The Effect of Transaction Costs on The Benefits of Hybrid Maize Farming in Dompu District, West Nusa Tenggara

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ABSTRACT

The characteristics of imperfect markets are characterized by the presence of transaction costs. One sector that is an imperfect market is the agricultural sector. The purpose of this study was to analyze the structure of transaction costs and the implications of transaction costs on the benefits of hybrid corn farming. The research method uses transaction cost analysis and multiple linear regression. The research was conducted in Dompu Regency, West Nusa Tenggara with 120 respondents as corn farmers. The results show that implementation costs are the component of transaction costs that have the highest percentage of 43.35%, then supervision costs are 28.37%, transportation costs are 20.61%, negotiation costs are 3.70%, information costs are 3.41% and coordination 0.57%. These transaction cost components are distributed in each hybrid corn farming cycle, among others; (1) birth cycle; (2) cropping cycle; (3) maintenance cycle; (4) supervision; (5) harvest cycle; and (6) postharvest cycle. The postharvest cycle is the cycle that has the highest percentage of 23.17%, then the maintenance cycle is 18.53%, the harvest cycle is 17.65%, the cropping cycle is 17.28% and the control cycle is 13.99%. Transaction costs have a positive and significant effect on the profits of hybrid corn farming.

Keywords: Dompu Regency, Farming Profits, Imperfect Market, Transaction Costs

JEL Classification Codes: D20, D23, D29

INTRODUCTION

Corn is a strategic commodity in Indonesia's agricultural and economic development, considering that this commodity has a multipurpose function (Agricultural Research and Development Agency, 2005). Corn is used as food and feed in Indonesia, so the availability of corn in the midst of people's lives is needed. Why not, corn is a source of carbohydrates that has many benefits, including as food ingredients (food and beverages), feed ingredients for livestock, and industrial raw materials as well as bioethanol raw materials (Rudi & Trias, 2017) For the people of Indonesia who live in the areas of Nusa Tenggara and Madura, corn is the main staple food substitute for rice. Usually, corn is made in the form of foods such as corn rice, grits, corn mixed with rice, and many other traditional foods derived from corn. Apart from being a source of carbohydrates, corn is grown as animal feed (forage and cobs). Generally, farmers in Indonesia use corn as an ingredient in animal feed mixtures. Some even use corn as the main feed ingredient (50% of the ration). Corn-based feed is generally given to chicken, duck and quail breeders (BPPP RI, 2018; Krisnamurthi, 2010; Rudi, et al, 2017)). Corn can also be used as an industrial support material. For example, corn kernels can be extracted for oil and made into flour. Corn cobs are rich in pentose which is used as a raw material for

making furtural. In addition, now corn can be used as a pharmaceutical-producing material by first doing genetics. Some industries that process corn into industrial products are dry milled industry which produces corn flour or cornstarch, wet milled industry which produces starch, syrup, corn sugar, oil and dextrin, and distillation and fermentation industry which produces ethyl alcohol, acetone, lactic acid, citric acid, glycerol, and others (Rudi et al, 2017) (. With the rapid development of technology, corn is also used as a raw material for making bioethanol, corn is a potential source of starchy raw materials to be developed to overcome the problem of dependence on fossil energy sources whose availability is dwindling and cannot be renewed. From some of the benefits of corn, it shows that corn has an important role in Indonesia so that corn is designated as one of the main strategic commodities in Indonesia's agricultural and economic development (Krisnamurthi, 2010). The need for corn as food and feed continues to increase along with population growth and the rapid development of the food and feed industry which makes corn the main raw material, but its availability is often limited (Rudi et al, 2017) (. Until now, Indonesia to meet the needs of domestic industry (feed and food factories) still relies on imports (BPPKP, 2017; Winarsono, 2012). According to the Industry Update of Bank Mandiri, the Association of Animal Feed Entrepreneurs (GPMT) estimates that the need for corn for raw materials for animal feed alone reaches 8.5 million tons a year and only 40% is met from domestically produced corn (Industry Update, 2015) . Domestic corn needs in 2015 reached 15.4 million tons and it is estimated that in 2020 the need for corn will increase by around 18.9 million tons. The dependence of domestic feed mills on imported corn is very high, with imports reaching an average of 40.3 percent (about 1-2 million tons/year) of the total domestic demand. Nationally, demand for corn in Indonesia is still experiencing many shortages, so that to meet domestic demand, a lot of it is still imported. The value of Indonesian corn imports in the 2010-2014 period grew with a trend of 15.72%, the three main countries of origin for imported corn are Brazil (38.51%), India (34.53%) and Argentina (22.24%). (BPPKP, 2017).

Corn demand continues to increase in line with the development of the food and animal feed industry. The food and food industry use corn as its main raw material, (Rudi et al, 2017). In addition to a bright market prospect, the availability of land suitable for maize development in Dompu district is very broad which consists of marginal land, dry fields, rainfed land and ex-cultivation land, besides that it is also supported by the availability of abundant labor, namely farmers, farm laborers and others, (Bambang, 2017).

If the potential for maize production continues to be developed, six absolute requirements and one facilitating condition are needed so that the development of maize production can be sustainable, namely; (1) there is an adequate market, (2) the existence of technology, (3), the availability of materials and means of production locally, (4) the existence of incentives (incentives) production for farmers and (5) the availability of smooth transportation and continuous. And the existence of production credit (as a facilitating factor) (Mosher in Arsyad, 2010).

Limited availability and market access, technology, materials / tools of production, and incentives (incentives) for production, as well as transportation services and production credit will cause high transaction costs. High transaction costs in accessing input market channels and output market channels are a fundamental problem for farmers in Dompu district, which has an impact on the lack of profits that farmers receive. This drastic fall in prices often does not merely reflect a surge in supply that is not accompanied by an increase in demand in a balanced proportion, but also illustrates the downstream subsystem that is not well developed (Yustika & Rukavina, 2015)

The facts above are not new, according to (Tefera & M, 2016) , many empirical studies in African agricultural markets have shown that high transaction costs are a serious obstacle to the participation of small farmers in the market. The results of the study (Sultan & Rachmina, 2016) showed that the component structure of transaction costs occurred at negotiation costs (60.30%), information costs (14.07%), coordination costs (12.22%), implementation costs (8.03) %), monitoring costs (4.23%) and risk costs 1.15%). These transaction costs arise due to lack of market information, weak bargaining position and perishability of many agricultural products (Abebe & Bijman, 2013; Lee, 2008).

The results of the study (Montalbano, Pietrelli, & Salvatici, 2018) showed that farmers 'participation in the right market channels had a positive effect on increasing farmers' income and food security. Likewise, research conducted by (Mmbando et al., 2017; shows that the participation of farmers with traders in nearby markets and large traders in nearby cities has a positive effect on per capita consumption expenditure compared with intermediaries on agricultural land. In addition to increasing farmer participation in the right nearest market channel, developing new market channels can minimize transaction costs and can contribute to higher incomes for farmers (Kalang, Lombogia, & Regar, 2012; Voors & Haese, 2010).

Farming is a production organization where farmers as implementers organize nature, labor and capital shown in production in the agricultural sector, whether based on profit or not. Natural conditions and climate also have an influence on the production process. To achieve production results, it is necessary to arrange sufficient incentives in the use of costs, capital and other production factors in farming (Hernanto, 1996) .

The purpose of farming, according to(Mubyarto, 1986) s to obtain the highest possible production at the lowest possible cost. Good farming is productive and efficient farming. Productive farming is farming that has high productivity, which is determined by the use of agricultural production factors or inputs such as seeds, labor, capital and other production factors. Efficient farming is farming that is economically profitable, the costs and sacrifices made for production are less than the selling price or the sales received from the production.

Meanwhile, according to (Hernanto, 1996) , said that farmers are managers in their farming activities. Farming has four main elements, namely land, labor, capital and management. Optimizing these factors is important to get efficient and profitable farming. The farming system has begun to shift from subsistence which is only to fulfill family needs to become commercial in order to obtain high profits in order to achieve a decent income.

Farmers become entrepreneurs who manage the allocation of inputs in an efficient way to obtain maximum production. The goal of maximizing production is useful for increasing profits from farming activities. Constraints faced by farmers are limited costs even though profits must still be achieved, then the use of costs must be reduced to obtain large profits (Mubyarto, 1986)

Corn is a type of grain food plant from the grass family. Originating from the Americans who spread to Asia and Africa through the business activities of Europeans to America. Around the 16th century the Portuguese spread it to Asia, including Indonesia. The Dutch called it Mais and the English called it corn (Badan Litbang Pertanian, 2005).

Corn plants are very beneficial for human and animal life. In Indonesia, corn is the second most important food crop commodity after rice. Based on the order of staple foods in the world, corn ranks 3rd after wheat and rice.

Recently, the use of corn plants is increasing. Corn plants are very useful, because almost all parts of the plant can be used, among others; Young stems and leaves: animal feed, Old stems and leaves (after harvest): green manure or compost, Dry stems and leaves: firewood, Corn stalks: lanjaran (turus), Corn stalks: pulp (paper material), and Corn fruit young (putren, Jw): vegetables, bergelel, bakwan, fried sambal, and old corn kernels: substitute for rice, marning, brondong, cornbread, flour, vermicelli, mixed ingredients for ground coffee, biscuits, pastries, animal feed, raw materials beer industry, pharmaceutical industry, dextrin, adhesive, and textile industry (Badan Litbang Pertanian, 2005) .

The existence of market failures in the economy gave birth to the theory of institutional economics which is part of the transaction costs theory (Yeager, 2004). It is common knowledge, neoclassical schools assume that the market runs perfectly without any cost (costless) because buyers (consumers) are considered to have perfect information and sellers (producers) compete with each other so as to produce low prices(Stone, 1996) . However, the fact in practice is the opposite, where information, competition, contract systems, and the buying and selling process can be very asymmetrical, (Yustika, 2012).

The asymmetry of information, competition, contract systems, and buying and selling processes creates transaction costs, which can also be defined as costs for negotiating, measuring and coercing contracts. Transaction cost theory uses transactions as the basis for its analysis. Defining transaction costs is very complicated, so to distinguish between transaction costs and production costs is also very difficult.

The economic literature provides various definitions of transaction costs, most of which rely on definitions that are in accordance with the theoretical conceptualization and/or that are relevant to the empirical case. According to Coase transaction costs are "the costs of organizing transactions", while according to (Williamson, 1989) , transaction costs are "the costs of running the economic system (the costs of running the economic system) and the costs of adjusting to environmental changes", further according to (North, 1990a).), transaction costs as fees for specifying and enforcing the contract upon which the exchange is based.

Meanwhile, according to (Mburu & R, 2002) transaction costs can also be defined as (1) search and information costs; (2) the costs of negotiating (bargaining) and making decisions or executing contracts; and (3) costs of monitoring, coercion and compliance. In short, transaction costs are costs to negotiate, measure, and enforce exchanges(Yustika, 2012) .

Transaction cost theory was first developed by Ronald Coase in The Nature of the (Coase, 1934) The theory was further developed in The Problem of Social Cost (1960), when he attempted to compare transaction costs in an economy with a market economy. Kirchner & Picot (1987) describes the general components of transaction costs which include; 1) the cost of seeking information, 2) the cost of contracting (negotiation and formulation of the contract), 3) the cost of monitoring (checking quality, quantity, price, on time delivery, security) and 4) the cost of adaptation (during the execution of the agreement).

However,(North, 1990b) provides limitations: "The costs incurred to define goods and services and to enforce exchange"; according to (Furubotn and Richter, 1999),

"Transaction costs are costs to create, utilize, change, and maintain institutions". Meanwhile, according to Benham & Benham (2000), "transaction costs are costs incurred when individuals exchange ownership of economic assets and maintain exclusive rights". Meanwhile, according to Milgrom & Roberts, transaction costs include all losses caused by inefficient decisions, plans, arrangements, or agreements.

According to Coase (1992) transaction costs are known as costs incurred for negotiating, contracts that must be made, inspections that must be made by yourself, arrangements that must be made to resolve disputes, and so on. If the costs of making an exchange were greater than the profits that would be generated by the exchange, the exchange would not occur and the greater production that would flow from specialization would not materialize. In this way, transaction costs not only affect contractual arrangements, but also what goods and services are produced.

In addition, transaction costs can be categorized into three types, First, Market transaction costs are costs for using the market (Furubotn & Richter, 1999). Transaction costs along market channels from the farm level. Costs that arise when individuals exchange ownership of economic assets and maintain their exclusive rights (Benham & Benham, 2001). Second, Managerial transaction costs are costs to create order in the form of: operational costs, public relations, information costs (Furubotn & Richter, 1999). And third, Political transaction costs are costs associated with mobilizing and adjusting to the institutional political framework, in the form of regulations such as government regulations, legal administration. Political costs, including matters related to the governance structure of economic activities, include the public bureaucracy (Furubotn &Richter, 1999).

The high costs incurred in conducting corn farming due to transaction costs will result in differences in prices received by consumers and prices received by producers, (Sultan & Rachmina, 2016). Besides transaction costs can cause different income received by farmers for farmers who have land and without land, rural and urban areas as well as men and women (Leonardo & Robert, 1997). The transaction cost economic approach opens space for researchers to identify transaction costs, (Dwiastuti, 2017). Transaction costs are a big problem for farmers, (Mishkin, 2008). The existence of transaction costs will increase the total costs incurred in corn farming.

Based on the aforementioned background, this study aims to analyze the structure of transaction cost components in corn farming, 2) Analyzing the effect of transaction costs on the profitability of corn farming.

RESEARCH METHOD

The study is conducted in Dompu District, West Nusa Tenggara (NTB). The choice of location is carried out with consideration because the area is one of the corn productions centers in NTB. Research time is from April 2019 to March 2020.

The primary data collection method is done through direct interviews with respondent farmers using a questionnaire.

Table 1. Number of research samples

No	Districts	Village	Number of Farmers	Number of Samples
1	Woja	Saneo	678	20
		Madaprama	224	6
2	Manggelewa	Sukadamai	689	20
		Kampasi Meci	357	11
3	Kempo	Kempo	745	22
		Ta'a	452	12
4	Kilo	Mbuju	629	18
		Taropo	326	10
Total Population and Sample			4.100	120

Source: Data processed (2019)

Based on table 1 that the number of samples in this study were 120 farmers. Of the 120 sample farmers, it is necessary to determine the number of respondents in each village. The technique of determining respondents in this study was using accidental techniques, the researchers determined respondents who happened to be met at the research location without being determined beforehand on the condition that the farmer had experience, ability, and understanding of corn farming. The research prioritizes respondents who are members of farmer groups. From table 4.1. above can be determined the distribution of respondents from 8 villages namely Saneo Village with 20 farmers, Madapara Village with 6 farmers, Kampasi Meci Village with 11 farmers, Sukapeace Village with 21 farmers, Kempo Village with 22 farmers, Ta'a Village with 13 farmers, Village Mbuju has 18 farmers and Taropo Village has 10 farmers.

Respondents were determined using the stratified proportional sampling method with different proportions for each district. The data analysis method uses transaction cost analysis and multiple linear regression.

To calculate the transaction cost components, the following calculation method is used (Mohamad, Darwanto, & Hartono, 2014);

$$TC_{tr} = \sum C_{IF+}C_{NG+}\ C_{KD+}C_{TP+}C_{PN+}C_{PW}$$

Information:
$TC_{(tr)}$ = Total Cost of Hybrid Corn Farming Transaction
$C_{(IF)}$ = Information Cost
$C_{(NG)}$ = Negotiation Fee
C_{KD} = Coordination Cost
$C_{(TP)}$ = Transportation Cost
$C_{(PN)}$ = Implementation Cost Biaya
$C_{(PW)}$ = Supervision Fee.

Before knowing the factors that affect profit, it is necessary to first know the profit function. Profit function is a function that shows some relationship between profit and the factors that influence it. The profit function can use the following equation (Mubyarto, 1986);

π = f (P.BP.BT)

Where
π = Profit

BP= Production cost
BT= Transaction fee
P = Income

RESULTS AND DISCUSSION

Component of Transaction Cost on Corn Farming in Dompu District

The size of the transaction cost depends on the efficiency or the absence of the existing economic institutional model. Especially economic institutional models in the form of rules that are created in the aspects of contracts (Menard, 2000), social capital (Narayan, 1999), governance structures (Williamson, 1998), transaction attributes (Browning, 1992) , enforcement procedures (Yeager, 1997), the behavior of the perpetrators (Furubotn & Richter, 1999), and incentives (Turvani, 1996). Therefore, this research was conducted to see a wider and comprehensive component of transaction costs in corn farming.

The results of the study had found the components of transaction costs in corn farming, namely the transaction costs component in the information costs, negotiation costs, coordination costs, transportation costs, implementation costs and supervision costs and can be classified into three types of transaction costs: first, market transaction costs consisting of intermediary costs buy seeds, sales contract fees, intermediary costs of financing arrangements, and the cost of the difference in selling prices. Second, the managerial transaction cost identified the cost of transporting labor, transporting fertilizer, transporting crops, transportation costs to financial institutions, food and drink costs during farming. Third, the political transaction cost identified components of credit interest costs, administrative costs, pph tax fees, land tax fees, NPWP fees, document fees and stamp duty costs.

At the location of the transaction structure transaction costs consist of explicit costs and explicit costs in accordance with the Williamson Research (1981) found explicit costs or also known as informal gift exchange costs and implicit costs or also known as emotional intervention costs. The two components of transaction costs are divided into information, negotiation, coordination, implementation, supervision and transportation costs. The entire cost is the costs incurred by the respondent farmers starting from the procurement of financing, land preparation (pre-planting) to the time of selling corn (post-harvest).

Each component of transaction costs is determined based on the results of the study. Information, negotiation and implementation costs in accordance with research(Angraini, 2005), supervision costs based on Sukmadinata research, in (Sultan & Rachmina, 2016), coordination costs based on research by Rudiyanto in (Sultan & Rachmina, 2016) and Transportation based on research (Budiman, 2014).

Based on the result of research involving 120 respondent farmers, the highest transaction cost component was the implementation fee, which was Rp. 1,525,000 (43.35%), then the transaction fee was Rp. 998,000 (28.37%) and the cost the average result of the respondent farmers was to pay transportation transaction costs, namely Rp.725,000 (20.61%). While the coordination transaction costs are the smallest transaction costs, namely Rp. 20,000 (0.57%).

Table 2. Average Transaction Costs for corn farming per hectare

Transaction Cost Components	Amount (Rp)	Percentage (%)
Information cost	120.000	3,41
Negotiation cost	130.000	3,70
Coordination cost	20.000	0,57
Transportation cost	725.000	20,61
Implementation cost	1.525.000	43,35
Supervision Fee	998.000	28,37
Total	3.518.000	100

Source: Primary Data Processed, 2019

Based on the farming cycle, the highest transaction costs are in the post-harvest cycle of Rp.815,000 (23.17%), then followed by the maintenance cycle of Rp.625,000 (18%) and subsequently the harvest and pre-cropping cycle with each which is Rp. 612,000 (17.65%) and Rp. 608,000 (17.28), while the planting cycle is the smallest one that incurs transaction costs, which is as much as Rp.330,000 (9.38%).

Seen from the highest cycle structure is the post-harvest cycle, which is 23.17 percent of the total transaction costs in corn farming, this is reasonable where in this cycle there are many activities carried out by farmers in this cycle, namely harvesting, harvesting, drying and selling. That is why this cycle becomes a cycle that costs a lot of transaction costs.

Table 3. Average Transaction Costs for corn farming per farming cycle

Transaction Fees Per Cycle	Amount (Rp)	Percentage (%)
Pre-Planting	608.000	17,28
Planting	330.000	9,38
Maintenance	625.000	18,53
Supervision	492.000	13,99
Harvest	621.000	17,65
Post-harvest	815.000	23,17
Total	3.518.000	100

Source: Primary Data Processed, 2019

The cycle that has the lowest transaction costs is the planting cycle, which is 9.38 percent. This is because the planting activity is only one activity, namely planting. While the pre-planting cycle, maintenance, supervision and harvest are ditas 10 percent of the total transaction costs in corn farming.

Effect of Transaction Costs on the Advantages of Corn Farming
From the data processing in table 5.16 above shows that the transaction cost variable has a negative and significant coefficient sign which means it indicates a negative relationship between transaction costs and profits. The higher the transaction costs, the lower the profit of hybrid corn farming and vice versa. The magnitude of the regression coefficient is -6.70 and gives an indication that the elasticity of transaction costs to profits is inelastic. This means that if transaction costs increase by 1%, profits will decrease by 6.70%.

Table 4. Estimation Results of Parameters of Equation Benefits for Hybrid Corn Farming in Dompu District

Koefiesien				Anova		R Square
Model	B	t	Sig.	F	Sig.	
Constanta	9,188		,000	41,256	,000	,516
Income	3,162	,985	,000			
Production cost	-2,800	-,308	,000			
Transaction cost	-6,700	-,435	,001			
Dependent Variable: The advantage						

Source: Primary Data Processed, 2019

Based on the regression analysis in Figure 4, the following equation is obtained:
Y = 9.188 + 3.162 X1 + -2,800 X2 + -6,700 X3

If you look at the data in table 4 above, it shows that the t-count value is good for market channel variables, production costs and transaction costs, the significance value is <0.05 (significant regression coefficient). This means that partially the independent variable has a significant influence on the dependent variable. So the first hypothesis is assumed that production costs, transaction costs and market channels individually affect the profits of hybrid corn farming received.

Furthermore, simultaneously based on table 5.16 above, it shows that this regression model has a calculated F value of 41,256 which is significant at a confidence level of 0.05%. Because calculated F is greater than F table, then H0 which states that all independent variables included in the model do not have a joint effect on the dependent variable can be rejected, meaning that it is proven that all independent variables are simultaneously able to explain the dependent variable.

The next step is to ensure that our model has reliability and accuracy, the method used to determine the reliability and accuracy of the model can be done by looking at the coefficient of determination (R2 Test). According to Kuncoro (2011), explaining that the magnitude of the ability of the independent variable in influencing the dependent variable can be known from the magnitude of the coefficient of determination (R2) the regression equation. The magnitude of the coefficient of determination is 0 to 1. The closer to zero the coefficient of determination (R2) of a regression equation, the smaller the influence of the independent variable on the value of the dependent variable. In other words, the smaller the model's ability to explain changes in the value of the dependent variable.

Based on table 4 above, it shows that the coefficient of determination for this model is 0.516. That is, 51.6% of hybrid corn farming profits can be explained by the independent variables in the model. The remaining 48.4% is explained by other variables outside the model, which are summarized in random error.

From the data processing in table 4 above, it shows that the transaction cost variable has a negative and significant coefficient sign, which means that there is a negative relationship between transaction costs and profits. The higher the transaction costs, the lower the profits of hybrid corn farming and vice versa. The magnitude of the regression coefficient is -6.70 and gives an indication that the elasticity of transaction

costs to profits is inelastic. This means that if the transaction fee increases by 1%, the profit will decrease by 6.70%.

Variable transaction cost coefficient is negative and significant towards the profit of hybrid corn farming. The transaction cost component that has the highest percentage is the implementation fee of 43.35%, followed by the supervision fee of 28.37% and the transportation cost of 20.61%, while the information, negotiation and coordination costs are under 5% of the total transaction costs. In accordance with the structure of transaction costs that are formed shows that the transaction costs in the implementation of the contract starting from the procurement of financing, land provision, land clearing, planting, maintenance, supervision and harvesting as well as postharvest negatively affect the profits of corn farming. This is consistent with research (Mayvani, 2011) and (Sultan & Rachmina, 2016) which say that transaction costs can be a factor that affects profits, the existence of transaction costs indicates the absence of concentration of activities at one point. This resulted in market failures and also a decrease in the level of very low farm profits.

CONCLUSIONS

The results showed that the transaction cost component of the hybrid corn farm in Dompu Regency consisted of (1) implementation costs; (2) supervision costs; (3) transportation costs; (4) negotiation fees; (5) information costs; and (6) coordination costs. The implementation cost is the transaction cost component that has the highest percentage of 43.35%, followed by supervision costs 28.37%, transportation costs 20.61%, negotiation costs 3.70%, information costs 3.41% and coordination costs 0.57%. The components of these transaction costs are distributed in each cycle of hybrid corn farming including; (1) the birth cycle; (2) the planting cycle; (3) maintenance cycle; (4) supervision; (5) harvest cycle; and (6) postharvest cycles. Postharvest cycle is the cycle that has the highest percentage of 23.17%, then the maintenance cycle is 18.53%, the harvest cycle is 17.65%, the cropping cycle is 17.28% and the control cycle is 13.99%. Transaction costs have a positive and significant effect on the profitability of hybrid corn farming.

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