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The Competitiveness of *Aren* sugar processing business: A Case Study from Kolaka District of Southeast Sulawesi

[1,2]Ilma Sarimustaqiyma Rianse, [3]Slamet Hartono, [3]Any Suryantini and [3]Jamhari

[1] Ph.D Student of Agriculture Science, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Indonesia
[2]Lecturer of Department of Agribusiness, Faculty of Agriculture, Universitas Halu Oleo
[3] Lecturer of Department of Agribusiness, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Indonesia

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Address For Correspondence:
Ilma Sarimustaqiyma Rianse, Ph.D Student of Agriculture Science, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Indonesia
Tel: +6285241717983; E-mail: wkgusmiarty09@yahoo.com

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ABSTRACT

Production of *aren* sugar can support the national program about sugar diversification. *Aren* sugar as an alternative of white sugar is expected to have high competitiveness. It is very important for the sustainability of *aren* sugar agroindustry. The objectives of this study were to analyze the financial and economic profitability, competitiveness (namely; competitive and comparative advantage) of *aren* sugar processing business in the Kolaka District, Southeast Sulawesi. Descriptive method by Policy Analysis Matrix (PAM) was used in this study. Financial profitability of *aren* sugar processing businesses was showed by the value of Private Profitability (PP), and its economic profitability was showed by the value of Social Profitability value (SP). Both values were obtained from the analysis of Policy Analysis Matrix (PAM). The results showed that *aren* sugar processing business have the financial and economic profitability, and have a competitive and comparative advantage. Therefore the *aren* sugar processing business has a very high competitiveness. Further, it was prioritized to be developed in sugar diversification. The implication of this study that high price of *aren* sugar in the international market is not felt by the *aren* sugar processing business. Thus, governments need to support and protect the *aren* sugar processing business in increasing the value added of *aren* sugar.
nt with UV-B radiation.

KEY WORDS
Aren sugar, processing business, economic profitability, financial profitability, competitiveness, Policy Analysis Matrix (PAM)

INTRODUCTION

Needs and dependence of national sugar consumption in Indonesia, especially for sugar cane or white sugar commodity is increasing from year to year. During this time, the needs of sugar cane or white sugar cannot be met by the production capacity of the national sugar mills that has been declined. Direktorat Jenderal Perkebunan (2014) said that there is 5.7 million tons of Indonesian's white sugar consumption, while the total production only 3.7 million tons. Therefore, sugar diversification program based on palm such as brown sugar very needs strategy and policy to reduce society and government dependence to sugar cane or white sugar and synthetic sugars.

There is two type of brown sugar, namely *aren* sugar and coconut sugar. Southeast Sulawesi had brown sugar production centers, namely District of Bombana, Kolaka, and Muna as *aren* sugar production area, and District of South Konawe as coconut sugar production area. It can support the diversification program of the sugar, because Southeast Sulawesi did not have sugar cane plantation as well as sugar cane factories. Therefore the development of brown sugar is the only way to reduce the import dependence (domestic and or international import) of sugar cane.

Demand for brown sugar in Southeast Sulawesi is high, actually. It was because most of snacks and desserts need brown sugar as an ingredient thereof. According to Rianse (2013) that Kolaka *aren* sugar is the most desirable by Kendari city consumer (capital of Southeast Sulawesi, and it is the main market place). Next, this study will focus on *aren* sugar because its abundant availability of raw material (*aren* sap) than coconut sugar (Abdullah, 2014). The abundant of *aren* sap was caused by abundant population in the Province of Southeast Sulawesi, Indonesia, the high productivity of sap of *aren trees*, length productive age of *aren trees*, high adaptability to various climatic and soil conditions coupled with the additional benefits of plant conservation. Resource potential is also indicated by the naturalness of *aren trees* that are free of artificial fertilizers and pesticides, the excellence nutrient content of *aren* sap and brown sugar, and the uniqueness aroma of brown also.

Competitiveness is also becoming one of the things that need to be considered in the sustainability of *aren* sugar agroindustry. It is suitable with result study of Fattakhova and Nureeva (2014) who said that competitiveness is the basis for the growth and prosperity of the company, and undoubtedly reflected in its financial stability.

Today, it is inevitable that businesses must be able to realize an increase in national competitiveness. It comparative and competitive advantages. Many economists and policy makers have given great attention to the concept of competitiveness and try to operationalize it in the economic development policy. The concept of competitiveness is also a keyword in agricultural development efforts in the broad sense. Competitiveness is interpreted by a variety of perspectives, including the perspective of economics, business, and politics (policy). Besides that, competitiveness drives from the micro perspective (company) to the macro perspective (national) perspective (Saptana, 2010).

According to Porter (1990), competitiveness is the ability of a commodity to enter foreign markets and to survive in the market. It means that the products that have competitiveness are the products that have high demand. Competitiveness of a commodity is classified into two types, namely natural advantages or superiority absolute and the advantage of being developed (acquired advantage).

Comparative advantages, according Simatupang (2005) is a measure of potential competitiveness (excellence) in terms of competitiveness that will be achieved in the economy will not distort at all. Comparative advantage is unstable and tends to change over the time and changes in production. According to Wilcox, Cochrane and Hardt *in* Dahl and Jerome (1977), there are several reasons in change of comparative advantage, namely (1) changes in natural resources such as soil erosion, (2) changes in biological factors such as an increase in pests and diseases, (3) changes in input prices, (4) an increase in mechanization of land, and (5) efficient improvement of transportation so it provide more convenience to far away areas from the market.

The competitive advantage is a measure of the competitiveness of an activity on actual economic conditions. Comparative advantage can be transformed into a competitive advantage, but requires the support of government policy. The government's policy is intended to eliminate market distortion that is mainly due to market imperfections or to protect the commodity in order to create its competitive advantage. Therefore, it is urgent to know the ability of *aren* sugar to enter the national or foreign markets and its ability to survive in the market through the study of its comparative and competitive advantages. Thus, this study aimed to analyze the financial and economic profitability, competitive and comparative advantage of *aren* sugar processing business in Kolaka District.

MATERIAL AND METHODS

The population of this study was the producers of *aren* sugar processing business in the Kolaka District, South East Sulawesi. Purposive random sampling method was used as the sampling method.

Financial profitability of *aren* sugar processing businesses was showed by the value of Private Profitability (PP), and its economic profitability was showed by the value of Social Profitability value (SP). Both values were obtained from the analysis of Policy Analysis Matrix (PAM).

Criteria:
PP > 1; indicated that *aren* sugar processing businesses has financial profitability
SP > 1; indicated that *aren* sugar processing businesses has economic profitability

Competitiveness was measured by using the Policy Analysis Matrix (PAM). PAM analysis would produce two core indicator in measuring competitiveness, namely (1) Private Cost Ratio (PCR) which was an indicator of the competitive advantage that indicated the ability to pay the cost of domestic resources and to always competitive in private price, and (2) Domestic Resource Cost ratio (DRCR) which was an indicator of comparative advantage that indicated the amount of domestic resources that could be saved to produce foreign exchange. There were four activities in commodity system that could be affected, namely farm level, product distribution from the farm to processing, processing and marketing (Monke and Pearson, 1995)

The main purpose of the PAM method was to provide information and tool in making of agriculture policy, especially in the *aren* sugar processing business. PAM table could be used to calculate the level of private profit, and competitiveness of *aren* sugar processing business at the level of the market price or actual price. It could be seen on Table 1.

Table 1: Policy Analysis Matrix (PAM).

Component	Revenue	Cost		Profit
		Tradable	Non-tradable	
Private price	A	B	C	D
Social price	E	F	G	H
Effect of divergence	I	J	K	L

Description:

A : Private revenue
B : Private tradable input costs
C : The cost of private domestic factors
D : Private profit (A-B-C)
E : Social revenue
F : Social tradable input costs
G : Social tradable input costs
H : Social profit (E-F-G)
I : Output transfer (A-E)
J : Transfer tradable input (B-F)
K : Transfer the domestic factor (C-G)
L : Net transfer (I-J-K)

PAM table consist of three rows and four columns. The first row was a calculation based on the actual price (private price) that occurred in the market (financial). It means that a price has been influenced by government policy and paid by farmers, traders, and processors in real terms. A business could be said to be feasible if the difference between total revenues (TR) and total cost (TC) at least equal to zero.

The second row was a calculation base on social price or shadow price depicting social value or actual economic value for the elements of cost and output. A business was feasible if the difference between the social income and social costs greater than or equal to zero.

The third row was a calculation between the market price and shadow price. The difference calculation showed the impact of government policies on both input and output. The government policy in price interference (supporting or inhibiting) was indicated by the negative or positive value of difference calculation between the market price and shadow price. The zero value indicated that there was no government policy in price interference and indicated a condition of perfectly competitive market (Monke and Pearson, 1989).

The sustainable of *aren* sugar processing business in supporting sugar diversification program was showed by efficiency value that could be seen from two indicators: competitive and comparative advantage. The competitive advantage was showed by the Private Cost Ratio (PCR) and the Domestic Resource Cost Ratio (DRCR). Mathematically:

$$efficiency = \frac{PCR}{DRCR}$$

Criteria:

PCR < 1; indicated that *aren* sugar processing businesses was efficient financially and has a competitive advantage.

DRCR < 1; indicated that *aren* sugar processing businesses was efficient economically and has a comparative advantage.

RESULT AND DISCUSSION

Financial and Economic Profitability:

Aren sugar processing business should have ability to generate profits (profitability) both financially and economically so as to be sustainable. It would increase the chances of *aren* sugar as a substitute of white sugar that were environmentally friendly.

Financial profitability of *aren* sugar processing business was indicated by the value of Private Profitability (PP), and economic profitability was indicated by the value of Social Profitability (SP). Both values are obtained from the analysis of Policy Analysis Matrix (PAM).

Private Profitability (PP) or also called financial profit was an indicator of financial efficiency, and Social Profitability (SP) or also called social profit was an indicator of the economic efficiency of *aren* sugar processing business on the condition there were no policies.

The results of the PAM analysis of *aren* sugar processing business in the Kolaka District could be seen in Table 2. Based on Table 2, the PP value of *aren* sugar processing business was IDR 19,437,887.38 (PP > 0). It indicated that the *aren* sugar processing business has financial profitability or financially profitable.

Table 2 also showed that SP value greater than zero (SP > 0) in the amount of IDR 147,618,446.24. It means that the *aren* sugar processing business has economic profitability or profitable economically. SP value of IDR 147,618,446.24 was obtained if all *aren* sugar were assumed to be exported. So,

the *aren* sugar processing business will get greater profit if it sells *aren* sugar in global markets than in the domestic market.

Table 2: PAM of *Aren* Sugar Processing Business in the Kolaka District, 2014.

	Revenue ()	Cost ()		Profit ()
		Tradable Input	Non Tradable Input	
Private Price	47,934,085.65	78,163.39	28,418,034.87	19,437,887.38 *Private Profitability* (PP)
Social Price	167,716,268.12	136,215.68	19,961,606.20	147,618,446.24 *Social Profitability* (SP)
Policy impact	(119,782,182.47)	(58,052.29)	8,456,428.67	(128,180,558.86)

Based on the analysis of the financial and social profit above, it was known that the value of the social profit was greater than the value of the financial profit (SP > PP). The phenomenon was due to the difference in output prices received by producers of 4.826.39 per kilogram that was lower than the social price of 16,887.02 per kilogram. It means *aren* sugar producers in Kolaka District experiencing disincentives in the *aren* sugar processing business.

Competitive and Comparative Advantage:

Aren sugar processing business that has financial and economic profitability, it has to have efficiency to be sustainable in supporting sugar diversification. Efficiency could be seen from the two indicators namely competitive and comparative advantage. The competitive advantage could be seen from the value of Private Cost Ratio (PCR) and the Domestic Resource Cost Ratio (DRCR). More information about the value of PCR and DRCR could be seen in Table 3.

Table 3: Parameter Value of Competitive and Comparative Advantage of *Aren* Sugar Processing Business in the Kolaka District, 2014.

Parameter	Value
Private Cost Ratio (PCR)	0.59
Domestic Resources Cost Ratio (DRCR)	0.12

Table 3 showed the PCR value of 0.59. It could be explained that additional domestic factor costs of IDR 5,900.00 on financial prices was needed to increase the revenue of IDR 10.000,00. PCR values smaller one (PCR < 1) indicated that the *aren* sugar processing business in the Kolaka District have financially efficient, so that it have a competitive advantage. In addition, it could also mean that the production system of *aren* sugar could pay its domestic factors.

Table 3 also showed DRCR 0.12. It means that *aren* sugar processing business have to sacrificed the opportunity costs of domestic resources amounted to IDR 120,000 to get profit IDR 1,000,000. DRCR smaller than one (DRCR < 1) indicated that the *aren* sugar processing business were economically efficient and have a comparative advantage. It indicated that it would be more advantageous to increase domestic production of *aren* sugar than to import from overseas.

The value of PCR and DRCR (contained in Table 3) were smaller than one. Thus, *aren* sugar processing business in Kolaka District have competitiveness in financial and economic value (international) or have competitive and comparative advantage. It was also known that the PCR value of *aren* sugar processing businesses have a higher value than DRCR (PCR > DRCR). It means *aren* sugar processing businesses have competitiveness but they have not been supported by government policies that could improve production efficiency. While Kormishkina, *et al*. (2014) said that to increase the competitiveness of agro-industrial complex, it must available programs for the support of farmers and smaller forms of business. Therefore, a supported government policy was important thing. Some types of government policies could be known through the PAM analysis, as follows:

1. Output Policy:

The output government's policy could be seen from two indicators: Output Transfer (OT) and Nominal Protection Coefficient Outputs (NPCO). More information about the value of OT and NPCO could be seen in Table 4.

Table 4: Parameter Value of the Output Policy Impact on the *Aren* Sugar Processing Business in the Kolaka District, 2014.

Parameter	Value
Output Transfer (OT)	(119,782,182.47)
Nominal Production Coefficient Outputs (NPCO)	0.29

Output transfer (OT) value was the difference between revenue that was calculated based on private prices and revenue that was calculated based on a social price. OT value of *aren* sugar processing business in Kolaka District was negative, namely IDR (119,782,182.47). It means the consumers bought *aren* sugar at a lower price

than the price to be paid. Thus, producers have disadvantaged. In other words, the *aren* sugar producer's revenue smaller of IDR 119,728,182.47 than the actual revenue without government policy.

Nominal output protection coefficient (NPCO) value was the ratio between revenue based on private price and revenue based on social price. Private revenue for Kolaka *aren* sugar commodities was amount of IDR 47,934,085.65 (saw Table 2), while the social revenue of IDR 167,716,268.12 (saw Table 2). It generated NPCO value was 0.29 (saw Table 4). NPCO value was less than one (NPCO < 1). It indicated that there were government policies that inhibited the export of output. The inhibit government was negative subsidy (tax) in the form of duties for the export of *aren* sugar. It caused a reduction in revenues of *aren* sugar processing business. Other side, it was a way to get raw materials from domestic easily and affordable prices, in order to encourage downstream industries. It was suitable with the result study of Fattakhova and Nureeva (2014) who said that developing of economic relations with consumer goods suppliers was important for creating a competitive and stable range.

2. Input Policy:

The government's policy was not only related to the output but also to the input. Implementation of this policy could not be separated from the government's efforts to protect *aren* sugar producers. The government's policy on production inputs could be seen from the value of Input Transfer (IT), Factor Transfer (TF) and Nominal Protection Coefficient on Inputs (NPCI). More information about IT, TF and NPCI could be seen in Table 5.

Input transfer (IT) was the difference between social and private prices that was received by producers of *aren* sugar to pay tradable inputs. The value of Input Transfer (IT) in this study was negative, namely IDR (58,052.29). It showed tradable inputs cost that was expensed in private prices was lower than the tradable inputs cost that was expensed in social prices. In this condition, government policy caused smaller revenue of *aren* sugar processing business than revenue in the absence of policy.

Table 5: Parameter Value of the Input Policy Impact on the *Aren* Sugar Processing Business in the Kolaka District, 2014.

Parameter	Value
Input Transfer (IT)	(58,052.29)
Transfer Factor (TF)	8,456,428.67
Nominal Protection Coefficient Inputs (NPCI)	0.57

Nominal Protection Coefficient Inputs (NPCI) was the ratio between the tradable cost in private price and tradable input costs in social price. The difference between these costs indicated a policy that caused the difference between private prices and social prices of tradable inputs. NPCI value in this study was 0.57 (NPCI <1). It indicated the existence of barriers to the export of inputs, so that *aren* sugar production used local input, only.

Factors Transfer (FT) was difference between social and private prices that was received by producers of *aren* sugar to pay domestic production factors. The value of Factors Transfer (FT) in this study was positive, namely IDR 8,456,428.67. It showed non-tradable inputs cost that was expensed in private prices was higher than the non-tradable input cost that was expensed in social prices. There was a negative subsidy for the non-tradable inputs or there were government policy that protected non-tradable inputs. These conditions caused the producer of *aren* sugar obtained non-tradable inputs that more expensive than its social price. It was profitable condition for the producers of non-tradable input, where they got profit of IDR 8,456,428.67.

3. Input-Output Policy:

Input-Output policy analysis was an analysis of input and output combination that has been described previously. Policy analysis of input-output could be explained through indicators, among others Effective Protection Coefficient (EPC), Net Transfer (NT), Profitability Coefficient (PC), and Subsidy Ratio to Producers (SRP). More information about the value of the EPC, NT, PC and SRP could be seen in Table 6.

Table 6: Parameter Value of the Input-Output Policy Impact on the *Aren* Sugar Processing Business in the Kolaka District, 2014.

Parameter	Value
Effective Protection Coefficient (EPC)	0.29
Net Transfer (NT)	(128,180,558.86)
Profitability Coefficient (PC)	0.13
Subsidy Ratio to Producers (SRP)	(0.76)

Effective Protection Coefficient (EPC) was an indicator of inputs and outputs policy impact to the *aren* sugar production system in the Kolaka District. EPC values illustrated about government policy in protecting or inhibiting the domestic production of *aren* sugar processing business. The value of EPC in this study was 0.29 (EPC < 1). It indicated ineffectiveness of government protection in *aren* sugar production system in the Kolaka District. It could be explained that the producer of *aren* sugar could not sell by higher price in this place. It was

supported by the condition that *aren* sugars were not directly purchased by end consumers but by traders who also wanted the margin from the sale of *aren* sugars. It was suitable with the result study of Hastang *et al*. (2015) who said that supply chain actors in supply chain downstream got bigger value added and profit than actor in internal supply chain and upstream supply chain.

Net Transfer (NT) described the overall impact of government policy on the revenue of *aren* sugar producers, whether it was profitable or not. The value of NT was the difference between value of private and social profit. NT value was amount of IDR (128,180,558.86). It indicated that there were not economic incentives to increase the production of *aren* sugar in the Kolaka District.

Profit Coefficient (PC) was the ratio between net private profit and net social profit. PC was an indicator that showed the impact of incentives on all output policy, tradable input policy and non-tradable input policy (net policy transfers). PC value in this study was 0.13 (PC < 1). It means that the *aren* sugar producer got smaller profit than profit without policy. Other words, net private profit of *aren* sugar producer smaller than net social profit.

Value of subsidies ratio was an indicator the level of increasing and decreasing revenue of producer in *aren* sugar processing business because of government policy. The value of Subsidy Ratio to Producers (SRP) was negative which equal to (0.76). It showed the government's policy in force. It caused *aren* sugar producer expensed production costs where 76 percent greater than the opportunity cost of *aren* sugar production. A negative value indicated that government policy gave negative affect to the structure of production costs. It could be explained that *aren* sugar processing business invested cost that greater than value added of its profit.

Assessment Matrix of Aren Sugar Processing Business:

Based on the analysis and interpretation above, then every indicator of competitive and comparative advantage, namely Private Profitability (PP), Social Profitability (SP), Private Cost Ratio (PCR) and Domestic Resources Cost Ratio (DRCR) were rated positive and negative. The assessment criteria of four indicators of competitiveness were shown in Table 7.

Based on the Table 7 *aren* sugar processing businesses have very high competitiveness, because of the positive value of PP, SP, PCR and DRC. It means *aren* sugar processing business have very high competitiveness to have competition with white sugar or sugar cane in the national market and so in the international market. The most important that *aren* sugar processing business could be one of solution to reduce the dependence of national sugar consumption in Indonesia. Thus, *aren* sugar processing business in the Kolaka District highly prioritized to be developed.

Conclusions:

Aren sugar processing business in the Kolaka District could be sustainable in supporting the program of sugar diversification, because:

1. *Aren* sugar processing businesses have financial and economic profitability.
2. *Aren* sugar processing businesses have competitive and comparative advantage with very high competitiveness that was shown by financial and economic profitability, and the positive value of PP, SP, PCR and DRCR.

The implication of this study that high price of *aren* sugar in the international market is not felt by the *aren* sugar processing business. Thus, governments need to support and protect the *aren* sugar processing business in increasing the value added of *aren* sugar.

Contribution of this study to the knowledge is a belief and certainty about sugar diversification through the existence and sustainability of *aren* sugar processing business with its high competitiveness.

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