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Original Article

The Elasticity of Investment and the Number of Productive-Age Population on Economic Growth in Parigi Moutong Regency

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Abstract

This research seeks to examine how investment elasticity and the size of the productive-age population impact the economic development in Parigi Moutong Regency. The study utilises a quantitative methodology, specifically employing multiple linear regression analysis. The data analysed consist of secondary time series data from 2010 to 2023 sourced from the Central Statistics Agency and other pertinent organisations. The findings of the investigation reveal that investment elasticity positively and significantly influences economic growth, whereas the number of productive-age individuals does not have a notable individual impact. Nonetheless, both factors collectively have a substantial impact on economic growth, as evidenced by a 90.8 percent coefficient of determination. These results shed light that enhancing investments plays a pivotal role in advancing regional economic growth, while strategies for empowering the workforce should be tailored more effectively. This study recommends that local governments integrate investment enhancement policies with human resource quality improvement to achieve inclusive and sustainable economic development.

Keywords: Economic Growth, Investment Elasticity, Productive-Age Population, Regional Development.

1. Introduction

Economic growth is a key indicator in macroeconomic analysis that serves as a benchmark for assessing the success of a country's or region's development. Economic growth serves as a measure of both increased productivity and better social well-being, including more job opportunities, higher incomes, and a fairer sharing of progress. In the context of a country's development, a key focus for the government is to attain steady, all-encompassing, and lasting economic growth as a way of dealing with the issues brought about by globalisation and the growing competition among nations.

In line with the implementation of fiscal decentralisation and regional autonomy in Indonesia, responsibility for economic development is no longer centred solely on the central government, but has also become a strategic priority for regional governments. Broader authority in resource management and development planning provides space for regions to optimally develop their local economic potential.

Parigi Moutong Regency is one of the regions that has prospects for economic growth through the utilisation of natural resource potential and supportive demographic characteristics. However, optimising this potential requires the formulation of development policies based on an empirical approach in order to accurately identify the factors that contribute to economic growth dynamics at the local level.

Two key factors that are commonly believed to have a substantial impact on regional economic growth are investment and the number of people in the workforce. Investment, whether it comes from Domestic Investment (PMDN) or public funding, is a crucial aspect in speeding up the process of building up capital, creating jobs and increasing production capacity. As per the Harrod-Domar economic growth theory, investment directly drives output growth by influencing both aggregate demand and aggregate supply.

On the other hand, the size of the productive-age population (15–64 years) also significantly affects the economy. Individuals in this age group play a crucial role in the economy, both as employees and consumers (Marhaenis, 2024). With regards to the demographic dividend, the rising proportion of the productive-age population can present a valuable opportunity for promoting faster economic growth, assuming there are policies in place that support job availability, education and skills development.

The situation in Parigi Moutong Regency shows fluctuations in economic growth over the past decade. Variables such as investment and demographic changes in the productive-age population are thought to impact these trends. The specific contribution of each factor to economic growth has not been thoroughly studied. Past research has explored the connection between investment and economic growth, as well as the link between the productive-age population and economic growth. However, these studies generally discuss the two variables separately and few have integrated them simultaneously in a single empirical model, even though they are interrelated and contribute to economic development dynamics. Various empirical studies have explained the influence of investment and the number of productive age population on economic growth separately; for example (Safitri et al., 2019) examines investment and human development indices on growth, but the variables of investment elasticity and productive population are analysed separately using static path analysis. Similarly, Rizal and Rahman (2023) found a positive correlation between the productive age population and economic growth.

Most previous studies also still use data from before 2020, so they have not captured the effects of the post-COVID-19 pandemic economic transformation and the acceleration of digitalisation. Hidayat and Pahlevi (2025) shows the positive effect of investment on growth. In addition, there are still limited studies that examine the role of moderating variables such as technological advances or an increase in the elderly population, which can affect the relationship between investment elasticity, productive demographics, and economic growth. Therefore, research that simultaneously examines investment elasticity and the productive age population on economic growth using more up-to-date methodological approaches and data is important to fill the gaps in the existing literature.

With this context in mind, the objective of this research is to examine the impact of investment flexibility and the productive-age population on the economy in Parigi Moutong Regency. It is hoped that the findings of this study will inform the creation of more efficient and lasting regional economic policies. The elasticity of investment is crucial for the economic progress of Parigi Moutong Regency. A rise in investment, notably through Domestic Direct Investment (PMDN), has been shown to boost the Regional Gross Domestic Product (PDRB), indicating the effectiveness of regional economic advancement efforts. Conversely, the variable of the productive-age population does not show a significant partial effect on economic growth, indicating that the productive demographic potential has not been fully optimised to support economic activities. This condition may be caused by limited job opportunities, low human resource quality, and ineffective policies for empowering productive labour. Nonetheless, the investment elasticity and the number of productive-age population (X2) are both shown to have a substantial impact on economic growth, with a coefficient of

determination value of 90.8 percent. As a result, it is essential for future regional development strategies to prioritise combining efforts to boost investment levels while also enhancing the skills and competitiveness of the productive age group. This approach will be vital in promoting inclusive and sustainable economic growth that can adapt to the challenges of long-term development.

2. Literature Review

2.1. Investment Elasticity

Investment elasticity is an important indicator in macroeconomic and regional analysis, as it describes the extent to which changes in investment affect other economic variables, particularly economic growth. In the context of regional economics, investment elasticity serves as an analytical tool for assessing the response of economic growth to variations in investment levels in a region. The Harrod-Domar theory asserts that investment plays a fundamental role in the economic development process because it directly contributes to the accumulation of capital stock and the expansion of production capacity.

Todaro and Smith (2020) state that an increase in investment will have a significant impact on economic growth if it is directed towards productive sectors with a high multiplier effect. A high level of investment elasticity reflects an economy that is responsive to capital increases, while a low elasticity value indicates that investment is not yet fully capable of optimally driving output growth (Todaro & Smith, 2020).

2.2. Productive Age Population

The productive-age population is a demographic asset that, if managed optimally, can generate a demographic bonus, which is a condition where the proportion of the productive-age population is greater than the non-productive population. This bonus has the potential to accelerate economic growth through increased labour productivity, national income, and development efficiency. According to Bloom & Canning (2008), the demographic bonus will be achieved if there is appropriate policy support in the areas of employment, education, and macroeconomic stability. Conversely, if the growth in the productive-age population is not accompanied by structural readiness, such as the availability of jobs, access to relevant education, and skills development, then this demographic advantage will instead create a social and economic burden (Fadillah et al., 2020). The phenomenon of open unemployment, social inequality, and an increase in poverty are impacts that often arise due to the non-absorption of the labor force in the formal labor market (Wulandari, 2023).

2.3. Economic Growth

Economic growth is often described as the enhancement of an economy's ability to generate goods and services over a period, as indicated by alterations in the actual value of Gross Domestic Product (GDP) or Gross Regional Domestic Product (GRDP) within a specified timeframe (Sukirno, 2019). As revealed by Sukirno (2019), economic growth reflects changes in national output that can be measured through GDP indicators or, at the regional level, GRDP. These indicator values show an increase in real per capita income and the ability of regional economies to expand the production and distribution of goods and services.

Several economic theories explain the mechanism of growth from different perspectives. Classical theory emphasises the role of capital accumulation and labour as the main factors of growth, while neoclassical theory, such as the Solow–Swan model, places technology and total factor productivity as the main determinants in the long term (Rodrigues & Souza, 2021).

In the context of regional development, economic growth analysis is important for identifying leading sectors and formulating targeted policies. Mankiw emphasises that growth research needs to understand production structures, productivity factors, and local characteristics so that regional policies can improve the economic efficiency of the region.

2.4. H1: Investment elasticity has a positive and significant effect on economic growth

Investment is crucial in stimulating economic expansion, as highlighted by the Harrod-Domar and Solow theories, which view capital accumulation as central to sustained increases in output. The investment elasticity gauges how much the Gross Regional Domestic Product fluctuates in reaction to shifts in investment levels. In developing regions such as Parigi Moutong Regency, strengthening the investment sector, particularly physical investment such as infrastructure development and production facilities, can generate a significant multiplier effect on local economic output.

Study by Huong (2023) confirms that gross fixed capital formation (GFCF) has a major positive link with GDP, indicating that fixed capital investment can increase productivity and production capacity. This is in line with the findings of Sheriffdeen et al. (2020) which emphasises the importance of institutional climate and governance in supporting investment effectiveness. Meanwhile, Olaoye (2023) states that infrastructure investment is a key driver of economic growth. Thus, in the context of Parigi Moutong Regency, this hypothesis leads to the assumption that increased investment elasticity will be a determining factor in driving positive and significant acceleration of regional economic growth.

2.5. H2: The number of people of productive age has a significant effect on economic growth

Although demographics, namely the large proportion of the productive-age population, are seen as a golden opportunity to drive economic growth, various literature emphasises that this potential does not automatically translate into growth without supporting policies. Demographic transition theory asserts that the contribution of the productive-age labour force to output depends on the extent to which it is absorbed into formal and productive economic activities. In areas like Parigi Moutong, which may face structural challenges in the education, health, and employment sectors, a high productive-age population does not necessarily translate directly into an increase in GDP.

Bloom and Canning (2008) assert that without investment in human capital and the creation of quality jobs, a surge in the productive-age population can actually become a burden. A similar point is made by Liana et al. (2024), which shows that an increase in the proportion of the productive population does not automatically increase output without institutional and social support. Maestas et al. (2023) also adds that a favourable age structure must be accompanied by labour productivity. Therefore, this hypothesis implies that even though the composition of the productive age population is increasing, its impact on the economic growth of Parigi Moutong is not significant, especially if the quality of human resources and employment absorption are inadequate.

2.6. H3: Investment elasticity and productive age population simultaneously have a significant effect on economic growth

The endogenous growth theory emphasises the importance of synergy between physical capital accumulation and human resource capacity building in creating sustainable economic growth. In this context, investment elasticity describes the contribution of capital, while the productive-age population reflects human capital potential. If both develop simultaneously

and reinforce each other, inclusive and resilient economic growth conditions can be created, especially in developing regions such as Parigi Moutong Regency.

Barro & Lee (2013) show that long-term economic growth is greatly influenced by the quality of education and physical investment. Mody & Aiyar (2011) state that labour productivity and investment complement each other in driving growth, especially in developing countries. Feyrer (2007) also found that the combination of an optimal productive age and productive investment has a synergistic effect on national output. Therefore, this hypothesis implies that when investment is increased in proportion to the optimisation of productive labour, the economic growth of Parigi Moutong Regency will be significantly driven in a simultaneous and synergistic dimension.

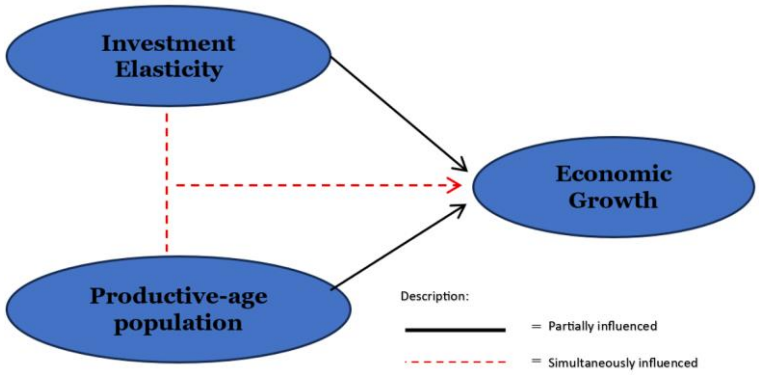

Figure 1. Research Framework

3. Methods

3.1. Research Types and Approaches

This study is a quantitative study with a descriptive and inferential approach. The descriptive approach is used to describe the development of investment, the number of productive-age population, and economic growth in Parigi Moutong Regency. Meanwhile, the inferential approach is used to analyse the effect of investment and productive-age population variables on economic growth using statistical techniques.

3.2. Data Types

The data was collected from official sources of the Central Statistics Agency (BPS). The type of data used in this study is secondary data in the form of annual time series data from 2010 to 2023. The data was obtained from official sources, such as the Parigi Moutong Regency Central Statistics Agency (BPS Parigi Moutong), the Parigi Moutong Investment Agency, and Parigi Moutong Regency government publications.

3.3. Research Variables

This study examines the relationship between regional economic growth dynamics and two interconnected independent variables. The Gross Regional Domestic Product (GRDP) at constant prices is used as a measure of economic growth in Parigi Moutong Regency, which is considered the dependent variable (Y). This variable was chosen because it is considered an indicator that reflects overall economic development performance. The independent variables include two main factors. First, investment elasticity (X_1), represented by the value of Domestic Investment (PMDN) in millions of rupiah, acts as a source of capital formation and increased regional production capacity. Second, the number of productive-age population

(X_2), namely people aged 15 to 64 years, who are the dominant age group in economic activities and have great potential to drive economic growth if managed optimally.

3.4. Data Collection Techniques

In this research, information gathering methods involved examining documents and conducting literature reviews. Secondary data from trusted sources like official agencies and reliable publications were used. The Central Statistics Agency (BPS), the Investment and Integrated One-Stop Service Agency (DPMPTSP), as well as regional development planning documents such as the Regional Medium-Term Development Plan (RPJMD) and the Strategic Plan (*Renstra*) provided valuable data. Moreover, scientific literature and academic reports were consulted to enhance the theoretical framework and validate the analysis and interpretation of the data.

3.5. Data Analysis Techniques

In order to analyse how investment and the size of the productive-age population impact economic growth, researchers employed multiple linear regression analysis, utilising the following general equation:

$$\mathbf{Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon}$$

Explanation:

Y = Economic Growth (GRDP of Parigi Moutong Regency)
X_1 = Investment (in million rupiah)
X_2 = Productive-age Population
α = Constant
β_1, β_2 = Regression coefficients
ε = Error

In this paper, a method called multiple linear regression is employed to examine how investment and the population of productive-age individuals affect economic growth. Before calculating the model, various tests were carried out to check for normality, multicollinearity, and heteroscedasticity to confirm the accuracy of the model. The study then proceeded to conduct partial tests, simultaneous tests, and determination coefficients to assess the extent of the connection between the variables. To address potential issues in time series data, the ADF stationarity test was used, and if necessary, advanced models such as VECM or VAR were applied to analyse the short-term and long-term relationships between variables more comprehensively.

3.6. Data Processing Tools and Software

This study utilised several statistical software programmes to improve the accuracy of data analysis. Microsoft Excel was used in the initial stages for data input and presentation, SPSS was used for multiple linear regression analysis and classical assumption testing, while EViews was used for time series data analysis, including stationarity testing (ADF) and advanced models such as VECM or VAR. The use of these software programmes was intended to obtain comprehensive and scientific analysis results.

4. Results and Discussion

4.1. Research Results

4.1.1. Descriptive Statistical Test Results

According to the findings of the descriptive statistical analysis presented in Table 1, it can be determined that there are 10 data sets in this research. The fluctuation of the Investment Elasticity variable (X1) ranges between 15.37 and 15.75, averaging at 15.6074 with a standard deviation of 0.13568. The relatively small standard deviation indicates that the X1 data has a low dispersion, meaning that the observed values tend to be close to the mean.

Table 1. Descriptive Statistical Test Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Investment Elasticity (X1)	10	15.37	15.75	15.6074	.13568
Productive-age Population (X2)	10	67.30	74.10	70.3600	2.43228
Economic Growth (Y)	10	16.06	16.34	16.2243	.08467

Source: Results of Ev's Analysis

Additionally, the variable X2 representing the Productive Age Population has a range of values from 67.30 to 74.10, with an average of 70.3600 and a standard deviation of 2.43228. This suggests there is a moderate level of diversity in the productive age population throughout the observation period. In contrast, the Economic Growth variable (Y) fluctuates between 16.06 and 16.34, with an average of 16.2243 and a standard deviation of 0.08467, signifying that the economic growth rate remains relatively stable and consistent over time, without major changes.

Thus, the three variables used in this study have a fairly good data distribution and do not show any extreme outliers, making them suitable for use in further regression analysis to test the relationship between variables inferentially.

4.1.2. Normality Test

According to the normality test findings laid out in Table 2, it is evident that the examination was carried out utilising the Kolmogorov-Smirnov technique, with an Asymp. Sig. (2-tailed) score of 0.077. Since this score exceeds the threshold of 0.05, it can be inferred that the leftover data follows a normal distribution. This condition indicates that there is no significant deviation from the normal distribution, so the assumption of normality in multiple linear regression analysis has been met.

Table 2. Normality Test Results

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		10
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.02563254
Most Extreme Differences	Absolute	.250
	Positive	.250
	Negative	-.127
Test Statistic		.250
Asymp. Sig. (2-tailed)[c]		.077

The assumption of residual normality is one of the important prerequisites in classical regression models, as it affects the validity of parameter estimation results and hypothesis testing, both partially and simultaneously. With this assumption fulfilled, the regression model used can be considered valid for further statistical analysis and can be interpreted scientifically, particularly in the context of the relationship between investment elasticity, productive age population, and economic growth in Parigi Moutong Regency.

4.1.3. Multicollinearity Test

According to the findings from the multicollinearity test shown in Table 3, it is evident that the Tolerance value for both independent variables, Investment Elasticity (X1) and Productive Age Population (X2), is 0.692, with a Variance Inflation Factor (VIF) value of 1.445.

Table 3. Multicollinearity Test Results

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Investment Elasticity (X1)	.692	1.445
	Productive-age Population (X2)	.692	1.445

a. Dependent Variable: Economic Growth (Y)

In the realm of multiple linear regression analysis, the presence of multicollinearity is not considered an issue as long as the tolerance value exceeds 0.10 and the VIF is under 10. As a result, it can be inferred that there is not a strong linear correlation among the independent variables in the model. Consequently, it can be determined that the regression model meets the requirement of being free from multicollinearity. This is important to ensure that regression parameter estimates are not biased or unstable due to high correlations among the independent variables, thereby allowing the model to be interpreted validly and accurately in measuring the influence of each variable on economic growth.

4.1.4. Heteroscedasticity Test

Based on the results of the Heteroscedasticity Test using the Glejser method presented in Table 4, it is known that the significance value for the Investment Elasticity variable (X1) is 0.653, and for the Productive Age Population variable (X2) is 0.350. Since both significance values are above the threshold of 0.05, there is no significant relationship between the absolute residual value (ABRESID) and each independent variable. This indicates that the variance of the residuals does not depend on the value of the independent variables, meaning that there is no systematic pattern of residual dispersion.

Table 4. Results of the Heteroscedasticity Test (Gleiser Method)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.159	.721		-.221	.831
	Investment Elasticity (X1)	.025	.052	.200	.470	.653
	Productive-age Population (X2)	-.003	.003	-.425	-1.001	.350

a. Dependent Variable: ABRESID

Thus, it can be concluded that the regression model used is free from heteroscedasticity, at least according to the Glejser statistical test. This condition indicates that the classical

assumption of homoscedasticity is fulfilled, so that the Ordinary Least Squares (OLS) model estimation can be said to be reliable in terms of constant residual variance.

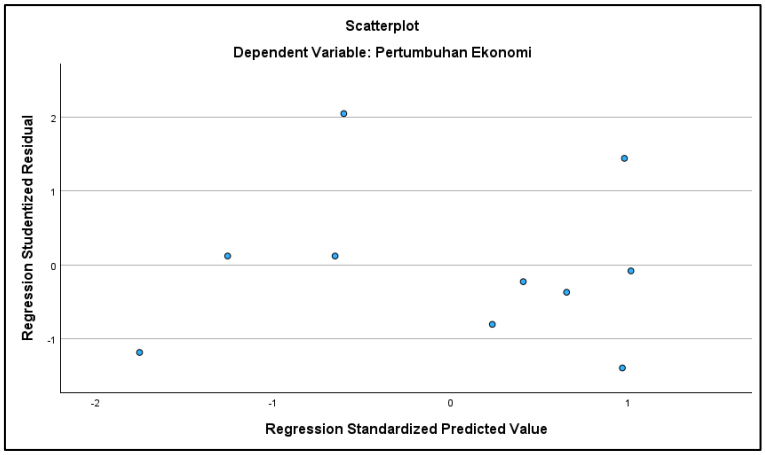

Figure 2. Scatter Plot of Heteroscedasticity Test

In the scatterplot results of this study, the residual points appear to be scattered randomly and do not cluster in one area or form a specific pattern. This indicates that the residual variance is constant across all predicted values, or in other words, there are no visual signs of heteroscedasticity.

4.1.5. Simultaneous test (F test)

According to the findings from the simultaneous test (F test) presented in Table 5, it is evident that the F significance value is less than 0.001, well below the significance level of 0.05. This suggests that both Investment Elasticity (X1) and Productive Age Population (X2) variables collectively have a noteworthy impact on Economic Growth (Y). Therefore, the regression model developed is considered appropriate for interpreting variations in the dependent variable.

Table 5. Simultaneous Test (F-test) Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.792	1.186		5.725	<,001
	Investment Elasticity (X1)	.613	.086	.982	7.140	<,001
	Productive-age Population (X2)	-.002	.005	-.054	-.394	.705

a. Dependent Variable: Economic Growth (Y)

Substantively, the simultaneous test results indicate that the combination of capital accumulation through investment and the dynamics of the productive age demographic contribute significantly to changes in the economic growth rate in the regions studied. Although in the partial test (t-test) only X1 is significant, collectively both still have predictive power for the dependent variable. Therefore, this model can serve as a valid analytical foundation for evaluating the simultaneous interrelationships among variables in the context of regional economic development.

4.1.6. Partial Test (t-test)

Table 6. Partial Test (t-test) Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.792	1.186		5.725	<,001
	Investment Elasticity (X1)	.613	.086	.982	7.140	<,001
	Productive-age Population (X2)	-.002	.005	-.054	-.394	.705

a. Dependent Variable: Economic Growth (Y)

The regression model obtained is as follows:

$$Y = 6{,}792 + 0{,}613X\_1 - 0{,}002X\_2$$

The findings suggest that an increase in investment has a favourable impact on economic growth, with a coefficient of 0.613. This means that for every additional unit of investment, there is a corresponding increase of 0.613 per cent in economic growth, all other factors being constant. On the other hand, the productive-age population has a coefficient of -0.002, indicating that a rise in this demographic group slightly decreases economic growth. However, this impact is not considered significant.

Based on the results of the partial regression analysis (t-test), it is known that the investment elasticity variable (X_1) has a significant effect on economic growth in Parigi Moutong Regency. This is indicated by a regression coefficient value of 0.613 with a t-value of 7.140 and a significance level of < 0.001. The significance level, which is far below the probability level of 0.05, indicates that investment elasticity contributes significantly to economic growth. The variable representing the quantity of productive-age individuals (X_2) has a regression coefficient of -0.002, a t-value of -0.394, and a significance level of 0.705. Given that this significance level greatly surpasses the threshold of 0.05, it can be inferred that the number of productive-age individuals does not wield a noteworthy impact on economic expansion.

4.1.7. Coefficient of Determination (R^2)

Table 8. Results of the Coefficient of Determination Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953[a]	.908	.882	.02906

a. Predictors: (Constant), Productive-age population (X1), Investment elasticity (X2).
b. Dependent Variable: Economic Growth (Y)

An R Square value of 0.908 suggests that the majority of the variation in economic growth is influenced by investment elasticity and the number of productive-age individuals. Approximately 9.2% of the variation can be attributed to other factors not considered in the model. This highlights the effectiveness of the model in understanding the economic growth phenomenon.

4.2. Discussion

4.2.1. The Effect of Investment Elasticity on Economic Growth

The findings point out that the flexibility of investment positively impacts the economic development in Parigi Moutong Regency, as demonstrated by the Gross Regional Domestic Product (GRDP) at constant prices. With a regression coefficient of 0.613 and a significance level below 0.001, it is indicated that a rise of one unit in investment elasticity will lead to a 0.613 per cent growth in GRDP, under the condition that other variables remain steady (ceteris paribus). This means that any improvement in investment efficiency, or the extent to which economic output increases due to additional investment, will directly accelerate the rate of real economic growth in the region.

This finding aligned with the Harrod-Domar growth theory, which states that capital accumulation through investment is the primary factor in driving output and economic growth. Productive investment will increase the production capacity of key sectors in Parigi Moutong, such as agriculture, fisheries, and manufacturing, which are major contributors to the region's GRDP. In practice, the realisation of Domestic Investment (PMDN) in Parigi Moutong shows a positive correlation with GDP growth based on constant prices, indicating that real investment is the main driver of the regional economy.

Macroeconomically, high investment elasticity indicates that capital invested in this region is capable of generating significant output growth. As emphasised by Chilarescu (2025), high investment elasticity implies an increase in per capita income and the share of capital in the production process, which ultimately strengthens the local economic base. In addition, Morina et al. (2023) emphasises that domestic investment, particularly in the form of Gross Fixed Capital Formation (GFCF), has a close long-term relationship with economic growth, as reflected in the dynamics of Parigi Moutong's GRDP.

In terms of policy implications, these results provide a strong basis for local governments to direct fiscal policy and development planning towards increasing investment attractiveness. Such strategies may include streamlining licensing processes, improving basic infrastructure, and offering incentives to investors in strategic sectors such as agroindustry and nature-based tourism. Additionally, in line with the findings of Bitros & Nadiri (2017), investment focus needs to be expanded to high value-added and innovation-based sectors, such as agricultural technology and digitisation of public services, in order to promote inclusive and sustainable long-term economic growth.

However, to maintain consistent economic growth, local governments must also pay attention to other factors such as human resource quality, SME development, and technological innovation, as over-reliance on physical investment alone risks neglecting the foundations of long-term growth. Therefore, Parigi Moutong's economic development policies must be holistic and integrated.

4.2.2. The Effect of the Productive-age Population on Economic Growth

The study findings show that the economic growth of Parigi Moutong Regency is not greatly influenced by the number of people of productive age, unlike investment flexibility. The regression coefficient of -0.002 and a significance level of 0.705 suggest that there is no statistical proof that an increase in the productive-age population leads to real growth in the Gross Regional Domestic Product (GRDP). This finding shows that the significant demographic potential has not been converted into a driving force for regional development. This is likely due to a number of structural constraints, such as low levels of education, workforce skills, limited formal employment opportunities, and the dominance of the informal sector, which tends to have low productivity.

Theoretically, this phenomenon aligns with the warnings of Bloom and Canning (2008), who emphasise that growth in the productive-age population will only become a demographic dividend if accompanied by substantial investment in human resource development, vocational training, and labour policy reforms. Without these prerequisites, an increase in the productive-age population could instead become a demographic burden rather than an asset. In a global context, poorly managed demographic dynamics can pose significant challenges to economic growth, especially as the population begins to age (Huang et al., 2019). For example, one study showed that a 10% increase in the elderly population (aged 60 and above) in the United States correlated with a 5.5% decline in GDP per capita between 1980 and 2010, mainly due to a decline in labour force participation and labour productivity (Maestas et al., 2023).

The study also revealed that population ageing has a non-linear impact on the economy. In the short term, the effect can be neutral or even positive, but when the proportion of elderly people exceeds a certain threshold, the negative impact becomes increasingly dominant (Lobo & Falleiro, 2024). Thus, for regions such as Parigi Moutong that are facing demographic transition, it is important to not only rely on quantitative figures of the productive-age population, but also to ensure its quality through increased access to vocational education, digitisation of job training, and the creation of a business climate conducive to labour-intensive and technology-intensive sectors.

Local governments need to design long-term strategies focused on enhancing the productivity of the current young workforce while preparing resilient social and economic systems to address the challenges of an ageing population in the future. Rahman et al. (2020) suggests that fiscal policy should be geared towards adjusting to these demographic changes, particularly through increased investment in education and health. Conversely, Lobo and da Piedade Falleiro (2024) emphasises that ageing is not necessarily a burden, provided that it is addressed with active policies such as extending working life, flexible working arrangements and the promotion of healthy ageing, which enable older people to remain productive and contribute to the economy.

4.2.3. Simultaneous Analysis of Independent Variables on Economic Growth

The results of the simultaneous test (F test) show that the investment elasticity and the size of the productive-age population together have a noteworthy impact on economic growth. With a significance level of < 0.001, it is certain that both factors together play a role in the changes in economic growth. Moreover, the coefficient of determination (R^2) is 0.908, indicating that 90.8% of the fluctuations in economic growth can be accounted for by these two variables. This implies that the predictive capabilities of the model are exceptional.

Thus, even though the productive age population does not have a significant effect in isolation, its existence remains relevant in the model when combined with investment. This means that there needs to be integration between strategies to increase investment and efforts to empower the local workforce in order to create more balanced and comprehensive economic growth.

The results of the study emphasise the importance of investment as a key determinant of economic growth, so concrete steps are needed from local governments to strengthen a conducive investment climate. These efforts can be realised through the simplification of licensing procedures, the provision of targeted fiscal incentives, and the structured and sustainable promotion of local economic potential. Investment development strategies should focus on economic sectors with high multiplier effects, such as technology-based agriculture, processing industries, and tourism that emphasises local advantages.

In addition, human resource development policies need to be formulated within a medium- and long-term framework to optimise the contribution of the productive age

population to the regional economy. These efforts include improving access to vocational education, providing job skills training that meets market needs, and strengthening entrepreneurship literacy. These steps are crucial to ensure that the productive age population is not merely part of the demographic structure, but is able to transform into a productive and competitive economic asset. By integrating strategies to increase investment and empower human resources, local governments have the opportunity to build an inclusive, resilient, and competitive economic structure in the long term.

5. Conclusion

According to the findings, it is evident that the elasticity of investment has a notable and beneficial impact on the economic development in Parigi Moutong Regency. This indicates that an increase in investment, particularly through Domestic Investment (PMDN), can drive an increase in Regional Domestic Product (PDRB), thereby reflecting the success of regional economic development supported by capital accumulation. Conversely, the number of productive-age population does not show a significant partial effect on economic growth, indicating that the demographic dividend potential has not been fully optimised. The absence of this effect may be attributed to several factors, including limited job opportunities, low quality of education and workforce skills, as well as the inadequate implementation of policies aimed at empowering the productive-age population. Nevertheless, both factors that are not dependent on each other - investment adaptability and quantity of productive-age inhabitants - jointly influence economic progress, as suggested by the coefficient of determination figure of 90.8%, illustrating that the regression model is highly effective in clarifying discrepancies in local economic expansion.

Based on these findings, it is recommended that the Parigi Moutong Regency Government strengthen the synergy between investment enhancement strategies and human resource development. This can be achieved through streamlining investment permits, providing adequate supporting infrastructure, and offering fiscal incentives for labour-intensive strategic sectors. On the other hand, the optimisation of the productive age population needs to be directed towards competency-based skills improvement programmes, strengthening vocational education, and developing local entrepreneurship oriented towards market competitiveness. The integration of policies between investment and human resource development is believed to encourage more inclusive, sustainable, and adaptive economic growth in the face of long-term development challenges.

6. References

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