UDC 332

# THE IMPACT OF AGRICULTURAL GOVERNANCE ON COCONUT FARMER INCOME IN INDRAGIRI HILIR RIAU

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**ABSTRACT**

Indragiri Hilir (Inhil) is the largest coconut producer in Riau, where 63% of its residents work as coconut farmers. However, Inhil's GDP per capita is considerably lower than that of other regions in Riau. This research aims to understand whether the agricultural contract between the farmer and the firm is beneficial towards improving farmer's revenue. Treatment effect model is employed in this research with two main equation to (i) discover the income level differences between contract farmer and independent farmer; and to (ii) discover the driving factors behind farmers decision to join contract. The results show that (i) the independent farmers has higher average revenue than that of contract farmer; and (ii) the driving factors behind farmer's decision in making contract are the numbers of family members, production variable cost, and organizational transaction cost.

**KEY WORDS**

Coconut farming, agricultural governance, contract farming, treatment effect model.

Indonesia is one of the major coconut producer in the world, contributing about 27% of world coconut production (Taufikkurahman, 1988; Arancon, 2000). The three largest coconut producers in Indonesia with are East Java, North Sulawesi, and Riau. Together, these three region produce about 60% of total Indonesian coconut production. However, Riau's role as national coconut producer tends to decline, as shown in figure 1.
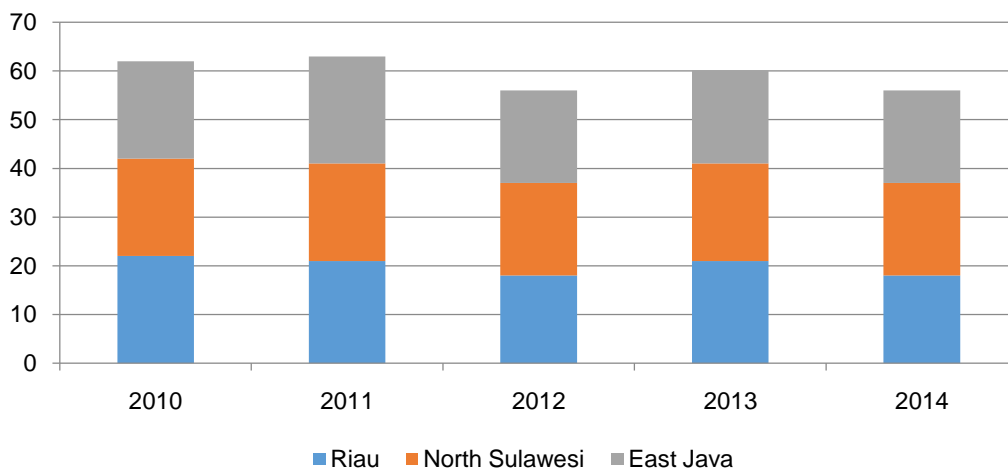


Figure 1 – Major Coconut Producer in Indonesia and Its Contribution, 2010-2014, %
(Source: Directorate General of Plantation, 2015)

About 85% of Riau's coconut plantations are located in Inhil (BPS, 2015). Therefore coconut farming become one of major economic activity on Inhil, contributing about 95% of total plantation product. Moreover it is known that in 2012 63% of Inhil residents work in coconut plantations, either as farmer or worker. However, the large economic activity can't improve the well-being of Inhil. During 2012 to 2014, Inhil's GDP per capita was always below the average GDP per capita of other cities in Riau. This indicates that the coconut plantation sector has not been able to improve Inhil coconut farmers' welfare.
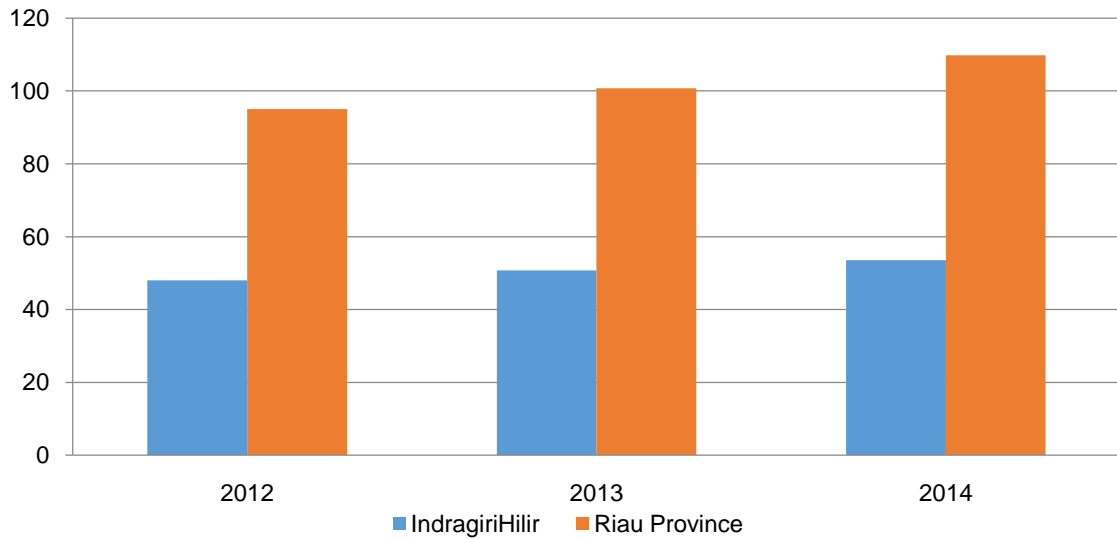
Figure 2 – Comparison of Inhil & Riau GDP, Million Rupiah (Source: Central Bureau of Statistics of Riau Province, 2015)

There are two types of agricultural governance, which are: (i) independent farmer (spot market); and (ii) contract farmer. Generally, both governances have fundamental difference (Hastuti and Bambang, 2004). First, independent farmers are characterized by local partnership which emphasized on trust and fairness without formal contract, while contract farmers are characterized by creating formal contracts with their partners. Secondly, independent farmers are free to sell their products directly to the market, while contract farmers can only sell their products to their respective partner. In the case of Inhil, contract farmers only sell their product to RSUPP enterprise.

The type of governance agriculture used, has implication on farmer revenue. Generally, independent farmer will face efficiency problems both in production and in marketing due to relatively narrower plantation area, causing small economic of scale. On the contrary, contract farmer generally works on wider plantation area owned by the company or rented from farmers. The farmers who rent their land are integrated as part of the company in a cooperative contract.

Previous research by Miyata (2009), indicates that contract farming is more beneficial than that of independent farming. Miyata found that, in average, contract farmer experience higher income growth compared to the independent farmer. However, Yustika (2008) and Waswa (2012) had opposite finding, in which both study found that independent farmer has higher income due to relatively lower transaction cost. Therefore, the main objective of this study is to determine the impact of agricultural governance on the differences in income of coconut farmers in Inhil and to find out the main factors that caused the difference in income.

## LITERATURE REVIEW

Spot market is a conventional system where the producer directly sell their product to the customer. The neoclassical model of spot market based on mathematical approach by Walras. The model aims to discover the market price establishment process, under the perfect competition assumption. Nevertheless, this model has rarely been practiced in the real market (Barjolle, 2005). Spot market is regarded as a profitable alternative on agriculture sector since producer may receive a direct profit when the commodities is sold, at the expense of the possibility to receive bigger profit in the future (van der Wijst, 2013).

On other hand, institutionalism consider contract to have important role in agricultural sector since contract can accommodate the interests of each parties. Contract farming provides a new form for agricultural organization, since one of the characteristic of

aggricultural sector is the necessity of coordination among the actors, from the bottom to top level. Contract itself is a series of rule agreed upon two parties or more, which can be enforced through binding law. Through a contract, a party (principal) seeks to obtain desired results by delegating a certain job to another party (agent) (Ryan, 2006). In order to form a contract, the involved parties must reach consensus, which achieved through bidding and accepting the terms and conditions of each parties (Enright, 2007). Excellent control and coordination is needed in order to answer the challenges of agricultural sector, such as consumer demand, increase in production efficiency through consistent input usage, as well as specialization of agricultural product. The best way to control and coordinate, especially for producer, is by establishing contract. However, by doing so, transaction fees are needed to manage the contract itself (Sykuta, 2001).

There is an inversed relationship between transaction and welfare, where an increase in transaction cost leads to decrease in welfare. According to Bhattari (2002), the transaction cost for establishing business and institutional structure have significant role in influencing farmer's income. Transaction cost in output market occurs in the interaction between seller (farmer) and buyer. Generally, farmer faces lower selling price than the government stipulated market price. That is due to farmer's low bargaining power caused by the difficulty of accessing information, as well as inadequate capital. Farmer has difficulty in selling their crop because they do not have their own marketing channel; thus, they are forced to sell it to wholesaler. This system effectively reduce 40% of farmer sales result as wholesaler's share (Sesbany, 2012).

Dorward (2001) hypothesized that farmers may choose to manage their farm by using contract or non-contract (market) system. The contract system can be further distinguished into two system which are bilateral contract and vertical integration. Furthermore, Dorward argue that farmers decision is based two things: (i) risk/uncertainty level, and (ii) market transaction cost. There are three conditions faced by the market based on its risk level which are low, medium, and high uncertainty (Figure 3). Within each market type, producer must make different decision in order to receive maximum profit.
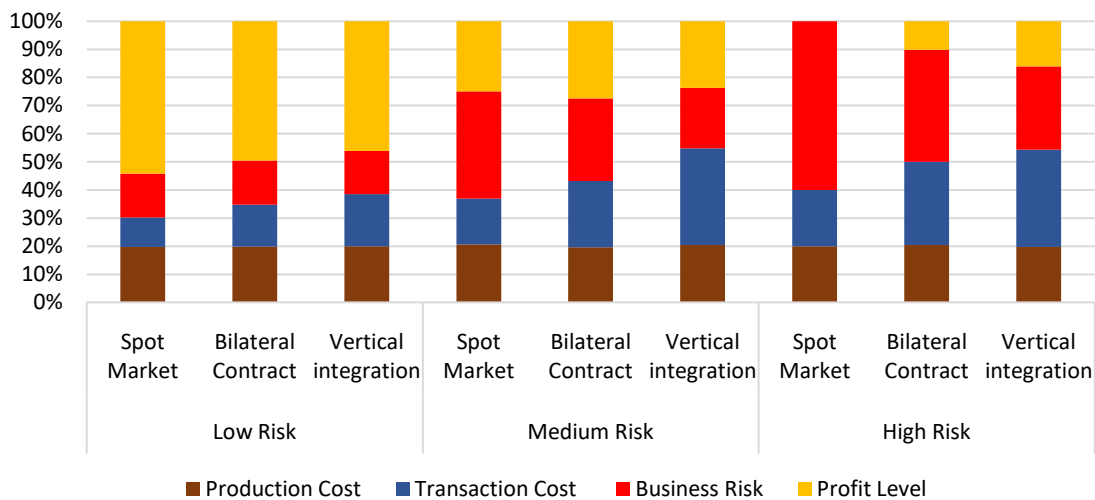


Figure 3 – Agricultural Governance in Dealing with Market Condition (Source: Dorward, 2011)

In the condition of low uncertainty, farmer will benefit from using independent governence. This is due to relatively low risk and low transaction cost, causing farmer to get more profit. While contract farmers, both in bilateral contract and vertical integration, need extra transaction cost in accordance with firm arrangement. On the other hand, in the condition of medium and high uncertainty, farmer will generally benefit from making contract with a firm, either bilateral contract or vertical integration respectively. In medium uncertainty, bilateral contract present lower transaction cost than vertical integration, giving farmer more profit. On the contrary, high uncertainty condition pose more risk for farmer; thus farmer will

have a better chance to get more profit using vertical integration system, albeit with a bit higher transaction cost.

## METHODS OF RESEARCH

This research employs quantitative approach with proportional random sampling cluster. Fifty samples are taken from each groups which are non-contract farmers (Independent Farmer) and contract farmer (PIR-Trans Farmer). Data analysis techniques are carried out as follows: First, data is obtained by in-depth interviews on several key informants who are considered to be able to provide an overview of Inhil's coconut farming governance. Some of the key informants were Inhil farmers, agricultural services, KUD (Local Village Cooperative) officer, and local village elders. Second, make a comparative analysis of Inhil district farmers' income structure based on the form of spot market and contract farming so that it is known which governance has higher income. Third, conduct a preference analysis of the differences in governance of Inhil coconut farming. Furthermore, the treatment effect is used as the analysis model to determine the impact of farming governance decisions on the income of coconut farmers (Figure 4).
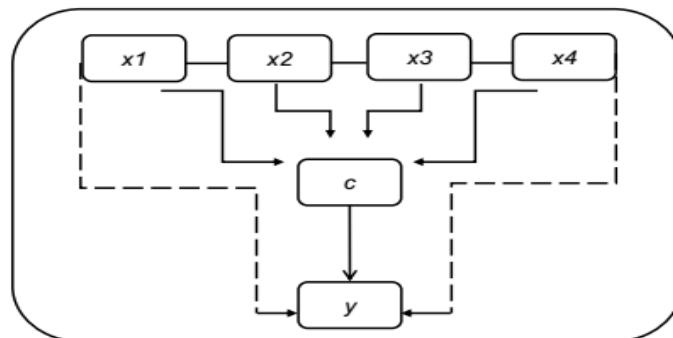


Figure 4 – Treatment Effect Model (Source: Author, 2016)

According to Heckman and Robb (1985) the treatment effect model is used to measure the average influence of binary variables on treated variables. In this study, the control variable is farmers' agricultural governance decision, namely contract farming (value 1) and non-contract or independent farming (value 0), while the treated variable is farmers income. Therefore, there are alternative treatment outcomes (causal) that differ between two quantities: $Y_1$ & $Y_0$ (Soderbom, 2009). This model illustrates the existence of a direct and indirect relationship to the income of coconut farmers so that the main factors causing differences in income is known. Thus, we can write the equations as follows:

$$Cf = \alpha_0 + \alpha_1 bpv + \alpha_2 bto + \alpha_3 rt3 \qquad (1)$$

$$Y = \beta_0 + \beta_1 cf + \beta_2 bta + \beta_3 bpf + \beta_4 bpv + \beta_5 d1 \qquad (2)$$

Both of these equations are regressed using the Maximum Likelihood Estimator (MLE) in the logistic model of the treatment effect. In the first equation, the decision to use contract (cf=1) or independent (cf=0) is influenced by variable production costs (bpv), organizational costs (bto), and number of family members (rt3). Meanwhile, in the second equation, the treated variable is income difference (Y) influenced by transportation costs (bta), production fixed costs (bpf), production variable costs (bpv), risk level (d1), and governance choices (cf )

## RESULTS OF STUDY

As shown in table 1, estimation results shows that variables affecting farmers income are: (i) transportation cost; (ii) fixed production cost; and (iii) choice of agricultural governance. Both variable production cost and business risk have no significant impact on

farmers income. Meanwhile, the agricultural governance itself is influenced by (i) variable production cost; (ii) organizational transaction cost; and (iii) number of family member

Table 1 – Estimation Result

| Variables | Coefficient | Standard error | alpha |
|---|---|---|---|
| Coconut Farmers Income | | | |
| Transportation cost | 4.1048 | 1.89 | *** |
| Fixed production cost | 4.9755 | 1.27 | *** |
| Variable production cost | 0.5145 | 0.48 | 0.287 |
| Business risk | -258.96 | 6015.07 | 0.966 |
| Agricultural Governance | -13397.55 | 4710.19 | *** |
| Agricultural Governance decision (contract) | | | |
| Variable production cost | 0.0002 | 0.00 | *** |
| Organizational transaction cost | 0.0014 | 0.00 | *** |
| Number of household member | -0.3885 | 0.12 | *** |

*Error level ***): 10%.*
*Source: Estimation Result.*

Based on the table, there are two main discussion with regard to the research objectives. First, identifying the governance form that increase farmers' income. Second, identifying main factors causing the difference of farmers' income with regard to farmers' governance choice.
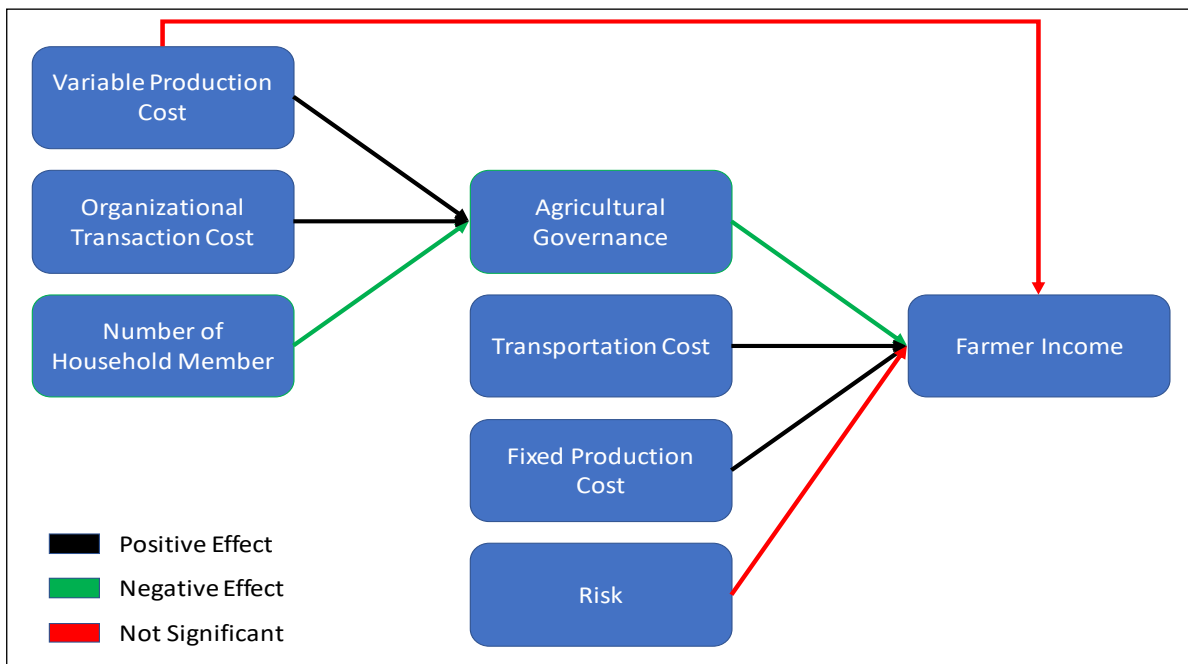


Figure 5 – The Effect of Agricultural Governance on Farmers' Income
(Source: Estimation results, 2016)

On average, independent farmer has higher income than contract farmer. That is to say that the decision to manage coconut business by contract farming actually causes a decline in farmers income. For farmers, the decision to choose wether to manage their land with contract farming is determined by the amount of production costs and transaction costs. Both variable, production costs and organizational transaction costs, tends to encourage farmer in using contract farming governance. High variable production costs will burden farmers finance forcing them to find ways to reduce variable costs, among which is by making contract with firm. Making an agricultural contract results in assistance from companies, which can be distribution of farming supplies such as seedling, fertilizer, and pesticide; free

skill training; or marketing network. The assistance is provided to ensure the quality of farmers' product to remain the same with company's standard.

While the organization's transaction costs, for example, the costs for local village cooperative and farmer association regular fees. The higher these costs, the higher the tendency of a farmer to follow an agricultural contract due to following a contract with the company so that a portion of the transaction costs will be lost or borne by the company. For example, contributions from farmer association. Farmers who follow agricultural contracts will be free from paying regular fee because the needs of contract farmer have been fulfilled by the company.

Moreover, the number of household member tends to reduce farmer interest in joining contract farming. This is understandable since with many family members, farmers also have extra labour that does not need to be paid. Generally, family members such as spouse or children will have an obligation to help tend for family farm, for example by helping with harvesting, maintaining plantations, or farm administration. Otherwise, if the family member is few farmer must pay additional labour to work at the farm, causing additional costs that must be paid by the farmer.

Fixed production costs and transportation costs have a positive and significant effect on differences in farmer income. The greater fixed production costs means that farmers will be able increase the quality and quantity of their production, for example by buying better coconut seedling, buying more land, hiring more labour, or using a better fertilizer and pesticide. Therefore farmers will be able to produce more coconut with better quality, thus increasing their income. Meanwhile greater transportation costs indicates the breadth of coconut market reached by farmers. Higher transportation cost means that farmers are able to sell the product in other regions, resulting in wider market coverage and more product sold. Therefore, it will increase farmers' income.

Non-independent coconut farmers face higher costs on average than independent farmers. It is known that the proportion of production costs of non-independent farmers can reach up to 50% of farmers' gross income, while the average production costs of independent farmers are only around 15-16% of their gross income. Thus, it can be concluded that although non-independent farmers receive higher incomes, they also bear higher production costs. On the contrary, transaction costs of contract farmers are lower than those of independent farmers.

## CONCLUSION

Based on the analysis results, it can be concluded that the most beneficial form of agricultural governance for coconut farmers in Inhil is independent governance. With independent governance, coconut farmers earn higher incomes on average. This is partly due to the condition of the coconut market which has a low risk level. Unlike other agricultural commodities, coconuts have longer shelf life and spoiled at rather slower rate, thus reducing the risk of unsold product. Independent farmers also do not need to incur greater transaction costs than contract farmers, resulting in bigger net income for the farmer.

Finally, we can said that the difference in farmer income is influenced by the decisions of agricultural governance, transportation costs, and fixed production costs. While the amount of variable production costs  and the level of risk does not significantly influence farmers' income. This is suppsoedly due to the characteristic of coconut that has a lower risk level since any amount of produced coconut will always be absorbed in the market.

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