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Submission date: 05-Aug-2022 02:07PM (UTC+0800)
Submission ID: 1879042896
File name: Wasiaturrahma_Artikel201_Productivity-And-Poverty.pdf (776.26K)
Word count: 7438
Character count: 41154

International Journal of Management (IJM)
Volume 11, Issue 8, August 2020, pp. 694-708, Article ID: IJM_11_08_064
Available online at http://iaeme.com/Home/issue/IJM?Volume=11&Issue=8
ISSN Print: 0976-6502 and ISSN Online: 0976-6510
DOI: 10.34218/IJM.11.8.2020.064

PRODUCTIVITY AND POVERTY RURAL FARM PLANTS: CASE STUDY IN JAWA TIMUR, INDONESIA

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ABSTRACT

This study discusses food crop agriculture in 29 districts in East Java, where many people are engaged in this field. This research defines two stages of equality. In this study using two model approaches, namely the first Model Analysis conducted using Data Envelopment Analysis (DEA) and the second model Partial least square (PLS). Research results Increasing agricultural productivity or efficiency is important to do with a variety of strategies both intensification and agricultural intensification.

Improving the quality of rural community resources is very to be done. Good quality resources will increase the absorption of high technology and will increase the productivity of farmers and workers in other sectors in rural areas, the Government's budget for development must continue to be increased both in nominal terms and the accuracy of its allocation so that it is absorbed into rural communities effectively and efficiently so that it can improve the welfare of rural communities and controlling the price of basic necessities in the region is also important to do. Bank Indonesia and in collaboration with local governments to form a Regional Inflation Control Team (TPID) must work better in maintaining stable inflation because the rural poor are relatively vulnerable to price increases

Key words: Productivity, Poverty, Rural Farm Plants, DEA, and PLS

Cite this Article: Abid Muhtarom, Tri Haryanto, Nurul Istifadah, Dyah Wulansari, Wasiaturrahma, Atik Purmiyati, Bambang Eko Afiatno, Zainuri, Rifai Afin, Productivity and Poverty Rural Farm Plants: Case Study in Jawa Timur, Indonesia, *International Journal of Management,* 11(8), 2020, pp. 694-708.
http://iaeme.com/Home/issue/IJM?Volume=11&Issue=8

1. INTRODUCTION

The role of the agricultural sector in an economy is very strategic because it is the fulfilment of basic needs so that sustainability needs to be maintained. The problem currently faced is the declining development of the contribution of the agricultural sector. Karmana, M.H., Ayesha, I.& Susilowati, S.H. (2010) stated that the fulfilment of basic food needs is provided by the farming community, which the farm families themselves still tend to wrestle with the problem of poverty in everyday life. Furthermore Christiaensen, L., Demery, L., & Kuhl, J. (2006) emphasized that the poverty conditions faced by these farming families occurred in almost all developing countries and several developing countries in various parts of the world. The results of the production of food crops are needed to ensure a country's food security, but the aspect to empower and improve the welfare of food crop farmers is also a challenge that must be faced in all countries.

Empirical facts show that there is an imbalance between the fulfilments of food needs which is increasing along with increasing population and a higher population. Slater, R., Prowse, M., Kaur-Mann, N., & Peskett, L. (2007) suggest the fact that there is a declining trend in the contribution of food crop agriculture to the guarantee of food availability and security in various countries, due to climate change and the policy behaviour of stakeholders in various regions which are often not in favour of efforts to ensure adequate food and the welfare of rural family farmers.

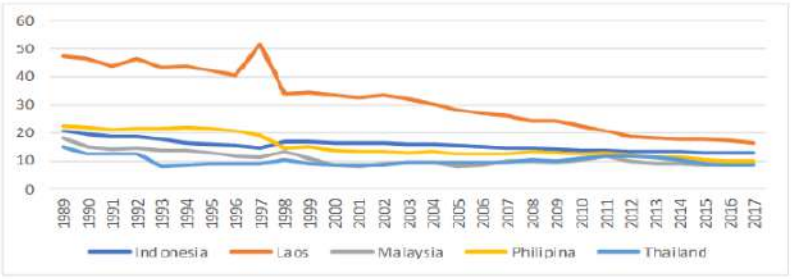

Figure 1.1 below illustrates the contribution of the agricultural sector to the economy in several ASEAN countries. (Source: world Bank)

Many factors can influence this mainly due to changes in the conversion of agricultural land and relatively modernization increases the contribution of other economic sectors in the process of economic development. Indonesia, which is geographically the largest country in the Southeast Asian region, still relies on a very densely populated region, namely Java, as a staple food crop area. Based on the 2010 Population Census data, it appears that 57.5 per cent of Indonesia's population lives on the vast island of Java with only 6.75 per cent of Indonesia. This fact is not ideal enough for businesses to increase agricultural production in areas with high population density. Another fact was revealed from data released by the Central Statistics Agency that until 2015, there was 40 per cent of Indonesia's paddy fields in Java. East Java Province has the most extensive paddy field area among other provinces on Java, which is more than 1 million hectares or equivalent to contributing 34 per cent of paddy land area in Java.

East Java has an important role in meeting national food needs so that East Java's food crop productivity is an important indicator to look at in the context of national food security. The question that arises then is how is the relationship between the welfare of the village community, the majority of which are farmers in East Java, able to play a strategic role in meeting national food needs? Soesilo, Y.H., Suman, A., & Kaluge, D. (2007) illustrate that farmers as the main business actors in the agricultural sector are at a low welfare level and are always faced with efforts to alleviate poverty problems for themselves. Furthermore, Arifin, B. (2006) emphasized that to build a strong food security system, the strategy to alleviate the poverty of farmers is the first step that must be taken by the Government together with many parties; so that the goal of establishing a strong food security system can be achieved.

Based on BPS poverty data in rural East Java in 2018 in September it reached 15.21 per cent while in urban areas it was 6.97 per cent if calculated as the number of poor population, East Java had the highest number of poor people in rural areas in Indonesia. This shows that in the agricultural sector of food crops in East Java which has a strategic meaning to the efforts to meet basic human needs in the food sector and at the same time is a dominant province as a national food producer, it is still inseparable from the problem of poverty that occurs in food crop farmers. Hermanto. (2018) mentioned that the problem of poverty alleviation of rural farming families is a common problem for all parties, not just the Government's obligation. Efforts to reduce poverty in rural areas must start from efforts to develop human resources, strengthen alternative businesses in the agricultural sector, and implement innovations to boost productivity increases in crop yields.

This research investigates how the relationship between food agriculture productivity and poverty in East Java to understand why in East Java which is the place of production and the largest rice fields for food crops in Indonesia but has the largest number of poor people in rural areas. Travers, Lee dan Jun Ma. (1994); Thirtle1, Colin, Xavier Irz, Lin Lin, Victoria McKenzie-Hill, & Steve Wiggins. (2001) state that high agricultural productivity of food crops does not necessarily alleviate poverty in the farming communities who live in rural areas. Majid, Nomaan.(2004) further emphasized that the majority of farming families in rural areas prioritize the production of rice and other food crops are to fulfil efforts to prepare food supplies for families until the next harvest period. Cervantes-Godoy, D. & J. Dewbre. (2010), report if a farming family needs funds to finance a need; then the stock of food in the storage in each house, is a saving that can be cashed.

Empirical facts of the life of rural farming communities show that the productivity of crop yields for small farmers is prioritized to meet the livelihoods of their own families. The livelihood needs of farming families generally revolve around efforts to meet the needs of educational costs for children, transportation costs, and socialite living costs of the community in the village which, when explored more deeply, can spend a very large amount of money in one cycle of food crop cultivation, to same income in the next cultivation cycle. The need to

meet education costs and transportation costs generally can be calculated unit of needs within a certain period. This is closely related to the quantity of food stock availability at home that can be traded.

Socialite needs are hereditary needs combined with contemporary needs, in the form of a need for a celebration, friendship, and tourism or pilgrimage. This need is widespread and widespread in various rural areas in Indonesia. Initial search results show the empirical fact that to meet the needs of the socialite; it is not uncommon for farming families to owe to other parties with guaranteed crop yields in the next cultivation cycle. This is an act that is pitted luck by relying on crop productivity as collateral to pay it off. In fact, the fact that there are crops is not always in line with expectations. There are certain periods of several cycles of food crop cultivation in a year that have a high chance of crop failure. At times of low yield productivity; then it is often found that farm families are trapped in the failure of efforts to pay off their debts. Another thing that also empirically often traps farmers on socialite needs is the 'investment' culture in a variety of celebration moments. Many farming families must bear the burden investment 'burden of food or cash from their neighbours and relatives; where at the time of 'maturity' must return the obligation occurs along with unsatisfactory harvest conditions so that to meet its socialite obligations, the farm family must return to debt.

Harvest productivity of crops of a region is influenced by many natural factors. Climate change, shifts in seasons, pest and disease attacks, floods or droughts, and even natural disasters; are the determining factors for the success of farmers in producing productivity of food crop cultivation following what they expect. Devkotaa, Satis & Upadhyay, Mukti P. (2013); Abro, Zewdu Ayalew, & Bamlaku Alamirew Alemu. (2014) reported that the calculation of the productivity of agricultural food crops for a country's food security needs should be based on the real productivity of crops sold by farmers to food markets; not just the average productivity of the harvest in an area multiplied by the total area of food crops.

The real calculation of food crop productivity derived from the behaviour and empirical thinking of farm families in rural farming communities is the basis for obtaining the results of the real calculation of food needs that can be widely traded Suharyadi, A., Hadiwidjaja, G., & Sumarto, S. (2012). Various approaches to calculate agricultural productivity are carried out starting from the ratio of production results with one input such as land and agricultural labour to using Stochastic Frontier Analysis (SFA) and then associated with poverty indicators, but no scientific publications have yet been found that use Data Envelopment Analysis (DEA) as a tool measure agricultural productivity. This research will use DEA as a measurement of agricultural productivity and dynamic model of panel data to estimate the effect of agricultural productivity and rural poverty.

The policy and construction of supporting infrastructure for agricultural food crops have received a large portion of attention from the Government. Conditions for the availability of quality irrigation channels, reservoirs and reservoirs, seeds and seeds that can be planted in various soil conditions and different agricultural environments, as well as mechanization and agricultural extension have been continuously improved through the involvement of many parties. Agricultural development, especially in the food crop sector is also a top priority of the Government based on the philosophy of the importance of meeting basic food needs for the community in advance to improve overall national development performance. Thus, it should be that the farming community in the villages should be able to continuously maintain the level of productivity of the cultivation of food crops at a certain level following the conditions of the characteristics of agricultural land in their respective regions.

The ability to maintain the level of productivity at this particular level should also rely on real conditions accompanied by the anticipatory behaviour of farmers so that fluctuations in crop productivity can be predicted accurately. Natural factors are the main factors that must be

considered by farmers so that the efficiency of agricultural food crops can be calculated carefully so that each farmer is no longer trapped in the problem of "big pegs than poles" in planning their economic life and avoid protracted poverty. Thus, the efficiency of the performance of agricultural production of food crops is really in line with the real productivity that can be produced.

2. RESEARCH REVIEW

Many have identified how agricultural productivity and poverty affect especially developing countries. All existing studies can be grouped based on approaches in calculating productivity that can be grouped, among others, by using output-to-input ratios such as Irz, Xavier, Lin Lin, Colin Thirtle & Steve Wiggins. (2001) who estimate 40 countries cross-section data using production indicators per land area and labour force as a measure of productivity and conclude that the productivity variable affects poverty reduction. Cervantes-Godoy, D. and J. Dewbre. (2010) use the ratio of the production value of the agricultural sector per workforce while Dhrifi, Abdelhafidh. (2014) uses the percentage of value-added of the agricultural sector per Gross Domestic Product (GDP),

Another study with a different approach in measuring agricultural productivity, namely the Stochastic Frontier Analysis (SFA) based on estimation of production models, among others, was carried out by Travers, Lee dan Jun Ma. (1994); Kheir-El-Din, Hanaa & Heba El-Laithy.(2008); Mendali, Rebati & Lewell F Gunter. (2013); Abro, Zewdu Ayalew, & Bamlaku Alamirew Alemu. (2014); and Devkotaa, Satis & Upadhyay, Mukti P. (2013). The advantage if using SFA is the bias of calculating the level of productivity with multiple inputs, unlike previous studies that use the production ratio of each particular input unit that is usually used island or labour. Another technique that accommodates multi-input calculations is Data Envelopment Analysis (DEA) which can accommodate single or multi-input and single or multi-output based on linear programming. In linking between agricultural productivity and poverty, no DEA technique has been used, so this study will use DEA techniques. In addition to efficiency variables, control variables need to be made models that accommodate other determinants of poverty to avoid specification bias. The control variables in the model are formed by previous theoretical or empirical grounds. Other control variables can be seen in Table 2. 1

Table 2.1 Empirical and Theoretical Basics of Control Variables in the Model

Control Variable	Supporting Research
GOV (Government Expenditures for development)	Fan, Shenggen, Peter Hazell, & Sukadeo Thorat. (1998); Paternostro, Stefano, Anand Rajaram, & Erwin R Tiongson. (2007); and Dollar, D. & Kraay, A. (2002).
Educ (Human Capital / Education / average length of school)	Dao, Minh Quang. (2007); Otsuka, Keijiro & Estudillo, Jonna P. & Yamano, Takashi.(2010); and Shimeles, Abebe & Audrey Verdier-Chouchane. (2016).
INF (Inflation)	Cardoso, Eliana.(1992); Meo, Muhammad Saeed, Vina Javed Khanb, Tella Oluwatoba

Control Variable	Supporting Research
	Ibrahime, Shabnam Khand , Shahzad Alie, & Kashif Noor.(2018); and Dessus, Sebastien, Santiago Herrera, Rafael de Hoyos.(2008).
Growth (Economic growth)	Iradian, Garbis. (2005); Geda, Alemayehu, Shimeles Abebe, & John Weeks. (2009); Kakwani, Nanak.(1990); and Škare, Marinko & Romina Pržiklas Družeta. (2016)
Struct (Economic Structure)	Malema, Brothers W.(2012): Christiaensen, Luc & Jonathan Kaminski. (2015); and Aba Fransiskus X. L. , Osman Mohd. Yussof , & Saidatulakmal Binti Mohd.(2015).
FD (Fiscal Decentralization)	Sepulveda Cristian F, Jorge Martinez-Vazquez.(2011); Bjornestad, Liv.(2009); and Sanogo, Tiangboho.(2019).
Unemp (Unemployment)	Martinez, R., Ayala, L., & Ruiz-Huerta, J. (2001); and McClelland, A. (2000).
Dependence (Age Dependency Ratio)	Cruz, Marcio, & Ahmed, S Amer. (2016); Dolls, Mathias & Doorley, Karina & Paulus, Alari & Schneider, Hilmar & Sommer, Eric. (2018).
source: research, processed	

3. METHODS

This study discusses food crop agriculture in 29 regencies in East Java, where many people are engaged in this field. This research defines two stages of equality. In this study using two model approaches, namely the first Model Analysis conducted using Data Envelopment Analysis (DEA) and the second model Partial least square (PLS).The first model of input variables is food crop farming land, total labour, irrigation proxy and rainfall proxy for food crop agricultural productivity. Analysis conducted using Data Envelopment Analysis (DEA) can be used to directly calculate economic efficiency and the factors that affect that efficiency

DEA method is a non-parametric frontier method that uses a linear program model to calculate the ratio of output and input ratios for all units compared in a population. The purpose of the DEA method is to measure the level of efficiency of the DMU (Food Crop Agricultural Sub-Sector) relative to similar food crop farming areas when all these units are on or below their efficient frontier "curves". So this method is used to evaluate the relative efficiency of several objects (performance benchmarking).

The DEA method calculates technical efficiency for all units. The efficiency score for each unit is relative, depending on the level of efficiency of the other units in the sample. Each unit in the sample is considered to have a non-negative level of efficiency, and a value between 0 and 1 provided that one indicates perfect efficiency. Furthermore, units that have a value of one

are used in making envelopes for frontier efficiency, while other units that are in envelopes show a level of inefficiency.

Here is a model of technical efficiency analysis assuming VRS with a one stage DEA approach:

Model VRS Pengukuran Efisiensi Teknis Berorientasi pada Output (*Output Oriented*)

Max $\Phi,\lambda\Phi$,

$$\text{s.t} \quad -\Phi yi + Q\lambda \geq 0$$

$$xi - X\lambda \geq 0$$

$$I1'\lambda = 1$$

$$\lambda \geq 0 \ldots\ldots\ldots\ldots\ldots\ldots \quad (3,1)$$

Where : Φ = efficiency score

λ = Ix1 constant vector or constraint vector

yi = output vector i

xi = input vector i

Q = whole ouput matrix i

X = whole input matrix i

The model above is a model with an output-oriented approach in which the variable Φ shows the calculation of technical efficiency Coelli, T.J., Rao, D.S.P., O'Donnell, C.J., Battese, G.E. (2005) with values Φ between 1 to ∞ (infinity), and Φ - 1 is a proportional increase in output that can be achieved by DMU with constant input quantity. λ is Ix1 vector of constants and $I1'\lambda = 1$ is the convexity constraint, with I1 being Ix1 vector of one. The convexity constraint shows that the variable return to scale (VRS) ensures that inefficient companies will only be compared with companies that have the same scale. Note that 1 / Φ indicates the value of technical efficiency which assumes a value at an interval of 0 to 1.

The second model uses panel data linking the results of technical efficiency (efficiency scores), proxies (Government spending for Development) government expenditure in food crop agriculture, (fiscal Decentralization) Ratio between Local Original Revenue (PAD) with total expenditure, proxy (human capital) education level and proxy (social indicators) of inflation, economic growth in each region, economic structure, age dependency ratio and percentage of the number of unemployed people who are open to poverty (poverty). To find out poverty can be seen from the number of poor people in the food crop agriculture sector in 29 districts in East Java. The specification of the second equation model used was adapted from several previous studies by making adjustments that are considered to provide better results to explain the poverty alleviation factors in the food crop agriculture sector in East Java.

The model built is a mathematical function as follows:

PVR = f (TE, GOV,FD,Educ,INF, Growt, Structure, Unempi, Dependence)…… (3,2)

From the function (3.1) can be modified into the basic econometric model as equation (3.2) is as follows:

$$PVR_{it} = \alpha + \beta_1 TE_{it} + \beta_2 GOV_{it} + \beta_3 FD_{it} + \beta_4 Educ_{it} + \beta_5 INF_{it} + \beta_6 Growt_{it} + \beta_7 Structure_{it} + \beta_8 Unempi_{it} + \beta_8 Dependence_{it} + \mu_{it} \ldots \quad (3,3)$$

3.1. Operational Definition

To facilitate the understanding of the variables used in this study, operational constraints/definitions need to be made as follows:

PVR = Number of Poor Population in the Food Crop Agriculture Sector (Unit Persons) in 29 Regencies in East Java (Poverty)

TE = Technical efficiency based on the results of the efficiency of the DEA model

GOV = Government expenditure on food crop agriculture in APBD expenditure of billions of Rupiah in the food crop agriculture sector 29 districts in East Java (Government Spending for Development)

FD = Centralized degree measured by the ratio between regional own-source revenue (PAD) and total expenditure. (Fiscal Decentralization

Educ = Average length of the school year

INF = Calculated by an implicit index of Gross Regional Domestic Product.

Growth = Economic growth in each region calculated from a constant GDP change indicator.

Structure =The economic structure of an area which is calculated by comparing the GRDP of the agricultural sector with other sectors.

Unempi = Open unemployment rate.

Dependence = Age dependency ratio where the calculation is the quotient between the number of unproductive ages per productive age

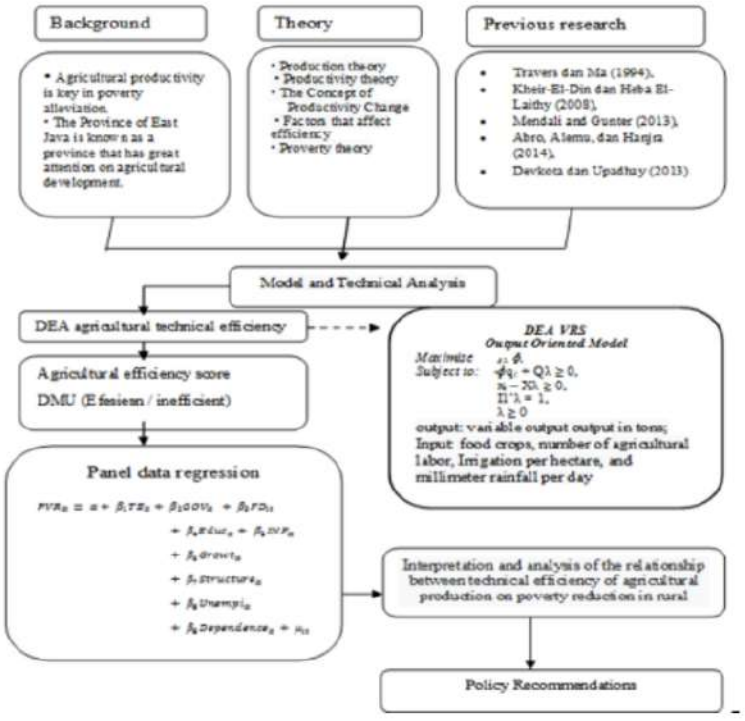

Figure 3.1 Flow Chart

4.1 RESULT

4.1 Efficiency Value Estimation Results

4.1.1 Estimation Results from Value of Data Envelopment Analysis

The results of the calculation of the efficiency of the agricultural sector in 29 districts in East Java by using Data Envelopment Analysis (DEA) can be seen in the appendix and while in this chapter are shown 5 regions with the lowest efficiency and 5 regions with the lowest efficiency as shown in table 4.1 which is the value average agricultural efficiency from 2010 to 2017.

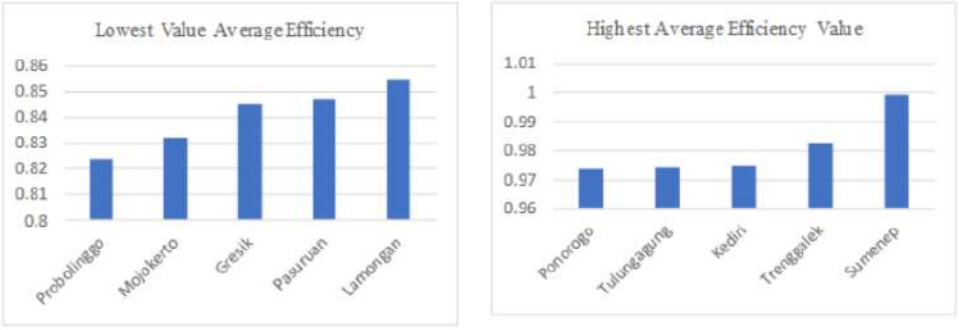

Figure 4.1 Value of Technical Efficiency of the East Java Agriculture Sector

Table 4.1 Average Value of Efficiency in the Agriculture Sector

Area	TE	Area	TE
Districts Pacitan	0.9685	Districts Sidoarjo	0.8695
Districts Ponorogo	0.9735	Districts Mojokerto	0.8318
Districts Trenggalek	0.9828	Districts Jombang	0.871
Districts Tulungagung	0.9744	Districts Nganjuk	0.8601
Districts Blitar	0.9701	Districts Madiun	0.8763
Districts Kediri	0.9748	Districts Magetan	0.8713
Districts Malang	0.9201	Districts Ngawi	0.8716
Districts Lumajang	0.9301	Districts Bojonegoro	0.8873
Districts Jember	0.9029	Districts Tuban	0.8979
Districts Banyuwangi	0.8825	Districts Lamongan	0.855
Districts Bondowoso	0.8801	Districts Gresik	0.8448
Districts Situbondo	0.87	Districts Bangkalan	0.8773
Districts Probolinggo	0.8236	Districts Sampang	0.8874
Districts Pasuruan	0.8474	Districts Pamekasan	0.9549
		Districts Sumenep	0.9995

The calculation is based on the DEA model that was explained in the previous chapter 4. Probolinggo, Mojokerto, Gresik, and Pasuruan and Lamongan districts where the average efficiency is less than 0.9 with a minimum value of 0.8. Whereas the regions with the highest efficiency values were occupied by Sumenep, Trenggalek, Kediri, Tulungagung, and Ponorogo. Table 4.1 gives the average value of efficiency for 8 years in each district and the categories

are relative across regionsThis efficiency value shows the performance of the agricultural sector in an area. The closer it is to value 1, the more efficient it is to combine inputs for production. Not necessarily areas that have wider land are more efficient in managing agricultural land or the use of more chemical fertilizers, but it is not yet able to increase plant efficiency or productivity.

4.2. Interpretation of Estimometric Model Estimation Results

The analytical model developed in chapter 4 is estimated and summarized in Table 4.2. The model is estimated with 3 basic panel data estimation techniques, namely Fixed Effect, Random Effect and Pooled Least Square with white regression. Model selection is based on the Lagrange Multiplier Breusch and Pagan tests to identify whether it is necessary to use a random model or a simple Ordinary Least Square model needed for the estimated data. Meanwhile, to find out whether the fixed or random model used, the Hausman test was applied. The model specification test results show that the Hausman Chi test value is 4.07 with a probability of 0.9069 which means that it is not significant at the level of 1, 5, 10 per cent so that when compared between fixed or random effect models the random model is better in estimating this data. When compared between the random technique with the pooled technique with white regression the resulting Breusch test and Pagan Langarange Multiplier Chibar test amounted to 461.21, it was concluded that the random effect model is more appropriate than the Pooled Least Square (PLS) test so that it can be concluded that the best model among the three models is random effect model.

Estimation results show that the initial hypothesis in the best model is that the technical efficiency of the agricultural sector has an impact on poverty reduction accepted in the random effect model. This is indicated by the significance of the TE variable in the random model at the 5 per cent level with a coefficient of 0.042 which means that an increase in one unit of agricultural productivity will reduce poverty by 0.042 per cent. The effect of agricultural efficiency on poverty in the fixed effect model also shows significance at the 5 per cent level and only in the Pooled model has an insignificant effect.

Table 4.2 Estimated Results of the Effect of Agricultural Sector Efficiency on Poverty

Variabel Dependen (Lpove)	**Fixed Effect**		**Random Effect**		**Pooled Least Square (White Regression)**	
Variabel Bebas	**Koefisien**	**Standard Error**	**Koefisien**	**Standard Error**	**Koefisien**	**Standard Error**
Lgovt-1	-0.0278172***	0.0053573	-0.0259873***	0.0054954	0.1134916**	0.0548615
INF	0.0194925 ***	0.0073352	0.0187205**	0.0075929	0.0057045	0.0797263
TE	-0.041708***	0.0150499	-0.0429423***	0.0156141	-0.2059575	0.2023064
Growth	-0.0001006	0.0001095	-0.0000966	0.0001139	0.0006843*	0.000375
Structure	0.0010748	0.0012209	0.0007178	0.0012337	-0.0080672**	0.0031829
Unemp	0.0020552	0.0017441	0.0023202	0.0018122	0.0641694***	0.01528
Dependence	0.0081235	0.006483	0.0063071	0.0062672	-0.0027315	0.0081986
FD	-0.0326799	0.0509193	-0.0230741	0.0524952	1.388253	0.9091247
Educ	-0.0336724***	0.0097805	-0.0367099***	0.0098887	-0.2454234***	0.0236719
Konstanta	12.36198***	0.2752716	12.43538***	0.2740498	10.59248***	1.416611
	Breusch dan Pagan Lagrangian multiplier test untuk random effects, Chibar = 461.21					
	Tes Hausman Chi Kuadrat = 4.07, dan Probabilitas 0,9069					

* Significant at the 10 per cent level, ** Significant at the 5 per cent level, and *** significant at the 1 per cent level

In addition to the efficiency variable agricultural other variables that are statistically significant in the best random effect model is the district government development expenditure variable (Lgovt-1) at the level of 1 per cent with a coefficient value of negative 0.0259 which means that government spending in the previous year increased by 1 per cent then will reduce poverty by 0.0259 per cent. This Lgov variable is used as lag 1 in the estimation model because it avoids the problem of endogeneity in the estimation between government spending and poverty. Some forms of government expenditure both from local government and local government sources such as village funds will be designed more in the following year if one economic indicator, namely poverty, increases so that the lag 1 variable will be useful to accommodate this condition. Another factor influencing poverty is inflation (INF) or the price level that uses a significant deflator at the 5 per cent level with a coefficient of quite small at 0.0187 which means that a 1 per cent increase in unemployment affects the increase in poverty by 0.0187 per cent. The next variable that has a relatively large effect is education (Educ) which is significant at the level of 1 per cent with a coefficient value of 0.036, which means that if the average length of school increases one year, poverty decreases by 0.036 per cent. Agricultural productivity or TE variable is the biggest contributor to poverty reduction compared to other variables because the coefficient value is the highest. Other variables in the model have no significant effect on poverty including unemployment rates (Unemp), economic growth (growth), economic structure or contribution of the agricultural sector to income (Structure), fiscal decentralization (FD), and dependency ratios (dependence).

Unemployment variable does not affect the number of poor people in regencies in East Java which is possible because unemployment is not necessarily poor because there are unemployment groups who have just been dismissed or indeed choose to stop and still consume savings and or have income-generating assets such as leased land or financial assets. Growth variable shows the insignificant value and this has consequences on income distribution. Significant economic growth on poverty should be beneficial for the community group growth is not poor, so the inequality rate increases. This can be clarified by BPS data that income inequality shown by the Gini index has increased from 2010 to 2017 from 0.31 in 2010 to 0.40 in 2017. Bourguignon (2004) suggests the concept of Poverty-Growth-Inequality Triangle which shows the interaction of the three variables.

Variable contribution of the agricultural sector in the model, represented by structure variables that are statistically based on table 5.2 are not statistically significant. It can be logically understood that the agricultural or traditional sector cannot yet lift poverty of controlling assets in the form of land which is only around 0.25 hectares per farmer plus market factors for farmers that cannot be responded quickly by farmers' production when prices rise, and the role of middlemen in the game Agricultural commodity prices make the agricultural sector still difficult to expect as a reduction in poverty in rural areas.

The variable fiscal decentralization (FD) is also not significant in influencing poverty. The regional autonomy policy which has been around for more than 10 years has had little effect in reducing poverty. FD which is calculated by dividing PAD by total income shows the regional fiscal capacity, the value in each district is relatively small, only about 30 per cent of the local fiscal regional capacity so it cannot be used much in reducing poverty. Besides, until now not many poverty program innovations have been carried out by the regions and only the central government has carried out innovative poverty alleviation programs and carried out massively in all regions in Indonesia.

4.3. Analysis of Estimated Results

Agricultural productivity or efficiency in East Java is still the main motor in reducing poverty because in addition to the agricultural sector it is still the main source of livelihood for people

in all districts in East Java where more than 6 million work as farmers and farm labourers or 32.48 per cent followed by the sector trade by 18 per cent and the industrial sector accounted for 15 per cent of the workforce. If this sector grows its productivity, of course, it will affect most of the people of East Java. East Java farmers whose average land ownership is less than 0.25 hectares, surely the increase in productivity will have a major influence on poverty reduction because small land tenure indicates that most farmers in East Java are not economically well-established farmers. Agricultural intensification and extensification will certainly have an impact on agricultural productivity and will certainly contribute to poverty reduction. Efficiency in agriculture means that less input or expenditure is paid by farmers to produce the same amount of crop value or with the same input or expenditure to achieve the highest yields. One of the published efficiency indicators is the ratio of farmers' income and expenditure, also known as Farmer Exchange Rate (NTP). East Java NTP value in December 2018 reached 108.61, which means that farmers' income is still greater than expenditure. The greater than the value of 100, the more prosperous farmers.

Poverty in East Java, one of which can be resolved by increasing agricultural productivity. Besides, the role of the government in poverty alleviation also needs to be improved. Infrastructure development, especially transportation infrastructure, water for drinking and irrigation is very meaningful for the people of East Java. The increase in development spending by the government as a support to the agricultural sector is a very large contribution to agricultural productivity. Some areas in East Java are very vulnerable to drought in the dry season because they are not irrigated, there is around 22 per cent (BPS, 2018) of irrigated paddy fields in East Java so that the productivity of farmers cannot be good throughout the year. Innovation in meeting the needs of water for agriculture is necessary so that the conditions of paddy fields will be productive throughout the year.

Based on the estimation results of the model also concluded that the quality of human resources became an important factor in determining poverty in districts or rural areas in East Java. Unemployment and low or no level of education become quite severe conditions in poverty alleviation. Human resource investment is the biggest contributor to poverty alleviation. The average length of schooling of East Java's population is only 7.34 years or the level of not graduating junior high is a severe obstacle in poverty alleviation. Unemployment that occurs can not be separated from the education they have. Provision of expertise for people who have dropped out of school and have grown up and the emphasis on dropping out is a priority in improving the quality of human resources in agriculture.

Macroeconomic variables do not influence poverty in districts in East Java in terms of economic growth, prices, and economic structure. Economic life in the regency which incidentally is dominated by the farming community and supported by the local economy makes the district or village not much affected by the economy as a whole. The poor in rural areas live by fulfilling their own needs and rarely consume industrial production. Besides, the growth of the industrial sector in rural areas where there are still many workers with low majority education will not be inclusive of the poor in the regions. Industrial workers are brought in from other regions with sufficient ability, expertise and experience in the same field. Even though the economic structure supported by most of the agriculture sector does not guarantee that the population does not live on the poverty line.

5. CONCLUSION

Agricultural productivity or efficiency is the most dominant factor in influencing poverty in rural areas in East Java. This is reasonable because poverty pockets exist in rural areas where the majority of the population works as farmers so increasing agricultural productivity will have

a major impact on the welfare of rural communities. Agricultural productivity does not only have direct and indirect impacts on farmers and workers in other sectors.

In addition to agricultural productivity, a factor influencing poverty in rural East Java is government spending on development. Local government development spending has an impact on poverty reduction in rural areas. Good village development especially for village infrastructure such as irrigation, and government assistance interventions to farmers such as improved seeds, fertilizers, farmers' training in technology and agricultural equipment assistance will have an impact on poverty in rural areas.

The variable price level or inflation is one that has a significant effect on poverty in rural areas. Rural communities that have relatively low incomes and live on the edge of the poverty line when there is an increase in prices or inflation will have an impact on increasing the number of poor people.

The quality of human resources which in this case is the level of community education has an impact on rural poverty. Education makes it easy for farmers to accept the development of agricultural technology and find alternative types of work.

ACKNOWLEDGMENT

Thanks to Lamongan Islamic University and Airlangga University Surabaya, LPDP-BUDI, Chairperson of UNAIR's KPPS Economics, Promoters and Dissertation Co-promoters, Friends of S3 UNAIR Economics.

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