Income Inequality in East Java

Nova Dwi Ise Aprelia and Muhammad Arif(✉)

Faculty of Economics and Business, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia
arif@ums.ac.id

Abstract. The goal of this study is to determine the direction and strength of the relationship between local original income, purchasing power parity, dependency ratio, construction cost index, and the number of impoverished people, and how these variables relate to income inequality across all East Java province residences. In this study, 2017–2021 secondary data are used. The Central Statistics Agency (BPS), the Directorate General of Fiscal Balance, provided the information (DJPK, Ministry of Finance). Theil Entropy Index approach is the analytical technique used to compute income inequality, and panel data regression analysis is the estimate model. Income inequality is the dependent variable in this study, whereas local revenue, purchasing power parity, dependence ratio, construction cost index, and the number of impoverished people are the independent factors. The Random Effect Model (REM), one of the findings from the panel data regression analysis, was chosen as the best method to describe how independent variables affected dependent variables in this study. According to the influence validity test (t test), the variables regional original income, dependency ratio, and construction expensiveness index significantly affect income inequality in East Java province between 2017 and 2021, whereas the variables purchasing power parity and the number of impoverished people have no bearing on it.

Keywords: Income Inequality · Regional Income · Purchasing Power Parity · Dependency Ratio · Construction Cost Index · Poverty

1 Introduction

Real income per capita must rise over the long term, and this process is known as economic development [1]. The inequality of income distribution is one of the major issues that cannot be separated from economic development. In developing nations that are only now starting to develop economically, income inequality is typically more widespread [2]. A nation must focus on the issue of equitable income distribution or the absence of income disparity in order to achieve successful economic development.

The disparity in income between high and low income groups is known as income distribution inequality. Income disparity arises from the community's uneven allocation of income between developed and undeveloped regions. Income inequality will have a detrimental effect on the growth of the economy. Consequently, these varied locations experience gaps in welfare. Income inequalities result from the variation in income distribution, which increases as the income gap widens [3].

H. Maulana et al. (Eds.): ICOEBS 2022, AEBMR 247, pp. 563–579, 2024.
https://doi.org/10.2991/978-94-6463-204-0_48

The 29 districts and 9 cities of the East Java Province each have a varying level of regional development and potential, which results in unequal wealth distribution. East Java Province is structurally divided into 7 residencies, including Surabaya, Bojonegoro, Madiun, Kediri, Malang, Madura, and Besuki. There are distinct qualities for each region. These contrasting traits have an effect on how an economically diversified region is developed. One of Indonesia's major contributors to the Gross Regional Domestic Product (GRDP) is the province of East Java. High economic performance, however, only happens in developed industrial zones, such as the cities of Surabaya and Malang. In contrast, coastal districts like Ngawi and Pacitan still rely on traditional economies like the industrial sector and agriculture, which are handled well. As a result, income inequality in East Java is becoming more apparent. The rising level of inequality shows that societal income allocation is becoming more unjust.

The Entropy Theil Index is a tool used to gauge income distribution inequality [4]. The index has the key benefit of being able to differentiate between inter-region inequality and region inequality, making it acceptable to examine the degree of income disparity between regions. The range of criteria used to determine the value of the theil entropy index is 0–1. When it goes close to 0, income disparity is more equally distributed, and when it gets close to 1, it becomes more less equally distributed.

Income inequality and gross regional domestic product are tightly connected. The rapid economic expansion, as indicated by the rising value of the region's gross domestic product across all economic sectors, is evidence of improved public welfare. This rise in public welfare demonstrates a lowering of the level of income inequality [5]. Inequality of income is often quite low in developed economies. As a result, community involvement has a significant impact on a region's economic development. It is anticipated that economic expansion will reduce income disparity.

Poverty and unequal income distribution are issues that developed and developing nations alike must solve. Poverty is a type of development phenomenon brought on by the unfavorable effects of unequal economic growth, which will affect the inequality issue [6]. The gap between rich and impoverished will deepen as the number of the impoverished rises. Less effective economic growth in the area is the cause of the rise in the number of impoverished people [7]. Rapid economic expansion is not always necessary for good development. Economic growth requires a lot of time to reach a high growth rate when economic development's goal is to establish an equitable distribution of income. However, the likelihood of income distribution inequality will rise if development is more concentrated on achieving rapid economic growth. Economic growth should be considered as a process that involves several different variables that may be examined on a national and local level [1].

This study seeks to ascertain the degree to which local income, purchasing power parity, dependency ratio, construction expensiveness index, and poverty will affect income distribution inequality in the East Java province between 2017 and 2021 based on the background information that has been provided.

2 Theoretical Background and Hypotheses Development

2.1 Income Inequality

A prevalent problem in a region's economic operations is disparity within or across areas. Because each region has different natural resources and demographics, there is disparity in these areas. The development process in a region varies as a result of these variances. As a result, developed and underdeveloped areas exist. The degree of regional disparities in community welfare is influenced by regional inequality. As a result, the issue of regional inequality affects how local governments formulate plans for regional development [8].

In his critique of the Neo-Classical Theory of Growth, Douglas C. North first brought up the issue of regional inequality. According to this idea, there is a connection between a nation's level of overall economic growth and regional development disparities. The Neo-Classical Hypothesis is the name given to this theory [8].

According to the Neo-Classical Hypothesis, as a nation begins to grow, regional disparities in development tend to widen. This cycle will continue until the inequality becomes intolerable. If the development process keeps going, the gap in development between these regions will gradually narrow. Based on this neo-classical theory, it may be deduced that development inequality between areas tends to be higher overall in emerging countries while being relatively smaller in industrialized countries. To put it another way, the inverse curve of regional development inequality is Reverse U-shape Curve [8].

Inequality in development between developing and developed nations is typically higher. This is due to the fact that regions with usually stronger development conditions tend to take advantage of growth possibilities when they first arise in emerging countries. Due to their inadequate infrastructure, low-quality human resources, and lack of facilities, undeveloped communities are unable to take advantage of these prospects. Economic and sociocultural elements also contribute to this barrier's development inequality-increasing tendency because more developed regions often experience faster economic growth than less developed ones. In industrialized nations, where regional conditions often have greater facilities, infrastructure, and people resources, different situations arise. Additionally, there are hardly any social or cultural hurdles to development. So that each chance for development can be used more equally across regions. Therefore, the development process carried out in industrialized countries can lessen regional disparities in growth [8].

Jefrey G. Williamson examined the validity of the neo-classical hypothesis in 1966 by examining the disparities in regional growth between developed and developing nations using cross sectional and time series data. According to the study's findings, the neo-classical hypothesis was empirically supported on a theoretical level. That is, a country's growth process cannot immediately minimize development disparities between regions; rather, at the beginning, the opposite occurs [8].

Several factors contribute to income distribution inequality, including: (1) rapid population growth, which can result in a decline in per capita income; (2) inflation, which is a situation in which increases in income for money are not accompanied proportionally by increases in the production of goods; (3) regional differences in development; (4) heavy

investment in capital-intensive projects, which causes the income ratio to be higher than the ratio of income from employment and high levels of government spending; (5) Low social mobility; (6) The uneven demand for export commodities in developing nations is a result of deteriorating exchange rates for developing countries in trade with affluent ones; (7) Import substitution industry strategy implementation, which led to an increase in industrial goods' pricing to support the efforts of the capitalist class; (8) the decline of traditional handicrafts, such as furniture making and home goods manufacturing [9].

2.2 Measures of Income Inequality

The Williamson Index was the first indicator of regional inequality to be found. The Williamson index is a prize granted to Jeffrey G. Williamson, who assesses regional disparities in economic development. One drawback of the Williamson index is that it is sensitive to the definition of region utilized in calculations. However, a research done in 1966 by Jeffrey G. Williamson found that this score is frequently used to gauge regional development disparities. The baseline data used in the Williamson index calculations is the gross regional domestic product per capita. This is so that the level of growth between regions, not the amount of prosperity between groups, may be compared [8].

Theil entropy index is another metric that is frequently used to quantify regional disparity. Gross Regional Domestic Product (GRDP) per capita and population are the variables considered. This index's ability to simultaneously calculate inequality within and between areas is a benefit. The scope of its analysis broadens as a result. The entropy theil index can also be used to determine how much each region contributes to overall regional inequality, which has significant policy consequences [8].

2.3 The Theory of Counter-Impact by Myrdal

According to Myrdal, economic growth results in a causal process that increases profits for the wealthy while hindering the progress of underdeveloped or backward societies. The impact is spreading less and the pushback is growing. Regional disparity in impoverished nations will likely come from this scenario, which is also likely to aggravate global inequality. According to Myrdal, a counterimpact is a negative shift in economic growth brought on by factors outside the affected area. The growth momentum that spreads centrifugally from economic development hubs to neighboring regions is referred to as spread impact. According to Myrdal, the weakening of the spread impact on developing nations and the strength of the backlash are the key contributors to regional inequality [10].

2.4 Growth Pole Theory

According to the growth pole idea, a group of sectors can propel economic progress in a nation if those industries have strong forward and backward links to more successful ones. Francois Perroux proposed the growth pole theory (1950). The growth that takes place will propagate through specific channels, which can then have an impact on the economy as a whole due to centrifugal force (spread effect/trickle down effect) and

centripetal force (polarization effect/backwash effect) on both the inside and outside. Economic growth will be aided by regional development in growth hubs, which will then spur regional development in the region's surroundings. This is so that the spread effect from the growth center to the surrounding area can be affected. Thus, the region also expands and changes [11].

2.5 Cumulative Causation Theory

The theory of cumulative causation provides insight into how industrialization has affected socioeconomic processes that follow a circulative-cumulative pattern. Myrdal (1957) used the words spread effect and backwash effect in his analysis. When economic progress takes place in a nation, there are two possible outcomes: either the spread impact or trickle-down effect, also known as the spread effect, or a worsening of the economic position for impoverished areas, also known as the backwash effect [11].

The backwash effect is the shift of industrial infants to developed areas, a decline in per capita income in the surrounding area, and the migration of educated and professional workers to developed areas. These events lead to a labor shortage. The positive effect that can result comes in the form of labor migration, which affects the local economy positively by lowering the unemployment rate, raising demand for raw resources and agricultural goods, and boosting investment and per capita income. Weakening the backwash effect will cause the cumulative cyclic process to go upward, reducing regional inequality [11].

2.6 Linkage Effect and Industrial Effect Theory

The degree to which certain economic functions are prevalent in each location is what contributes to uneven economic growth. Group industries exist in regions where growth is occurring, and they provide advantages such as cost savings and ease of activity. In locations that become development centers and subsequently spread to the surrounding areas, economic growth can emerge quickly. Polarization and the trickling-down effect are two effects of the growth center that are felt throughout the neighborhood. Polarization is felt when there is a larger flow of activity into the growing center than there is toward the surrounding area. The trickling-down effect, meantime, happens when the growth point spreads development throughout the surrounding area. According to Hirschman (1958), the trickling down effect can outweigh the effects of polarization. By establishing more growth centers, it is possible to affect effective development distribution [11].

2.7 Regional Income

According to Article 1 Number 18 of Law No. 33 of 2004 Concerning Financial Balance Between the Central and Regional Governments, Regional Original Income is income obtained and collected in compliance with regional legislation. Local taxes, regional levies, segregated wealth management, and other legal regional income are the primary sources of regional income as defined in Law No. 33 of 2004's article 157 governing local government [12].

2.8 Dependency Ratio

The population of productive age is contrasted with the population of unproductive age to determine the dependency ratio. The productive age range is from 15 to 64 years, whereas the unproductive age group includes people under the age of 14 and people above the age of 65. The group of persons who are of working age and able to earn money to support themselves is referred to as the labor force. In the meantime, the unproductive age group of the population is referred to as the "non-labor force," which does not generate enough revenue to get by. The increased dependency ratio shows that the amount of work required of the people in productive age is rising. The reduced dependency ratio, therefore, indicates a reduction in the load placed on the population of productive age [13].

2.9 Construction Cost Index

Constructions cost index is a comparison of the construction price level of each district/city against the reference city. The constructions cost index is used to determine how difficult a location's geography, the more difficult a location's geography, the higher the area's price level [14].

2.10 Poverty

When a person cannot afford to meet their basic dietary requirements, they are said to be in a state of poverty. If the population's average monthly per capita spending falls below the poverty level, the population is categorized as being impoverished. The basic needs method is the notion used to calculate the level of poverty. This idea refers to the Worldbank publication entitled "Handbook on Poverty and Inequality." People are categorized as being impoverished if they have subpar health, suffer from malnutrition, have low literacy rates, reside in slums, are underrepresented in politics, and work for meager wages on marginal farms or in slums [15].

There are two types of poverty: absolute poverty and relative poverty. In order to survive and get employment, a person must be able to provide for their most basic necessities, including food, shelter, health care, and education. To compare overall poverty, the absolute poverty line is utilized. If two nations utilize the same poverty standard, i.e., the absolute poverty line, then the rates of poverty in the two nations can be compared. The World Bank compares national poverty rates using absolute poverty thresholds. This is helpful for figuring out how financial resources are currently distributed as well as for tracking the development of the fight against poverty.

Relative poverty is a state of poverty brought on by the influence of development strategies that have not been successful in reaching all spheres of society, leading to unequal income distribution. The lowest 20 or 40 percent of the entire population, as determined by income or expenditure, represent the impoverished class of citizens, and minimum standards are set according to the living conditions of a nation at any particular period. So, relative poverty has an impact on how people distribute their income. Since income distribution essentially serves as a gauge for relative poverty, it is one of the crucial factors that must be taken into account while addressing the issue of poverty [4].

2.11 The Relationship Between Regional Income and Income Inequality

One of the variables that can impact the inequality of income distribution is regional native income. The capacity of a region to produce income varies. This is determined by the various levels of resource wealth that each region possesses. High or low intensity economic activity can also affect a region's ability to provide a range of earnings. As a result, the level of economic inequality varies depending on the growth capabilities of each location [16].

Studies on the connection between local indigenous income and economic disparity abound. According to research by [17], local indigenous income has a detrimental impact on income inequality. As a result, income inequality will decline if the original regional income rises. This research is backed up by research [18] that shows how incomes that have grown significantly can be used to finance government spending in order to alleviate income disparity and combat societal unhappiness. The government should focus more on initiatives that help boost local income in order to lessen regional income disparities.

2.12 The Relationship Between Dependency Ratio and Income Inequality

The dependency ratio is a crucial demographic marker. The high dependency ratio demonstrates the growing responsibility placed on the people of working age. The percentage of dependency is also declining, indicating a lessening of the load placed on the population of working age [19].

According to research by [13], there is a correlation between the dependency ratio and income disparity. The income distribution gap has widened as a result of the rising dependency ratio. The unproductive age population group can result in a decrease in the growth of real gross domestic product (GDP).

2.13 The Relationship Between Poverty and Income Inequality

Poverty and income inequality are intimately related. Because of the rise in the number of the impoverished, income disparity in society is becoming more obvious. In other words, the income gap is getting wider. Therefore, it is anticipated that the population of those living in poverty will decline, resulting in a more equitable distribution of income within the community [20].

There are numerous research on the connection between economic inequality and poverty. According to a study by [20], there is a positive correlation between poverty and income inequality. As a result, income inequality will rise along with the poverty rate. On the other hand, if the poverty rate falls, income disparity will as well. In addition, research conducted by [21] found that low levels of poverty will have an impact on increasing income inequality. [22] discovered that the impoverished had a detrimental impact on income inequality, which lends validity to this research. That is, income disparity declines as the population of the impoverished rises. In contrast, income disparity will rise as the proportion of those living in poverty decreases.

Based on the findings of earlier research, it can be said that there are both good and negative findings in the relationship between the number of impoverished people and income disparity. The study found that the number of impoverished people had little

impact on income inequality. In other words, the distribution of income is not affected by changes in the number of impoverished individuals.

2.14 The Relationship Between Accessibility and Income Inequality

Accessibility refers to how easy it is to conduct economic activities like economic growth and development in a certain place. Because of the area's improved accessibility, changes there are advancing, especially in the economic sector [23]. The availability of accessibility will make it simpler for people to raise their standard of living. Income levels and accessibility have a close link. Accessibility is growing, which may also mean that there are more opportunities for people to earn more money. Accessibility serves as a benchmark for the convenience of travel when engaging in activities to meet needs brought about by the interaction of land use and transportation network systems [24].

3 Research Method

In this study, the Entropy Theil Index, which functions as a dependent variable, was used to measure income inequality. The degree of income inequality is relatively low or the distribution of people's incomes is getting more evenly distributed when the theil entropy index value gets closer to 0. However, if the theil entropy index value is close to 1, the level of income disparity in the area is considerable. Theil entropy index calculates income inequality using the following formula:

$$\mathrm{IET} = \Sigma y_j/Y.\log\left[\left(y_j/Y\right)/\left(x_j/X\right)\right]$$

Description:
y_j = GRDP per capita of each Regency/City
Y = Average GRDP per capita of East Java province
x_i = Total population of Regencies/Cities
X = Total population of East Java province

The analysis method used in this study is panel data regression, with the following econometric model:

$$\begin{aligned}\mathrm{Log(IET)_{it}} &= \beta 0 + \beta 1\ \log(\mathrm{RI})it + \beta 2\ \log(\mathrm{PPP})_{it} + \beta 3\ \log(\mathrm{DR})it \\ &+\ \beta 4\ \log(\mathrm{CCI})it + \beta 5\ \log(\mathrm{POV})_{it} + \varepsilon_{it}\end{aligned}$$

Description:

IET = Index Entropy Theil
RI = Regional Income (Million Rupiah)
PPP = Purchasing Power Parity (thousand rupiah)
DR = Dependency Ratio
CCI = Construction Cost Index
POV = Poverty
β_0 = Constanta

$\beta_1 \ldots \beta_5$ = Regression Coefficient
it = panel data

Secondary data, or data collected inadvertently based on information that has been compiled and published by certain authorities, is used in this study. Panel data, which combines cross-sectional and time-series data, is the type of data used. Seven residences in the province of East Java are included in the cross-section data for this study. The time series data spans the years 2017 through 2021. Data on Income Inequality, Regional Income, Purchasing Power Parity, Dependency Ratio, Construction Cost Index, and the Number of impoverished People are among the statistics that were used. The Central Statistics Agency and the Directorate General of Financial Balance of the Ministry of Finance provided this information.

The Chow test and the Hausman test are used in the estimate stage of panel data regression analysis to choose between the Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM) approaches the optimum estimation model. If the Hausman test and Pooled Least Square (PLS) model are chosen as the Random Effect Model (REM) in the Chow test, then a Lagrange Multiplier (LM) test is conducted to determine which model estimate from Pooled Least Square (PLS) and Random Effect Model (REM) is the best.

4 Result and Discussion

4.1 Analysis Result

The direction and magnitude of the influence of Regional Native Income, Purchasing Power Parity, Dependency Ratio, Construction Cost Index, and Poverty on Income Inequality between residency areas in East Java province in 2017–2021, is estimated by Panel Data Regression analysis, which econometric model formulation or estimator model is as follows:

$$\begin{aligned}\text{Log(IET)}_{\text{it}} = &\beta 0 + \beta 1 \log(\text{RI})it + \beta 2 \log(\text{PPP})_{\text{it}} + \beta 3 \log(\text{DR})it \\ &+ \beta 4 \log(\text{CCI})it + \beta 5 \log(\text{POV})_{\text{it}} + \varepsilon_{\text{it}}\end{aligned}$$

Chow Test

An estimated Pooled Least Square (PLS) or Fixed Effect Model (FEM) model is chosen using the Chow test. Pooled Least Square (PLS) is the estimated model according to the H_0 Chow test, while the Fixed Effect Model (FEM) is the estimated model according to the H_A. H_0 is accepted if the p-value, probability or statistical empirical significance of $F > \alpha$; H_0 is rejected when the p-value, probability or statistical empirical significance of $F \leq \alpha$.

Table 1. Analysis Result Data Panel

Variable	Coefficient		
	PLS	**FEM**	**REM**
C	-13.38162	-4.900239	-13.83186
logRI	0.071496	0.048530	0.042825
logPPP	0.343624	-0.105121	-0.083393
logDR	3.017161	0.315069	1.838558
logCCI	-1.469711	0.137747	0.195625
logPOV	-0.190468	-0.004701	0.012171
R^2	0.981349	0.999967	0.856615
Adj R^2	0.977110	0.999945	0.824028
F-statistic	231.5064	44443.58	26.28670
Prob F-stat	0.000000	0.000000	0.000000

Source: Processed Result E-Views 9

Table 2. Chow Test Result

Redundant Fixed Effects Tests (Chow test)			
Effects Tests	Statistic	d.f.	Prob.
Cross-section F	1517.102771	(6,16)	0.0000
Cross- section Chi-square	177.673571	6	0.0000
$R^2 = 0.981349$; F-Stat = 231.5064; Sig. F-Stat = 0.000000			

Source: Processed Result E-Views 9

Table 2 shows that H_0 is rejected because F has a p-value of 0.0000 (< 0.01), which is the probability or statistical empirical significance of F. Consequently, the Fixed Effect Model (FEM) is the estimated model.

Hausman Test

Table 3. Hausman Test Result

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.718129	5	0.1725
$R^2 = 0.999967$; F-Stat = 44443.58; Sig. F-Stat = 0.000000			

Source: Processed Results E-Views 9

The estimated Fixed Effects Model (FEM) or Random Effects Model (REM) is chosen using the Hausman test. The estimated models are the Fixed Effects Model (FEM) and the Random Effects Model (REM), respectively, according to the Hausman test H_0. If the p value, probability, or empirical statistical significance is $\chi^2 > \alpha$, H_0 is accepted; otherwise, H_0 is rejected.

Table 3 shows that H_0 is accepted because the p value, probability, or empirical statistical significance χ^2 is 0.1725 (>0.10). Consequently, the Random Effects Model (REM) is the estimated model. To determine which of the three estimation models in Table 1 is the best based on the results of the Chow test and Hausman test, the Lagrange Multiplier test must be run.

Lagrange Multiplier Test

The Prob.Chi-Square value with the Breusch-Pagan method of 0.0000 can be used to determine the outcomes of the lagrange multiplier test in Table 4. As may be seen, Prob.Chi-Square is 0.0000 < 0.05.

Therefore, the Random Effect Model (REM) is the optimal estimation model. Table 5 displays the following outcomes of the Random Effect Model (REM) test.

Existence Model Test (F Test). In the panel data regression analysis, the effect of the independent variables on the dependent variable was assessed using the model's

Table 4. Lagrange Multiplier Test Results

Lagrange Multiplier Tests for Random Effects			
	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	24.92477 (0.0000)	0.156196 (0.6927)	25.08097 (0.0000)

Source: Processed Result E-Views 9

Table 5. Estimation for the Random Effect Model

$$\log IET_{it} = -13.83186 + \underset{(0.0151)^{**}}{0.042825}\log RI_{it} - \underset{(0.2689)}{0.083393}\log PPP_{it} + \underset{(0.0000)^{*}}{1.838558}\log DR_{it} + \underset{(0.0029)^{*}}{0.195625}\log CCI_{it} + \underset{(0.7759)}{0.012171}\log POV_{it}$$

$R^2 = 0.856615$; $DW = 1.511508$; $F. = 26.28670$; Prob. $F = 0.000000$

Source: Processed Result E-Views 9. **Note:** *Significant α = 0.01; **Significant α = 0.05; ***Significant α = 0.10

existence (F test). When at least one independent variable influences the dependent variable, the model is present (not all regression coefficients are zero). The wording of the hypothesis is H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$, which means that all regression coefficients are zero or the model does not exist because the econometric model has five independent variables. In light of this, income disparity is unaffected by local revenue, purchasing power parity, dependence ratio, construction cost index, or the total number of impoverished people. H_A: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ denotes the existence of the model or the presence of at least one regression coefficient that is not zero. Income disparity is thus influenced by local revenue, purchasing power parity, dependence ratio, construction cost index, and the total number of impoverished individuals. If the p value, probability, or statistical empirical significance of $F > \alpha$, H_0 will be accepted; otherwise, H_0 will be rejected.

According to Table 5, H0 is rejected since the model existence test (F test) findings showed that the p value, probability, or empirical significance of the F statistic is 0.0000 (<0.01). In this manner, the estimated Random Effect Model (REM) model is present. As a result, income inequality is influenced by local revenue, purchasing power parity, dependence ratio, construction cost index, and the total number of impoverished individuals.

R-Squared Interpretation. The predicted model's predictability is shown by the coefficient of determination (R^2). It is clear from Table 5 that the R^2 value is 0.856615. This suggests that the variables of local income, purchasing power parity, dependence ratio, construction cost index, and the number of impoverished individuals may account for 85.66% of the variation in the variables of income inequality. 14.34% of the total, or other variables or factors not taken into account by the model, affect the remaining data.

Validity Test. The Random Effect Model (REM) was determined to be the optimum estimation model based on the outcomes of the estimation selection. The outcomes of the t-test for the random effect model are shown in Table 6.

As shown in Table 6, the t-test random effect model (REM) results are as follows:

1. The significance value of the local revenue variable is $0.0151 < 0.05$. H_0 is therefore disregarded, indicating that the regional original income variable has some influence on the income inequality variable.
2. With a t-value of $0.2689 > 0.10$, the purchasing power parity variable is statistically significant. H_0 is therefore accepted, indicating that the purchasing power parity variable has a limited impact on the income inequality variable.

Table 6. Results of the validity test random effect model

Variable	Coef.	Sig. t	Criteria	Conclusion
logRI	0.042825	0.0151	<0.05	Significant on $\alpha = 0.05$
logPPP	-0.083393	0.2689	>0.10	Not Significant on $\alpha = 0.10$
logDR	1.838558	0.0000	<0.01	Significant on $\alpha = 0.01$
logCCI	0.195625	0.0029	<0.01	Significant on $\alpha = 0.01$
logPOV	0.012171	0.7759	>0.10	Not Significant on $\alpha = 0.10$

Source: Processed Result E-Views 9

3. The t significant value for the dependence ratio variable is 0.0000 < 0.01. Therefore, H_0 is disproved, indicating that the dependency ratio variable has a modest impact on the income inequality variable.
4. The significance value of the building cost index variable is 0.0029 < 0.01, H_0 is therefore disregarded, indicating that the building cost index variable has a limited impact on the income inequality variable.
5. The t significant value for the variable "number of impoverished people" is 0.7759 > 0.10. Therefore, H_0 is accepted, indicating that the variable number of impoverished individuals has a limited impact on the variable measuring income disparity.

4.2 Interpretation Variables

The dependency ratio variable's coefficient value is 1.838558, which means that if the dependency ratio variable rises by 1% while other factors stay the same, income inequality will also rise by 1.838558%. On the other hand, if the dependency ratio variable goes down by 1%, income inequality goes down by 1.838558%. According to the findings of panel data regression analysis, there is a positive and substantial relationship between the dependency ratio and income inequality. The regression coefficient demonstrates this, and the significant value of t is 0.0000 < 0.01. A positive value for this variable indicates that there is a direct correlation between the reliance ratio and income inequality, meaning that as the dependency ratio rises, so does income inequality. The findings of this study are consistent with research by [13], which discovered a positive association between the dependency ratio and income inequality, indicating that as the dependency ratio rises, income disparity will increase. The findings of this study, however, are in direct opposition to studies by [25] and [19], which concluded that the population's dependency ratio had no bearing on income inequality. The high dependency ratio shows that the strain placed on the population in the productive age group is growing. Meanwhile, if the dependency ratio is smaller, the productive age population will bear less of the financial burden associated with the costs of the unproductive age group [13]. Because there is volatility between the revenue earned and the expenses that must be incurred to meet the demands of both productive and unproductive age, this dependency ratio may have an impact on income disparity. Therefore, if the dependency ratio rises, the amount of income disparity will also rise.

The regional original income variable has a regression coefficient value of 0.042825, which indicates that if other factors remain constant while the regional original income variable increases by 1%, income inequality will also increase by 0.042825%. On the other hand, the income inequality will also fall by 0.042825% if the regional original income drops by 1%. According to the findings of panel data regression analysis, local revenue will have a positive and significant impact on the disparity in income between residential regions in East Java Province between 2017 and 2021. The direction of the regression coefficient and the significant value of t, which is 0.0151 < 0.05, both indicate this. Local revenue has a direct association with this variable if the regression coefficient is positive. This study is consistent with earlier research [17] that discovered a negative association between local original income and income inequality on the island of Sumatra. In other words, if the initial regional income rises, the income disparity will go down or the distribution of income will become more evenly distributed. The local

original income variable, according to study by [16], has a favorable and significant impact on income disparity.

The variable number of impoverished people's regression coefficient value is 0.012171, which means that if the variable number of impoverished people rises by 1% while other factors stay the same, income inequality will also rise by 0.012171%. The number of impoverished people, however, has no impact on income inequality, as indicated by the significance value of t being $0.7759 > 0.10$ so that the degree of income disparity is unaffected by the size of the coefficient of the number of impoverished individuals. The number of impoverished people in East Java Province in 2017–2021 has no discernible impact on the inequality of income distribution amongst residency areas, according to the findings of this study's panel data regression analysis. The findings of this study are consistent with earlier research [7] that found no relationship between the number of impoverished people and income inequality. The findings of this study, however, conflict with those of a study by [20], which discovered that poverty had a large and partial favorable impact on income inequality in Indonesia. Researchers [6, 22], and others also discovered that poverty has a negative and considerable impact on income disparity. One of the elements that influences the unequal distribution of income is poverty. This occurs when the community's bare necessities cannot be satisfied. The percentage of people living in poverty will decline as communal income rises. This indicates that the neighborhood has been able to provide for its basic necessities [20]. Increased economic growth may be aided by the province of East Java's developing more sophisticated manufacturing sector. This has an effect on lowering the amount of poverty in the East Java province [7].

The purchasing power parity variable's regression coefficient value is -0.083393, which means that if it rises by 1% while other factors stay the same, income inequality will fall by 0.083393%. On the other side, income inequality will rise by 0.083393% if purchasing power parity declines by 1%. However, if the significance level of the t variable for buying power parity is $0.2689 > 0.10$, then there is no impact of purchasing power parity on income inequality. so that the degree of income disparity is unaffected by the purchasing power parity coefficient's value.

The building cost index variable has a regression coefficient value of 0.195625, which indicates that if other factors remain constant while the construction cost index variable grows by 1%, income inequality will also increase by 0.195625%. On the other hand, income inequality will also reduce by 0.195625% if the construction cost index drops by 1%. The construction cost index variable has a positive and significant impact on income disparity between areas in East Java Province in the years 2017–2021, according to the findings of panel data regression analysis. The significant value of t of $0.0029 < 0.01$ demonstrates this. When the regression coefficient is positive, it means that there is a direct correlation between the building cost index and income inequality.

5 Conclusion

The following inferences can be made based on the discussion of the regression analysis's findings about the impact of regional original income, purchasing power parity, dependence ratio, construction cost index, and poverty on income inequality between residency areas in East Java province:

1. According to the entropy theil index calculation, income inequality between residential regions in the province of East Java from 2017 to 2021 is categorized as having a reasonably low level of inequality.
2. In order to appropriately estimate the effect of the independent variable on the dependent variable in this study, the Random Effect Model (REM) method was selected.
3. The Random Effect Model (REM) estimated model passes the model existence test (F test), according to the results.
4. The validity test (t test) results indicate that local revenue, dependence ratio, and construction cost index are the independent variables that have an impact on income inequality between residential regions in East Java province in 2017–2021. While the number of impoverished people and Purchasing Power Parity (PPP) have little bearing on income disparity between resident areas in East Java Province from 2017 to 2021.
5. The value of local revenue, dependence ratio, and construction cost index have a substantial impact on income disparity between residence areas in East Java province in 2017–2021, according to the effect validity test (t test) at a significance of (α) 0.01 and 0.05.

Acknowledgments. The author is aware that many people provided assistance and support for this research project to be completed. On this occasion, the author wishes to offer his deepest thanks to Prof. Dr. Anton Agus Setyawan, M.Sc., the Dean of the Faculty of Economics and Business, and Prof. Dr. Sofyan Anif, M.Si., the Chancellor of the Muhammadiyah University of Surakarta.

References

1. M. Arif and R. A. Wicaksani, "Ketimpangan Pendapatan Propinsi Jawa Timur dan Faktor-faktor yang Mempengaruhinya," Univ. Res. Colloq., pp. 323–328, 2017.
2. Y. A. Ramadhan and S. W. Sulistyono, "Jurnal Ilmu Ekonomi (JIE)," J. Ilmua Ekon., vol. 5, pp. 763–772, 2021.
3. A. M. Damanik, Zulgani, and Rosmeli, "Faktor-Faktor yang Mempengaruhi Ketimpangan Pendapatan Melalui Pertumbuhan Ekonomi di Provinsi Jambi," E-Jurnal Perspekt. Ekon. Dan Pembang. Drh., vol. 7, no. 1, pp. 15–25, 2018.
4. S. Sukirno, "Makroekonomi," Jakarta: PT. Raja Grafindo Persada, 2013.
5. D. S. D. Kusuma, S. N. Sarfiah, and Y. Septiani, "Analisis Pengaruh Produk Domestik Regional Bruto (PDRB), Inflasi, dan Indeks Pembangunan Manusia (IPM) Terhadap Ketimpangan Pendapatan di Daerah Istimewa Yogyakarta Tahun 2011–2017," Din. Dir. J. Econ., vol. 1, no. 3, pp. 338–347, 2019.
6. A. I. Pradipta and R. S. Wijaya, "Faktor Yang Mempengaruhi Ketimpangan Pendapatan Melalui Pertumbuhan Ekonomi di Provinsi Daerah Istimewa Yogyakarta," Ekonomika, vol. 6, no. 1, pp. 110–122, 2022.
7. W. P. Kurniawati, "Analisis Ketimpangan Pendapatan di Provinsi Jawa Timur Tahun 2016–2020," 2022.
8. Sjafrizal, Ekonomi Regional Teori dan Aplikasi. Padang: Badous Media, 2008.
9. L. Arsyad, Ekonomi Pembangunan. Yogyakarta: STIE YKPN, 2010.

10. L. Fitriyah and L. Rachmawati, "Analisis Ketimpangan Pembangunan Daerah Serta Hubungannya Dengan Kesejahteraan Masyarakat Di Kawasan Gerbangkertosusila Provinsi Jawa Timur," J. Pendidik. Ekon., vol. 13, pp. 1–16, 2013.
11. M. H. M. Qibti and R. M. Hendarto, "Analisis Spillover Effect Pertumbuhan Ekonomi Antar Kabupaten/Kota di Kawasan Purwomanggung Jawa Tengah Tahun 1988–2018," Diponegoro J. Econ., vol. 9, no. 4, 2020, [Online]. Available: https://ejournal2.undip.ac.id/index.php/dje.
12. E. Adyatma and R. M. Oktaviani, "Pengaruh Pendapatan Asli Daerah dan Dana Alokasi Umum Terhadap Belanja Modal Dengan Pertumbuhan Ekonomi Sebagai Pemoderasi," Din. Akuntansi, Keuang. dan Perbank., vol. 4, no. 2, pp. 190–205, 2015.
13. R. B. Utami, "Analisis Pengaruh Angka Beban Ketergantungan, Kepadatan Penduduk, Garis Kemiskinan Terhadap Indeks Gini Di Indonesia," Med. Technol. Public Heal. J., vol. 4, no. 2, pp. 212–223, 2020, doi: https://doi.org/10.33086/mtphj.v4i2.806.
14. BPS, "Indeks Kemahalan Konstruksi Provinsi Dan Kabupaten/Kota." https://www.bps.go.id/publication/2021/10/01/5c4a07aac6a0ab5df7987dcf/indeks-kemahalan-konstruksi-provinsi-dan-kabupaten-kota-2021.html.
15. BPS, "Penduduk Miskin," 2022. https://jatim.bps.go.id/subject/23/kemiskinan-dan-ketimpangan.html (accessed Sep. 23, 2022).
16. R. Juliana and A. Soelistyo, "Analisis Pengaruh Pertumbuhan Ekonomi, Jumlah Penduduk, PAD, IPM, dan UMK terhadap Ketimpangan di Provinsi Banten," J. Ilmu Ekon., vol. 3, no. 2, pp. 293–300, 2019.
17. E. Sari, "Analisis Faktor-Faktor Yang Mempengaruhi Ketimpangan Pendapatan Di Pulau Sumatera Tahun 2011–2015," Prodi Ekon. Pembang. – S1 Fak. Ekon. Dan Bisnis Univ. Muhammadiyah Surakarta, no. April, pp. 1–11, 2017.
18. N. putu V. S. Putri and I. K. S. Natha, "Pengaruh Pendapatan Asli Daerah, Dana Alokasi Umum dan Belanja Modal Terhadap Ketimpangan Pendapatan," E-Jurnal Ekon. Pembang. Univ. Udayana, vol. 4, no. 1, pp. 41–49, 2014.
19. D. E. Saputra, "Determinan Disparitas Distribusi Pendapatan Penduduk di Pulau Jawa Tahun 2012–2018," Skripsi, 2021.
20. H. Hindun, A. Soejoto, and H. Hariyati, "Pengaruh Pendidikan, Pengangguran, dan Kemiskinan terhadap Ketimpangan Pendapatan di Indonesia," J. Ekon. Bisnis dan Kewirausahaan, vol. 8, no. 3, p. 250, 2019, doi: https://doi.org/10.26418/jebik.v8i3.34721.
21. A. Afandi, V. P. Rantung, and H. Marashdeh, "Determinant of income inequality in Indonesia," Econ. J. Emerg. Mark., vol. 9, no. 2, pp. 159–171, 2017, doi: https://doi.org/10.20885/ejem.vol9.iss2.art5.
22. S. R. Ningsih and E. Setyowati, "Income Inequality of West Java Province and the Factors That Affect It," pp. 138–147, 2022.
23. W. D. Anggraini, A. Jumiati, and E. Santoso, "Analisis tipologi, struktur dan aksesibilitas wilayah di kabupaten Jember," 2012.
24. S. Dewi, "Pengaruh Aksesibilitas dan Kelengkapan Fasilitas terhadap Pedagang Muslim di Pasar Jekulo Kudus," 2017.
25. Mujahid, Rizali, and N. Rahmini, "Pengaruh Pertumbuhan Ekonomi, Rasio Ketergantungan Penduduk, Rasio Belanja Modal dan Dana Desa Terhadap Distribusi Pendapatan Kabupaten/Kota Di Provinsi Kalimantan Selatan," Syntax Lit., vol. 7, no. 1, pp. 1064–1078, 2022.