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To cite this article: S Bulkis *et al* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **343** 012106

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Competitiveness analysis of cocoa commodities in South Sulawesi

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Abstract. Cocoa is one of the plantation's leading commodities which has a considerable contribution to the Indonesian economy, including sources of farmers' income, producers of industrial raw materials, and creators of employment. The free and competitive facing of free trade, requires that plantation products have competitiveness in order to be able to survive and attract the public compared to similar imported commodity products. This study aims to analyze the competitiveness of cocoa commodities in South Sulawesi and analyze the impact of government policies on the competitiveness of cocoa commodities in South Sulawesi. The analysis method uses the Policy Analysis Matrix (PAM). Through this matrix, the criteria for Private Cost Ratio (PCR) and the Domestic Resource Cost Ratio (DRCR) that can be competitive and comparative advantages can be calculated. The results of this study indicate that cocoa commodities have competitiveness seen from comparative and competitive advantages as indicated by the value of $DRCR < 1$ and $DRCR < 1$. The value of cocoa commodities of DRCR and RBP is 0.20 and 0.22. The smaller the value of DRCR and RBP is obtained, the higher the level of comparative and competitive advantages possessed. Government policies on input-output that have been in effect so far have not been effectively protected by cocoa farmers, which means the government has not had a positive impact on cocoa commodities in South Sulawesi. This can be seen from the private price which is lower than the social price.

1. Introduction

One of the leading commodities in Indonesia's plantation sub-sector which is quite potential and export-oriented is cocoa. This is supported by the planting area in Indonesia which is still available, the workforce and cocoa experts are also adequate so it is not excessive if this potential can still be improved. Besides that, cocoa is also a provider of foreign exchange and has a role in encouraging regional development and the development of agroindustry [1].



Cocoa development is an effort carried out to develop and improve the quality of export crops in order to maintain the existing international market share and new market penetration, this is in line with the government's goal of making cocoa a mainstay export commodity, high cocoa production makes Indonesia wrong one of the largest producers and exporters of cocoa beans in the world [2].

Facing increasingly open and competitive free trade requires that plantation products have competitiveness to be able to survive and attract the public compared to similar imported commodity products. Operationally, competitive advantage can be defined as the ability to supply goods and services at the time, place, and form desired by consumers; both in domestic or international markets, at prices that are equal or better than those offered by competitors for profit [3].

Sulawesi Island is the largest producer (78%) of Indonesian cocoa beans. South Sulawesi is the largest contributor of cocoa beans (31.9%) in Indonesia [4]. The local potential and excellence possessed by South Sulawesi must continue to be optimized to contribute significantly to the economy and improve community welfare. Therefore, it is necessary to study the competitiveness of cocoa commodity exploitation in South Sulawesi and find out the position of Indonesian specialization as a country specializing in cocoa importers or exporters.

Given that cocoa is an export-oriented Indonesian plantation commodity, its trade is inseparable from government policies such as tariffs, quotas, subsidies and taxes. Therefore, if the government considers cocoa economic policy, it is necessary that Sulawesi Island is prioritized for thought, if cocoa production on Sulawesi Island is disrupted, it can cause instability in Indonesian cocoa production. Existing government policies will also affect the competitiveness of cocoa commodities in South Sulawesi as the largest producer of cocoa in Indonesia [5].

This policy will affect the input and output of cocoa commodity exploitation in South Sulawesi. Policies that cause input costs to decrease and add value to output will increase the competitiveness of cocoa commodities, while policies that cause input costs to rise and the value of output decreases will also reduce competitiveness. Therefore, it is necessary to analyze government policies that affect the competitiveness of the business of cocoa commodities, especially in South Sulawesi.

The competitiveness does not only rely on aspects of comparative advantage contained in these commodities but must be viewed holistically in comparative advantage, competitive advantage and government policy in the business of cocoa commodities. Competitiveness is an illustration of the ability of producers to produce a commodity with good quality and the lowest production costs. The competitiveness of a commodity can be measured through two approaches, namely the level of profit generated and the efficiency of farming. The level of profit generated can be seen from two sides, namely private benefits and social benefits.

While competitiveness can be seen from two indicators, namely competitive advantage and comparative advantage. Based on the background and these problems, this study aims to: 1) Analyze the competitiveness of cocoa commodities in South Sulawesi, 2) Analyze the impact of government policies on the competitiveness of cocoa commodities in the South of Sulawesi.

2. Methods

This research was conducted in South Sulawesi and data collection began in September to November 2017. To answer the objectives to be achieved in this study, the analytical method was used, namely Policy Analysis Matrix (PAM). PAM is used to analyze: 1) Feasibility analysis both privately and socially, 2) Competitive advantage (financial efficiency) and comparative advantage (economic efficiency), and 3) Impact of government intervention or policy on the commodity system. Competitiveness analysis basically requires basic data and processes as follows: 1) Physical input-output data of commodity farms studied, 2) Financial and economical prices of farm input-output, 3) Separation of domestic and foreign components input (input) farming, 4) Calculation of the principal components of the policy matrix analysis, and 5)

Calculation of indicators resulting from analysis that includes profit analysis, financial and economic efficiency, and the impact of government policies, at the farm level. Data obtained is processed using Microsoft Excel software. The PAM model as follows:

Table 1. Policy Analysis Matrix (PAM).

Analysis	Revenue	Input Cost		Return
		Tradable	Non tradable	
Private price	A	B	C	D
Social price	E	F	G	H
Divergence effect	I	J	K	L

Information:

- Private Benefit (D) = $A - (B + C)$
- Social Benefit (H) = $E - (F + G)$
- Output Transfer (I) = $A - E$
- Input Transfer Tradable (J) = $B - F$
- Input Transfer Non Tradable (K) = $C - G$
- Net Transfer (L) = $I - H$
- Private Cost Ratio (RBP) = $C/(A - B)$
- Domestic Resource Cost Ratio (DRCR) = $G/(E - F)$
- Nominal Output Protection Coefficient (NOPC) = A/E
- Nominal Input Protection Coefficient (NIPC) = B/F
- Profit Coefficient (PC) = D/H
- Producer Subsidy Ratio (PSR) = L/E

3. Results and discussion

3.1. Policy Analysis Matrix (PAM)

The results of the Policy Analysis Matrix (PAM) analysis in table 2 show that cocoa commodities in South Sulawesi benefit both financially (privately) and economically (socially). Private benefits and social benefits of cocoa commodities show positive values. This indicates that the cocoa commodity has competitiveness and is a commodity worthy of cultivation.

Table 2. Cocoa commodities in South Sulawesi policy analysis matrix (IDR/Ha).

Analysis	Output receipt	Cost		Return
		Tradable input	Non tradable input	
Private price	45,240,000.00	682,261.00	9,804,439.44	34,753,299.56
Social price	54,128,009.00	981,299.00	10,497,059.84	42,649,650.16
Divergence	-8,888,009.00	-299,038.00	-692,620.40	-7,896,350.60

Table 2 shows that have been compiled above are then calculated to obtain values that will be indicators of the level of profits derived from cocoa commodities in private and social conditions, the value of competitive and comparative advantages and to measure the influence of government policies on outputs and inputs. Based on table 2, we get the policy analysis matrix indicators in table 3.

Table 3. Policy analysis matrix indicators on cocoa commodities in South Sulawesi.

Indicator	Value
Private return	34,753,299.56
Private benefits	42,649,650.16
Private cost ratio	0.22
Domestic resource cost ratio	0.20
Output transfer	-8,888,009
Nominal output protection coefficient	0.84
Input transfer	-299,038.00
Factor transfer	-692,620.40
Nominal protection input coefficient	0.69526
Effective protection coefficient	0.84
Net transfer	-7,896,350.60
Profit coefficient	0.81
Producer subsidy ratio	-0.15

Based on Table 3, these indicators will then be explained further in the results of the policy analysis matrix to see analysis of competitive and comparative advantages, and the impact of government policies can be seen from the impact of output policies, the impact of input policies and the impact of input policies output.

3.2. Competitiveness analysis

Cocoa competitiveness can be seen from two indicators, namely, indicators of competitive advantage and comparative advantage. Both of these are used to determine the level of cocoa competitiveness. To determine the competitiveness of cocoa commodities, policy analysis matrix is based on table 3 for cocoa commodities.

3.2.1. *Competitive advantage.* Analysis of the competitive advantage of this plantation commodity, namely cocoa can be seen from private profit which is calculated based on the prevailing price in the market (actual price), and Private Cost Ratio (PCR) which shows that the commodity produced is efficient in using resources and profitable. Private benefits obtained from cocoa commodities are as significant as IDR 34,753,299.56 per hectare. Cocoa commodities produce private revenues that are greater than the input production costs so that the value of private profits is positive. The positive benefits of cocoa commodities in South Sulawesi indicate that the existence of government intervention in cocoa commodities in Indonesia provides a positive incentive for the profits of cocoa commodities in South Sulawesi. With government intervention, cocoa farmers in South Sulawesi can receive positive farming benefits.

Competitive advantage can also be seen from the value of the Private Cost Ratio (PCR), which is an indicator of how resource allocation is directed towards achieving efficiency in cocoa farming. The ratio of private costs is the ratio between non-tradable input costs or domestic factors with the difference between receipts and tradable input costs at the actual price level. The PCR value less than one ($PCR < 1$) shows that farming is run financially efficiently. The smaller the PCR value obtained, the higher the level of competitive advantage possessed. The PCR value obtained in cocoa commodities in South Sulawesi is less than one. Based on these interpretations the allocation of resources in the cocoa commodity system has achieved financial efficiency and thus has a competitive advantage. The PCR value of cocoa commodities is 0.22 indicates that the cocoa commodity system in South Sulawesi has limited capacity to finance its domestic factors.

3.2.2. *Comparative advantage.* Analysis of comparative advantage can be seen using the value of social benefits and domestic resource cost ratio, which are indicators of competitiveness without government assistance. The value of social benefits in cocoa commodities is IDR 42,649,650.16 per hectare. The value of positive social benefits or more than zero shows that cocoa commodities are economically profitable without interference from government policies.

The value of social benefits obtained on cocoa commodities is due to the use of smaller inputs. Then the price of cocoa social prices is higher than the private price so that the social benefits obtained are more enormous. When viewed from private benefits and social benefits, private benefits are still lower than social benefits. This shows that cocoa farming in South Sulawesi is more profitable when there is no government policy than government policy. Government policies on cocoa input simultaneously still provide incentives for cocoa farmers, but government policy on output still has no significant effect so that the private benefits obtained are smaller than social benefits. The magnitude of the impact of the policy can be seen from the value of the divergence of the gain obtained is negative.

Apart from the social benefits, the comparative advantage of cocoa can also be known from the Domestic Resource Cost Ratio (DRCR). DRCR is the ratio between non-tradable costs or domestic factors with the difference between receipts minus tradable costs on shadow prices or social prices. The value of DRCR obtained from cocoa commodities is 0.20. Less than one DRCR value indicates that cocoa commodities are economically efficient and have a comparative advantage without government assistance or intervention.

Judging from the difference between private benefits and social benefits and the value of DRCR that is smaller than the value of RBP obtained in cocoa commodities, it can be concluded that the private benefits obtained are lower than the social benefits. This shows that input prices paid by farmers are higher or the output prices received by farmers are lower than social prices. This means that there is government influence or market distortion that does not provide proper incentives for cocoa farmers so that the private benefits obtained are lower than the social benefits of production inputs and distortions in the output market. The existence of market distortions can be seen as a policy to reduce import tariffs to zero percent, which causes consumers to buy imported cocoa because the price is lower, besides the impact that arises is that cocoa prices will decrease because competing producers must reduce cocoa prices.

3. *Analysis of the impact of government policy*

The impact of government policies is analyzed through the PAM matrix, namely policies on output, policies on inputs, and policies on input-output.

3.3.1. *Impact of output policy.* Government policy on output can be seen from the value of Output Transfer (OT) and Nominal Output Protection Coefficient (NOPC). Based on the OT value in Table 3, the most significant losses experienced by cocoa farmers were IDR 8,888,009 per hectare. This occurs because the social price of cocoa calculated based on international market prices is higher than the cost of local cocoa. On the other hand, the low price of local cocoa makes cocoa can compete with imported cocoa, but the effect of income and profits obtained by farmers will decrease. The NOPC value of cocoa commodities is smaller than one, which is 0.84. This indicates that there is a policy that causes the private price of cocoa to be lower than the social price. NOPC values of less than one value also suggest that government policies for cocoa farmers have not been effective, resulting in a reduction in farmers' income.

3.3.2. *Impact of input policy.* Government policies on inputs can be seen from the value of Transfer Input (TI), Transfer Factor (TF), and Nominal Input Protection Coefficient (NIPC). Based on table 3, the value of TI on cocoa commodities is negative, which is IDR 299,038.00 per hectare. The negative TI results indicate that the subsidy policy to reduce tradable input costs causes cocoa farmers to receive prices lower

than social prices. The NIPC value obtained by the cocoa commodity is 0.69. The NIPC value of less than one indicates that there is a subsidy for tradable inputs which causes private prices to be lower than the social price. This has resulted in transfers from the government to cocoa producers. Some of these policies include government assistance such as seeds and inorganic fertilizers in the context of intensification programs, as well as subsidy policies and the ordering of the highest retail prices for inorganic fertilizers such as Urea and SP-36. In addition to tradable inputs, cocoa farmers also use non-tradable inputs (domestic factors) such as equipment, capital costs, land, and other domestic inputs. The transfer factor value shows the amount of government intervention on non-tradable inputs. Table 3 shows that the TF value in cocoa commodities is negative. This value indicates that the price of non-tradable inputs issued by the government at the private price level is lower than the non-tradable input costs incurred at the level of economic or social prices. That is, there are implicit subsidies or transfers from domestic factor producers to farmers so that farmers receive domestic input prices lower than their social prices.

3.3.3. Impact of input-output policy. The impact of the combined policy can be seen from the indicators of the Effective Protection Coefficient (EPC), Net Transfer (NT), Profit Coefficient (PC) and Producer Subsidy Ratio (PSR). Based on table 3, the indicators of the Effective Protection Coefficient (EPC) value for the cocoa commodity is equal to 0.84. An indicator of the effective protection coefficient value of less than one indicates that there is no government protection or protection against farmers. This causes farmers not to have added value for their products and private prices tend to be smaller than their social prices.

Net Transfer (NT) describes the impact of the overall government policy on farmers whether it is harmful or profitable. The value of net transfer cocoa is negative, namely IDR 7,896,350.60 per hectare. This shows that the existing policies on inputs and outputs still do not provide economic incentives to increase production because there has been a reduction in producer surplus or lost farmers' profits in the amount of the transfer value, which is IDR 7,896,350.60 per hectare.

The coefficient of profit in table 3 also shows that there is no protection from the government towards cocoa farmers. A value obtained from cocoa commodities shows less than one. This value indicates that the government's policy towards input-output has caused private profits from farming cocoa commodities in South Sulawesi to be lower than the profits that should have been received if there were no policies (social benefits). In other words, the current government policy on input-output does not have a positive impact on cocoa farming.

The value of the PSR. Based on Table 3, PSR value of the two cocoa commodities is negative, which is equal to 0.15. This explains that government policy towards inputs and outputs is detrimental to farmers, because farmers issue production costs greater than the social cost/opportunity cost for production.

3 Conclusion

Based on the results and discussion, it can be concluded in this study that cocoa commodities generally have competitiveness seen from comparative and competitive advantages as indicated by the value of $DRCR < 1$ and $PCR < 1$. In cocoa commodities, the value of DRCR and PCR is equal to 0.20 and 0.22. The smaller the DRCR and PCR values obtained, the higher the level of comparative and competitive advantages possessed. Overall, the government's policy on input-output that has been in effect so far has not effectively protected cocoa farmers in South Sulawesi, which means that the government has not had a positive impact on cocoa commodities in South Sulawesi. This can be seen from the private price, which is lower than the social price.

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