sector in GDP formation was 29.86%. In addition, in terms of employment, the agricultural sector is the main source of livelihood for around 41.53% of the total labor force in 2014 [4].

At the regional level, cocoa products play a strategic role and contribute to the economy of South-East Sulawesi (South-East Sulawesi). With a production of 161,514 tonnes in 2014, cocoa trees in southeastern Sulawesi made the largest contribution, ranging from 30 to 35% of the overall GDP of the agricultural sector, and absorbed 149,754 farmers or 15.75% of the total workforce in Southeast Sulawesi. One of the main agricultural sectors in the South-East Sulawesi province, where about 52%...
of the total plantation area is cocoa plantations, cocoa farming plays an important role as the main source of income for most farmers in South-East Sulawesi [4].

Kolaka Regency is one of the main cocoa producing areas in South-East Sulawesi Province. The total area of cocoa plantation in Kolaka regency in 2013 was 29,166.76 hectares with the amount of cocoa beans production reaches until 8,563 tones [5]. Cocoa commodities from the Kolaka regency have successfully penetrated the domestic and international market and become one of the contributors to the gross domestic product (GDP) structure. According to data from the Central Bureau of Statistics (BPS), cocoa production in the Kolaka Regency in the last five years has decreased. This decrease generally occurs due to pest attacks [5]. The purpose of this study was to analyze the comparative and competitive advantage of cocoa commodities, as well as the impact of government policies on the comparative and competitive advantages of cocoa commodities in Kolaka regency.

2. Method
This research was conducted in the Kolaka regency from August 2015 to December 2016. The sample of this study included 101 cocoa farmers, with sample determination using the cluster method. The data collection in this study was conducted in two ways, namely the collection of primary data obtained through a questionnaire interview process, while the secondary data were obtained through studies library and agencies or services related to this research, specifically data on production and trade. The data will be analyzed using a policy analysis matrix (PAM). The PAM matrix is prepared using input-output structures at the farm level and commercial actors. The results of the PAM analysis will provide information on the comparative advantage of a commodity, its competitive advantage, the impact of government policies on the commodity system. The Policy Analysis Matrix (PAM) by [6] is presented in Table 1.

Table 1. Policy analysis matrix

| Description          | Revenue (IDR) | Cost                    | Income (IDR) |
|----------------------|---------------|-------------------------|--------------|
|                      | Revenue (IDR) | Tradable Input (IDR)   | Non Tradable Input (IDR) | Income (IDR) |
| Private Price        | A             | B                       | C            | D             |
| Social Price         | E             | F                       | G            | H             |
| Divergence           | I             | J                       | K            | L             |

3. Result and Discussion

3.1 Justification of Shadow Price

3.1.1 Price of shadow exchange rates
The shadow price of the rupiah exchange rate is approximated using the Standard Conversion Factor (SCF) as the prevailing exchange rate [7] with the following mathematical formulas:

\[
SCF_t = \frac{X_t + M_t}{(X_t - T_xt) + (M_t - T_m_t)}
\]

\[
SER = \frac{OER_t}{SCF_t}
\]

Information:
SCFt = Standard Conversion Factor of t year
Xt = Export value of t year (IDR)
Mt = Import value of t year (IDR)
T_xt = Value of the export tax year t (IDR)
T_m_t = Value of the import tax year t (IDR)
SER = Shadow Exchange Utilized Rate of year t (IDR/US $)
OER = Official exchange rate for the year t (IDR/US $)

3.1.2 The shadow price of output
The price used as a basis for determining the shadow price of production is the border price. Based on information and data obtained from the Ministry of Industry and Trade of South-East Sulawesi Province, the last registered cocoa bean export activity was carried out in 2014 in the closest, namely the port of Tanjung Perak Surabaya.

3.1.3 The shadow price of production and equipment facilities
Shadow prices of production facilities and equipment are the actual prices of production facilities used without government subsidies. Shadow prices of production facilities (seeds, urea, TSP, KCL, pesticides, and equipment) are adjusted by separating the elements that can be obtained by import activities (foreign) and those coming from the country. The shadow prices of fertilizer production facilities (urea, TSP and KCL) are based on CIF prices and Rupee exchange rate (SER) conversion [11], while shadow prices for seed production facilities, pesticides, and equipment resulting from their acquisition come from the country, then the fictitious price is the same as the real price.

3.1.4 The shadow price of labor
The labor used in growing cocoa in the research area is unskilled labor. This is consistent with [8] that the labor force typically used in rural agricultural activities is unskilled labor and that there is no divergence in the labor market in rural areas. The fictitious job price in this study is 80% of the prevailing wage level [7]. This is based on the assumption that there are 20% opportunity costs for these farmers to obtain income or employment outside the cocoa crop.

3.1.5 The shadow price of land
The fictitious price of land used in this study is the value of their rent that applies in the research area. This is based on the assumption that the land market mechanism in the research location is going well so that the average price of ground rent in the research location is IDR 3,000,000 per hectare per year.

3.1 Financial and Economic Profitability
The analysis of the financial and economic benefits of cocoa cultivation provided a general and simple description of the feasibility level of cocoa cultivation in Kolaka district, especially at the study site. On the economic level, the price of cocoa beans received by farmers at the social price level is higher than the real price (private price), which shows that the net economic benefit (based on social prices) is IDR 10 169 805 a year with a ratio RC higher of 1.69 to the net financial profit (calculated on the basis of the private prices), which amounts to IDR 8 579 759 per year with a ratio RC of 1.56. This shows that cocoa cultivation in the Kolaka Regency is very competitive because the difference between social benefits and private benefits is not too different.

Social profitability indicates the comparative advantage of a commodity in the use of scarce resources in the country. In this condition, the price of inputs and products is calculated under conditions of perfect competition, where all forms of subsidies and protection that distort the market have been removed. Commodity systems with higher levels of social (economic) profitability indicate a higher degree of comparative advantage. Table 4 shows that cocoa cultivation in Kolaka district has a high social return. This result is a first indication that cocoa cultivation in the Kolaka regency has a comparative advantage.

Table 2. Analysis of the matrix policy of cocoa farming

| Description | Revenue (IDR) | Cost Input Tradable (IDR) | Cost Input Non-Tradable (IDR) | Income (IDR) |
|-------------|--------------|--------------------------|-------------------------------|-------------|

3
3.3 Analysis of comparative and competitive advantage

The results showed that in cocoa cultivation in Kolaka district, the DRCR value obtained was 0.69. Based on the value of the DRCR, it can be said that cocoa cultivation in the Kolaka regency has a comparative advantage and high competitiveness. This is consistent with [9], which indicates that high competitiveness occurs when the DRCR and PCR values are between 0.510 and 0.759. The value of the DRCR shows that the production of cocoa beans in the Kolaka Regency only requires 69% of the domestic resource cost of the necessary import costs. In other words, every dollar needed to import cocoa beans only requires a national tax of US $ 0.69 to produce cocoa beans in the Kolaka regency. This comparative advantage is created by the fact that the majority of cocoa producers in the research area use their resources efficiently. This is consistent with [10] study, which indicates that the efficient use of resources will increase the comparative advantage of cocoa production.

The value of the DRCR shows that cocoa bean production in the Kolaka Regency requires only 69% of the domestic resource cost of the necessary import costs. In other words, every dollar needed to import cocoa beans requires only a national tax of US $ 0.69. It to produce cocoa beans in the Kolaka Regency, which means that to meet national needs, cocoa beans must be produced alone in the Kolaka Regency and not it must be imported or imported from other regions or countries, because it saves enough foreign currency if it produces it in this region rather than importing it.

In the cocoa culture in the Kolaka Regency, a PCR value of 0.67 was obtained. Based on the value of the PCR, it can be said that cocoa cultivation in the Kolaka Regency has a competitive advantage and high competitiveness. This is consistent with [9], which indicates that high competitiveness occurs when the DRCR and PCR values are between 0.510 and 0.759. The PCR value of 0.67 indicates that to produce a value-added unit of production on private prices, it is sufficient to have a domestic resource account of 0.67 units.

The PCR value of 0.67 indicates that to produce a value-added unit of production on private prices, it is sufficient to have a domestic resource account of 0.67 units. The value of the PCR also shows that the amount of costs that must be sacrificed because of the use of resources at market prices is lower than the profits obtained by producing producers. With a PCR value of 0.67, the cocoa crop in the Kolaka Regency is still limited to financing domestic factors, the production of cocoa beans in the Kolaka Regency can finance its own needs as domestic factors.

3.4 Analysis of The Impact of Government Policy

3.4.1 Impact of output policy

Based on the analysis, it is known that the value of the output transfer (OT) of the cocoa crop in the Kolaka Regency is -1.007 635, which means that the price of production in the domestic market is
lower than its international price. This indicates a price policy and trade barriers in the form of compensation for cocoa bean production or subsidies applied to achieve non-efficiency objectives.

The output transfer value is also supported by the value of the nominal protection coefficient on the output (NPCO), which corresponds to a ratio for measuring the transfer output. Based on the results of the analysis, the NPCO value is 0.9567. The NPCO value also shows that due to the divergence, the price of cocoa products received by the producer producers of Kolaka Regency is lower than the social price, is only 95.67% of the social price; therefore there are 4.33% of the prices. The profits that producers should receive are intended for consumers of the cocoa product.

3.4.2 Impact of input policy

According to the results of the analysis, it is known that the value of input transfers in cocoa cultivation in the Kolaka Regency is -1,958,269. The input transfer value, which has a negative sign indicates that there is implicitly a government policy in the form of subsidies for tradable inputs that must be provided by the government each year. The transfer value of inputs also indicates the amount to be paid by the government due to the existence of subsidy policy for tradable inputs.

The analysis shows that the value of NPCI on cocoa cultivation in the Kolaka Regency is 0.4434, which indicates that producer producers buy tradable inputs at lower prices or only 44.34% of their social prices. In other words, the government protects the inputs of producing producers. Government policies on tradable inputs are generally beneficial because producer-producers pay only 44.34% less than the social prices of tradable inputs.

Based on the results of the analysis, it was found that the value of the transfer factor was 582,441, which means that in cocoa cultivation in Kolaka district, discrepancies or policies were observed in the level of national inputs. Transfer Value This factor shows that, implicitly, the subsidy to be provided by the government to internal factors (labor, seed, land, and capital) is IDR 582,441 for cocoa farming. The value of transfer factors also shows that there are government policies that protect domestic producers of inputs.

3.4.3 Impact of input-output policy

Based on the results of the analysis, the EPC value of 1.0442 was achieved, which means that the policies adopted by the government supported the cocoa production activities in Kolaka District. The policy takes the form of a policy of subsidizing production inputs. So that cocoa farmers, in this case, pay only a fraction of the real price of production inputs. The policy also has an impact on increasing production, as farmers can more easily obtain production inputs.

Based on the results of the analysis, an NT value of -1,590,046 (NT) indicates that the government or a market failure caused the Kolaka Regency cocoa producers to lose the potential profits. The government policy that would be the cause would be the tax levied on agricultural products, including cocoa.

Based on the results of the analysis, obtained the value of the coefficient of profitability (CP) of 0.8436. As the CP value is less than 1, it can be said that government policy on cocoa cultivation has a negative impact because it results in a reduction of 84.36% in profits of cocoa farmers in Kolaka Regency. The CP value also shows that there is a potential profit of 15.64% that can be realized by cocoa farmers if there is no government policy.

The results of this study should be taken into account by local governments when developing policies on the development of cocoa farming and can provide information to farmers so that they can have good bargaining power in marketing their cocoa production.

4. Conclusion

Based on the result, the findings of this study are as follows: 1) Cocoa cultivation in the Kolaka regency is highly competitive, as indicated by the DRCR and PCR values. 2) Government policy on production shows that cocoa farmers in Kolaka District do not benefit from government production policies. 3) The impact of government policy on inputs (tradable inputs) translates into increased
efficiency of cocoa farming in the Kolaka Regency. 4) In the Government's policy on inputs - production shows that there are government policies that reduce the profits of cocoa farmers in the Kolaka Regency.

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