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Conference Proceedings
Jakarta Indonesia, ICABE 2018

International Conference on
Applied Business and
Economics

Volume of Proceeding
14th ICABE 2018

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14th International Conference on Applied Business &
Economics

February 23rd-24th 2018

Venue: Park Hotel
Jl.DI. Panjaitan Kav 5 Cawang, East Jakarta Indonesia

*“Structural and Financial Deficiencies in the ASEAN EC:
Strategies Moving Forward”*

ISSN: 2623-3525 (print)

ISSN: 2623-3517 (on line)

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The Editors Dr. Simon Grima and Eleftherios Thalassinis are very thankful to the members of the Scientific Committee for its efforts to select, to correct and edit the articles according to the guidelines of the collective volume. Remaining errors are in the sole responsibility of the authors.

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Determinant of Food Crop Agribusiness and Horticultural Crop Agribusiness in Indonesia

Dudung Mulyadi *, Darwati Susilastuti **, Sunar **)

Abstract:

This study aims to examine and compare the high influence of agricultural land, business capital, technology, product marketing and human resources to agribusiness of food crops with horticultural as well as its determinant factors.

Research with the explanatory method that explains the causal relationship between several factors related to agribusiness in the West Java region of Indonesia. Cross-sectional data of farm households from 17 districts. The model was formulated as Cobb-Douglas and is analyzed using linear regression through Ordinary Least Square.

The results of the research show that agricultural land, business capital, product marketing technology and human resources have a positive effect on crop agribusiness and horticulture agribusiness. As a finding, this research succeeded to show the determinant factors i.e. the food crop agribusiness is more dominated by business capital and marketing compared with technology, agricultural land, and human resources.

While in horticultural crop agribusiness is more dominated by product marketing and business capital. The strengthening of marketing and financial institutions is expected to increase the agribusiness of food crops and horticulture.

Keywords: *Agricultural land, business capital, product marketing, technology, human resources.*

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1. Introduction

Indonesia as an agricultural country, the agricultural sector has an important role in the development of the national economy. The contribution of the sector to the GNP of 13.38% and absorb 30% of the workforce (Hermanto and Hardono, 2015). The agricultural sector is expected to contribute considerably in terms of increasing production for the provision of food and industrial raw materials and increased incomes of farmers.

For Indonesia, the food sector is also a wider determinant of the welfare level of most of the on-farm rural inhabitants comprised of small-scale farmers and agricultural workers who are mostly poor. Food determines the welfare of the urban poor consumers whose portion of the income is mostly used for consumption. Food availability maintains food security (Susilastuti, 2017). However, the basic problems faced by farmers in Indonesia are the lack of access to capital resources, limited market access, narrow land, not yet the optimal use of technology, low agricultural productivity, and weak farmer organizations (Anonymous, 2011).

Policies to increase rice production, such as irrigation facilities development, seed subsidy, fertilizer and pesticide, subsidized farming credit, and institutional development of farming have been taken. Similarly, in the marketing of results, the government issued a policy of Basic Price of Rice to protect farmers and the fall of production prices. Meanwhile, imports are carried out to meet the increasing demand, and cannot afford to be met by domestic production. Self-sufficiency of rice (Swa Sembada Program in Indonesia) cannot be fulfilled (Suismono and Hidayat, 2011).

Horticultural agribusiness in Indonesia, especially for fruits commodities, is dominated by fruits that come from small farms and yards. Therefore, uniformity and quality are low, and the continuous supply is not guaranteed. Obstacles in the development of horticulture are: (1) Limited capital ownership and narrow landholding area and require highly skilled labor. (2) Horticultural commodities consist of various clones that make it difficult to graduate and standardize the quality of the results, the supply of products that meet the export scale is often difficult to meet. (3) The attack of plant disturbing organisms is very high. (4) Integrated Pest Management System has not been properly implemented. (5) The handling of post-harvest products is still traditional with the level of damage and yield loss is high enough. (6) Product marketing is not efficient, the price is very volatile (Poerwanto, 2010).

The results showed that horticulture production is influenced by the availability of production facilities and technology, while income is influenced by selling price and marketing cost. Product quality is low due to low access of farmers to production facilities, high pest and disease attacks and low selling prices (Kasimin, 2013). Horticultural agribusiness should effectively manage working capital (Tonui and Kimani, 2016). Land use by land engineering method is the best method to optimize the land effectively and efficiently (Kastono, 2007). Encouraging exports of horticultural crops, aiming to achieve household food security (Chege et al., 2015).

Based on the above description it will require more in-depth study to examine or analyze the problems related to crop agribusiness and horticulture, so it is known which the determinants in an effort are to increase productivity.

2. Literature review

The main farmers live in production areas that do not cause work fluctuation effects. This ensures the supply of food from agricultural products but can lead to instability in farm prices and income (Schultz, 1945). Kuznets in Subrata and Ken (1984) stated that the agricultural sector in developing countries has the potential to bring four types of contribution to the overall national economic growth and development that is: 1). Expansion of the non-agricultural sector; 2). Market contribution; 3). The main source of capital for investment elsewhere; and 4). Giving foreign exchange. Daniel (2004, p.19) states that the main problem in the agricultural economy is the considerable time-span in production processes, production costs, population pressure, and farming systems.

Research by Miftakhuriza (2011) and Puguh (2015) shows that the determinants of agribusinesses are Land Area, Capital, Labor, Technology, the number of working days, and training affect simultaneously to farmers' income. Gender, farming experience, tool farming, land area, credit, wage labor and manure and manure applied are significant determinants (Mwangi et al., 2015).

One of the main issues in agricultural economics is the availability of agricultural land, because of the increasing population pressures and changes in the nature and intensity of economic activity (Firdaus, 2012). The concept of agricultural land is the extent of certain agricultural land although recently found also the mastery of agriculture that is not solely developed on a certain land area but on other resources such as water or other media. The area of agricultural land will affect the scale of the business and will ultimately affect the efficiency of agricultural enterprises. Area and productivity of agricultural land has a very strong relationship with agricultural production (Susilastuti, 2018).

Credit is a tool to help the creation of capital. Therefore, credit is also called capital, derived from outside the farm. Mubyarto (1986) states that the most important source of credit for farmers is the individual one. Theoretically, the capital can be divided into two, namely fixed capital and mobile capital. This difference is used in cost calculations. The cost of movable capital should be taken into-account in the real cost price, while fixed capital costs are calculated through depreciation of value (Daniel, 2004).

Technology has two dimensions, namely science and engineering which are interconnected with one another (Djojohadikusumo, 1994). Agricultural technology is a tool or method used in processing of agricultural inputs to produce efficiently of agricultural products (Roni, 2013).

Marketing is one of the main activities that should be done by entrepreneurs including farmers (agri-business man). Success or failure of the business depends on his expertise in marketing, production, finance, and human resources (Firdaus, 2012). All decisions taken in marketing must be shown to determine production, market, price, promotion, and distribution system (Pasaribu, 2012).

Likewise, in the more micro-affairs such as the management of the economy, to how to manage agricultural land and market agricultural products desperately need superior and experienced human resources in the field. In general, there are four functions of human resources in agribusiness are 1). as owner and entrepreneur; 2). as owners, savers, and entrepreneurs; 3). as a connoisseur and entrepreneur; and 4). as agricultural laborers or employees. Sudarmanto et al. (2004) and Nawawi (2005) explained that human resources who function as owners and entrepreneurs in agriculture, must bear all the actions in the own farm. Research shows that the respondents' education, non-farm income, land area and degree of mechanization are influenced by the participation of youth labor in Abia State, Nigeria (Nnanna, Nwankwo, Anyanwu, 2014).

The resulting balance in agricultural and labor markets can affect poor households buying food differently than food producers. The available evidence supports the theory that when agricultural income and the rate of increase in real wage and nonfarm rural economies grow, real increases in household incomes and percentages the population living below the international poverty line is declining (Schneider and Gugerty, 2011).

In this research, agribusiness is farming, that is an economic activity trying to manage the elements of production such as nature, labor, capital, technology, and skill with the aim of producing to produce something in the agriculture field. The hypothesis of this research is agricultural land, business capital, technology, marketing and human resources which simultaneously and partially affect the agribusiness of food crops and horticulture. Several factors will be determinant in the agribusiness of food crops and horticulture

3. Methodology

The research was conducted in West Java Province of Indonesia. Cluster purposive random sampling at 34 districts in 17 regency. Primary cross-section data from respondents through the survey with the questionnaire, and secondary data from Central Bureau of Statistic. The number of samples is of 400 respondents from 233 farmers of food crops and 167 horticulture farmers. The independent variables include Agricultural Land (ha); Business Capital (IDR); Agricultural Technology (IDR); Product Marketing (IDR); and Human Resources (scale). The dependent variable includes the productivity of Crop Agribusiness (IDR) and the productivity of Horticultural Crop Agribusiness (IDR). Data analysis using parameter estimation of multiple linear regression model with least squares method (OLS) and hypothesis test.

The structure of model I (food crop)

$$Y = \alpha + b_1X_1p + b_2X_2p + b_3X_3p + b_4X_4p + b_5X_5p + \text{et} \quad (1)$$

Structure of model II (horticultural crop)

$$Y = \alpha + b_1X_1h + b_2X_2h + b_3X_3h + b_4X_4h + b_5X_5h + et \tag{2}$$

Description:

α = Constant a

X1 = Agricultural Land

X2 = Business Capital

X3 = Agricultural Technology

X4 = Product Marketing

X₅ = Human Resources

Y = Agribusiness of Food Crop or Agribusiness of horticulture Crop

et = Error Term

b1, ..., b5 = regression coefficient = elasticity.

4. Result and Discussion

Descriptive analysis of food crop agribusiness is presented in Table 1, and horticultural crop agribusiness is presented in Table 2. Horticultural agribusiness with the average land area is lower than food crops, requires business capital, technology cost, and higher marketing costs than food crops agribusiness, but can generate a much higher farming income than food crops in agribusiness.

Table 1. *Descriptive Analysis of Food Crops*

Descriptive	Field (ha)	Business capital (000 IDR)	Technology (000 IDR)	Marketing (000 IDR)	Agribusiness (000 IDR)
Min	0.07	650.00	125.00	100.00	1420.00
Max	1.50	9850.00	1200.00	5000.00	18720.00
Mean	0.39	2820.03	415.94	1163.03	7303.17
Std Dev	0.22	1615.47	230.65	749.68	3755.12

Table 2. *Descriptive Analysis of Horticultural Crops*

Descriptive	Field (ha)	Business capital (000 IDR)	Technology (000 IDR)	Marketing (000 IDR)	Agribusiness (000 IDR)
Min	0.07	650.00	550.00	200.00	4900.00
Max	1.30	18600.00	16740.00	10300.00	97000.00
Mean	0.36	5893.71	4282.41	3277.34	29520.10
Std Dev	0.28	3958.90	3094.28	2529.84	18203.04

The results of the correlation coefficient (R), the coefficient of determination (R²), and F test on food crop agribusiness are presented in Table 3, while in horticulture agribusiness in Table 4.

Table 3. Test Results R, R² F-Test of Food Crop Agribusiness

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	F	Sig.
1	.847a	.717	.711		2019.344	115.053	.000a

a. Predictors: human resources (X5), marketing (X4), Technology (X3), Business capital (X2), Land (X1)

b. Dependent Variable: food crops agribusiness (Yp)

Table 4. Test Results R, R² and F-Test of Horticulture Agribusiness

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	F	Sig.
1	.881a	.777	.770		8728.165	112.204	.000a

a. Predictors: human resources (X5), marketing (X4), Technology (X3), Business capital (X2), Land (X1)

b. Dependent Variable: Horticulture agribusiness (Yh)

The correlation of agricultural land, business capital, technology, product marketing and human resources simultaneously with agribusiness income is very high ($R \geq 0.8$) with adjusted $R^2 \geq 70\%$ on both the agribusiness of food crops and Horticulture crops (Table 3 and 4). This shows that the agricultural land, Business capital, technology, marketing and human resources will be able to increase the food crops agribusiness or horticulture agribusiness.

Simultaneously agricultural land, business capital, technology, product marketing and human resources have significant effect on food crop agribusiness and horticulture agribusiness ($p\text{-value} \leq 0.05$). The partial effect of each independent variable (X) on the dependent variable (Y) is positively significant both in crop agribusiness and horticultural crops (Tables 5 and 6).

Table 5. t-Test Results on Food Crop Agribusiness

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	328.199	350.905		.935	.351
Land farming (X1)	2033.169	681.618	.119	2.983	.003
Business capital (X2)	.888	.100	.382	8.911	.000
Technology (X3)	3.061	.737	.188	4.153	.000
Marketing (X4)	1.802	.247	.360	7.288	.000
Human resource (X5)	707.327	267.521	.094	2.644	.009

Results of multiple linear regression equations in food crops agribusiness are:

$$\hat{Y} = 328.199 + 2033.169X_1 + 0.888X_2 + 3.061X_3 + 1.802X_4 + 707.327X_5 \quad (3)$$

Results of multiple linear regression equations on horticulture agribusiness are:

$$\hat{Y} = 2152,858 + 8184,484X_1 + 1,577X_2 + 1,120X_3 + 2,624 X_4 + 2955,323X_5 \quad (4)$$

Table 6. t-Test Results on Horticulture Agribusiness

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2152.858	1477.797		1.457	.147
Land farming (X1)	8184.484	3185.442	.128	2.569	.011
Business capital (X2)	1.577	.271	.343	5.826	.000
Technology (X3)	1.120	.288	.190	3.884	.000
Marketing (X4)	2.624	.387	.365	6.781	.000
Human resource (X5)	2955.323	1373.219	.081	2.152	.033

Based on Tables 5 and 6 above, the value of the beta coefficient as the amount of contribution of the influence of the independent variable to the dependent variable of business capital influence greater than the marketing cost of the agribusiness of the food crop. While in horticulture agribusiness, the effect of marketing cost is higher compared to business capital.

The model feasibility analysis shows that the feasibility of the research model has been supported by theoretical plausibility aspect since the post-estimation hypotheses correspond to the expectations of the pre-estimation hypothesis and are supported by relevant postulates/theories. The results also show that for all food crops and horticultural commodities; the dependent variable of agribusiness has p-value value ≤ 0.05 ; this means that the feasibility of the research model has been supported by the Accuracy of the estimates of the parameters. Meanwhile, the results showed that $R^2 > 50\%$; this means the feasibility of the research model is supported by the aspect of Forecasting ability is very high.

The research showed that agricultural land, business capital, technology, product marketing and human resources had the significant effect both simultaneously and partially to the agribusiness of food crops and horticulture. Based on the value of beta standardized coefficients, in food crops, the major contribution from high to small in turn is business capital, marketing, technology, agricultural land and human resources. While in horticultural crops the high contribution of influence from high to small namely; marketing, business capital, technology, agricultural land and human resources. So, in the food crops business capital is a determinant and in horticultural agribusiness, product marketing is the determinant.

5. Conclusion

Based on the results of the study, the conclusions in this study are as follows:

- a. The influence of agricultural land, business capital, technology, product marketing and human resources simultaneously or partially to food crop agribusiness as well as to significant horticultural crops.
- b. The determinant factor of food crop agribusiness is a variable of the business capital, while horticultural crop agribusiness is a variable of product marketing.

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