**Determinants of Poverty in East Java after the Covid-19 Pandemic**

Dyah Purwanti, Sigit Budiantono, Nurhidayati, Pardomuan Robinson Sihombing, Ade Marsinta Arsani

**ABSTRACT**

*The Covid-19 pandemic has significantly impacted the economy both nationally and regionally. Economic activity slowed down, many businesses closed their businesses, and there was an increase in the poor. The government is conducting fiscal interventions to overcome the impact of the pandemic both on supply and demand. The intervention is expected to keep the economy growing despite being thin. East Java Province had achievements in reducing poverty until the end of 2019; after the pandemic, poverty increased significantly at the end of 2021. This condition is challenging for the Provincial Government and the City / Regency Government in East Java. Therefore, this study analyzes the determinants of poverty in East Java after the pandemic. Data was sourced from the Statistic Indonesia of East Java for 2018-2021. Using a regression of panel data (fixed effect model), we found that the human development index reduced poverty. On the contrary, the Covid pandemic, Gini Ratio, and economic growth positively impact poverty. The implications of the findings suggest the need for evaluating the quality of economic growth in East Java in order to reduce poverty.*

**Keywords**: economic growth, Gini ratio; HDI; pandemic; poverty

**JEL Classification**: C68, F43, L52

**INTRODUCTION**

In early 2020 the international community was shocked by the health disaster (pandemic) of the virus that attacks acute breathing, widely known as COVID-19. The outbreak was transmitted through human interaction, and the transmission rate increased, resulting in millions of casualties. To reduce the transmission of COVID-19, each country imposes restrictions on social interaction, even the closure of cities/regions (lockdowns). The restrictive policy has resulted in the paralysis of transportation and economic activity globally, nationally and locally. The widespread impact of the pandemic not only collapsed the base but also gave rise to a deep contraction in the economic sphere. As a result, many businesses closed and triggered an increase in unemployment, eventually adding new poor people by the end of 2020.

In the Indonesian context, social interaction restriction policies impact all areas. The economic contraction was severe enough to result in negative economic growth during 2020. The number of poor people increased by 1.12 million or around 0.36 percent (SMERU, 2021). Especially for Java Island, East Java Province, we experienced a relatively high increase in poverty during the COVID-19 pandemic (±1 percent) (BPS, 2023). Before the pandemic, the poverty rate in East Java Province showed a significant downward trend in 2015-2019 (see Chart 1). After 2019, poverty showed an upward trend (2020-2021).

Chart 1. Poverty In East Java 2015-2021

Source: BPS Jawa Timur

In addition to poverty problem, provincial and district governments in East Java are facing widening disparities between districts after the pandemic. Based on processed data from BPS East Java publications, the poverty rate in Madura region districts is relatively high (greater than 20 percent), and Probolinggo, Pacitan, and Tuban regencies have poverty above 15 percent. In contrast, other districts have an average poverty of 12.93 percent, while urban areas have lower poverty (6.15 percent on average). The increase in poverty and interregional parity in East Java is a problem that must be resolved immediately by the local government.

Studies that specifically analyze poverty conclude that in order to alleviate poverty, every country needs to grow (Dollar & Kraay, 2002; Ravallion & Datt, 2001;Montalvo & Ravallion, 2010). The "trickle-down effect" of growth is expected to reach the poor population in each region. Thus, economic development is expected to reduce poverty, inequality and unemployment. Todaro and Smith's (2012) view is supporting line with Kuznets' (1995) framework where economic growth increases the income of local people, thereby encouraging the income of people who are below the poverty line to slowly increase.

Theoretically, alleviating poverty requires economic growth (Jonnadi et al., 2012). Economic growth is intended as a production activity that results in the accretion of goods and services in a country or a smaller region within a country (Boediono, 2001). Based on neoclassical theory, growth requires factors of production, such as humans (population), capital/capital, and technology. In other words, economic growth absorbs labor in the sectors on which the local economy depends. Studies that focus on analyzing poverty conclude that in order to alleviate poverty, every country needs to grow (Dollar & Kraay, 2002; Ravallion & Datt, 2001;Montalvo & Ravallion, 2010). The "trickle-down effect" of growth is expected to reach the poor population in each corner of region.

For East Java Province, regional economic growth mainly rests on the processing (industrial) and trade sectors, followed by contributions from the mining and agricultural sectors (publication of BPS East Java 2023). Thus, the recovery of economic activity, especially in the mainstay sector, will accelerate economic growth, thus opening up job opportunities. Factually, expectations for growth as a prerequisite for poverty alleviation are running low because East Java's regional economic growth in 2020 contracted quite deeply to minus 2.33. However, entering 2021 and 2022, East Java's regional economic growth has begun to optimistically increase by 3.56 and 5.34, respectively (BPS, 2023), so the opportunity to reduce the poor is wide open.

An essential factor vital to poverty alleviation is the development of human quality (Ginting et al., 2008). Empowering the poor is crucial to getting out of the trap of poverty. By strengthening human development through education and health, the poor can become subjects and actively participate in development. The HDI index of East Java Province is at an average of 71,774, with the highest index in the city of Surabaya (82.74), Kota Malang (82.71), Madiun City (82.01) and Sidoarjo Regency (81.02). The HDI trend in East Java Province is upward from 2015 to 2022. This study seeks to prove that human quality is an essential determinant in poverty alleviation post COVID-19.

In addition to the two factors above, the socio-economic conditions of the community, especially East Java, have undergone many changes after the pandemic (Saputri & Rahmawati, 2022). The rise in urban and rural poverty has resulted in widening inequality between cities and villages and between levels of society. Based on the publication of BPS East Java, this Gini ratio East Java has continued to expand in the last three years (2020-2022), from an index of 0.366 to 0.371 at the end of 2022. With a more significant Gini ratio, the poverty rate becomes higher. This gap largely contributes to the COVID-19 pandemic, which has a multidimensional effect on human life.

Based on the above, this study formulates the following hypotheses:

H1: Economic Growth has a significant effect on the percentage of poor people in East Java

H2: HDI has a substantial impact on the rate of poor people in East Java

H3: Covid conditions have a significant effect on the percentage of poor people in East Java

H4: Gini ratio has a significant impact on the rate of poor people in East Java

**METHODOLOGY**

The data used in this study came from the publication of the Statistics Indonesia of East Java. This research focuses on all all regencies/cities in East Java Province with a research period of 2018-2021. The dependent and independent variables in this study can be seen in Table 1.

Table 1. Research Variables

|  |  |  |
| --- | --- | --- |
| Dependent Variables | Unit | Scale Data |
| Percentage of Poor People | Percent | Ratio |
| Independent Variables | Unit | Scale Data |
| Gini Ratio | Points | Ratio |
| Human Development Index (HDI) | Points | Ratio |
| Economic Growth | Percent | Ratio |
| Dummy Covid | 1 for 2020-2021  0 for 2018-2019 | Nominal |

The regression model used is a panel data regression analysis. The equation of the model:

Percentage of Poor People=β0+Gini Ratio

+β1HDI+ β0Economic Growth+ β3Dummy Covid

There are three types of modelling in panel data regression: standard/pooled models, fixed-effect models, and random-effect models (Baltagi, 2005). Model selection tests are performed to determine the best Model that informs the relationship between variables. Table 2 show the panel selection test.

Table 2. Panel Model Selection Tests1

|  |  |  |
| --- | --- | --- |
| Test Panel Model | Null Hypothesis | Alternative Hypotheses |
| LM BP Test | Pooled/common models are better than Fixed | Fixed models are better than Pooled/common models |
| Chow Test | Pooled/common models are better than Random | Random Model is better than Pooled/common Model |
| Hausman Test | Random models are better than Fixed | Fixed models are better than Random |

After choosing the best model, a classic assumption test is carried out. This test is performed to ensure that the Model can be used to see the influence between variables and predict the dependent variable's value from the independent variable's known value (Gujarati, 2004). The test of classical assumptions can be seen in Table 3.

Table 3. Classical Assumption Test2

|  |  |  |
| --- | --- | --- |
| Test assumptions | Null Hypothesis | Alternative Hypotheses |
| Long Run Normality Test | Normally distributed data | Data is not normally distributed |
| White Test | Homoscedastic data variants | Heteroscedastic data variants |
| LM Correlation Test | Non-Autocorrelation Models | Autocorrelation Model |
| Ramsey Linearity Test | Linear-patterned Model | Linear-Patterned Non-Patterned Models |

Once the best Model is selected and meets the classical assumptions, the next step is to test the goodness of the Model (Walpole, 2012). The goodness of the model test can be seen in Table 4. After all, the test criteria of the Model are met, and the interpretation of the formed regression equation is carried out.

Table 4. Model Goodness Test3

|  |  |  |  |
| --- | --- | --- | --- |
| The goodness of Fit Test | Null Hypothesis | Alternative Hypotheses | Reject Ho |
| Test Coefficient of Determination / adjusted R square | R square > 0.5 | | |
| Simultaneous Test / F Test | Model Not fit/  All variables have no effect | Model fit/minimum one variable has a significant effect | Prob. Value < 0.05 |
| Partial Test / T Test | Certain independent variables have no effect | Independent variables have an effect | Prob. Value < 0.05 |

**RESULTS AND DISCUSSIONS**

The discussion started by using descriptive analysis to determine the characteristics of each variable in the study during the research period. Table 5 shows a descriptive analysis.

The average percentage of the Poor Population of East Java Province is 10.88 percent, with the highest score of 23.76 percent in Sampang Regency in 2021 and the lowest value of 3.81 percent in Batu City in 2019. The average Gini Ratio of East Java Province is 0.33 points, with the highest score of 0.42 points in the Nganjuk Regency in 2019 and the lowest score of 0.25 points in the Sumenep Regency in 2018. The average Human Development Index (HDI) of East Java Province is 71.69 points, with the highest score of 82.31 points in Surabaya in 2021 and the lowest value of 61.00 points in Sampang Regency in 2018. The average Economic Growth (PE) of East Java Province was 1.56 percent, with the highest value of 6.09 percent in Bojonegoro Regency in 2019 and the lowest of -12.86 percent in Lamongan Regency in 2020.

Table 5. Descriptive Analysis4

| Variable | Mean | Maximum | Minimum |
| --- | --- | --- | --- |
| Poverty | 10,88 | 23,76 | 3,81 |
| Gini Ratio | 0,33 | 0,42 | 0,25 |
| Human Development Index (HDI) | 71,69 | 82,31 | 61,00 |
| Economic Growth | 1,56 | 6,09 | -12,86 |

The regression model requires no high relationship/multicollinearity between independent variables, as seen from a Variant Inflation Factor (VIF) value of less than 10. In Table 6, all independent variables had a VIF value of less than ten in this study. This result means all the independent variables used in the Model.

Before further analysing modelling in panel data regression analysis, panel model selection is performed. The authors used the tests mentioned in the methodology section through the three tests in Table 7. The fixed effect model is considered the best for describing the relationship between research variables.

Table 6. Multicollinearity Test5

| Variable | VIFs |
| --- | --- |
| Poverty | 1.147378 |
| Gini Ratio | 1.796450 |
| HDI | 1.169171 |
| Economic Growth | 1.798567 |

Table 7. Test Panel Model

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|  |  |  |  |
| --- | --- | --- | --- |
| Test | Test Value | Prob. Value | Conclusion |
| LM BP Test | 205.64 | 0.00 | Random Model is better than the Common/Pooled Model |
| Chow Test | 661.95 | 0.00 | Fixed model is better than Common/Pooled models |
| Hausman Test | 11.3 | 0.0 3 | Fixed Model is better than Random Model |

Once the panel model is selected, the panel-chosen Model is not interpreted directly but tested for classical assumptions. This test is intended so that the Model chosen can be used to see the effect of predictions. The assumptions used are the assumptions of normality, heteroskedasticity, and autocorrelation. In Table 8, the assumption of normality is met. The probability value is more significant than 0.05. On the other hand, there is still a violation of heteroskedasticity and the assumption of autocorrelation. The probability value of each test is less than 0.05.

Table 8. Classical Assumption Test7

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Test Value | Prob. Value | Conclusion |
| Normality Test | 2,556226 | 0,278 | Normality |
| White Test | 45.65483 | 0.0 00 | Heteroskedasticity |
| LM Series Correlation | 151.9830 | 0.0 00 | Autocorrelation |

Due to heteroskedasticity violations and autocorrelation assumptions, fixed models were transformed using the Panel Corrected Standard Error/ PCSE model (Greene, 2018). The final mode used can be seen in Table 9.

Table 9. Hypothesis test8

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Coefficient | t-Statistics | Probability. | Hypothesis Conclusion |
| Economic Growth | 0.037160 | 8.132128 | 0.0000 | H1 accepted (sign) |
| HDI | -0.473822 | -10.74135 | 0.0000 | H2 accepted (sign) |
| Dummy COVID-19 | 1.142367 | 17.07051 | 0.0000 | H3 accepted (sign) |
| Gini ratio | 1.744339 | 2.139845 | 0.0346 | H4 accepted (sign) |
| Constant | 43.63605 | 13.56820 | 0.0000 |  |
| R-Square | 0.998077 | F-Statistics | 1392,474 |  |
| Adjusted-R Square | 0.997360 | Prob-F (Stat) | 0,00000 |  |

From Table 9 above, the value of the determination coefficient is 0.9973. This value means that all independent variables can explain the variation in the percentage of the poor population of 99.73 percent; other variables outside the model influenced the remaining 0.27 percent. The F test showed that all independent variables simultaneously affect poor people. The statistical probability value of F=0.00 identifies the result as less than alpha=0.05. It means that the modelling carried out is appropriate. Partial tests identified with the probability value of the t-test showed that all significant variables had an effect where the probability value was 0.000 < alpha 0.05.

***Discussion***

The study find that economic growth positively affects the percentage of poor people in East Java. The result shows that the coefficient of 0.037160 with a value of |t stat|=8.132128> t table=1.96 and a probability value = 0.0000 < alpha = 0.05. This result means that each 1 percent increase in economic growth will increase the poverty rate by 0.0371 percent, assuming other variables are constant. Theoretically, economic growth will reduce the poverty rate. However, not all economic growth has a negative effect on poverty. If economic growth occurs only in specific sectors and is uneven across sectors, or if it is dominated by only particular sectors and benefits only a handful of people or companies, then its limited the benefit on the poor (W. Bank, 2016).

Several studies show that economic growth does not always reduce poverty. Even in some cases, economic growth can increase poverty. This research indicates that several factors, such as income inequality, changes in economic structure, and side effects of government policies, can affect the impact of economic growth on poverty. For example, a study by Ravallion (2004) showed that economic growth in China, India, and Indonesia during the 1980s and 1990s did not significantly reduce poverty rates, especially among poorer groups of people. Instead, the study showed that income inequality increased during the period, contributing to rising poverty.

Another survey by Nallari et al. (2006) shows that changes in the economy's structure, such as the shift from the agricultural sector to the industrial sector, can increase unemployment and poverty in some countries. In addition, government policies that do not consider their impact on poverty can also worsen the poverty situation in developing countries.

The Human Development Index (HDI) negatively influences the percentage of poor people in East Java with a coefficient of -0.473822 with a value of |t stat|=10.74135 > t table=1.96 and a probability value=0.0000 < alpha=0.05. This result means that every 1-point increase in HDI will bring the poverty rate to 0.473 percent, assuming other variables are constant. Increasing the Human Development Index (HDI) is one of the indicators of the success of a country's or region's development in meeting the basic needs of its people, such as health, education, and a decent standard of living. Therefore, it can be said that an increase in HDI can help reduce poverty in a country or region. Several studies have also shown a positive relationship between increased HDI and decreased poverty. For example, research conducted by Klasen (2010) found that an increase in HDI can significantly reduce poverty rates in developing countries. In addition, research by UNDP (UNDP, 2014) also shows that countries that achieve higher HDI levels tend to have lower poverty rates than countries whose HDI is still lacking.

Gini Ratio positively affects the percentage of poor people in East Java with a coefficient of 1.744339 with a value of |t stat|=2.139845> t table=1.96 and a probability value value=0.0346 < alpha=0.05. This result means that every 1-point increase in the Gini ratio will increase the poverty rate by 1.744 percent, assuming other variables are constant. The Gini ratio measures income inequality used to measure how evenly or unevenly distributed income is in a country or region. So, the higher the Gini ratio, the more uneven the income distribution in a region or country. Research conducted by Milanovic (2002) shows that countries with a high Gini ratio tend to have a higher poverty rate than countries with a low Gini ratio. Similarly, research by Ravallion and Chen (2003) shows that the higher the level of income inequality, the higher the poverty the poor face. Although the relationship between the Gini ratio and poverty is complex, it can generally be said that the higher the Gini ratio, the more poor people there will be in a country or region. This result happens because the more uneven the distribution of income, the fewer people have access to resources and more and more people are unable to meet their basic needs such as food, housing, and health services.

Dummy Covid positively affects the percentage of poor people in East Java with a coefficient of 1.142367 with a value of |t stat|=17.07051> t table=1.96 and a probability value value=0.0000 < alpha =0.05. This result means there is a difference in the poverty rate of 1.14 percent before the covid pandemic and after the covid pandemic. The COVID-19 pandemic has significantly impacted the global economy and increased poverty rates in many countries around the world. Due to the pandemic, declining incomes, job losses, and rising living costs have contributed to increasing poverty. A report from the World Bank (T. W. Bank, 2021) shows that the COVID-19 pandemic has increased the number of people living below the global poverty line for the first time in more than twenty years. According to the report, the pandemic is expected to increase the number of people living below the global poverty line by 119 million to 124 million by 2020. In addition, the report also shows that the pandemic has resulted in an increase in income inequality around the world, which exacerbates the situation of poverty for poorer groups of people. In many countries, the COVID-19 pandemic has also increased the unemployment rate and lowered the economic growth rate, further aggravating.

**Conclussion and Recommendation**

The fixed effects *model* was the best based on testing panel models (Chow, LM BP, and Hausman). There is still a violation of the classical assumptions of heteroskedasticity and autocorrelation. Because violation of the classical assumptions, the Fixed Model is transformed with the PCSE model. The results showed that all independent variables significantly affect the percentage rate of poor people in East Java. Partially, the Gini ratio, pandemic and economic growth have a significant positive effect on the percentage rate of the poor. Meanwhile, HDI significantly negatively impacts the percentage rate of the poor.

Based on the results of this study, a comprehensive policy related to evaluation of economic growth which has a trickle-down effect to reduce poverty and inequality East Java. For further research, adding other potential independent variables that affect the poverty rate, such as unemployment, investment, income, and others, is possible. Meanwhile, in the subsequent modeling*, we can* use the *panel model with* random *effects*, dynamics panels, or spatial effects in panel models.

**REFERENCES**

Baltagi, B. H. (2005). *Econometric Analysis of Panel Data* (Third). John Wiley & Sons Ltd.

Bank, T. W. (2021). *COVID-19 to Add as Many as 150 Million Extreme Poor*. https://www.worldbank.org/en/news/press-release/2021/01/20/covid-19-to-add-as-many-as-150-million-extreme-poor-by-2021

Bank, W. (2016). *Poverty Reduction and Shared Prosperity 2016: Taking on Inequality*.

Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. *Journal of Economic Growth*, *7*, 195–225.

Greene, W. H. (2018). *Econometric Analysis* (8th ed.). Pearson.

Gujarati, D. (2004). *Basic Econometrics BY Gujarati* (pp. 1–1002). McGraw-Hill Inc.

Klasen, S. (2010). Measurement of and trends in inequality and poverty in developing countries. *World Development*, *38*(3), 420–435.

Kuznets, S. (1995). *International differences in capital formation and financing. In Capital formation and economic growth*. Princeton University Press.

Milanovic, B. (2002). True world income distribution, 1988 and 1993: First calculations, based on household surveys alone. *The Economic Journal*, *112*(476), 51–92.

Montalvo, J. G., & Ravallion, M. (2010). The pattern of growth and poverty reduction in China. *Journal of Comparative Economics*, *38*(1), 2–16.

Nallari, R., Griffith, B., & Goodyear, R. K. (2006). Poverty reduction strategy papers and growth: what is the connection? *World Development*, *34*(4), 613–631.

Ravallion, M. (2004). Pro-poor growth: a primer. In *World Bank Policy Research Working Paper*.

Ravallion, M., & Chen, S. (2003). Measuring pro-poor growth. *Economics Letters*, *78*(1), 93–99.

Ravallion, M., & Datt, G. (2001). *When Is Growth Pro-Poor? Evidence from the Diverse Experiences of India’s States*.

Todaro, M. P., & Smith, S. C. (2012). *Economic development* (11th ed.).

UNDP. (2014). *Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*.

Walpole, R. E. (2012). *Probability & Statistics for Engineers & Scientists*. Pearson.