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Research Article

Empirical Analysis of Labor, Income, and Human Development Influences on Poverty in Central Sulawesi Districts and Cities

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ABSTRACT

Central Sulawesi Province has high economic potential, especially in the manufacturing, mining and agricultural sectors. However, this potential has not been able to lift Central Sulawesi Province out of poverty, which is 12.41 percent. This analysis aims to see the effect of labor, per capita income and human quality on poverty in districts and cities of Central Sulawesi Province in 2021–2023 through a panel data regression approach. This study shows that per capita income and the Human Development Index (HDI) have a significant negative effect on district/city poverty, while the Labor Force Participation Rate (LP) variable does not have a significant effect. Per capita income has a "trickle-down" effect that helps alleviate poverty, while a higher HDI is correlated with poverty reduction. The results of this analysis suggest the need for policies that focus on increasing HDI through access to education and health, as well as increasing income/capita through the development of leading economic sectors.

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INTRODUCTION

Indonesia currently has a vision of "Golden Indonesia 2045." One of the targets in this vision is to reduce poverty and inequality. The poverty rate is targeted to be in the range of 0.5-0.8 percent, or poverty close to 0 percent. This provides a view of future conditions with poverty close to 0 percent creating equitable prosperity for all Indonesian people. This condition will look like the concept of the future or "The Future" in " *Banker to the Poor: Micro-lending and the Battle Against World Poverty"* (1) that the existence of poverty will no longer be relevant in the future and will not be part of human civilization. Yunus imagines that in the future poverty will only be part of a museum, where school students visit it as part of history. Yunus stated that when the world is without poverty, then no one can be described as poor and cannot meet their basic needs.

However, poverty in Indonesia remains quite high. As an archipelagic nation, Indonesia needs to prioritize equitable prosperity across all regions. According to Statistics Indonesia (BPS) data, Central Sulawesi Province is one of the provinces with the highest economic growth. Since 2015, Central Sulawesi Province has consistently ranked among the top three in Indonesia for economic growth. In 2023, Central Sulawesi Province's economic growth was projected at 11.91 percent, ranking second in Indonesia. However, this growth rate is considered artificial because it has not been able to reduce poverty (BPS, 2022). The development paradigm should shift towards equitable growth, shifting from *growth-oriented* to *equity-for-growth* in poverty alleviation.

According to [NO_PRINTED_FORM] (2), the poverty rate in Central Sulawesi Province is 12.41 percent, placing it among the top 10 provinces in Indonesia. This is further exacerbated by a high poverty depth index of 2.12 in 2023. This index indicates how far the expenditure of the poor is from the poverty line. Meanwhile, the poverty severity index in Central Sulawesi Province is also high, at 0.54. A higher index value indicates greater inequality in expenditure among the poor.

Many factors can influence poverty. Expected years of schooling have a significant impact on poverty reduction. However, life expectancy has no significant impact on poverty (Aziza et al., 2022).

The study [NO_PRINTED_FORM] (4) concluded that there is a relationship between human capital, as indicated by the Human Development Index (HDI), and poverty. Increasing human capital can reduce the percentage of the poor. Furthermore, the HDI can also influence the labor force participation rate (LP) in Central Sulawesi Province. Therefore, the government needs to implement policies focused on increasing life expectancy, per capita expenditure, and average years of schooling.

On the other hand, to reduce poverty, the Central Sulawesi Provincial Government needs to pay more attention to the basic or leading business sectors that contribute the most to GDP, as GDP significantly impacts poverty (5). This aligns with research [NO_PRINTED_FORM] (6) that GDP also has a negative impact on poverty.

Based on the elaboration of these issues, research is needed to identify factors influencing poverty in Central Sulawesi Province, particularly in terms of labor, income, and human capital. The influence of these aspects can determine appropriate policies for poverty alleviation in Central Sulawesi Province.

Absolute poverty is a condition where a person lacks the ability to obtain adequate resources to sustain life and meet their basic needs. This is calculated using *the Headcount Index*, which is manifested in the poverty line, which is the limit at which a person lives in a state of misery and can threaten their health (7). According to Todaro, there are economic characteristics of poor communities, one of which is poverty in rural areas. In rural areas, the main activity is usually the agricultural sector and there is a tendency for women and children, ethnic minorities, and indigenous people to dominate. Then there are considerations for government policy interventions in addressing poverty, including changing functional distribution through corrections in production factor prices, equal distribution through increasing the assets of the poor, imposing progressive taxes, and increasing government spending on providing goods and services for public consumption.

Furthermore, there are indicators that determine a poverty-free society with the aim of fulfilling basic needs and going beyond the limits of poverty (Yunus, 2007). These indicators include tin-roofed houses, having a bed, access to clean drinking water, having a toilet and sanitation and early childhood attending school.

Solow-Swan growth theory, labor force participation contributes to economic growth through factors of production (Todaro and Smith, 2015. The participation of a qualified workforce through education and training can increase productivity and support economic growth by optimizing a country's economic potential. Furthermore, in the context of developing countries, Todaro and Smith also highlight the potential contribution of women and marginalized groups to economic growth.

In *Poverty Trap Theory*, the poor are trapped in a cycle of incompetence that leads to low productivity and limited access to decent work. Increasing labor force participation, coupled with education and training, can break the poverty trap. High labor force participation can have a direct impact on poverty alleviation by increasing household incomes.

When income or GRDP per capita increases, there will be *a trickle-down effect* that can reduce poverty, although income distribution factors are also important (7). Todaro assesses that based on analysis of global poverty data, increases in GRDP per capita in developing countries have a significant impact on reducing absolute poverty.

Human Capital Theory states that education, skills, and labor are forms of human resource investment that result in increased economic growth (7). Human development is more than simply increasing economic income. According to Keith Griffin, as discussed in Development *Theory: Deconstructions/Reconstructions,* development needs to be viewed as a multidimensional process (Pieterse, 2009). Considerations include equality, empowerment, human capital investment, ecological sustainability, and the redistribution of income and resources. Human capital investment emphasizes the importance of investing in people through education, health, and training. With good health and higher education, people will have greater potential in the economy and society as a whole. Ultimately, this will have an impact on poverty alleviation.

To measure human development, the Human Development Index (HDI), previously designed by the United *Nations Development Programme* (UNDP), is used. The method for measuring a country's human development targets uses the dimensions of health, education, and standard of living (9). This perspective is then applied by the Statistics Indonesia (BPS) in a calculation called the Human Development Index (HDI). In this case, the health dimension uses life expectancy as an indicator; the higher the value, the better. The education dimension uses indicators such as average years of schooling and expected years of schooling. Meanwhile, the standard of living is approximated by Gross Regional Domestic Product (GRDP) per person or per capita, which reflects the average economic capacity of the population.

Precedent *(Best Practice)*

Based on the theories mentioned above, several countries around the world have implemented these theories, thereby reducing poverty. First, Germany has a job training system integrated with formal education, leading to direct employment in the industrial sector (*apprenticeships*). This has contributed to Germany's unemployment rate of 3 percent, one of the lowest in the world (10).

Second, China has consistently reduced poverty through economic growth efforts, resulting in increased per capita income, coupled with significant investment in rural infrastructure. This has *a trickle-down effect* on the poor. Furthermore, China has implemented *targeted poverty alleviation,* directly assisting disadvantaged regions (11).

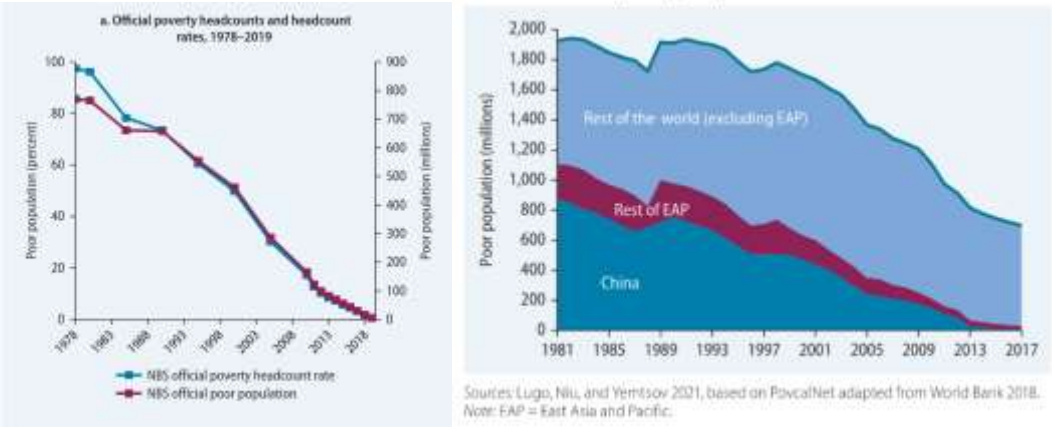

Figure 1. China's contribution to global extreme poverty reduction since 1981: Poverty rate based on international poverty lines, 1981–2017
Source: *Four Decades of Poverty Reduction In China* (The World Bank, 2022)

China has achieved progressive progress in the fields of health, education, income which can be seen in the increase in the HDI from 106th in 1990 to 85th in 2019. Furthermore, multidimensional poverty experienced a significant decline from 12.5 percent in 2002 to 3.9 percent in 2014. China's success in eradicating extreme poverty has contributed greatly to *the achievement of the Sustainable development goals* in the world to eradicate extreme poverty 10 years earlier. In 1981 to 2017, China succeeded in reducing global extreme poverty by one-third in the world, with an average of 24 million poor people free from poverty every year (11).

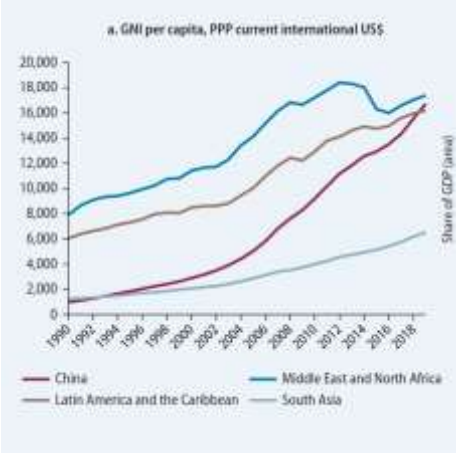

Figure 2. GDP per capita, PPP in current international US dollars
Source: *Four Decades of Poverty Reduction In China* (The World Bank, 2022)

Based on the figure above, China had a much lower starting point for per capita GRDP compared to Middle Eastern, North African, and Latin American countries in the early 1990s. However, China experienced rapid per capita GRDP growth with an exponential pattern and surpassed Latin America in 2018. (11)The increasing per capita GRDP value, supported by a high HDI, has contributed significantly to poverty alleviation in China.

Third, Norway has consistently focused on improving its Human Development Index (HDI), resulting in its score being one of the highest in the world. Norway strives to provide universal access to health and education services and equitable development. Consequently, Norway has a very high life expectancy and a very low

poverty rate (12).

In light of these conditions, the persistent poverty in Central Sulawesi despite strong economic performance highlights the need to examine the fundamental determinants that shape welfare outcomes in the region. While previous studies have emphasized the roles of labor, income, and human development in poverty reduction, the empirical evidence for Central Sulawesi remains limited and inconclusive. Therefore, this study aims to analyze the influence of labor force participation, per capita income, and human development on poverty across districts and cities in Central Sulawesi Province during 2021–2023 through a panel data regression approach, providing an updated and region-specific understanding to support more effective poverty alleviation policies.

RESEARCH METHODS

Data collection

The secondary data used in this research analysis is district/city data in Central Sulawesi from the Central Sulawesi Provincial Statistics Agency. The percentage of the poor population is used as the dependent variable in the panel data regression. The independent variables include the poverty rate, labor force participation rate, per capita GRDP, and the Human Development Index (HDI).

Research Variables

The selected research variables are intended to represent three aspects: labor, income, and human resource quality. The labor aspect is represented by the Labor Force Participation Rate (LP), the income aspect by GRDP per capita, and the human resource aspect by the HDI. The definitions of each variable are detailed in Table 1.

Table 1. Research Variables Used

Aspect	Variables	Variable Description
Poverty	Poverty Percentage(y)	The number of people below the poverty line divided by the total population in percentage units (%)
Labor	Labor Force Participation Rate(x_1)	Comparison of the labor force with the total working age population.
Income	GRDP/Capita(x_2)	The average value of the production of goods and services in an area produced by each resident in 1 year.
Human Quality	Human Development Index(x_3)	Four indicators are used in the composite index to measure human development: expected years of schooling (HLS), mean years of schooling (RLS), life expectancy (UHH) and per capita expenditure.

Panel Data Regression

The following are the procedures that must be taken to complete the analysis carried out in this research (13).

a. Collecting secondary data.
b. Exploring poverty data descriptively.
c. Conduct the best model analysis using the Chow Test and Hausman Test with the following formula.
   i. Chow Test

   This research process was conducted to determine the most suitable model between the single effects model (CEM) and the fixed effects model (FEM). The methods used are as follows.

   H_0: $\mu_1 = \mu_2 = \cdots = \mu_{n-1} = 0$(CEM)

   H_1: There must be at least one $\mu_i \neq 0$(FEM)

   Test Statistics:

$$f = \frac{(RRSS - URSS)/(n-1)}{URSS/(nt - n - p)}$$

   With:

   RRSS: restricted residual sum of squares / sum of squares of residuals from a model with restrictions

   URSS: unrestricted residual sum of squares/sum of squares of residuals from an unrestricted model

   nt: number of observations per time

   p: number of parameters

   Reject H_0 when F count >$F_{(n-1,nt-n-p)}$

   ii. Hausman test

This test is used to select the appropriate model between FEM and REM, with the following hypothesis.

$H_0: E(\delta_{it}|X_{it}) = 0$(selected REM model)

$H_1: E(\delta_{it}|X_{it}) = 0$(selected FEM model)

After that, the test statistics used are as follows:

$$\chi^2_{hit} = (b-\beta)^T Var(b-\beta)^{-1}(b-\beta)$$

With:

$\boldsymbol{b}$= the parameter value estimated from the sample

$\boldsymbol{\beta}$= actual parameter value

Reject H_0if$\chi^2_{hit} > \chi^2_{p\ tabel}$

After determining the appropriate model, the results are interpreted. Based on the previous explanation of the problem and related research, the framework used in this study to examine the perspective of poverty in Central Sulawesi Province is as follows.

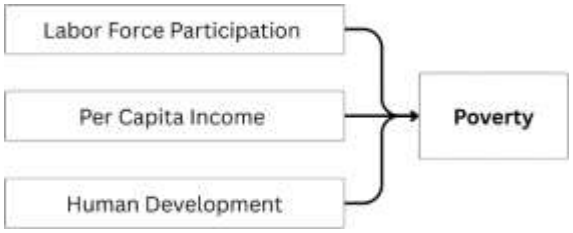

Figure 3. Research Framework
Source: Author, 2025

RESULTS AND DISCUSSION

Regional Profile Analysis of Central Sulawesi Province

Central Sulawesi Province borders Gorontalo Province and the Sulawesi Sea in the north. To the south, it shares borders with South Sulawesi and West Sulawesi Provinces. To the west, it shares borders with the Makassar Strait, and to the east, it borders Maluku Province. With a total area of 61,605,718 km2, Central Sulawesi Province comprises 12 regencies and one city.

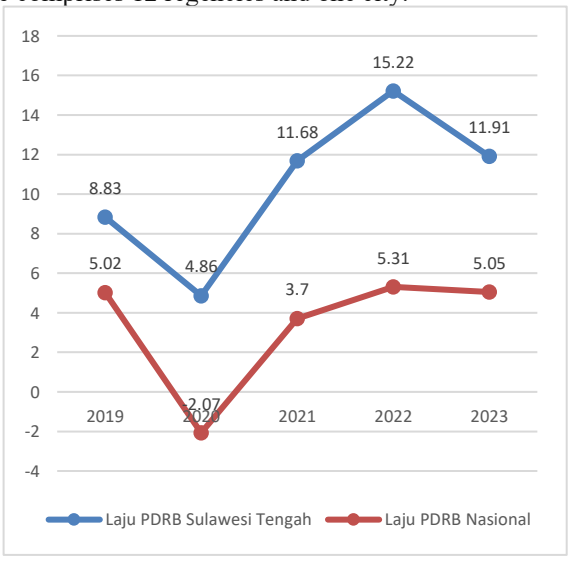

Figure 4. GRDP Rate of Central Sulawesi Province and Nationally 2019-2023.
Source: Central Sulawesi Province Statistics Agency

Central Sulawesi boasts numerous potential advantages. One of these is its consistently higher GRDP growth rate than the national average. Central Sulawesi Province has consistently ranked among the top five GRDP growth rates in Indonesia since 2015.

Central Sulawesi Province's mining GRDP value reached Rp 33,238.02 billion in 2023, contributing to the top 10 mining GRDP in Indonesia. This includes nickel processed in the Morowali Industrial Estate. Furthermore, in agriculture, Central Sulawesi Province has significant potential, with a rice harvest area reaching 177,699 hectares and a production of 821,367 tons of dry milled grain in 2023. This is the basis for projections that Central Sulawesi Province will become the rice granary for the Indonesian capital.

However, despite its potential, Central Sulawesi Province has not been able to overcome the challenges of poverty, inequality, and low education. The poverty rate in Central Sulawesi Province is 12.41 percent, placing it among the top 10 provinces in Indonesia. Inequality is also high, indicated by high poverty depth and severity indices. This indicates that the average expenditure of the poor is far below the poverty line, and there is significant disparity in expenditure among the poor. Central Sulawesi Province's Gini Ratio is 0.304, which is considered moderate. Furthermore, unemployment, education, and low per capita income are issues that will be discussed further in the descriptive analysis.

Descriptive Analysis

Poverty Percentage

According to the Central Sulawesi Statistics Agency (BPS), Donggala Regency had the highest poverty rate from 2021 to 2023, with a poverty rate of 16.73 percent. Meanwhile, Palu City had the lowest poverty rate from 2021 to 2023, at 6.63 percent. The results of this exploration are presented in the map in Figure 1 below.

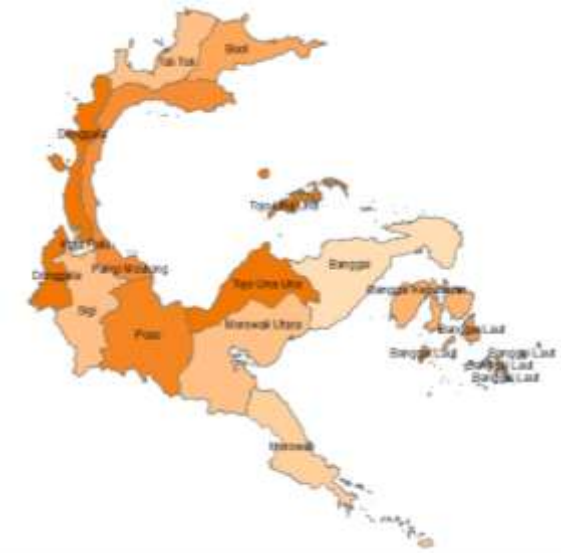

Figure 3. Visualization of the Poverty Map of Central Sulawesi Province Regencies by Regency and City Area in 2023
Source: Central Sulawesi Province Statistics Agency (processed)

Based on the map above, besides Donggala Regency, Tojo Una-Una Regency has the highest poverty rate. Therefore, the government needs to pay more attention to this regency to reduce poverty.

Labor Force Participation (LP)

Based on Table 2 below, there is an interesting correlation phenomenon in the LP of districts/cities. The region with the highest LP is Tojo Una-Una Regency, even though this regency has the second highest poverty percentage in Central Sulawesi Province. Likewise, Palu City, which has a high poverty percentage, has a LP with a medium value of 69.28 percent. Furthermore, the regency with a low LP value is Morowali Regency at 58.52 percent. This indicates that although Morowali Regency has enormous potential in the mining and quarrying sector, it has not been able to fully absorb the workforce. According to the Central Sulawesi Province Statistics Agency (BPS), the description of the LP of districts/cities is as follows.

Table 2. LP by Regency and City in Central Sulawesi Province

No	Regency	LP
1	Banggai Islands	72.76
2	Banggai	71.7
3	Morowali	58.52
4	Poso	71.07
5	Donggala	66.57
6	Tolitoli	68.8
7	Buol	69.43
8	Parigi Moutong	73.3
9	Tojo Una-una	75.06
10	Sigi	70.94

11	Banggai Sea	59.17
12	North Morowali	70.33
13	Palu City	69.28

Source: BPS Central Sulawesi Province, 2023

GRDP per Capita

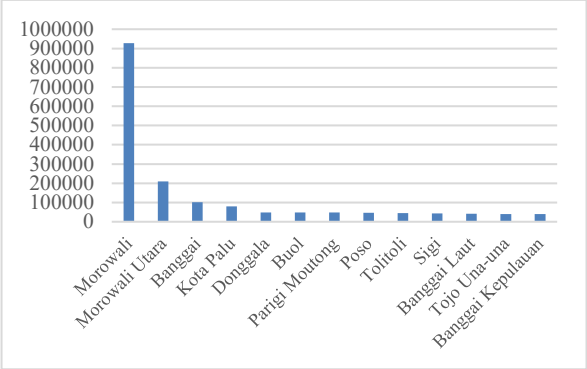

Figure 4. Graph of GRDP per Capita of Regencies/Cities in Central Sulawesi Province
Source: BPS Central Sulawesi Province, 2023

Figure 4 above shows that Morowali Regency has an extraordinary per capita GRDP compared to other regencies/cities, namely 927,230.48 thousand rupiah. This is due to the large contribution of the processing industry, mining, and quarrying sectors, thanks to the Morowali Industrial Estate. Meanwhile, the region with the lowest per capita GRDP is Banggai Kepulauan, with a value of 39,908.69 thousand rupiah per year.

Human Development Index (HDI)

Overall, the Human Development Index (HDI) in Central Sulawesi Province is 70.95, which is in the moderate category, ranking it the tenth lowest in Indonesia. The development of each HDI component is shown in the following figure.

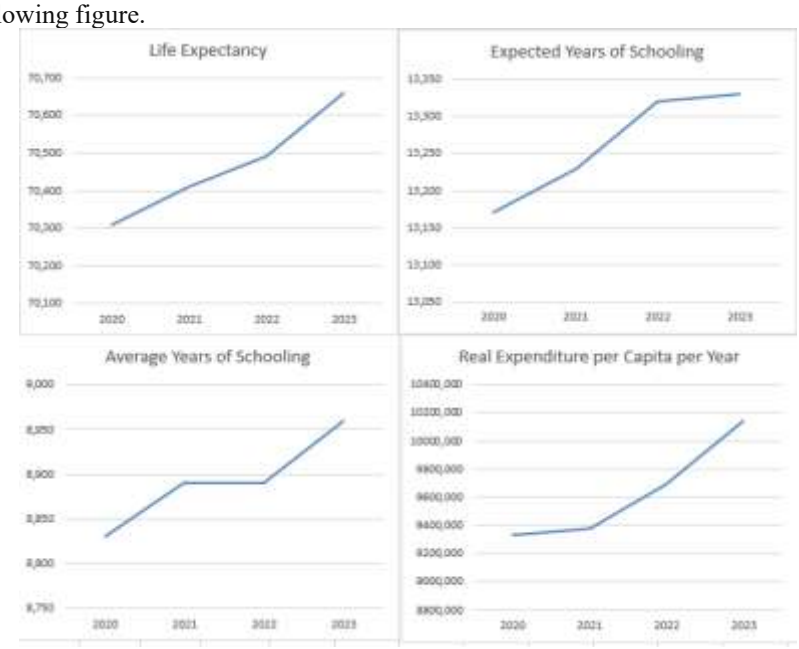

Figure 5. Growth of Human Development Index Components in Central Sulawesi Province in 2020-2023
Source: BPS Central Sulawesi Province, 2020-2023

Based on Figure 5, the components of the Human Development Index (HDI) for Central Sulawesi Province have increased year over year, including the UHH (Household Living Standards), HLS (House Living Standards), RLS (House Living Standards), and per capita expenditure. However, these HDI components remain below the national average and remain quite low.

The figure above shows that the education component of human development in Central Sulawesi Province is still relatively low. This is indicated by the average years of schooling (RLS) of 8.96, meaning the average number of years of schooling in Central Sulawesi Province is less than 9th grade, or less than junior high school graduation. The Human Development Index (HDI) scores for each district/city are presented in Figure 6 below.

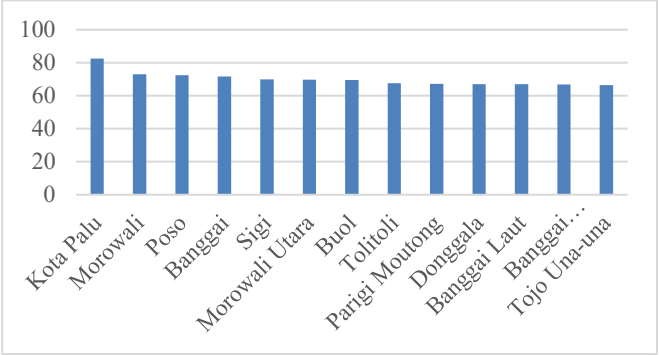

Figure 6. Human Development Index (HDI) of Central Sulawesi Province by Regency and City in 2023
Source: BPS Central Sulawesi Province, 2023

Based on the graph above, Palu City has a Human Development Index (HDI) of 82.52, which is very high compared to other regencies. This indicates that Palu City also has good components in terms of life expectancy, years of schooling, and per capita expenditure. Meanwhile, the region with the lowest HDI is Tojo Una-Una Regency, with an HDI of 66.39.

Data Exploration

The next exploration is used to identify the relationship between variables in the model used in the research, by creating a correlation matrix plot.

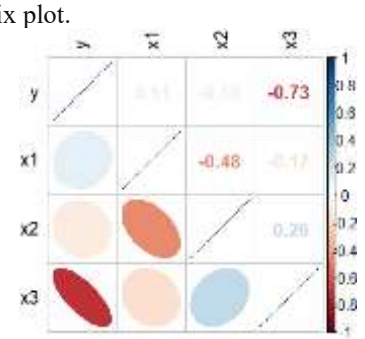

Figure 7. Correlation Matrix Plot of Variables in Research
Source: Data processing results with Rstudio, 2024

The LP (x_1)has a positive but small correlation with the poverty rate (y). The GRDP per capita (x_2)has a negative and low correlation with the poverty rate (y). Furthermore, the HDI variable has a high and positive correlation with the poverty rate. The higher the HDI value of a district/city, the better the quality of human development, thus reducing the poverty rate.

Regression Model Construction

Developing a model using panel data regression requires several steps. First, logarithmic transformation is performed for all variables. Next, a Chow test is performed to select the best model among the CEM and FEM models. The Chow test results from the processing output are presented in the table below.

Table 3. Chow Test Results

Chi-Square Value	Degrees of Freedom	p-value
99.82	12	0.0000

Source: Data processing results with Rstudio, 2025

Based on the p-value in the Chow test above, with a significance level of 5 percent or a confidence level of 95 percent, the p-value is less than 0.05, so H0 is rejected, meaning the FEM model has better use than the CEM model.

Then, from the results of the Hausman test to determine between the FEM and REM models to obtain the best model, the test results in Rstudio produce the following output.

Table 4. Hausman Test Results

Chi-Square Value	Degrees of Freedom	p-value
7,189	3	0.06611

Source: Data processing results with Rstudio, 2025

Based on the Hausman test results above, the p-value is greater than 0.05, indicating that the hypothesis H0 is not rejected. This indicates that the REM model is the best model compared to FEM.

Based on the model selection testing procedures using the Chow Test and the Hausman Test that have been conducted previously, the best model to explain the influence of the LP, GRDP per Capita, and HDI variables on poverty is the REM model. Furthermore, the REM model that was formed is as follows.

Table 5. Summary of REM Parameters

Variable	Coefficient	z-count	p-value
Intercept	97.24341	3.0744	0.002109
Log_LP(x_1)	1.52976	0.6832	0.494476
Log_GRDP/Capita(x_2)	-1.26167	-2.2790	0.022667
Log_HDI(x_3)	-18.09050	-2.2113	0.027016
Parameter			Coefficient
Total Sum of Squares			8.1706
Remaining Sum of Squares			4.7133
Coefficient of Determination (R-Squared)			0.42314
Adj. R-Squared			0.3737
Chi-Square Test (Chisq)			25.6733
Degrees of freedom			3
p-value			0.0000

Source: Data processing results with Rstudio, 2025

From Table 5, when translated into a mathematical model it will be as follows.

$$poverty_{it} = 97.24341 + 1.52976\, Log\_TPAK_{it} - 1.26167\, Log\_GRDP/Capita_{it} - 18.09050\, Log\_HDI_{it} + \varepsilon_{it}$$

Information:

$poverty_{it}$: Poverty level of district/city i in year t

Log_TPAK_{it} : Labor force participation in district/city i in year t

$Log\_GRDP/Capita_{it}$: GRDP per capita of district/city i in year t

Log_HDI_{it} : Human Development Index of district/city i in year t

ε_{it} : Residual of district/city i in year t

The R-squared value of 42.31 percent means that the model is able to explain 42.31 percent of the variability in poverty levels, while the remainder of the explanation or influence of poverty is explained by aspects of the variables that are not included in the model.

Furthermore, the Chi-Square value is 25.67 with a p-value of 0.0000 and less than 0.05, which indicates that the overall model is significant, or at least there is one coefficient that is not equal to zero.

After that, a classical assumption test is required because the parameters in this model are formed using GLS (Generalized Least Squares). The following classical assumption tests are required.

Classical assumption test:

Multicollinearity Test
The following is the output of the Multicollinearity test.

Table 6. Summary of REM Parameters

Variables	Log_LP	Log_GRDP_CAPITA	Log_HDI
VIF value	1.184918	1.395908	1.207137

Source: Data processing results with Rstudio, 2025

The VIF values of the LP, GRDP per capita, and HDI variables are less than 10, indicating that each variable does not have multicollinearity, so the assumptions are met.

1. Breusch-Godfrey Autocorrelation Test
   To test for autocorrelation, the Breusch-Godfrey autocorrelation test was used. Based on xx, with 3 degrees of freedom, the Chi-square value was 5.9356 with a p-value of 0.1148. Since the p-value is greater than 0.05, there is no autocorrelation.
2. Heteroscedasticity Test
   To test for heteroscedasticity in this study, the Breusch-Pagan heteroscedasticity test was used. Based on the model, the resulting p-value was 0.1125, above 0.05. This means there is no heteroscedasticity in the model, indicating that the assumptions are met.
3. Residual Normality Test
   The Shapiro-Wilk Normality Test was used to test the normality assumption. Based on the R Studio output, the p-value in the REM model was 0.5867, indicating that the normality assumption was met.

Labor with Poverty

Based on Table 4, the LP variable has a calculated z-value less than the z-table, or a p-value of 0.494476 or more than 0.05, indicating a 95 percent confidence level, or that $\alpha = 0{,}05$there is insufficient evidence to support that LP has an influence on the percentage of poverty in districts/cities in Central Sulawesi Province.

This indicates that, in reality, increasing the LP has not been effective in reducing poverty in Central Sulawesi Province. Based on a previous descriptive analysis of the LP, Morowali Regency, which has a high GRDP per capita, actually has the lowest LP in Central Sulawesi Province. This high GRDP per capita with a low LP indicates that a high LP does not guarantee a high economic growth.

In contrast to the labor force theory and *the Solow-Swan growth theory*, which argue that labor force participation influences economic growth, which ultimately impacts poverty alleviation in a region, these results align with research by [NO_PRINTED_FORM] (14)showing that the LP has a significant, but negative, effect on poverty. This is because an increase in the number of workers will increase household income, which will ultimately lead to a decrease in the poverty rate.

Income with Poverty

In Table 4, the GRDP per capita variable has a p-value of 0.022667, or less than the 0.05 significance level. Therefore, with a 95 percent confidence level, there is sufficient evidence to support that GRDP per capita has a significant influence on poverty reduction in districts and cities in Central Sulawesi Province.

This is in accordance with the income theory and the *trickle-down effect*, that increasing GRDP per capita will reduce poverty. This is also in line with the results of the analysis in the study which showed that GRDP per capita had a significant negative influence on the poverty rate in Gorontalo Province during 2012-2017 (15). Therefore, the government needs to increase income per capita by increasing investment in areas that can absorb a large workforce so that income per capita will increase so that people can meet their basic needs and escape poverty.

Human Quality with Poverty

According to table 4, the HDI variable has a p-value of 0.027016 or less than the 0.05 significance level. This value indicates that at a 95 percent confidence level, there is sufficient evidence to support that the HDI has an influence on poverty in Central Sulawesi Province. In accordance with *Human Capital Theory*, education, skills, and labor have an influence on economic growth that can alleviate poverty. The quality of people with good health and education will have greater potential in economic access, thus encouraging poverty alleviation. This is also in line with previous research that the HDI variable has a significant influence in a negative direction on the poverty rate, where when the HDI increases, the poverty rate will decrease (16).

CONCLUSION

The panel data regression analysis concluded that the variables with a negative and significant influence on the poverty rate in Central Sulawesi Province were GRDP per capita and the HDI. Meanwhile, the LP (Employment Allowance) did not significantly influence poverty in Central Sulawesi Province.

The local government's recommendations include focusing its poverty alleviation policies and programs on improving the community's economy by developing leading economic sectors to increase GDP/capita, as this has been shown to significantly impact poverty rates in Central Sulawesi Province. Furthermore, the government should focus on human resource development by improving access to education and healthcare to increase the Human Development Index (HDI) in Central Sulawesi Province, enabling the community to be more competitive and reducing poverty in the province.

This study analyzed the influence of labor force participation (LP), per capita GRDP, and the Human Development Index (HDI) on poverty levels across districts and cities in Central Sulawesi Province for the period 2021–2023 using panel data regression with the Random Effect Model (REM). The results show that two variables, GRDP per capita and HDI have a negative and statistically significant impact on poverty, meaning that increases in income per capita and improvements in human development contribute directly to reducing poverty. Meanwhile, the LP variable does not have a significant influence on the poverty rate, indicating that higher labor force participation does not automatically translate into poverty reduction, especially when employment opportunities are not aligned with productive economic sectors.

Overall, the findings emphasize that poverty reduction in Central Sulawesi is strongly determined by both economic capacity (income per capita) and human capital quality (HDI). Despite strong economic growth, structural barriers such as unequal access to productive jobs, low educational attainment, and limited health service quality remain key challenges. Therefore, strategic poverty alleviation must focus on expanding productive economic opportunities while simultaneously strengthening human development outcomes.

SUGGESTION

Based on the findings, it is recommended that the provincial and district/city governments of Central Sulawesi strengthen poverty alleviation efforts by prioritizing the development of productive economic sectors that can sustainably increase GRDP per capita, given its significant role in reducing poverty. At the same time, the government should enhance human development outcomes by improving access to education, healthcare services, and skill-building programs to raise the HDI across regions. Efforts to expand employment opportunities must focus not only on increasing labor force participation but also on ensuring that available jobs are productive and capable of generating sufficient income to lift households out of poverty. Future researchers are encouraged to incorporate additional variables, such as unemployment rates, inequality indicators, public infrastructure quality, and investment levels as well as to explore spatial or qualitative approaches to gain deeper insights into structural poverty determinants. Finally, this study may serve as a reference for academic institutions to enrich learning resources in development economics and public policy, and universities are encouraged to continue updating their scientific literature collections to support further research in this field.

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