

Explaining Regional Economic Growth in South Sulawesi: The Role of HDI and Unemployment in a Panel Data Framework

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Abstract

This study aims to analyse the determinants of economic growth in districts/cities in South Sulawesi Province during the period 2020–2024. The independent variables analysed include population size, unemployment rate, poverty rate, and Human Development Index (HDI). This study uses a quantitative approach with static panel data analysis methods on 24 districts/cities. The selection of the best model was carried out through the Chow test and the Hausman test, which showed that the Fixed Effects Model (FEM) was the most appropriate model. To ensure the reliability of the estimates, robust standard errors were used to overcome potential autocorrelation. The results show that the unemployment rate has a negative and significant effect on economic growth, while the HDI has a positive and significant effect. Conversely, population size and poverty rate did not show a significant effect on regional economic growth. These findings indicate that the quality of human resources and labour market conditions play a more decisive role than quantitative demographic factors alone. Therefore, regional development policies need to focus on improving human quality and creating productive jobs to promote inclusive and sustainable economic growth in South Sulawesi Province.

INTRODUCTION

Regional economic growth is an indicator used to measure the success of development and the effectiveness of public policy. In Indonesia, the dynamics of economic growth show that there are disparities between regions, including in South

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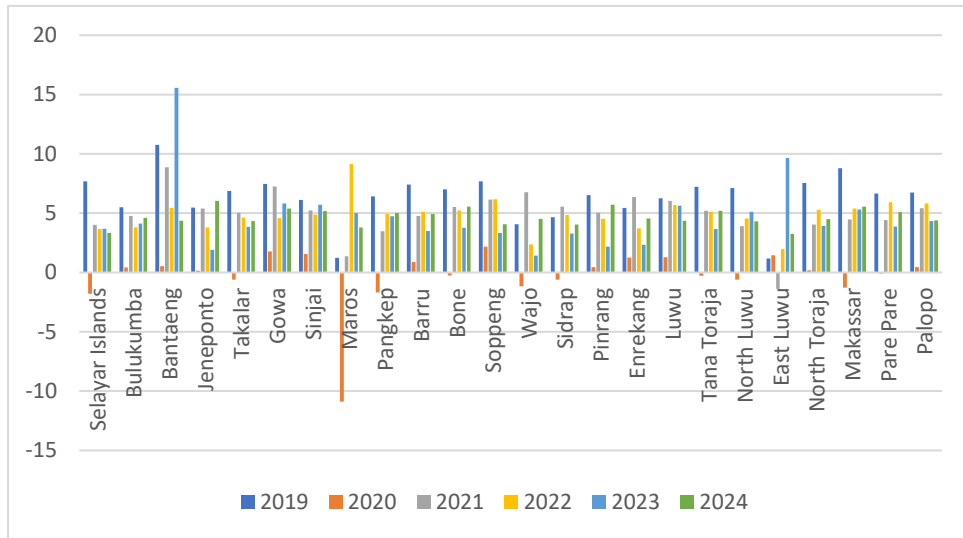
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Sulawesi Province, which has 24 districts/cities with very diverse economic structures, fiscal capacities, human resource qualities, and socio-demographic conditions. This variation is evident in the differences in economic growth rates, population size, unemployment rates, poverty rates, and Human Development Index scores, which indicate that not all regions are able to optimally utilise their resource potential (Suparman & Muzakir, 2023). Inequality is a comprehensive analysis to identify the factors that influence economic growth in greater depth. The phenomenon in South Sulawesi Province shows that economic growth is not always directly proportional to the population or the size of a region's economic base. Several districts with large populations have recorded relatively low economic growth, while areas with medium or small populations have been able to grow faster. This shows that a large population does not automatically become a capital for development without improvements in the quality of education, health, and skills (Ndaguba & Hlotywa, 2021). Economic growth is one of the most important indicators in assessing the performance of an economy, especially for analysing the results of economic development that has been implemented in a country or in a region (Puttitanun & Lerskullawat, 2025a). The economy is said to be growing if the production of goods and services increases from the previous year. Thus, economic growth indicates the extent to which economic activity can generate additional income or welfare for the community in a certain period (Hung & Thanh, 2022a). If the economic growth of a country or a region continues to show an increase, it indicates that the economy of that country or region is developing well (Dramani, 2022a).

Based on Graph 1.1, which shows the economic growth of regencies/cities in South Sulawesi Province during the 2019–2024 period, it can be seen that regional economic performance experienced significant fluctuations. In 2019, almost all regions recorded positive growth, reflecting stable economic conditions before the COVID-19 pandemic. However, in 2020, there was a significant decline, with some regions even experiencing negative growth due to the impact of the pandemic on various economic sectors. From 2021 to 2022, the growth rate began to show signs of recovery in line with increased economic activity and government efforts to promote regional economic recovery. Furthermore, from 2023 to 2024, most regions showed a relatively stable and increasing growth trend, indicating a process of adaptation and strengthening of productive sectors after the pandemic.

Figure 1.1 South Sulawesi Economic Growth Data



Source: South Sulawesi Provincial Statistics Agency, 2024

On the other hand, economic growth must be supported by human resources, with variations in the human development index between regions in South Sulawesi indicating that the quality of human development is not yet evenly distributed (Sofilda, 2023). Regions with high human development indices tend to show better economic performance, with human capital theory suggesting that the quality of the workforce plays a major role in driving long-term growth (Chen & Ji, 2024a; Solihin, 2024). Therefore, variables such as population size, unemployment, poverty, and HDI related to economic growth are highly relevant issues to analyse (Hlongwane, 2025b). The urgency of this research becomes even stronger when considering the 2020–2024 research period, which is the post-COVID-19 pandemic economic recovery phase. The impact of the pandemic was not felt evenly, and the recovery process showed significant variations between districts/cities. Local governments need *evidence-based policy* that can identify the most strategic variables in accelerating recovery and promoting sustainable economic growth (Zhao, 2025). However, most previous studies only used provincial-level analysis units or *cross-sectional* approaches, thus failing to fully capture the dynamics of time and heterogeneity between regions at the district/city level. This research gap provides an important opportunity for studies using panel data to capture regional socioeconomic dynamics more accurately.

Using a panel data approach covering 24 districts/cities over five years, this study seeks to identify the determinants of economic growth by selecting the best model among *pooled least squares*, *fixed effects*, and *random effects*. This approach allows for a more in-depth analysis because it is able to control for fixed heterogeneity between regions and capture time variations. The selection of the *fixed effects* model through

Chow and Hausman *tests* ensures that the specific factors of each region that cannot be directly observed can be accommodated in the model. The validity is strengthened through classical assumption tests and autocorrelation corrections using *robust standard errors*, so that the research results have a high level of reliability. Theoretically, this study contributes to the literature on regional economic growth by providing more comprehensive empirical evidence based on panel data. Practically, the results provide strategic information for local governments in formulating more focused development policies, particularly in improving human capital and the labour market. The findings on variables that significantly influence economic growth can form the basis for strategic policy-making in more inclusive and sustainable regional economic development. Thus, this study not only enriches academic understanding but also contributes directly to strengthening regional development planning in South Sulawesi Province.

Literature Review

Economic growth is the process of increasing the production capacity of an economy over time, increasing national output, where there is an increase in economic activity that leads to an increase in the production of goods and services in a country during a certain period. This growth is generally measured by changes in Gross Domestic Product (GDP) or Gross Regional Domestic Product (GRDP). Economic growth is a multidimensional process that is not only characterised by an increase in output or income, but also by structural transformation and an improvement in the quality of life of the community.

$$\text{Economic Growth} = \frac{GRDP_t - GRDP_{t-1}}{GRDP_{t-1}} \times 100\%$$

Explanation:

$GRDP_t$ = Gross Regional Domestic Product for the current year

$GRDP_{t-1}$ = GRDP of the previous year

*The output shows the percentage increase in the economy from the previous year.

Long-term economic growth is supported by three main pillars, namely physical capital accumulation, human capital improvement through education and health, and technological advances that drive productivity. In addition, economic growth must be accompanied by institutional change, poverty reduction, expansion of employment opportunities, and equitable distribution of development benefits in order to be inclusive growth (Franses, 2025). Thus, economic growth is not only an increase in GDP, but also a comprehensive change in the production capacity, quality of human resources, and economic structure of a country or region (Ghorbel et al., 2025a). Sustainable economic growth reflects the ability of a country or region to expand its production base, increase community income, and improve living standards. Regional economic growth is

influenced by internal factors such as physical capital, labour, human capital, and the socio-economic conditions of the community (Gharsallah & Trabelsi, 2025a). An increase in population and labour is one of the main drivers of growth, but it will only be effective if it is balanced with the availability of resources and productivity. This is in line with Malthus' view that population growth without increased productivity can actually be an obstacle to economic growth. In the neoclassical Solow-Swan growth theory (1956), economic growth is influenced by capital accumulation, population growth, and technological development.

The population size reflects the labour force, while the HDI represents the quality of human capital that determines a region's ability to adopt technology. Regions with higher quality human resources will have higher productivity, resulting in better economic growth. Growth theory emphasises that human capital, education, innovation, and technology are internal factors that drive long-term growth (Onifade et al., 2024). Population is the total number of individuals living in a region at a given time. In the context of economics and development, population is not just a number, but an important indicator that reflects the potential of the labour force, consumers, and dependency burden in an economy (Asmara et al., 2024). The productive age population (15–64 years) is the labour force that determines a region's production capacity. If the population is large, there is more potential for growth. However, this only applies if the quality of human resources and labour absorption are high. Population refers to the entire human population within a certain geographical boundary recorded in a given period, either through a census, registration, or demographic survey. Population size is the total population within a district/city administrative area at a given time, which includes the productive and non-productive age groups, and serves as an indicator of the availability of labour, dependency burden, and the size of the domestic market in the economy.

The unemployment rate is the percentage of the population that is classified as part of *the labour force* but is not working and is actively seeking employment. According to the International Labour Organisation (ILO, 2020), unemployment is a situation in which a person is not working, is available for work, and is seeking employment.

$$\text{Unemployment} = \frac{\text{Number of Unemployment}}{\text{Number of Workforce}} \times 100\%$$

The unemployment rate is the percentage of the working population that does not have a job but is actively seeking work during a given period. There is a negative (*inverse*) relationship between unemployment and economic growth. For every 1% increase in unemployment, economic growth falls by about 2%. This means that the higher the unemployment rate, the lower the economic growth. One of the fundamental concepts that explains this relationship is Okun's Law. This law states that when economic growth increases, especially in labour-intensive sectors, the demand for labour increases and the unemployment rate tends to decrease. Conversely, if economic growth slows down or contracts, companies reduce production, stop recruiting, and even

lay off employees, causing unemployment to increase. Thus, stable and inclusive economic growth is an important factor in reducing the unemployment rate.

The Human Development Index (HDI) is a composite measure for assessing broad human development achievements. The HDI was developed by the UNDP, which emphasises that development should be viewed as an expansion of human capabilities, not merely economic growth. Therefore, the HDI combines three basic dimensions of human welfare—health, education, and decent living standards—as the basis for evaluating development. These three dimensions are measured through indicators of life expectancy, average years of schooling, expected years of schooling, and gross national income per capita based on PPP. The UNDP normalises each indicator on a scale of 0–1, then combines them with a geometric mean to prevent excessive compensation between dimensions. With this approach, the HDI can describe human development in a more balanced and comprehensive manner than single economic indicators such as GDP per capita. It acts as a representation of the quality of human capital. Human capital has a positive externality effect on productivity, so that the higher the quality of human capital, the greater its contribution to economic growth (Wani, 2024). Meanwhile, poverty creates a vicious cycle: low income reduces consumption, which reduces savings, which reduces investment, which reduces productivity, and ultimately leads to slow economic growth (Kasongo & Makamu, 2024b).

Data and Methodology

This study was conducted to analyse the economic growth model in South Sulawesi Province, particularly in level II regions (districts/cities), based on influencing determinants such as population size, unemployment rate, poverty rate, and human development index using panel data from 24 districts/cities from 2020 to 2024. This study uses a static panel data analysis approach. In static panel data research, it is necessary to select the best model between *pooled least squares* (PLS), *fixed effect model* (FEM), and *random effect model* (REM) using the Chow test and Hausman test.

¹ Chow Test

The Chow test is used to determine whether data can be combined in a single PLS model or if there are significant differences between groups that require the use of separate models. This test examines the null hypothesis that the regression coefficients are the same across all groups (e.g., region, sector, or time) (Granger & Newbold, 1974). If the test results reject the null hypothesis, then the PLS model cannot be used, and it is recommended to use separate models (such as *Fixed Effects Model* (FEM) or *Random Effects Model* (REM)).

In the context of this test:

H_0 : The regression coefficients are the same across groups (*pooled* model is valid)

H₁: Regression coefficients differ between groups (separate models are more appropriate)

Where, if *the Chow Test p-value* < 0.05, we reject the null hypothesis and choose a model with separate groups (e.g., FEM or REM)

- Hausman Test

The Hausman test is used to determine the most appropriate model between FEM and REM by testing whether there is a correlation between unique errors (individual effects) and independent variables in the model. If individual effects correlate with independent variables, then the FEM model is more appropriate to use because it is able to control for unobserved individual effects, thereby producing consistent estimates. Conversely, if individual effects are not correlated with independent variables, then the REM model is more efficient because it does not require additional estimates to control for individual variation and produces estimates with smaller variance. Thus, *the Hausman Test* serves as a tool to ensure the selection of a panel data model that is not only statistically efficient but also theoretically consistent in representing the relationship between the research variables (Frondel & Vance, 2010).

In the context of this test:

H₀: There is no correlation between individual effects and independent variables (REM is more efficient).

H₁: There is a correlation between individual effects and independent variables (FEM is more appropriate).

Where, if *the Hausman Test p-value* < 0.05, we reject the null hypothesis and choose FEM, whereas if *the p-value* > 0.05, REM is the more efficient choice.

Furthermore, classical assumption tests are conducted, such as multicollinearity and Kezdi tests, to confirm the absence of multicollinearity, heteroscedasticity, and autocorrelation so that the model and research results are not biased.

Table 1. Variable Descriptions

No	Variable	Indicator	Unit	Source
Dependent Variable				
1	Economic Growth	Economic growth rate	Percentage (%)	Indonesian Central Statistics Agency
Independent Variable				
2	Population (pop)	Population	Thousands	Indonesian Central Statistics Agency

No	Variable	Indicator	Unit	Source
3	Unemployment Rate (uemp)	Unemployment Rate	Percentage (%)	Indonesian Central Statistics Agency
4	Poverty Rate (pov)	Poverty Rate	Percentage (%)	Indonesian Central Statistics Agency
5	Human Development Index (HDI)	HDI Figure	Index unit	Indonesian Central Statistics Agency

Table 1 presents a description of the variables used in this study, including one dependent variable and four independent variables, all sourced from Statistics Indonesia (BPS). The dependent variable is Economic Growth (*econgrowth*), measured by the annual economic growth rate in percentage terms (%), which reflects the increase in the output of goods and services in a region over a certain period. Meanwhile, the independent variables consist of Population (*pop*), measured in thousands of people, which describes the demographic scale of a region; Unemployment Rate (*uemp*), expressed as a percentage (%) to measure the proportion of the labor force that is not working; Poverty Rate (*pov*) which shows the percentage of people living below the poverty line as an indicator of social welfare; and Human Development Index (HDI) which is measured by an index number and reflects the quality of education, health, and living standards of the community. Overall, this table illustrates the empirical framework used to analyse the influence of social and economic factors on economic growth in Indonesia based on valid and measurable macro data.

$$ICTecongrowth_{it} = \beta_0 + \beta_1 \ln pop_{it} + \beta_2 uemp_{it} + \beta_3 pov_{it} + \beta_4 HDI_{it} + \delta_{it} \quad (1)$$

where:

econgrowth : Economic growth

lnpop : natural logarithm of population

uemp : Unemployment rate

pov : Poverty rate

HDI : Human Development Index

β_0 : Intercept

$\beta_1, \beta_2, \beta_3, \beta_4$: Regression Coefficient

δ : Random error (noise)

i : 1-24 *cross-sectional* data from districts/cities

t : 1-5 time series data from 2020 to 2024

Results

Descriptive Statistics

Table 2. Descriptive Statistics

Variables	N	Mean	Std. Dev.	Min	Max
econgrowth	120	55.29	24.26	25.70	165.9
pop	120	386.0	275.4	137.1	1,465
uemp	120	4.183	2.437	0.580	15.92
pov	120	9.227	2.725	4.540	14.58
HDI	120	71.56	3.941	64.26	83.90

Table 2 presents descriptive statistics for all research variables, consisting of economic growth (econgrowth), population (pop), unemployment rate (uemp), poverty rate (pov), and human development index (HDI) based on 120 observations from districts/cities in South Sulawesi Province. The average economic growth rate was recorded at 55.29 with a standard deviation of 24.26, indicating considerable variation between regions, ranging from 25.70 to 165.9. The population variable had an average of 386,000 people and a standard deviation of 275.4, indicating significant disparities in population size between districts and cities. The average unemployment rate reached 4.183%, with a minimum value of 0.580% and a maximum of 15.92%, reflecting differences in labour market conditions between regions. Furthermore, the poverty rate had an average of 9.227% with a variation of 2.725, indicating welfare inequality between regions in South Sulawesi. Meanwhile, the Human Development Index (HDI) showed an average of 71.56, with a range of values between 64.26 and 83.90, which describes the quality of human development that is generally in the upper-middle category, although there are disparities between districts/cities. Overall, these descriptive results show considerable heterogeneity in socio-economic aspects in the South Sulawesi region, which is an important basis for understanding the dynamics of regional economic growth in the province.

Selection of the Best Model

In static panel data analysis, Chow and Hausman tests need to be conducted to select the best model between pooled least squares (PLS), fixed effect model (FEM), or random effect model (REM) (Arellano & Bond, 1991; Ciarreta et al., 2019; Verbeek, 2021). First, the Chow test is performed to choose between PLS and FEM. Based on FEM, the Prob > F value is 0.000 (<0.05), so the decision is to reject H₀, thus the FEM model is selected based on the Chow test. Next, a Hausman test was conducted to choose between FEM and REM. Based on the REM estimation, the Prob > Chi² value was 0.000 (<0.05), so the decision was made to reject H₀; thus, the model chosen remained FEM based on the Hausman test. Based on the above description, the best model in this study is *the fixed effect model* (FEM).

Table 3. Comparison of PLS, FEM, and REM Estimates

Variables	PLS	FEM	REM
Inpop	13.70*** (3.118)	57.74 (50.76)	18.86*** (6.677)
uemp	1.905* (0.970)	-2.368*** (0.443)	-2.316*** (0.398)
pov	0.332 (0.685)	1.421 (0.904)	1.170 (0.793)
HDI	2.987*** (0.622)	4.502*** (1.030)	5.148*** (0.483)
Constant	-248.9*** (50.86)	-604.7** (236.5)	-423.4*** (50.69)
Observations	120	120	120
R-squared	0.533	0.806	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author (processed data) (2025)

Classical Assumption Test

Testing classical assumptions in econometrics is an important step to ensure the validity of the regression model used in data analysis. In this study, multicollinearity and heteroscedasticity tests were conducted, where multicollinearity occurs when two or more independent variables in the regression model are highly correlated with each other. This can cause difficulties in accurately estimating regression coefficients. In a fixed-effects model, multicollinearity can be detected by looking at the correlation between independent variables, in which case the correlation value should not exceed 0.75 (Goodman, 2013). Furthermore, heteroscedasticity occurs when the variance of the residuals is not constant. This can lead to inefficient estimates and biased standard errors (Yang, 2021). To detect heteroscedasticity in this study using a fixed-effect model, the Kezdi test was used (Kezdi, 2005; Uchôa et al., 2014).

Table 4. Correlation between Independent Variables

	Inpop	uemp	pov	HDI
Inpop	1.000			
uemp	0.2857	1.000		
pov	-0.1680	-0.4521	1.000	
HDI	0.1171	0.7280	-0.5483	1.000

Source: Author (processed data) (2025)

Based on Table 4 above, it is known that the correlation values between independent variables (lnpop, uemp, pov, and HDI) do not exceed 0.75, so it can be concluded that this research model is free from multicollinearity. The next table explains the heteroscedasticity test.

Table 5. Kezdi Test

Test for	Statistic	P-value
H1 vs. H ₀	13.775	0.246
H2 vs. H ₀	19.996	0.045
H3 vs. H ₀	14.866	0.189

H₁: *Cross-sectional homoskedasticity*

H₂: *Serially uncorrelated: e_{it}, x_{it} or both*

H₃: *Homoskedasticity and serially uncorrelated*

H₀: *Heteroskedasticity*

Source: Author (processed data) (2025)

Table 5 above shows the results of the Kezdi test on the *fixed effect* model conducted to identify violations of classical assumptions in panel data. The first hypothesis (H1) tests homoscedasticity between cross-sectional units, namely whether the error variance is constant across all districts/cities; the p-value of 0.246 (>0.05) indicates that there is no cross-unit heteroscedasticity. The second hypothesis (H2) tests for serial autocorrelation, namely the correlation between residuals in different periods; with a p-value of 0.045 (<0.05), this result indicates autocorrelation in the model. The third hypothesis (H3) tests the combined conditions of homoscedasticity and the absence of autocorrelation, and a p-value of 0.189 (>0.05) indicates that, in general, the model is still stable against combined violations. Based on these results, it can be concluded that the model does not experience heteroscedasticity but contains serial autocorrelation, so the appropriate corrective measure is to use Fixed Effects (FE) regression with *robust standard errors* to ensure that parameter estimates remain efficient, consistent, and statistically valid.

Table 6. FEM Estimates with Robust Standard Errors

Variables	FEM Robust
lnpop	57.74 (97.56)
uemp	-2.368** (1.127)
pov	1.421 (0.994)
HDI	4.502*** (1.405)

Constant	-604.7 (486.3)
Observations	120
Number of Dist	24
R-squared	0.806

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author (processed data) (2025)

Based on the results of the best model selection, where FEM with *robust standard errors* was the best model, several variable relationships can be explained in Table 6. The table shows an *R-squared* value of 0.806, which means that the independent variables of population, unemployment rate, poverty rate, and human development index (lnpop, uemp, pov, and HDI) can explain 80.6% of the independent variable of economic growth (econgrowth), while the remaining 19.4% can be explained by other variables outside this research model. The variables of population (lnpop) and poverty rate (pov) do not affect the economic growth variable (econgrowth) because the significance value is greater than 10% ($p < 0.1$). However, the unemployment rate (uemp) variable shows a negative effect with a coefficient value of -2.368 at a significance level of 5% ($p < 0.05$), which means that every 1% increase in the unemployment rate causes a 2.368% decline in economic growth. Furthermore, the human development index (HDI) variable has a positive effect with a coefficient value of 4.502 at a significance level of 1% ($p < 0.01$), which means that every 1-unit increase in the HDI can increase economic growth by 4.502 percent.

Discussion

The Effect of Unemployment Rate on Economic Growth

The results of the Fixed Effects Model estimation with robust standard errors show that the unemployment rate has a negative and significant effect on economic growth in regencies/cities in South Sulawesi Province. A coefficient of -2.368 at a 5 percent significance level indicates that a 1 percent increase in unemployment will reduce economic growth by approximately 2.37 percent. This finding confirms that the labour market plays a central role in determining regional economic performance, especially during the post-COVID-19 pandemic recovery phase.

Theoretically, these results are consistent with Okun's Law, which states that there is an inverse relationship between unemployment and economic growth. Low economic growth reflects weak labour absorption, while high unemployment reduces aggregate income and people's purchasing power, thereby hampering regional output expansion. Similar empirical findings are also shown by (Suparman & Muzakir, 2023)

and (Hlongwane, 2025), who found that unemployment significantly suppresses regional economic growth through productivity and aggregate demand mechanisms.

The Role of the Human Development Index (HDI) in Driving Economic Growth

The results show that the Human Development Index (HDI) has a positive and significant effect on economic growth, with a coefficient of 4.502 at a 1 percent significance level. This means that a one-point increase in the HDI can increase regional economic growth by 4.5 percent, *ceteris paribus*. These findings confirm that the quality of human capital is a key determinant of regional economic growth.

Conceptually, HDI represents the accumulation of human capital through the dimensions of education, health, and decent living standards. Endogenous growth theory states that improvements in human quality increase labour productivity, accelerate technology adoption, and strengthen regional innovation. Studies (Chen & Ji, 2024; Puttitanun & Lerskullawat, 2025) show that regions with higher human quality tend to enjoy more sustainable economic growth because they have better institutional capacity and productivity.

These results are also in line with the findings (Gharsallah & Trabelsi, 2025b; Sofilda et al., 2023), which confirm that investment in education and health has a long-term multiplier effect on regional economic growth. Thus, the HDI not only serves as an indicator of social welfare but also as a strategic instrument for regional economic development (Ghorbel et al., 2025; Wani et al., 2024).

Population Size and Its Insignificance to Economic Growth

The population variable in this study did not have a significant effect on economic growth in regencies/cities in South Sulawesi. These findings indicate that population size does not automatically drive economic growth if it is not accompanied by improvements in the quality and productivity of human resources.

In the context of South Sulawesi, the insignificant population size reflects structural challenges in the form of low labour quality and limited productive employment opportunities. Therefore, development policies should not only focus on the demographic bonus but should also be directed at improving the quality of human capital and labour market absorption (Hung & Thanh, 2022; Solihin et al., 2024).

Poverty Levels and Their Relationship with Economic Growth

The estimation results show that poverty levels do not have a significant effect on economic growth in districts/cities in South Sulawesi. These findings indicate that the relationship between poverty and economic growth is indirect and complex, and is mediated by other factors such as the quality of education, health, and regional economic structure.

Theoretically, poverty is often associated with the poverty trap, where low-income limits access to education and health care, thereby reducing productivity and economic growth. However, several studies show that the impact of poverty on

economic growth is often long-term and not always detected in short-term estimates (Dramani, 2022; Kasongo & Makamu, 2024)

During the 2020–2024 research period, which is the post-pandemic recovery phase, various government social protection and fiscal stimulus programs have the potential to mitigate the direct impact of poverty on regional economic growth. This finding is in line with the results of studies (Hung & Thanh, 2022b; Zhao et al., 2025), which show that public policy interventions can break the direct link between poverty and economic slowdown.

Theoretical and Policy Implications

Overall, the results of this study confirm that regional economic growth is determined more by the quality of human capital and labour market conditions than by demographic factors alone. These findings reinforce the endogenous growth theory, which places education, health, and labour productivity as the main drivers of long-term economic growth (Gharsallah & Trabelsi, 2025; Puttitanun & Lerskullawat, 2025).

From a policy perspective, local governments in South Sulawesi Province need to prioritise programs to improve human resource quality through vocational education, improved health services, and the creation of productive jobs. This approach is considered more effective in promoting inclusive and sustainable economic growth than policies that are only oriented towards increasing short-term output (Sofilda et al., 2023; Zhao et al., 2025).

Conclusion

This study aims to analyse the determinants of economic growth in districts/cities in South Sulawesi Province during the period 2020–2024 using a panel data approach and a fixed effects model. The results show that the unemployment rate has a negative and significant effect on economic growth, indicating that high unemployment is a major obstacle to regional economic recovery and expansion. Conversely, the Human Development Index (HDI) has a positive and significant effect, confirming that the quality of human resources through education, health, and decent living standards is a key factor in driving regional economic growth.

Meanwhile, population size and poverty levels do not significantly affect economic growth, indicating that population size and poverty levels do not directly determine regional economic performance without being supported by improvements in human capital and labour productivity. Overall, these findings confirm that regional economic growth is determined more by the quality of human capital and labour market conditions than by demographic factors alone. Therefore, regional development policies need to focus on improving the quality of human resources, creating productive jobs, and strengthening the labour market to promote inclusive and sustainable economic growth in South Sulawesi Province.

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