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Analysis of the Effect of HDI and Road Length Infrastructure Development on Improving Economic Inequality in Eight Districts of the Region La Pago Tradition

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ABSTRACT

The objective of this research is to examine the impact of human development index and road length infrastructure development on the reduction of economic inequality, as shown by general publication, throughout the period from 2013 to 2022. The inclusion of secondary data is essential in order to provide a comprehensive explanation or response to the research inquiry. The present work used a panel data model with a linear regression methodology, namely the ordinary least squares (OLS) method, for data analysis. The findings indicate that there is a substantial positive relationship between the Human Development Index (HDI) and the improvement of economic inequality. The regression coefficient for HDI is 0.003326, and it is statistically significant with a probability value of 0.0000, which is less than the conventional significance level of 0.05. The length of roads (X2) has a positive impact on the enhancement of economic inequality (Y), as shown by a regression coefficient of 0.00000143 or 1.43E-06. However, this relationship is not statistically significant, as the probability value (Prob.) of 0.2974 is greater than the conventional significance level of 0.05.

Keywords: Economic Inequality Improvement, HDI, Road Length Infrastructure

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INTRODUCTION

Hamid and Anto (1977) stated that the greater income inequality will result in increased relative poverty and reflect the existence of unfairness and inequality in the distribution of development results. In 2022 the gini ratio value in the eight districts of La Pago's indigenous territory lies at 0 Table 1.1. Jayawijaya 0.386%, Yahukimo 0.357%, Yalimo 0.343%.

Tabel 1.1. Gini Gini Ratio by District/City of La Pago Customary Area of Papua Mountainous Province (Percent) 2013-2022

Tahun	Jayawi Jaya	Yahu kimo	Pegunu ngan Bintang	Tolikara	Nduga	Lani Jaya	Mambe ramo Tengah	Yalimo	Papua
2013	0,367	0,271	0,146	0,198	0,199	0,181	0,234	0,259	0,442
2014	0,366	0,299	0,220	0,218	0,222	0,224	0,257	0,212	0,408
2015	0,397	0,257	0,268	0,363	0,222	0,299	0,274	0,135	0,421
2016	0,337	0,251	0,288	0,381	0,249	0,275	0,270	0,193	0,390
2017	0,331	0,332	0,336	0,299	0,212	0,309	0,225	0,247	0,397
2018	0,318	0,400	0,380	0,361	0,212	0,232	0,248	0,337	0,384
2019	0,318	0,414	0,373	0,340	0,188	0,297	0,248	0,320	0,394
2020	0,342	0,394	0,448	0,388	0,188	0,281	0,330	0,362	0,392
2021	0,344	0,336	0,344	0,291	0,231	0,293	0,320	0,363	0,397
2022	0,386	0,357	0,252	0,299	0,271	0,265	0,287	0,343	0,406

Source: National Socio-Economic Survey (SUSENAS).

The passage highlights the significance of the Human Development Index (HDI) in the context of modern economic growth, as discussed by Suriadi (2019). The author emphasizes a strong correlation between the optimization of production parameters and the quality of human development. In essence, the argument posits that when human growth is marked by positive traits and advancements, it creates an environment conducive to the optimal utilization of production components.

Furthermore, the narrative delves deeper into the importance of having a population characterized by superior attributes. A population with innate traits associated with positive human development is deemed crucial. Such a population not only maximizes the utilization of current production components but also exhibits a propensity for fostering innovation. This innovation, in turn, acts as a catalyst for the ongoing advancement and improvement of the existing industrial environment.

In summary, the passage underscores the integral role of human development in shaping economic growth. It suggests that a population with positive traits not only optimizes current production but also contributes to innovation, driving continuous progress in the industrial landscape.

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Tabel 1.2. Human Development Index (HDI) (Percent) of the Indigenous Territory of La Pago Mountainous Papua Province 2013-2022

Tahun	Jayawi Jaya	Yahu kimo	Pegunungan Bintang	Tolikara	Nduga	Lani Jaya	Mamberamo Tengah	Yalimo	Papua
2013	52,94	45,63	38,94	45,68	24,42	43,05	62,43	43,33	56,25
2014	73,37	46,36	39,68	46,16	75,38	43,28	43,19	44,21	56,75
2015	74,18	46,63	40,91	46,38	25,47	44,18	73,55	44,32	57,25
2016	54,96	47,13	41,90	47,11	26,56	45,16	44,15	44,95	58,05
2017	55,99	47,95	43,24	47,89	27,87	46,49	45,50	46,19	59,09
2018	56,82	48,51	44,22	48,85	29,42	47,34	46,41	47,13	60,06
2019	57,79	49,25	45,21	49,68	30,75	48,00	47,23	48,08	60,84
2020	58,03	49,37	45,44	49,50	31,55	47,86	47,57	48,34	60,44
2021	58,67	49,48	46,28	49,60	32,84	48,68	48,32	49,01	60,62
2022	71,24	50,25	47,21	50,51	34,10	49,62	49,25	49,90	71,39

Source: BPS, Human Development Index Publication Series.

The passage discusses the comparison between Gini ratio data and Human Development Index (HDI) data for the year 2022 in the La Pago customary region, specifically focusing on Jayawijaya and Nduga districts. Notably, Jayawijaya is identified as having the highest mean HDI value at 71.24%, while Nduga exhibits the lowest value at 34.10%. These findings underscore the significant impact of the Human Development Index in addressing economic disparity among the eight districts within the La Pago customary region.

Additionally, the text emphasizes the crucial role of road infrastructure in influencing the distribution of products and services. This perspective is supported by the work of Suripto and Lestari (2019), who highlight the strategic importance of road infrastructure as a vital connector between different locations. The presence of well-developed road networks is argued to expedite the movement of economic activities and enhance overall accessibility.

In summary, the passage provides insights into the varying Human Development Index values across districts in the La Pago region, illustrating the role of HDI in mitigating economic disparities. It also links the distribution of goods and services to the importance of road infrastructure, drawing on the research of Suripto and Lestari (2019).

Tabel 1.3. Road Length by District/City and Level of Government Authority (KM) in La Pago Customary Area 2013-2022

Tahun	Jayawi Jaya	Yahu kimo	Pegunungan Bintag	Toli kara	Nduga	Lani Jaya	Mamberamo Tengah	Yalimo	Papua
2013	602,75	399,00	146,00	217,90	256,00	551,14	334,00	148,25	8781,02
2014	602,75	399,00	146,00	1217,9	256,00	551,14	334,00	1485,5	8781,02
2015	150,60	18,50	44,00	63,30	161,00	31,10	34,10	98,00	2957,78
2016	150,60	18,50	44,00	63,30	161,00	31,10	34,10	98,00	2957,78

2017	150,60	18,50	44,00	63,30	161,00	31,10	34,10	98,00	2957,78
2018	150,60	18,50	44,00	63,30	161,00	1942,1	34,10	98,00	2957,78
2019	526,73	453,90	137,40	501,00	490,90	235,8	303, 0	248,85	18 884,95
2020	526,73	453,90	137,40	501,00	490,90	235,8	303, 0	248,85	18 884,95
2021	526,73	453,90	137,40	501,00	490,90	235,8	18760	248,85	18 884,95
2022	526,73	453,90	137,40	501,00	490,90	235,8	303, 0	248,85	18 884,95

Source: BPS Papua in figures.

Infrastructure development of road length in the La Pago customary territory reached 50%. The length of the road in each district focuses on the district city while in each sub- district/district there are still many dirt roads, not connected and even many broken roads or bridges. This causes an improvement in economic inequality in the eight districts, with inadequate access in each district, the economic cycle does not run properly. Table 1.3. Jayawijaya's first road length is 526.76 km, Tolikara's second is 501.00 km, and Nduga's third is 490.90 km. Research Hypothesis: Human development index and road length infrastructure development have a positive effect on improving economic inequality in the La Pago indigenous territory. The purpose of this study is to analyze the human development index and road length infrastructure development, towards improving economic inequality in the La Pago indigenous territory.

LITERATURE RIVIEW

Human Development Index (HDI)

The passage provides an overview of the Human Development Index (HDI) and its multidimensional framework for assessing achievements in human development. The HDI considers various essential aspects of quality of life, encompassing dimensions such as health, knowledge, and living standards. HDI highlights the countries contribution to the human well-being, focusing on needs for improvement (Lind, 2019). HDI measures the overall accomplishment of one region/country within three basics dimensions of human development such as the length of life, knowledge, and status of decent standard living (Runtunuwu & Kotib, 2021).

The three-dimensional framework of the HDI incorporates interconnected variables to gauge human development comprehensively. The health dimension, for instance, is often measured by life expectancy at birth, while the knowledge dimension considers indicators like literacy rate and average years of education. The assessment of quality of life involves evaluating a community's ability to afford essential goods and services, determined by average per capita spending as an income-based indicator of progress in achieving a satisfactory quality of life (BPS, 2022).

The passage also references the Human Development Report (HDR) from 1990, which defines human development as a progressive endeavor aiming to expand the range of options available to people. These options include the ability to lead a long and well-being-oriented life, acquire knowledge, and secure essential resources for a commendable level of livelihood.

In essence, the passage underscores the comprehensive nature of the HDI in capturing various dimensions of human development, emphasizing health, knowledge, and living standards. The mention of the HDR (2018) further highlights the broader goals of human development in enhancing individuals' options and well-being.

Infrastructure Development Road Length

The passage highlights the substantial importance of roads in the domain of land transportation infrastructure, as discussed by Suriani and Keusuma in 2015. According to their findings, roads are crucial elements due to their strategic role as vital intermediaries connecting diverse geographical areas. The significance of roads lies in their ability to serve as essential links facilitating the transportation of goods and services between production centers and marketing regions. This, in turn, makes a substantial contribution to the economic growth of a region. In summary, the passage underscores the pivotal role of roads in land transportation infrastructure, emphasizing their strategic importance as connectors that facilitate the movement of goods and services, ultimately playing a key role in fostering economic growth within a region.

The passage highlights the insights from Nugraha, Prayitno, Situmorang, and Nasution (2020), as cited in Adisasmita, regarding the role of road development as a mechanism for connecting producing regions with consumers. Furthermore, it suggests that road development may serve to integrate producing regions with markets, fostering the integration of producers and consumers. The significance of transportation, particularly in the form of roads, is emphasized as paramount, playing a crucial role in facilitating connections, reconciliation, and the restoration of links between mutually dependent parties. In summary, the passage emphasizes the importance of road development in connecting producing regions with consumers and integrating producers with markets. It underscores the pivotal role of transportation, specifically through road infrastructure, in facilitating and restoring connections between various stakeholders who depend on each other.

It seems like you've provided a statement discussing the importance of enhancing connectivity in border regions through the construction of various types of roads. The argument suggests that improved transportation infrastructure, including non-status roads linking villages, district roads connecting capital cities, and provincial/national roads interconnecting districts, can have positive effects on the region. The statement highlights the role of land transportation in facilitating various activities by enabling the movement of people. The enhanced transportation infrastructure is expected to impact the mobility of individuals and the transit of goods, ultimately leading to population growth. This population growth is then seen as a driver for increased demand for goods and services. In summary, the argument revolves around the idea that improving connectivity through the construction of roads can have a cascading effect, positively influencing economic and social aspects of the border regions.

Economic Inequality

The provided passage discusses the concept of inequality as it pertains to the distribution of income or welfare. Rising economic inequality would always been a universal concern (Tadjoeddin, 2019). Economic disparities between high income and low-income groups and the poverty level have always been the major problem in developing country like Indonesia (Muhtar & Lutfi, 2021). According to Yusuf (2018), inequality is a measure of how evenly income is distributed within a population. The statement suggests that economic growth can be high even if only a specific group of people experiences an increase in income. It also notes that the overall average income may rise quickly if one group faces a decline in income but another group sees a much higher increase. The central idea is that inequality measures the disparity between the wealthiest and the poorest segments of the population. In other words, it focuses on the gap in income distribution among different groups. This perspective on economic growth and inequality underscores the importance of considering not just the overall growth in income but also the distribution of that income across different sections of society. The implication is that a more comprehensive understanding of economic development should involve an examination of how benefits are distributed among various socioeconomic groups.

The passage highlights Firdaus's (2013) assertion regarding the growing inequality in the manufacturing sector's share, signaling a concerning trend in regional economic development in Indonesia. Firdaus suggests that this increase in inequality reflects a phase akin to the maximum point of the Williamson U-curve. The Williamson U-curve is a conceptual framework that illustrates the relationship between income inequality and economic development over time. The passage implies that the government should take this development seriously. It emphasizes the concern that, according to the development plan outlined in the MP3EI document, the focus on developing the manufacturing industry, particularly high-tech industries, is predominantly centered on Java. This geographical concentration may contribute to the observed increase in inequality. In essence, the statement suggests that the unequal distribution of development efforts in the manufacturing sector, particularly favoring Java, could have adverse effects on regional economic development in Indonesia. The reference to the Williamson U-curve implies that, at this stage, the current development trajectory might lead to increased inequality, urging the government to reconsider and perhaps rebalance its regional development strategies for a more inclusive and sustainable economic growth.

The passage from Novianti & Panjaitan (2022) discusses the persistent challenge of regional inequality as a barrier to economic progress. It attributes this inequality to shifts in the economic framework and the process of industrialization. The focus of both private sector and government investments, particularly in terms of infrastructure and institutions, tends to concentrate on more advanced regions, contributing to regional disparities. The passage goes on to highlight that Indonesia has experienced consistent levels of inequality over the past 15 years, with a range of 0.3 to 0.4, indicating a medium level of inequality. Additionally, metropolitan regions are noted to exhibit higher levels of inequality compared to rural areas. The authors point out that regional inequality is often linked to developmental disparities between regions, especially between developed and undeveloped areas, citing examples such as South Kalimantan and Central Kalimantan. Furthermore, the passage introduces the concept of income inequality as a measure of differences in income, wealth, and living conditions. It notes that such disparities lead to an uneven distribution of income across different areas, impacting the correlation between the inequality index and the economic performance of the country, measured by the Gross Domestic Product (GDP). In summary, the passage underscores the challenges posed by regional inequality in Indonesia, highlighting its roots in economic shifts and industrialization processes. It emphasizes the need to address developmental disparities between regions to foster more equitable economic growth.

RESEARCH METHOD

The study employs a quantitative approach to investigate the relationship between the Human Development Index (HDI) and the road length infrastructure development index in eight districts within the La Pago indigenous region. The data utilized for this analysis is sourced from the Badan Pusat Statistik (BPS) publications of Papua Province, specifically the Figures for the years 2013-2022.

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To conduct the analysis, a panel data model is employed, utilizing a linear regression approach known as Ordinary Least Squares (OLS). The OLS method is chosen as it allows for the estimation of the relationship between variables while minimizing the sum of squared differences between observed and predicted values. The panel data model is particularly suitable for this study as it enables the examination of both cross-sectional and time-series variations across the eight districts over the specified time period. The panel model is transformed to analyze the human development index and road length infrastructure development to improve economic inequality, then the transformation becomes:

$$\text{Log }(Y)it = \beta\alpha + \beta 1X1it + \beta 2X2\ itit + e$$

Description:
(Y) it = Improvement in economic inequality β1- β2 = Regression coefficient
X1 = Human development index (HDI)
X2 = Road length infrastructure
α = Constant
i = Eight districts of La Pago customary territory t = Time period data (2013-2022)
ε = Error term

Transformed into: (Y) it = improvement in economic inequality, β1 = human development index (HDI), β2 = infrastructure development index of road length in eight districts of La Pago indigenous territory of Papua Mountain Province.

The series of statistical examinations comprises: (1) traditional tests to verify assumptions, such as normality, multicollinearity, autocorrelation, and heteroscedasticity. The method employed for establishing the estimation model, which involves choosing between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) in panel data regression, incorporates the utilization of the Chow test. The models available for consideration include the common effect model, fixed effect model, and random effect model. The procedure for opting for the Panel Data Regression Estimation Model entails the application of examinations like the Chow test, Hausman test, Lagrange multiplier test, and LM test. The evaluation of the coefficient of determination (R^2) is carried out as an integral part of the examination process.

Ghozali (2013) expounds on the significance of the coefficient of determination (R^2) as a crucial metric in assessing the effectiveness of a model in explaining fluctuations in the dependent variable. The R^2 value, residing on a continuum from 0 to 1, serves as an illuminating gauge: a lower R^2 signifies a constricted capacity of independent variables to explicate variations in the dependent variable. In an ideal scenario, an R^2 value nearing 1 signifies that the independent variables contribute substantially, providing nearly all the requisite information to forecast the dependent variable accurately.

RESULTS

Descriptive Statistical Analysis

The study employs descriptive statistical analysis to furnish a comprehensive summary of the data, focusing on key attributes such as the highest and lowest values, the average (mean), and the measure of variability represented by the standard deviation. The variables subjected to these descriptive statistics calculations are the Human Development Index (HDI, denoted as X1), road length (X2), and the improvement in economic inequality (Y).

Tabel 1. Statistik Deskriptif

Variable	Minimum	Maksimum	Mean	Std. Deviation
HDI	24,42	79,62	49,0529	10,772
Road Length	18,5	18884,95	2102,5233	5024,4693
Improving Economic Inequality	0,135	0,448	0,3039	0,073

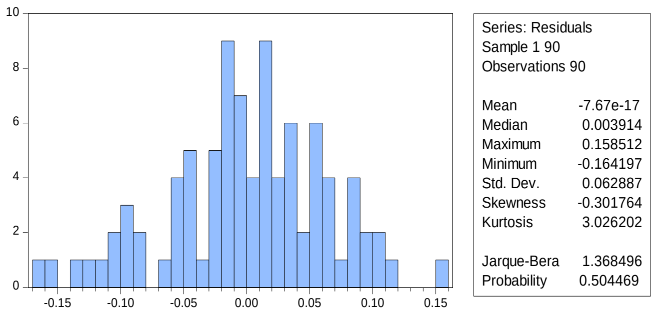
Based on Table 4.1, it is known that the minimum value of HDI is 24.42, with a maximum value of 79.62. The average HDI is 49.0529, with a standard deviation of 10.772. The minimum value of road length is 18.5, with a maximum value of 18884.95. The average road length is 2102.5233, with a standard deviation of 5024.4693. The minimum value of economic inequality improvement is 0.135, with a maximum value of 0.448. The average improvement in economic inequality is 0.3039, with a standard deviation of 0.073.

Classical Assumption Test

Normality Test

In the course of this investigation, the assessment of normality in residuals is carried out utilizing the Jarque-Bera (J-B) test, with a predetermined significance level of α = 0.05. The criteria for decision-making entail a thorough examination of the probability linked to the J-B statistic, subject to the specified conditions. If the probability value $p \geq 0.05$, then the normality assumption is met. If the probability <0.05, then the normality assumption is not met.

Figure 1. Normality Test with Jarque-Bera Test



Source: Results of EViews 10 software.

Note that based on Ficture 4.1, the probability value of the J-B statistic is 0.504469. Because the probability value p, which is 0.504469 is greater than the significance level, which is 0.05. This means that the normality assumption is met.

Multicollinearity Test

In the present study, an examination of multicollinearity symptoms is conducted through the assessment of Variance Inflation Factor (VIF) values. As outlined by Ghozali (2013), a VIF score exceeding 10 indicates the presence of multicollinearity. The findings of the multicollinearity test are presented in Table 2 for reference.

Table 2. Multicollinearity Test with VIF

Independent Variable	VIF
X1	1.061635
X2	1.061635

Source: Results of EViews 10 Software.

Table 2 demonstrates the careful assessment conducted to determine whether there is multicollinearity among the independent variables, as shown by the Variance Inflation Factor (VIF). Utilising the advanced features of EViews 10 Software, this critical study plays a crucial role in guaranteeing the strength and dependability of subsequent regression studies.

The reported data indicate that the VIF for both X1 and X2 is recorded as 1.061635. However, this numerical discovery becomes meaningful when analysed in relation to established standards. Ghozali's criteria (2013) establishes that a threshold of 10 is considered a sign of potential multicollinearity issues. Based on this benchmark, the VIF values found in the current analysis are far lower than the specified limit, indicating the lack of significant multicollinearity.

Autocorrelation Test

Table 3. Autocorrelation Test with Durbin-Watson Test

Log likelihood	121.7751	Hannan-Quinn riter	-2.605844
F-statistic	15.12213	Durbin-Watson stat	1.356924

Source: Results of EViews 10 Software.

Table 3 is a key component in the field of statistical analysis, as it helps us comprehend the complexities of autocorrelation. Autocorrelation is a phenomenom that can affect the reliability of regression models. The inclusion of this statistic, together with other statistical indicators such as log likelihood (121.7751), Hannan-Quinn criteria (-2.605844), and F-statistic (15.12213), contributes to a comprehensive comprehension of the model's performance.

Heteroscedasticity Test
The assessment of the existence of heteroscedasticity can be carried out by employing the Breusch-Pagan test, a statistical method designed to detect variance inhomogeneity. A comprehensive overview of the results obtained from the examination for heteroscedasticity using the Breusch-Pagan test is meticulously provided in Table 4 for easy reference and in-depth analysis.

Table 4. Heteroscedasticity Test with Breusch-Pagan Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Obs*R-squared	4.218253	Prob. Chi-Square (2)	0.1213

Source: Results of EViews 10 Software.

Table 4 provides a detailed analysis of heteroscedasticity assessment using the Breusch-Pagan test, shedding light on the complex nature of statistical inspection. The enhanced features of EViews 10 Software allow for a thorough assessment, revealing the intricacies inherent in the diversity of mistakes inside the regression model.

The main focus of this analysis lies on the probability chi-square value, which has been carefully recorded at 0.1213. This numerical discovery plays a crucial role in determining whether there is heteroscedasticity, a phenomenom characterised by a systematic pattern in the variety of errors. The comparison with the predefined significance level of 0.05 reveals a convincing story the probability chi-square value exceeds this threshold. The deviation from statistical significance implies a significant conclusion: there is no presence of heteroscedasticity in the sample.

Determination of Estimation Model between Common Effect Model (CEM) and Fixed Effect Model (FEM) with Chow Test

In the process of selecting the optimal model for constructing the regression model, specifically choosing between the Common Effect Model (CEM) and Fixed Effect Model (FEM), the Chow test is employed as a valuable statistical tool. This test serves as a crucial mechanism for assessing and deciding upon the most appropriate model among the Common Effect Model and Fixed Effect Model in the context of regression analysis. The hypothesis under examination is articulated as follows:

H_0: The CEM model is better than the FEM model
H_1: FEM model is better than CEM model

The following are the results based on the Chow test using EViews 10.

Table 5. Results of the Chow Test

Redundant Fixed Effects Tests			
Pool: DPANEL			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.721830	(8,79)	0.1062
Cross-section Chi-square	14.465289	8	0.0704

Source: Results of EViews 10 Software.

The guidelines for hypothesis determination are outlined as follows:
If the p-value associated with the Chi-square test statistic is below 0.05, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted. If the probability value for the cross-section Chi-square is equal to or greater than 0.05, the null hypothesis ($H0$) is accepted, and the alternative hypothesis ($H1$) is rejected.

Derived from insights garnered from the outcomes of the Chow test, as elucidated in Table 5, the computed probability value is recorded at 0.0704. Given that this probability value exceeds the conventional significance threshold of 0.05, the inference drawn is that the adopted model is the Common Effect Model (CEM). This deduction underscores the endorsement of the CEM as the apt model, signifying the absence of compelling evidence to deviate from this selection based on the results of the statistical test.

Determination of Estimation Model between Fixed Effect Model (FEM) and Random Effect Model (REM) with Hausman Test

The utilization of the Hausman test is aimed at determining the appropriateness of employing either the Fixed Effect Model (FEM) or the Random Effect Model (REM) in constructing the regression model. The results extracted from the Hausman test, conducted through EViews 10, are detailed as follows:

Table 6. Results of the Hausman Test

Correlated Random Effects - Hausman Test			
Pool: DPANEL			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.779279	2	0.4108

Source: Results of EViews 10 Software.

Table 6 the Hausman test, meticulously documented at 0.4108. This numerical revelation assumes a paramount role in the statistical analysis, serving as a gateway to discerning the most suitable model for estimation. The significance threshold of 0.05.

Determination of Estimation Model between Common Effect Model (CEM) and Random Effect Model (REM) with Lagrange-Multiplier (LM) Test
To determine whether the CEM or REM estimation model in forming the regression model, the LM test is used. The following are the results based on the LM test using EViews 10.

Table 7. Results of the Lagrange Multiplier (LM) Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	5.724794	Prob. F (2,85)	0.0047
Obs*R-squared	10.68395	Prob. Chi-Square (2)	0.0048

Source: Results of EViews 10 Software.

Table 7 analysis precisely determined probability value, which stands at 0.0048. This numerical discovery acts as a doorway to a deep deduction—a discovery that has ramifications for choosing the most appropriate estimating model. The threshold of statistical significance, which is set at 0.05.

Hypothesis Testing
The hypothesis testing procedure will encompass an analysis of the coefficient of determination, the execution of simultaneous effect testing via the F test, and the conduct of partial effect testing using the t test. Detailed statistical data for the coefficient of determination, F test, and t test are presented in Table 8 for reference.

Table 8. Statistical Values of the Coefficient of Determination, F Test, and T Test (Random Effect Model)

Dependent Variable: Y?				
Method: Pooled EGLS (Cross-section random effects)				
Date: 10/04/23 Time: 10:42				
Sample: 2013 2022				
Included observations: 10				
Cross-sections included: 9				
Total pool (balanced) observations: 90				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1?	0.003326	0.000633	5.254335	0.0000
X2?	1.43E-06	1.36E-06	1.048253	0.2974
C	0.137819	0.031753	4.340392	0.0000
R-squared	0.273587	Mean dependent var		0.227831
Adjusted R-squared	0.256888	S.D. dependent var		0.071362
S.E. of regression	0.061517	Sum squared resid		0.329234
F-statistic	16.38329	Durbin-Watson stat		1.545984
Prob(F-statistic)	0.000001			

Source: Results of EViews 10 Software.

Coefficient of Determination Analysis
Based on Table 4.6, it is known that the coefficient of determination (R-squared) is equal to $R2$ = 0,2735. This value means that HDI (X1) and Road Length (X2) simultaneously or together affect the Improvement of Economic Inequality (Y) by 27.35%, the remaining 72.65% is influenced by other factors.

Simultaneous Effect Significance Test (F Test)
Test F aims to test the effect of independent variables together or simultaneously on the independent variable. Based on Table 4.6, it is known that the Prob. (F-statistics) value, which is 0.000001 < 0.05, it can be concluded that all independent variables, namely HDI (X1) and road length (X2) simultaneously, have a significant effect on the variable of economic inequality improvement (Y).

Panel Data Regression Equation and Partial Effect Significance Test (T-test)
Based on Table 4.6, the multiple linear regression equation is obtained as follows.

$$Y = 0.137819 + 0.003326X1 + 0.00000143X2 + e$$

Based on the results in Table 4.6: HDI (X1) has a positive effect on improving economic inequality (Y), with a regression coefficient of 0.003326, and is significant, with a Prob. = 0.0000 < 0.05. Road length (X2) has a positive effect on improving economic inequality (Y), with a regression coefficient of 0.00000143 or 1.43E-06, but not significant, with a Prob. = 0.2974 > 0.05.

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DISCUSSION

Geography of La Pago Customary Area

The La Pago customary territory, comprising eight districts, stands as a burgeoning autonomous region within the expansive Papua Province Mountains. Nestled in the heart of this new autonomous region is the capital city of Wamena, overseen by the Jayawijaya Regency government. The geographical coordinates of this burgeoning region are firmly anchored on the meridian line, stretching from 137° 12' to 141° 00' East longitude, and from 3° 2' to 5° 12' South latitude, establishing a distinct footprint on the map. The territorial expanse spans an impressive 52,916 km^2.

Demographics of La Pago Customary Area

At the forefront of this demographic panorama is Jayawijaya, Papua, boasting the largest population of indigenous Papuans (OAP) at 90,618, juxtaposed with 10,599 non-Papuans. Yahukimo, Papua, secures the second position with an OAP population of 85,234 and a non-Papuan population of 1,883. Lani Jaya, Papua, claims the third spot with 79,608 OAP residents and 1,501 non-Papuan residents. Tolikara, Papua, follows closely in the fourth position, hosting 61,120 OAP individuals and 681 non-Papuans. Nduga, Papua, ranks fifth with a population of 42,721 OAP residents and 376 non-Papuan residents. Pegunungan Bintang, Papua, occupies the sixth position, with 33,422 OAP residents and 232 non-Papuans. Yalimo, Papua, secures the seventh spot, comprising 26,753 OAP residents and 114 non-Papuans. Mamberamo Tengah, Papua, takes the eighth position with 21,213 OAP residents and 83 non-Papuans.

Weighted Centrality Index Analysis for Determining the Hierarchical System of Eight Districts of La Pago Indigenous Territory of Papua Mountain Province

The culmination of this analysis produces a clear ranking, which outlines a hierarchy based on a weighted centrality index, starting from the district/city that has the highest centrality to the district/city that occupies the last position, namely Jayawijaya, Yahukimo, Bintang Mountains, Lani Jaya, Central Mamberamo, Tolikara, Nduga, and Yalimo.

CONCLUSION

The positive impact of the Human Development Index (HDI) on enhancing economic equality implies that an increase in human development is associated with economic improvement across the eight districts within the La Pago customary area. The positive influence of road length infrastructure development on the enhancement of economic equality underscores the significance of a well-developed road network. Such infrastructure serves as a catalyst in the economic sector, facilitating the growth of interconnected industries through a multiplier effect. Ultimately, this dynamic contributes to the creation of business opportunities and generates output for consumption within the La Pago customary area.

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