Competitiveness and Government Policy Impact Analysis of Cassava Starch in East Java, Indonesia: Policy Analysis Matrix Approach

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Abstract: East Java in Indonesia is one the largest production area of cassava where the cultivation and producing areas are adjacent to each other. Seventy percent of cassava was processed locally to produce cassava starch. However, policy for cassava starch is considered less successful because production is still fluctuating and only accounts for 8% per year (2007-2015) in national production. The purpose of this research is to analyze competitiveness, policy impact and perspective change of cassava starch competitiveness in East Java by using Policy Analysis Matrix (PAM). This research was conducted in small industry from two production centers of cassava starch with census method, all 33 industries in Trenggalek Regency and all 25 industries in Kediri Regency. Primary data was generated through interviews with owners of cassava starch industry in July-September 2017. Based on the research, cassava starch industry in East Java has a competitiveness that includes competitive advantage with PCR value was 0.62 and comparative advantage with DRCR value was 0.23. Overall government policy has not been able to provide incentives to producers. After the policy, the industry must increase spending on input costs so that the profits derived by the cassava starch industry in East Java decrease. Abolition of import tariff tax for cassava starch by 10% causing cassava starch industry in East Java has no competitive advantage, but fixing the base price for cassava to 650.00/kg makes the competitive advantage of the cassava starch industry in East Java slightly increased. Thus, the cassava starch industry still has a comparative advantage despite the strengthening and weakening of the rupiah exchange rate against US $.

Keywords: SME, Cassava Starch, Competitiveness, Government Policies, PAM.

INTRODUCTION

Indonesia is one of the world's major cassava producers (9% of world production) [1]. Cassava in Indonesia is traded more in the form of derivatives but not in fresh form. Cassava starch is one of the strategic products. According to the Ministry of Agriculture no. 50/2012 that one of the objectives is to reduce rice consumption by 1.5% per year and increase the added value of flour products by up to 20% to replace imported wheat. Cassava starch is one of the diversified cassava flour products that are considered to replace wheat[2].

East Java Province is one of cassava producers in Indonesia. East Java cassava production fluctuated every year, but its contribution is quite large in national production. This is because the locations of planting and processing of cassava in East Java is close to each other so that the industry is featured by the integration between sub-system agribusiness. This is evidenced by 70% of cassava production in East Java was processed in its own region. Thus, East Java is also one of the largest cassava starch producing provinces in Indonesia [3].

The policy of developing agribusiness subsystem of cassava starch processing in East Java based on the empowering the village community is known as ITTARA (Cassava Starch Industries Community). In its development, this policy is considered less successful because the production of cassava starch in East Java tends to fluctuate in the contribution of national production. Cassava starch

production in East Java fluctuates annually and contributes about 8% per year in 2007 to 2015 [4].

From this condition, the objectives of this research are 1) To analyze the financial and economic benefits of cassava farming in Pogalan village, 2) to analyze the comparative advantage of cassava in Pogalan village and 3) to analyze the level of sensitivity of domestic cassava competitiveness to the effect of change of input price of inorganic fertilizer and exchange rate.

RESEARCH METHODS
Method of Determination of Location and Time of Research
The research was conducted at home industry at cassava starch industrial center in Trenggalek and Kediri districts which have been registered in Industry and Trade Office of East Java Province. Determining the location of the study was done purposely (purposive sampling) to achieve the objectives in the study. Determination of Respondents conducted by census consisting of 33 home industry in cassava starch industry center in Trenggalek Regency and 25 home industry in cassava starch industry center in Kediri Regency. The study was conducted in July 2017.

Empirical Analysis
The Policy Analysis Matrix is an analytical tool that can be used to look at competitive and comparative advantages and the influence of government intervention. The steps to be taken in PAM analysis are:
a. Determination of Cost Allocation Methods for Inputs
1) Domestic Components (non-traded goods)

Domestic factors or non-tradable goods are goods that cannot be traded in the international market. Domestic factor allocation in East Java industrial center is labor and capital (tub washing cassava, drying board and land rent).

Foreign Components (tradable goods)
Tradable goods are inputs that can be traded in the international market. According to Kadariah [10], tradable goods are. The allocation of tradable goods in this research is sacks, fuel, cassava and capital.

Shadow Price Determination
The shadow price calculation formula will be used as follows:
Shadow price of export component = (FOB x SER) - cost of trading
Shadow price of import component = (CIF x SER) + cost of trading

The cost of trading in the allocation of these costs is to calculate all the trading costs from the producers to the port of export, namely Tanjung Perak Port Surabaya or from the import port to the consumer that is the farmers of the respondents. Transport consists of port-regency and handling.

Shadow exchange rate (SER)
Data sources for shadow exchange rate calculation are from Statistics Indonesia and Bank Indonesia. Official exchange rate in 2016 was 13,307.38 IDR/USD [8] while the shadow exchange rate was 13,450.47 IDR/USD[11].

Shadow Price of Output
The output of this research is cassava starch in the form of flour (HS1108140000). Cassava starch is an import commodity (CIF) in 2016[9]. CIF price for cassava starch industry in Trenggalek Regency is 5,028 IDR/kg and Kediri Regency is 4,994 IDR/kg.

Shadow Price of Tradable Input
The tradable inputs that take into account social prices are cassava, sacks, fuel diesel and capital. Cassava is internationally marketed. The social price of cassava is done through CIF price approach for dry cassava, after it is converted, the social price of cassava (HS0714101100) in Trenggalek Regency is 658.36 IDR/kg and Kediri Regency is 650.00 IDR/kg.

Although sacks are produced domestically but their raw material (polypropylene) from the manufacture of these sacks is imported so that the price of social sacks is determined from the CIF price in 2016. According to the Regulation of the Minister of Finance No.6/PMK.010/2017, government imposes import duty for this polypropylene by 5%. So as to get social price for sack in Trenggalek Regency is 924.29 IDR/sack and at Kediri Regency that is 900.25 IDR/sack.

Diesel fuel used in cassava starch industry is diesel owned by PERTAMINA. PERTAMINA is the only state-owned company engaged in oil field. The actual price of diesel fuel in East Java is 5,150 IDR/liter in accordance with Ministry of Energy and Mineral Resources No. 2304 K/12/MEM/2017. The social price for diesel fuel is 5,120.80 IDR/liter in Trenggalek Regency and 5,102.80 IDR/liter in Kediri Regency.

Shadow Price of Non-tradable Input
Non-tradable inputs are goods that are not internationally traded so they do not have world prices. Because non-tradable input does not face international competition, domestic market prices will change to the level required to cover costs [5]. Non-tradable inputs in this study include labor and capital. Labor in this research is divided into three types that is labor for

peeling, labor for filtering and dissolution and labor for drying and packaging. The social price for labor is equal to the private price. Thus, employment policies can be ignored in PAM analysis and social valuations for labor are estimated from their private prices. However, the final price of labor is the total price of labor. It was 100,455 IDR/person/day for cassava starch industry in Trenggalek Regency while in Kediri Regency is 120,000 IDR/person/day.

Furthermore, in this study capital used is building and production equipment. Production equipment includes tub washing cassava and drying board. The social price for capital in this study was approximated by the depreciation cost. The total social price for Trenggalek Regency is 9,430 IDR/day and Kediri Regency is 6,282 IDR/day.

Policy Scenario and Sensitivity Analysis

Policy scenario was created to determine the impact of changing cassava starch competitiveness in East Java in the event of a policy change. However, sensitivity analysis is to know the response of competitiveness indicator that is PCR and DRCR. The policy scenarios carried out are as follows: (1) Abolishment cassava starch import duty 10%, (2) Floor price for cassava is 650 IDR/kg. Sensitivity to be analyzed is about the exchange rate change of 10%.

RESULTS AND DISCUSSION
Result of Policy Analysis Matrix

Table 2 shows the calculation of PAM analysis for cassava starch industry in the study sites

Table-1: Policy Analysis Matrix of Cassava Starch Industries (IDR/Process)

Description	Revenue	Cost		Profit
		Tradable Input	Non-Tradable Input	
Private	A	B	C	D
Trenggalek	7,742,424	6,099,093	771,179	872,152
Kediri	8,056,000	6,199,516	1,441,593	414,891
Social	E	F	G	H
Trenggalek	9,731,356	5,364,107	771,179	3,596,069
Kediri	10,5733,202	5,733,202	1,441,593	3,413,014
Divergence	I	J	K	L
Trenggalek	-1,988,931	734,985	-	-2,723,917
Kediri	-2,531,809	466,314	-	-2,998,123

Source: This Research

Based on Table 2 above, then the discussion can be discussed into three analyzes that are as follows:

Private and Social Profitability

Based on the analysis of private profit in Table 3, this shows that the private profit value of cassava starch in East Java is positive or profitable. The private profit of the cassava starch industry in East Java is 643,521,5 IDR/process. The value of private income in the cassava starch industry in East Java can still cover the private costs incurred for the production process. This shows that cassava starch in East Java is still feasible if in its production apply government policy for cassava starch.

Meanwhile, the social profit analysis of cassava starch in East Java is positive. The amount of social profit generated by the cassava starch industry in East Java is 3.584.914 IDR / process. A positive value in social profit shows that producing cassava starch is very profitable.

Table-2: Private and Social Profitability of Cassava Starch in East Java

Location	Profit (IDR/process)	
	Private Profits	Social Profits
Trenggalek	872,152	3,672,787
Kediri	414,891	3,497,041
East Java	643,521.5	3,584,914

Source: This Research

However, the value of private profit is less than the value of social profit, which means that the profit of the owner of the cassava starch industry in East Java is less than the real profit. This happens because on the output side, the social price of cassava starch is greater than its private price. While on the input side, the social price of cassava is smaller than the private price. On the input side, cassava has a considerable influence on profit received by industrial owners because 86-88% of production cost in cassava starch industry in East Java is cassava (raw material).

Analysis of Competitiveness

The measurement of competitiveness of agribusiness sector can use two indicators, namely Private Cost Ratio (PCR) as an indicator of competitive advantage and Domestic Resource Cost Ratio (DRCR) as an indicator of comparative advantage [5]. The result of analysis in Table 4 shows that PCR value was 0.62. The PCR coefficient value of less than one indicates the cassava starch industry in East Java had a competitive advantage. To produce one unit value added production of cassava starch with private price hence require domestic cost equal to 62%.

The smaller the value of PCR then the cassava starch industry in East Java is increasingly competitive.

The value of DRCR for cassava starch industry in East Java is 0.23. This value indicates that the cassava starch industry in East Java requires 23% additional units of domestic factor costs to obtain additional units of output at social prices. So it can be said that cassava starch industry in East Java is feasible to produce cassava starch in domestic or have comparative because it has DRCR coefficient value less than 1.

Table-3: Competitiveness Indicators of Cassava Starch in East Java

Location	Competitiveness Indicators	
	PCR	DRCR
Trenggalek	0.47	0.17
Kediri	0.78	0.29
East Java	0.62	0.23

Source: This Research

Based on the analysis, there is the possibility of East Java cassava starch to be exported, but marketing of cassava starch in East Java was still limited in its region has not been widely to other areas or other countries. If cassava starch had efficiency in the use of input but did not yet have a large market share, it was difficult to maintain the competitiveness of cassava starch in East Java. Previous research, Rachmat and Nuryanti [6] stated that Indonesian cassava starch was not considered as a comparative advantage due to fluctuations in cassava starch competitiveness in Indonesia with decreasing trend in 1990-2009. This happens because the market share of cassava starch was formed only because of the distribution effect, not the influence of the composition in the market.

3. Impact of Government Policy
a. Policy Impact to Output

The policy of government intervention or incentives in output can be seen from the amount of

Output Transfer value (OT) and Nominal Protection Cost Output (NPCO). Based on Table 5, the value of Output Transfer (OT) from the cassava starch industry is -2.340.743 IDR/process/day. The value of OT obtained by the cassava starch industry is negative, indicating that the social revenue of the cassava starch industry in East Java is greater than the private revenue. This is because the price of cassava starch output in East Java is lower than the actual price.

While the ratio value seen from the value of NPCO is 0.77, which means revenue in the cassava starch industry in East Java 0.77 times lower than revenue with the actual price. This condition shows that government policy toward cassava starch production in East Java is more beneficial to consumers because consumers buy cassava starch products at lower prices than actual prices. The revenue earned by cassava starch industries in East Java is revenue that has been affected by the policy government.

Table-4: Policy Impact to Output Indicators of Cassava Starch in East Java

Location	Policy Impact to Output Indicators	
	OT (IDR)	NPCO
Trenggalek	-2,065,650	0.78
Kediri	-2,615,836	0.75
East Java	-2,340,743	0.77

Source: This Research

The government's policy for cassava starch output is a 10% import tariff for export cassava starch. In fact, the government's policy is the government's way of protecting domestic producers. This policy is contained in Minister of Finance Regulation

No.6/PMK.010/2017. However, the revenue earned by cassava starch industry is still smaller than its social price. Thus, import restrictions by the government are not only useful as disease prevention, but also important in improving the competitiveness of cassava

starch. The determination of this policy is more beneficial to consumers than producers when viewed from the side of private and social prices, but with the restrictions on imports, the government also has to protect domestic producers so it is expected that cassava starch in East Java can still be competitive and can be developed.

- **Policy Impact to Input**

The incentive policies contained in tradable inputs are shown by the value of Input Transfer (IT) and Nominal Protection Coefficient on Input (NPCI), whereas for non-tradable inputs are Transfer Factor (FT). Based on the results in Table 6, IT values are positive at 600,650 IDR / process which mean that

private tradable goods prices in cassava starch industries in East Java are greater than their social prices. It also indicates that there is a tax applied to inputs in the cassava flour industry in East Java.

Meanwhile, the value of the NPCI ratio is 1.11 which means that the tradable input price on the cassava starch industry in East Java is 1.11 times higher than the actual price. This indicates that government intervention does not protect the tradable input of cassava starch industries in East Java. In addition, the FT zero value indicates that cassava flour producers do not accept transfers to pay for non-tradable inputs.

Table-5: Policy Impact to Input Indicators of Cassava Starch in East Java

Location	Policy Impact to Output Indicators		
	IT (IDR)	NPCI	FT (IDR)
Trenggalek	734,985	1.14	-
Kediri	466,314	1.08	-
East Java	600,650	1.11	-

Source: This Research

The prevailing government policy is tax for cassava and raw material of sack is Polypropylene in cassava starch industry in East Java. The government has set a tariff policy on cassava and sack of 5 percent as regulated in Regulation of the Minister of Finance no. 6 / PMK.010 / 2017 [7]. However, the application of tradable input rates also contributes to the positive value of IT. Thus, a 5 percent import duty for cassava (raw materials) has a high impact on total cost of tradable inputs. This is due to the high portion of raw material costs of 86-88 percent of total production costs. This is proportional to the cost of sacks that accounted for only 1.2 percent of the cost of producing the cassava flour industry in East Java. This tax rate policy made by the government is more detrimental to the producer because the production cost incurred should be more than not applied tax but this is done to keep protecting the domestic product.

Policy Impact to Input and Output

Indicators for the impact of government policies on inputs and outputs can be seen from the value of Effective Protection Coefficient (EPC), Net Transfer (NT), Profitability Coefficient (PC) and Subsidy Ration to Producers (SRP). Based on the results of the analysis of Table 7, Net Transfer Value (NT) for cassava starch industry in East Java obtained negative value that is equal to -2,941,392. The value of Net Transfer (NT) is negative, indicating that the absence of policies that provide economic incentives received by producers, so that the development program of cassava starch industry in East Java cannot

run well. This is a factor inhibiting the development of cassava starch industries in East Java both in the main production centers and new development areas. One policy for cassava starch in East Java is ITTARA. This policy is to provide the assistance of diesel equipment to facilitate producers to process cassava starch production in East Java. But the economic lifespan of this tool is only three years and there is no reexamination by the government so some diesel in industrial centers is starting to be unfit for use. Inadequate solar is causing reduced efficiency of cassava starch input in East Java.

The value of Effective Protection Coefficient (EPC) in the cassava starch industry in East Java is 0.37. EPC less than one indicate that there is no government protection against the cassava starch industry in East Java. Government policies tend to hinder the development of cassava starch industry in both locations. This is due to the ineffectiveness of the basic selling price policy applied by the government because there is no special institution to buy cassava starch at a price determined by the government.

The value of profitability coefficient (PC) in cassava starch industry in East Java is 0.18. Less than one PC shows that overall government policy does not provide incentives to producers. The existing policy causes the industry not to get more profit than it should. After the policy, the industry must increase spending on input costs so that the profit earned by the cassava starch industry in East Java is decreasing.

Table-6: Policy Impact to Input and Output Indicators of Cassava Starch in East Java

Location	Policy Impact to Input and Output Indicators			
	EPC	NT (IDR)	PC	SRP
Trenggalek	0.37	-2,800,635	0.24	-0.29
Kediri	0.38	-3,082,150	0.12	-0.29
East Java	0.37	-2,941,392	0.18	-0.29

Source: This Research

The Subsidy Value for Producer Ratio (SRP) for cassava starch industry in East Java is -0.29. That is, in general, existing government policies have a negative impact on industries in East Java. The cassava starch industry is obliged to pay taxes. Government policies negatively affect production costs; the cost incurred by the cassava starch industry becomes greater than the added value of the profits it receives.

Based on the impact of government policy divergence on input-output of cassava starch industry, it shows that current government policy is detrimental to exploitation of cassava starch industry in East Java. The cost incurred by the cassava flour industry is greater than the profit earned. This condition is one of the reasons why the production of cassava starch is not developed; the lack of government attention to cassava starch will make the cassava starch industry decline year by year.

4. Influence of Prospective Changes in Policies
a. Policy Scenario

In this study the researchers determined two scenarios. The first scenario is the removal of 10%

import duty for cassava starch. This is based on Indonesia's dependence on multilateral cooperation, one of which is the ASEAN Economic Community (AEC). This Agreement contains an agreement between Southeast Asian countries to implement free markets by removing or reducing the entry fee of goods. Goods in question were goods that were traded internationally. Each year the countries joined in the AEC will review its determination, so it was possible that this scenario will be applied in the future by the government.

Table 8 shows that Scenario 1 regarding the abolition of import duty for cassava starch by 10% makes PCR value in East Java of normal value without abolition of 10% import duty is 0.62 to 1.13 after the abolition of import duty. At the time of import duty, the cassava starch industry still has a competitive advantage but if applied tax abolition 10% cassava starch industry will lose its competitive advantage. Thus, the elimination of these import duties cannot be applied because it would harm the domestic cassava starch producer.

Table-7: Policy Scenario Results

Policy Scenario	Trenggalek		Kediri		East Java	
	PCR	DRCR	PCR	DRCR	PCR	DRCR
Normal	0.47	0.17	0.78	0.29	0.62	0.23
Abolishment of cassava starch import duty 10%	0.89	0.17	1.37	0.29	1.13	0.23
Floor price for Cassava 650 IDR/kg	0.32	0.17	0.63	0.29	0.47	0.23

Source: This Research

The second scenario is obtained from the phenomenon of increase and decrease of cassava price because the raw material of cassava starch production then influence the price of cassava starch. In the harvest season, the price of cassava will be much lower, and vice versa. The basic price determination for cassava is to protect the cassava flour producers so that there is no significant decrease in the price of cassava starch. The base price for cassava makes PCR value in East Java tend to increase competitiveness, it is seen that the PCR value is close to zero from 0.62 to 0.47. The pricing of this floor is to protect the price of

cassava and cassava starch price so that it can still compete with imported products.

The DRCR value for all scenarios shows a fixed value of 0.1432 in East Java. The policy scenarios made from both are applied to the actual price occurring in the market so as not to affect the value of the DRCR. So cassava starch in East Java still has a stable comparative advantage if there is a policy to remove import duties and determine the minimum price for cassava starch.

Sensitivity Analysis

The sensitivity of this research is the change of the rupiah against the US dollar by 10%. This change is determined from the condition of Indonesia which sometimes occurs the strengthening of the rupiah against the US dollar and vice versa at the level of 10%. This change only affects the value of DRCR or only affects the comparative advantage of cassava starch in East Java. Change does not affect the value of PCR or competitive advantage in East Java. This is because of the changes that occur in social prices alone, not on the actual price. The results are summarized in Table 9.

Table-8: Sensitivity Analysis Results

Sensitivity Analysis	Trenggalek		Kediri		East Java	
	PCR	DRCR	PCR	DRCR	PCR	DRCR
Normal	0.47	0.17	0.77	0.29	0.62	0.23
Change in Exchange Rate (10%)						
Appreciation 10%	0.47	0.19	0.77	0.33	0.62	0.26
Depreciation 10%	0.47	0.16	0.77	0.26	0.62	0.21

Source: This Research

The first sensitivity is based on a change in the rupiah against the US dollar of 10%. The weakening of the rupiah against US $ 10% did not significantly affect the comparative advantage of cassava starch in East Java. This is because the changes are not significant even though the value of DRCR has increased, from 0.23 in normal condition to 0.26 when there is a weakening of 10%. Thus, the cassava starch industry will still have a comparative advantage despite a weakening of the rupiah against the US $ 10%.

The second sensitivity is based on the strengthening of the rupiah against the US $ 10%. This has little to do with the comparative advantage of cassava starch in East Java. This is because the change is not significant even though the DRCR value decreased from 0.23 in normal condition to 0.21 when the weakening of 10%. Thus, the cassava starch industry will still have a comparative advantage despite the strengthening of the rupiah against the US $ 10%.

CONCLUSION
Based on the objectives and research results, it can be concluded that

The cassava starch industry in East Java has a competitiveness that includes competitive advantage and comparative advantage. The results show that the cassava starch industry in East Java can use the available natural resources efficiently. The PCR (Private Cost Ratio) indicator is to see the competitive advantage of the cassava starch industry in East Java. The PCR value in the study was 0.62 which means that to produce one unit of value added production of cassava starch with private price requires 62% domestic cost. While on comparative advantage, the indicator used is Domestic Resource Cost Ratio (DRCR). The DRCR value in the study was 0.23, which means that the cassava starch industry in East Java requires an additional 23% of the domestic factor cost to obtain additional units of output at social prices.

The impact of government policy on the cassava starch industry in East Java on the output side is shown at the OT value of -2.340.743 IDR / process / day and NPCO of 0.77. This indicator can be concluded that government policy in the form of 10% tax for tariff of import cassava starch gives more benefit to consumer because it impact on output price which is cheaper than actual price. Meanwhile, the impact of government policy on tradable inputs is shown on IT value is 600,650 IDR / process and NPCI is 1.11. Government policies on the input side apply taxes for cassava and polypropylene (raw material from sacks) requiring manufacturers to incur production costs for larger tradable goods. The impact of government policy on the input and output of the cassava starch industry in East Java is seen from the EPC value of 0.37, the NT value of -2.941.392, the PC of 0.18 and the SRP of -0.29 which means that the overall government policy has not been able to provide incentives to producers. The existing policy caused the cassava starch industry to not gain more profit than it should. After the policy, the industry must increase spending on input costs so that the profits derived by the cassava starch industry in East Java decrease.

The change of perspective analyzed in the research is policy scenario and sensitivity. In scenario 1 that is the abolition of import tariff tax for cassava starch by 10% causing cassava starch industry in East Java has no competitive advantage. The initial value of PCR before the abolition of import tariffs by 10% was 0.62 to 1.13 after the tax abolition. While the second scenario of fixing the base price for cassava (raw material) to 650.00 / kg makes the competitive advantage of the cassava starch industry in East Java slightly increased with the initial PCR value of 0.62 to 0.47. While the sensitivity on the strengthening and

weakening of the rupiah exchange rate against US \$ 10% resulted in the value of DRCR of 0.26 at the moment of weakening and 0.21 at the moment of strengthening with the initial condition value is 0.23. Thus, the cassava starch industry still has a comparative advantage despite the strengthening and weakening of the rupiah exchange rate against US \$.

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