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Human Development Index, Poverty and Gross Regional Domestic Product: Evidence from Malang, Indonesia

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Abstract

This study aimed at analyzing the relationship between human development index, poverty level and gross regional domestic product in Malang Regency in Indonesia. This research was initiated by the poverty level which shows a moderate level in Malang Regency and how its impact on gross regional domestic product after the Development of Southern Cross Lane (JLS) in Malang. The study applied an explanatory research using time series data between 2014 and 2018. For the analysis, Vector Error Correction Model (VECM) was applied to understand the relationship between variables both in the short-term and in the long-term. The findings showed that in the short-run both variables have a negative correlation with gross regional domestic product. Meanwhile, in the long-run, human development index has a negative relationship to gross regional domestic product, whilst poverty variables positively affects gross regional domestic product.

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh index pembangunan manusia, tingkat kemiskinan dan produk domestik regional bruto (PDRB) di Kabupaten Malang, Indonesia. Studi ini didasari pada tingkat kemiskinan di Kabupaten Malang yang tergolong sedang dan bagaimana dampak PDRB setelah adanya pembangunan Jalur Lintas Selatan (JLS) di Kabupaten Malang. Penelitian ini merupakan penelitian eksplanatoris dengan menggunakan data time series selama 2014-2018. Lebih lanjut, data dianalisis dengan menggunakan Vector Error Correction Model (VECM) untuk mengetahui hubungan jangka pendek dan jangka panjang antar variabel. Hasil penelitian menunjukkan bahwa dalam jangka pendek kedua variabel memiliki hubungan yang negatif terhadap PDRB. Hasil lain menunjukkan bahwa pada jangka panjang, indeks pembangunan manusia memiliki pengaruh yang negatif terhadap PDRB sedangkan kemiskinan secara positif berpengaruh terhadap PDRB.

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INTRODUCTION

The economic development in a certain area is an opportunity to increase economic growth and improve the welfare of the community. In general, the term of welfare refers to a condition where the communities meet their needs both in social and economic activities (Patel et al., 2012). In addition, Jäntti et al. (2014) mentioned that the economic welfare is associated with poverty, equality and economic growth.Indonesia needs an obvious high economic growth, because it is expected to boost the production of goods and services in the country. With more production of goods and services, the economy is also forecasted to increase and it will lead to the welfare of the community (Edeme, 2018).

The quality of human resources owned by each country depends on the availability of supporting facilities and infrastructure. These facilities and infrastructure can be a factor of the most important as well as education, health and other infrastructure services (Fleisher et al., 2010; Srinivasu & Rao, 2013). However, in its implementation, it should be supported by good financial by the State. Unfortunately, not all Nations have good funding because they do not have high incomes. The development paradigm which currently enhanced is economic growth as measured by human development. The human development can be seen from the high and low quality of human life in each country. The benchmarks of human development can be illustrated by the Human Development Index (HDI). The coverage of the HDI indicator is measured by the level of education, health and economy (purchasing power) (Mishra & Nathan, 2008). These indicators can explain the extent of a human development growth. On the other hand, the challenges of human development are economic, geographic and social disparities in society.

In Malang regency for instance, the growth of the human development index (HDI) showed an upward trend. In 2014,the Human Development Index was about 63.47 and continued to increase to the level of 69.4 in 2018 (BPS, 2018). This is certainly a positive change in direction, considering that Malang is one of the reference cities in the field of education. In addition, the availability of schools is almost all in every village, making easy access for every Malang community to get education rights. In addition, the ease of health services both through health centers and hospitals make a special advantage especially for users. Easy access for the mobility of citizens, especially farmers, makes it easy for logistics and shipping their products.

In addition, economic development is aimed to improve the quality of welfare and income distribution for the community. The population also has an important role in economic development. According to Subri (2003) which states that the total population is usually also associated with growth (income per capita) of the country, which roughly reflects the progress of a country's economy. Poverty is also a complex problem that is still difficult to solve in almost every region in Indonesia including in Malang. The government policies to overcome poverty are still being studied to present. East Java and Malang regency in particular is one region where poverty is in moderate levelthat needs to know what factors are underlying it and how much influence these factors.

According to Suliswanto (2010) poverty is one of the problems that is always faced by humans. The problem of poverty is the same as human age itself and has an impact on problems that can involve all aspects of human life, although often its presence is not recognized as a problem for the human being concerned. As one of the largest regions in East Java Province, Malang Regency still has a double digit of poverty rates, In 2014 the poverty rate was about 11.7 percent, slightly inclined in 2015 and showed a positive trend in 2018 with the level of poverty was about 10.37 percent (BPS, 2018). In the development progress, this has been very positive where the poverty rate has inclined every year. One of the causes of poverty in Malang is the lack of employment, low levels of education, especially for residents of the periphery.

Studies on the human development index have been conducted in numerous countries. For Instance, Arisman (2018) carried out a study on Determinant factors of human development index in Asean countries. In Pakistan, Wang et al. (2018) focused on the relationship between renewable energy consumption, economic growth and human development index. In addition, Arimah (2004) concerned on the causality of poverty reduction and human development in Africa. While

Roshaniza & Selvaratnam (2015) conducted study on gross domestic product, human development index and poverty rate in Malaysia.

However, in fact, there is a little studyconcerning related to human development index, poverty and regional economic growth in Indonesia. For example, Iskandar (2017) focused on the relationship between human development index and economic growth. Meanwhile, Mulyasari (2016) conducted study on the causality between human development index and regional economic growth in Central Java, Indonesia. Therefore, this study aims to contribute to this growing area of research by exploring the relationship between human development index, poverty and gross regional economic growth in Malang regency of Indonesia.

METHOD

This study followed an explanatory research using time series data from January 2014 to December 2018. The time frame is chosen considering the business cycles particularly in the period of presidential election. The data were gathered from Indonesia Statistics in Malang regency. Furthermore, the data were analysed using Vector Error Correction Model (VECM) to determine the relationship between variable both in the short-run and in the long-run. In more detail, the variables used in this study include human development index, poverty level and product domestic regional product.

There are several stages in study consisting of stationarity test, cointegration test, and VECM test. In more detail, stationarity test is estimated using ADF test (Augumented Dicky Fuller Test) which can be seen using following formulation.

$$\Delta Y_t = a_0 + z_t + a_1 Y_{t-1} + + \sum_{i=1}^{p} ai\Delta Y_t - 1 + \varepsilon_t$$

Where λ_i is estimated with, t is *deterministic trend*, and **ε** is *error term*. If autoregressive Y (Y_{t-1}) consists of unit root, then *t-ratio*) for a_1 should consistent with hypotesis a_1=0. In the other hand, the cointegration in this study followed Johansen's approach in which using two statistics test namely *Trace test* and *maximum Eigenvalue test*. For the two statistics model are illustrated in the following formulas.

$$\lambda_{Trace}(r) = -T \sum_{i=r+1}^{g} in(1-\lambda_i)$$

$$\lambda_{Max}(r, r+1) = -T\,\text{In}(1-\lambda_{r+1})$$

where λ_i is estimated with ordered eigenvalue. The standard approach for Johansen'sis maximum likelihood. First, estimating Trace and Maximum Eigenvalue statistics, then comparing the appropriate critical values. In this cointegration test, if there is a cointegration between variables or the rank of cointegration is higher than zero, the Vector Error Correction Model can be conducted. In the final stage is VECM test using following formulations.

$$7\Delta Y\_GDRP = a + \sum_{i=1}^{m} \beta i\Delta Y\_GDRP_{-i} + \sum_{j=1}^{n} \gamma j\Delta Y\_GDRP_{-j} + \sum_{k=1}^{0} \omega\Delta X1\_HDI + \sum_{l=1}^{0} \delta\Delta X2_{Poverty} + \Theta Z_t - 1 + \varepsilon_t$$

RESULTS AND DISCUSSION

The result of the stationarity test using Augmented Dickey Fuller (ADF test) is presented in the Table 1. Based on the table, it can be known that all variables are not stationer in the degree of level. Therefore, it needed to be tested in the first difference, however, the result is indifferent that remain not stationer. Thus, the data were tested for stationarity test in the second difference and the results showed that variables are on the same degree.

Table 1.
The Result of Stationarity Test using ADF

Variable	Decision
Y_Gdrp	Stationer in the *second difference*
X_1_HDI	Stationer in the *second difference*
X_2_Poverty	Stationer in the *second difference*

Furthermore, the data were followed the next test using unit root test to know the relationship between variables in the long run. The result of the test is presented in the Table 2.

Table 2.
The Result of Johansen's Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.250000	52.33423	47.85613	0.0179
At most 1 *	0.250000	35.93635	29.79707	0.0086
At most 2 *	0.250000	19.53848	15.49471	0.0116
At most 3	0.053608	3.140598	3.841466	0.0764

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.250000	16.39788	27.58434	0.6318
At most 1	0.250000	16.39788	21.13162	0.2025
At most 2 *	0.250000	16.39788	14.26460	0.0227
At most 3	0.053608	3.140598	3.841466	0.0764

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Based on the cointegration test in the Table 2, it can be seen that the trace statistic and maximum eigenvalue on r = 0 is greater than critical value with the significant level of 5 percent. Based on the analysis, the three of variables have a cointegration relationship. Therefore, from the cointegration test, it indicates that among variables have stability correlation and the same movement in the long term. In other word, in the short-term, all variables tend to make an adjustment to achieve the equilibrium in the long-term.

Table 3 provides information about the result of vector error correction model test in both short-term and in the long-term. From the table, it can be concluded that gross domestic regional bruto has a positive coefficient as much as 0.90. It implies that every 1 percent increase in the previous year there will be an increase in Gross Domestic Product of 0.90 percent in the current year. In the other side, human development index has a negative coefficient value which is -7.91 percent. It means that an increase in gross regional domestic product by 1 percent will reduce the level of the Human Development Index by -7.91 percent in the current year. This finding has indifferent result from prior study by Lestari (2017) which mentioned that human development index negatively affects gross domestic regional bruto. It can be understood that development is not permanently has a positive correlation with human development index. It is reasonable because the development commonly focuses on physical unit that usually occurred in the developing countries.

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Table 3.
Vector Error Correction Model (VECM) Test

Cointegrating Eq:	CointEq1		
Y_GDRP(-1)	1.000000		
X1_HDI(-1)	-2.212009.		
	(1.312788)		
	[-1.68497]		
X2_Poverty(-1)	5.036139.		
	(1.899249)		
	[26.5165]		
C	4.15E+09		
Error Correction:	D(Y_GDRP)	D(X1_HDI)	sD(X2_Poverty)
CointEq1	0.000317	1.14E-08	-4.82E-09
	(0.01252)	(4.4E-09)	(2.7E-09)
	[0.02530]	[2.58134]	[-1.80596]
D(Y_GDRP(-1))	0.906950	-7.71E-08	3.26E-08
	(0.52379)	(1.8E-07)	(1.1E-07)
	[1.73151]	[-0.41710]	[0.29181]
D(Y_ GDRP(-2))	0.086767	-1.32E-07	-4.47E-09
	(0.53817)	(1.9E-07)	(1.1E-07)
	[0.16123]	[-0.69693]	[-0.03898]
D(X1_HDI(-1))	-7.914.275	0.624093	0.120469
	(1.011008)	(0.35680)	(0.21557)
	[-0.00783]	[1.74915]	[0.55883]
D(X1_HDI(-2))	1.085387	-0.162585	-0.041960
	(9.77159)	(0.34485)	(0.20835)
	[0.11108]	[-0.47146]	[-0.20139]
D(X2_Poverty(-1))	-4.260046	-0.153407	0.973936
	(1.795436)	(0.63363)	(0.38283)
	[-0.00237]	[-0.24211]	[2.54403]
D(X2_Poverty(-2))	6.06217.2	-0.421889	-0.056001
	(1.852062)	(0.65362)	(0.39491)
	[0.32732]	[-0.64547]	[-0.14181]
R-squared	0.892945	0.904555	0.848074
Adj. R-squared	0.872446	0.886278	0.818982
Sum sq. resids	2.34E+11	0.029139	0.010637
S.E. equation	70554.27	0.024899	0.015044
F-statistic	43.55868	49.49197	29.15121
Log likelihood	-711.7376	135.1140	163.8348
Akaike AIC	25.32413	-4.389966	-5.397712
Schwarz SC	25.68256	-4.031536	-5.039282
Mean dependent	551389.7	0.105673	-0.029152
S.D. dependent	197549.3	0.073836	0.035359
Determinant resid covariance (dof adj.)		11.13375	
Determinant resid covariance		5.146757	
Log likelihood		-370.2114	
Akaike information criterion		14.53373	
Schwarz criterion		16.11083	

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The estimation model of VECM can be written following the equation.

D(y_GDRP=0.000317(y_GDRP(-1)-2212009(X1_HDI(-1))+5036139(X2_Poverty(-1))-0154.54D(Y_GDRP(-1))+0.086767D(Y_GDRP(-2))-7914.275D(X1_HDI(-1))+108538.7D(X1_HDI(-2))-4260.046D(X2_Poverty (-1))+ 606217.2 D(X2_Poverty(-2))+374.8262

From the poverty variable, it can be seen that poverty has a negative coefficient value for about -4.26 percent. It can be interpretated that every 1 percent increase in gross domestic product will reduce poverty by -4.26 percent in the current year. This finding is in line with previous study by Siregar and Wahyuniarti (2008) which conducted research on the impact of economic growth on the poverty alleviation. The result of the study confirmed that economic growth positively affects the poverty reduction. Indeed, this findings support Setyobudi (2016) which revealed that economic growth dynamically reduces the number of poverty level.

The long-run relationship between variables is shown the vector error correction model test. First, human development index has a negative coefficient with the value of -2.21. It remarked that every 1percent increase in Gross Domestic Product will have an impact in decreasing the level of Human Development Index by -2.21 percent. In contrast, the poverty variable has a positive coefficient score for about 5.03. It implies that when the Gross Domestic Product increases by 1 percent, in the long run it will increase poverty by 5 percent. This can occur when development is physical in nature, such as infrastructure, office development and a lack of budgetary allocations in education (Susanti, 2013).

CONCLUSIONS AND SUGGESTION

This study insights the relationship between human development index, poverty level and gross regional domestic product in Malang Regency in Indonesia. From the previous discussion, it can be seen that in the short-run both variables namel human development index and poverty level have a negative correlation with gross regional domestic product. Meanwhile, in the long-run, human development index has a negative relationship to gross regional domestic product, whilst poverty variables positively affects gross regional domestic product.

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