Optimization Of Human Capital Development On Economic Growth And Poverty In East Java

Mochammad Chotib, Babun Suharto, Lucik

Abstract:East Java Province has high economic growth accompanied by a high number of poor people. This study aims to analyze the impact of human capital on economic growth and poverty in East Java Province. The analytical tool used in this study is the Vector Autoregression (VAR) to analyze in detail the relationship between human capital, economic growth and poverty. The results of this study indicate that human capital has an influence on economic growth and reduces the rate of poverty in East Java. Thus, the influence of Human Capital on economic growth and poverty alleviation in East Java is an implementation of the effectiveness of fiscal policy in managing income, implementing people's economy, increasing investment in education that is less than optimal.

Keyword:human capital, economic growth, poverty, VAR

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1 INTRODUCTION

Human capital is one of the changes that occur in the social life of society both social structures and attitudes and national institutions (Maulana, 2015). This gives an understanding of human capital can be used as an input in providing encouragement to the quality of community resources, both in terms of education, health and social economy. Thus human capital becomes a reflection of the quality of labor which in this case will have an influence on economic growth (De la Fuente and Domenech, 2000, 2006; Pelinescu, 2015). Increased economic growth occurs due to labor productivity in improving economic sectors.In the classical economic growth theory, labor productivity is considered as an exogenous factor which depends on the ratio of labor, capital and other factors (Pelinescu, 2015). However, classical economic growth theory does not include human capital in the effect of economic growth. Therefore, the economic growth model experienced development proposed by Solow revealed that economic growth is influenced by capital and labor (Mankiw, 2012; Samuelson and Nordhaus, 2001). Solow's growth theory is a relevant theory in looking at the picture of economic growth movements. On the other hand, human capital can provide an overview of the rate of poverty that occurs (Jonaidi, 2012; Ali and Ahmad, 2013). This is caused by human capital making a picture of the knowledge and skills of the workforce, so that the low human capital will affect the performance of the workforce (Tilak, 1994; Awan et al., 2011). Therefore, a good workforce performance will present an increase in human capital and can reduce poverty. Based on this explanation, it can be seen that human capital can influence economic growth and poverty rates. In a study conducted by Arnold et al. (2011) explains that human capital which is proxied by the level of schooling has an influence on economic growth. While the research conducted by Maulana (2015) confirms that human capital has an influence on economic growth.

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The relationship between human capital in influencing poverty is supported by research conducted by Adetoso et al. (2012). Research conducted by Joanaidi (2012) also provides evidence of the influence of poverty on human capital. This is proof of the relationship between human capital and economic growth and the rate of poverty. East Java which is a province with a high level of productivity also has human capital low, this condition is also supported by the occurrence of unemployment. This is caused by an increase in economic growth as seen from regional income each period, not a guarantee of a prosperous life for the community (Prasetyo, 2008). Community life guarantees are difficult to calculate because every household has a different size in meeting their needs. An increase in poverty still originates from the increase in fuel prices which affects the purchasing power of the poor, so that food commodities have increased due to rising prices (Bank Indonesia). Meanwhile, when there is an increase in poverty accompanied by a decrease in the human development index and vice versa in an increase in the human development index there is a decrease in poverty. This also seems to be in harmony with economic growth. Based on this description, this study wants to see the optimization of human capital in influencing economic growth and poverty in East Java with the approach Vector Autoregression.

2 LITERATURE REVIEW

2.1 Theory

Human Capital Development Theory

Human capital is a variable consisting of the quality of human resources including health, nutrition, and formal education that can provide individual benefits in the future (Dao, 2008). Another opinion states that human capital is a concept that includes a process of human life to survive in a world that has complex challenges (Omotayo, 2015). Maulana (2015) also describes human capital as one of the changes that occur in the social life of society both social structure and attitude and national institutions. Therefore human capital is an input that gives impetus to the quality of human resources, both in terms of education, health, social and economic aspects. Economic growth has a relationship with human capital, this happens if there is sustained growth of capital per capita. Sustainable development will occur if it can minimize the exploitation of natural capital in

line with efforts to grow physical capital and human capital (Abbas, 2010). There are four lines described Kumar (2006 in Maulana, 2015) the process of keterpengaruhan human capital and economic growth is human capital act as a factor of production inputs, play a more productive which produces positive externalities and the case of endogenous growth caused by the accumulation of human capital more big. Human resource development is basically a development of the quality of human resources by strengthening the relevant institutions. Educational institutions provide an important role towards the human condition both in intellectual development, character and psychomotor development (Omotayo, 2015). Development of the quality of human capital can encourage individual character to be better, especially the efforts to earn income so as to reduce the number of unemployed people in the region (Acosta et al. 2007). Literacy rate is one of human capital in the form of calculation of educational success in an area that is seen in the reading and writing ability of each individual (Rachmawati and Wulani, 2007). Education and health as well as life expectancy determine the ability to absorb the ability to manage the economy, especially those related to technological and institutional developments as an economic driver (Safi'i, 2009). The assumptions used by Mankiw et al. (1992) modeling human capital as follows: $Y(t) = K(t)^{\alpha}(A(t) L(t))^{t-\alpha}$ information is as follows Y as output, K is labor and A is the level of technology. Achievement of economic growth must go hand in hand with increased investment in both savings and technology, where saving and technology are of high quality because of the existence of quality investments human capital (Prasetyo, 2008). Human capital is one indicator in achieving community welfare so it is one of the tools to minimize poverty (Mierza, 2012). Thus in addition to human capital influencing economic growth, the quality of human capital can affect the level of poverty that occurs in an area.

The Theory of Economic Growth

Neoclassical economic growth models explain that output is the result of capital and labor (Mankiw, 2012; Samuelson and Nordhaus, 2001).economic growth Solow's explains that the level of savings, technological innovation, and capital stock in conditions full employment are important factors in influencing economic growth (Mankiw, et al, 1992; Mankiw, 2012; Samuelson and Nordhaus, 2001). This explains that economic growth requires capital accumulation to increase output national. The Economic growth model Solow can be formulated as follows $Yt = f(Lt, Kt)$ based on equation (2) above explains that the amount of capital (K_t) both human capital accompanied by an increase in the amount of labor (L_t) will give influence on economic growth.

The Poverty of Theory

Poverty in the concept of ability to meet basic needs (basic needs approach), poverty is seen as the inability of the economic side to meet the basic needs of food and non-food measured from the expenditure side (Statistics Indonesia, 2006). The poverty line is the value of expenditure needs. The poor population is the population that has an average per capita expenditure per month below the poverty line. There are several characteristics of the poor population including not having their own

production factors, low level of education, lack of opportunities to obtain needs (Suryawati, 2005). Absolute poverty lines play a role in assessing the effects of anti-poverty policies over time (Mirza, 2012). Therefore, the function of poverty rate is to find out the comparison of poverty values in various regions so that the right solution is found to overcome them. There are several factors that cause poverty growing, which is as follows (Nasikun 2001 in Suryawati, 2005): The process of impoverishment preserved Having production patterns colonial Due to the mismanagement of natural resources and environmental quality of resources human is relatively low access infrastructure and public facilities Limited The development of poverty has an influence on economic growth because it is in line with the quality of human resources. One of the keys to the welfare of society is to minimize poverty, so that economic and social inequality can be reduced (Prasetyo, 2008). Poverty can be reduced by the development of human capital that provides incentives and facilities for physical investment that can help reduce poverty levels accompanied by economic growth (Aimon, 2012). The alleviation of poverty is theoretically supported by quality economic growth that is realized by the policy of expanding employment opportunities in an effort to reduce poverty (Jonaidi, 2012).

2.2 Review of Related Literature

Sunde and Vischer (2011) with proof that *human capital* has an influence on the increase in economic growth in the 81 countries. The variables that were the target of the research used were GDP, GDP per capita, *human* capital in the average school year, *stock of physical capital per worker*. *Human capital* which is proxy by the level of education contributes to productivity growth. The results were stated by Fuente (2011) who also examined *human capital* and productivity. Economic growth is inseparable from the rate of poverty and social and economic inequality in society. As research conducted by Jonaidi (2012) on economic growth and poverty, Jonaidi's research (2012) uses independent investment, life expectancy, literacy, length of education and economic growth and poverty dependent variables. The results obtained from Jonaidi's research that investment, literacy, length of education, life expectancy and economic growth of the country have a significant negative effect on poverty in Indonesia. Based on the results of research conducted by Jonaidi (2012), the government is advised to improve welfare through equitable distribution of income and the allocation of the regional budget in the education and health sector as a driver of the quality of *human capital* Indonesia's. *Human Capital* has many proxies, as research by Maulana (2015) made Central Java Province a target of research. Maulana (2015) uses variables of average length of schooling, life expectancy, number of workers and the ratio of general allocation funds to total regional revenues. Estimation results obtained using the GLS (*Generalized Least Square*) method with a model *fixed effect* that is the average length of school variables, life expectancy and labor force have a positive and significant impact on economic growth in Central Java. One of the conclusions from the results of Maulana's study (2015) is the classification of regencies / cities in Central Java both as growth poles or not in 2008-2012 has a distinguishing characteristic that lies in the average length of schooling

and labor growth. The OLS (*Ordinary Least Square*) method is used in Otomayo (2015) research in Nigeria using several proxies from *human capital* that have an influence on economic growth in Nigeria. Otomayo (2015) uses *oil export* (OIL), *real gross domestic product growth rate* (RGDPG), *real gross fixed capital formation* (RGFCF), *recurrent expenditure on education* (REE), *capital expenditure on education* (CEE), *recurrent expenditure on health* (REH), *capital expenditure on health* (CEH), *Primary school enrolment* (PSE), *secondary school enrolment* (SSE), *tertiary enrolment* (TERE). Nigeria's economic growth is influenced by the quality of the *human capital* countries, especially the education sector. In addition, investment in the education and health sectors has a significant positive relationship on Nigerian GDP growth.

3 METHODOLOGY

Formation of the model in this study adopted from previous research. The use of economic growth models that is influenced by *human capital* modifies the research of Rachmawati and Wulani (2007) and Maulana (2015). While the poverty rate model that is influenced by *human capital* modifies from Jonaidi's research (2012). The use of previous research as a basis in the formation of this research model in order to provide answers to the influence of *human capital* in influencing economic growth and poverty in East Java. The research model used by modifying research by Rachmawati and Wulani (2007), Maulana (2015) and Jonaidi (2012) is based on the research conducted in Indonesia. So that it can provide an approach to the condition of *human capital* in Indonesia in influencing economic growth and poverty rates. The specification of an economic growth model with *human capital* modified from Rachmawati and Wulani (2007) and Maulana (2015) research can be seen as follows. $f(PDRB) = f(LC, RRLS, AHH, TK)$ transformed into the econometrics model to

$$PDRB_{it} = \alpha + \beta_{1i}LC_{it} + \beta_{2i}RRLS_{it} + \beta_{3i}AHH_{it} + \beta_{4i}TK_{it}$$

while, in the poverty model with modification from Jonaidi's study (2012), as follows. $f(IG) = f(LC, RRLS, AHH, TK)$ transformed into econometrics to

$$IG_{it} = \alpha + \beta_{1i}LC_{it} + \beta_{2i}RRLS_{it} + \beta_{3i}AHH_{it} + \beta_{4i}TK_{it}$$ Where PDRB: gross regional domestic product (billion rupiah) LC: literacy level (%) RRLS: average length of schooling (%) AHH: life expectancy (%) TK : labor (number) IG: gini index (%)Analysis *Vector Autoregression* (VAR) Smith (1980) stated that the dynamic estimation method is caused not based on theoretical concepts, but based on the basic assumptions of economic theory. Therefore, this method has the characteristics of a model that adjusts to changes in economic phenomena that occur. In addition, the VAR method does not provide the presence of endogenous and exogenous variables, so that all variables are considered endogenous (Luetkepohl, 2011; Chandia and Javid, 2013). VAR modeling (with *lag* p) which is based on the research of Maddala (2005) and Canova and Ciccarelli (2013) can be formulated as follows. $Y_t = A_0(t) + A(l)Y_{tv} + \mu_t$ equation (7) if it is changed in the form of a VAR panel based on Canova and Ciccarelli's research (2015).

Table 1 *Results Johansen-Cointegration*

| Model 1		
Augmented Dickey Fuller (ADF)	t-statistics	Probability
Kao Residual Cointegration Test	-7,627343	0,000 *
Model 2		
Kao Residual Cointegration Test	-5.984040	0,000 *

* Significant α = 1%

$$Y_t = A_{0i}(t) + A_i(l)Y_{tv} + \mu_{it} \qquad i = 1,\ldots,N \; t = 1,\ldots,T$$

From the equation model (8) VAR panel can be adopted in this study as follows.

4 RESULT AND DISCUSSION

Optimization of *human capital* in influencing economic growth and poverty rates in East Java using the approach *Vector Autoregression* (VAR)will be presented in this section. The stage taken is the cointegration test used to see the long-term relationship between the variables used. This test has the benefit of seeing the variables used have been cointegrated, so that the regression obtained is not spurious. This cointegration test is used in estimating using *Augmented Dickey Fuller* (ADF). Cointegration results in Table 1 as a whole have a long-term relationship between *human capital* and economic growth and poverty rates in East Java. Cointegration test on the relationship of economic growth with *human capital* shows cointegration. This can be seen from the probability value of 0.00 less than the value of α (1%). While the relationship of poverty rate with *human capital* also provides similarity to the results that show cointegration. This condition is supported by a probability value of 0.00 less than α (1%).The next step is to analyze the *Impulse Response Function* (IRF) and *Variance Decomposition* (VD). This analysis is carried out after the VAR modeling stage using *lag* 2. The use of the *impulse Response Function is* used to see shocks caused by *human capital* on the movement of economic growth and poverty. In the meantime, *Variance Decomposition* (VD) functions as seeing the magnitude of the influence of variables *human capital* in influencing economic growth and poverty.

Figure 1. *Impulse Response Function (IRF) on model 1*
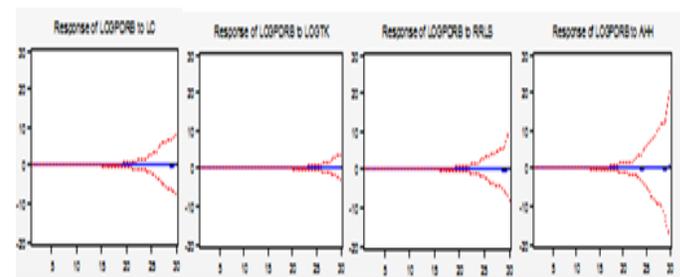
In Figure 1 explains the IRF analysis on the relationship of economic growth with *human capital* in East Java. The occurrence of shocks at the literacy level is in response to economic growth in the 15th period to the 30th period. While at the average level of schooling, it provides shocks to the response of economic growth in the 17th period. Economic growth has stabilized due to the response from

the average level of schooling in the 30th period. This condition is in accordance with the response given by economic growth due to shocks to the life expectancy rate that was responded to in the 13th period with a stable return at the level above the 30th period. Shocks to the workforce are also responded by economic growth in the 20th period to the 30th level. Overall the shocks caused by the proxy of the variable *human capital* in the long-term response by economic growth. Thus, *human capital* has a long-term influence on changes in economic growth

Figure 2. *Impulse Response Function (IRF) on model 1*
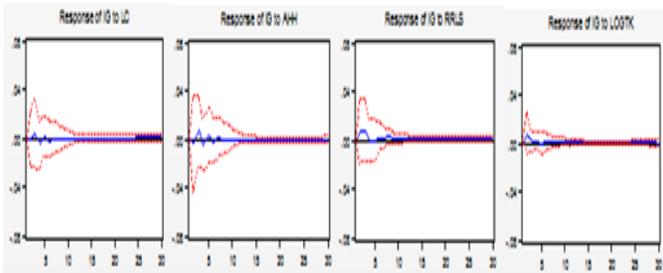
Explanation of the relationship between poverty and *human capital* can be seen in Figure 2. On the Figure 2 explains the IRF analysis on the relationship of poverty with *human*

capital in East Java. The response of the Gini index as a proxy for poverty on shocks from the literacy level occurred at the beginning of the period until the 13th period which experienced stability. In line with this, shocks are caused by the average level of school length at the beginning of the period by the poverty level. However, poverty levels returned to stable conditions in the 15th to the 30th periods. Shocks to life expectancy are also responded by poverty variables at the beginning of the period up to the 13th period. While the shocks that occurred in the labor variable were also responded by poverty at the beginning of the period until the 10th period experienced a stable. In the IRF results the relationship of poverty with *human capital* shows the occurrence of short-term relationships that are seen from shocks to *human capital* responded at the beginning of the period by poverty. IRF analysis which is used to see the relationship between *human capital* and poverty and economic growth can be continued by looking at the magnitude of influence seen in the analysis *Variance Decomposition* (VD). VD analysis can provide an illustration of the magnitude of variables *human capital* the influence of in influencing economic growth and poverty at the beginning of the period until the 30th period. It also can provide an overview of the variable *human capital* that has a major influence in influencing the variables of economic growth and poverty.

Table 2
Analysis Variance Decomposition on Model 1

Period	S.E	Log PDRB	LC	RRLS	AHH	Log TK
1	0.007510	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.014531	89.40608	0.537060	3.208546	6.768539	0.079776
3	0.021260	81.15704	5.999544	5.529252	7.121456	0.192706
4	0.026730	72.43176	9.152890	6.061598	12.10612	0.247636
5	0.031290	66.48433	15.03672	7.300162	10.77234	0.406447
15	0.064583	45.02770	29.88026	8.580039	15.31048	1.201524
16	0.071316	37.47302	24.81646	7.991242	28.70434	1.014936
17	0.085230	29.22003	27.70989	11.05527	31.15346	0.861352
18	0.099234	22.70997	21.63510	9.690753	45.24169	0.722487
19	0.111074	18.26662	28.85537	9.746816	42.44311	0.688084
20	0.116211	21.61702	26.77962	9.168291	40.72952	1.705538
25	0.426421	3.374139	19.69279	11.61957	64.61172	0.701788
26	0.458011	4.253875	24.61932	10.21092	59.40809	1.507796
27	0.496734	9.167363	21.23357	11.82901	54.55204	3.218019
28	0.691702	7.873632	12.32263	15.14366	61.82440	2.835683
29	1.100939	4.659358	12.17981	15.77442	65.93277	1.453639
30	1.597234	2.315191	14.46797	14.19383	68.32869	0.694315

Table 2, which is the result of VD analysis on the relationship of economic growth with *human capital,* gives the variable life expectancy results which have a large contribution in influencing economic growth. While the literacy level variable which has a contribution of 14.46 becomes the variable that has the second contribution in influencing economic growth. In line with this, the old school level variable also had a large contribution of 14.19 and the workforce had the least contribution. Overall, each variable has a contribution in influencing economic growth. The results of the VD analysis

on the relationship of economic growth with *human capital are* shown in Table 3. VD analysis on variables *human capital* that have a large magnitude of influence on economic growth is the old level variable of 5.38 schools starting at 5.38 the beginning of the period until the 30th period. Furthermore, the variable which has the second magnitude of influence is the life expectancy variable of 3.08. In addition, variables such as labor and literacy levels have a small contribution amount of 2.51 and 1.97.

Table 3
Analysis Variance Decomposition on Model 2

Period	S.E	IG	LC	RRLS	AHH	LogTK
1	0.043219	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.045851	93.98159	0.134856	2.188550	0.600403	3.094601
3	0.047512	89.39702	0.543622	4.704509	2.411159	2.943694
4	0.051564	88.79584	1.779323	4.043206	2.851437	2.530195
5	0.051682	88.47631	1.819938	4.027988	3.101634	2.574132
15	0.052967	87.54247	2.035938	4.713007	3.123736	2.584852
16	0.053055	87.50192	2.034504	4.765349	3.116876	2.581351
17	0.053131	87.46349	2.031913	4.815627	3.110908	2.578058
18	0.053208	87.42409	2.028457	4.867858	3.105267	2.574328
19	0.053282	87.38749	2.024597	4.917204	3.100411	2.570301
20	0.053355	87.35210	2.020167	4.965975	3.095907	2.565850
25	0.053691	87.19194	1.996159	5.188564	3.083068	2.540274
26	0.053753	87.16172	1.991625	5.229454	3.082401	2.534795
27	0.053814	87.13181	1.987399	5.269107	3.082385	2.529299
28	0.053874	87.10199	1.983544	5.307611	3.083034	2.523816
29	0.053932	87.07217	1.980143	5.344925	3.084369	2.518395
30	0.053989	87.04217	1.977265	5.381098	3.086393	2.513073

improving human quality that encourages poverty alleviation and promotes economic growth. The Government of East Java needs to pay attention to the conditions of regions with less education levels such as literacy levels that are less than the specified target. The way that can be done with training or counseling on the importance of reading and writing skills, it can be done sustainably with the creation of a mini school or village study group that accommodates especially those who have very low literacy and writing on condition that there is no age limit so all household members are involved. Because education is an important factor in the development of human capital, local governments need to consider the amount of the budget for education, both in terms of school fees, school facilities provided, rewards or rewards to students or teachers as their motivation to develop the world of education, compulsory school emphasis with the help of costs, especially for those who come from poor families, and the existence of a good educational institution structure

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