



The Effect of Macroeconomic Factors and Interest Rates on Economic Growth in South Sulawesi Province: An Empirical Study (1995-2022)

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Abstract. As the gateway to the economy in Eastern Indonesia and the island of Sulawesi in particular, South Sulawesi plays an important role in the economy of the surrounding region. This study aimed to test and analyze macroeconomic variables in the form of investment, exports, labor, and interest rates on economic growth in South Sulawesi. This research was tested and analyzed using a quantitative approach. The data used were secondary data. The method used was Ordinary Least Squares. From the relationship of the variables studied, the results obtained identify that investment has a positive and significant effect on economic growth in South Sulawesi. Exports also showed a positive and significant effect on the growth rate. However, labor and interest rates did not have a significant effect. These findings provide important insights for policymakers in formulating more effective and sustainable economic development strategies. It is also useful for all stakeholders, especially economic actors in related sectors. Thus, the results of this study are expected to be a reference in planning and implementing economic policies in South Sulawesi Province.

Keywords: First Keyword, Second Keyword, Third Keyword.

1 Introduction

Economic growth is a key indicator used in evaluating the progress of a region. During the study period, from 1995 to 2022, there were fluctuations in the economic growth of South Sulawesi. The purpose of this study is to analyze the various factors that influence growth. The selected variables are labor, investment, exports, and interest rates. As shown by the data, the economic growth rate of South Sulawesi in the period 1995-2005 was characterized by highly fluctuating growth due to the economic and monetary crisis. At the beginning of the period, the economic growth rate was 8.10 percent, but it decreased to 4.30 percent in 1997 and further to 2.83 percent in 1999. The economic improvement in 2004, due to the implementation of regional autonomy, had an impact on growth, which increased steadily, reaching its highest value of 8.87 percent in 2012. The decline occurred again in 2019 and continued in the following years due to COVID-19, reaching 3.68 percent in 2022 (BPS, 2022). A country's economic growth is intrinsically linked to the economic

performance of its constituent provinces. High national economic growth can significantly influence regional development, as economic growth leads to increased national income, thereby enabling greater allocation of funds for economic infrastructure development. Aggregate demand consists of consumption, investment, government spending, exports, and money supply and demand (Mankiw, 2013).

Lack of investment causes economic growth to be hampered. The Harrod-Domar growth theory is one of the modern economic growth theories that emphasizes the importance of investment formation for economic growth. High levels of investment will stimulate economic growth. This increase in investment enhances production capacity and affects both aggregate demand and supply. In the long term, investment increases the capital stock. In the Neo-Classical growth theory proposed by Solow and Swan (Nurbayani, 2024), economic growth is viewed from the supply side. Solow and Swan argue that economic growth depends on the development of production factors, including the rate of capital growth, population, and technology. The capital referred to in this context is physical capital, such as capital goods and investment

2 Literature

Economic growth has been a central focus of economic theory for centuries. Ray (1998) defines it as an increase in Gross Domestic Product or Gross National Income, regardless of population growth or structural changes. The discourse on economic growth theory can be broadly categorized into classical and modern approaches. Economic growth is essential in analyzing economic development in a country or region. Classical economists like Adam Smith and David Ricardo emphasized the efficiency of free market mechanisms (Arsyad, 2015). Smith posited that national wealth stems from a country's workforce and the balance between productive and non-productive workers, rather than gold and silver holdings.

The Neo-classical growth theory, pioneered by Robert Solow and Trevor Swan in the 1950s, built upon the classical view. Solow, who won the 1987 Nobel Prize in Economics, argued that economic growth depends on factors such as population growth, labor force, capital accumulation, and technological progress (Weil, 2013).

Schumpeter's theory, first presented in his 1934 book "Theory of Economic Development" and further elaborated in his 1939 work "Business Cycle," highlighted the capitalist system as the most effective for rapid economic development (Arsyad, 2015; Schumpeter, 2008).

Investment plays a crucial role in economic growth. Investment defines it as expenditures on capital goods and production equipment to replace or augment existing capital. Mankiw views it as a government tool to boost economic growth and, in the long run, elevate living standards. The Harrod-Domar theory suggests that output and employment growth can be achieved through capital accumulation (investment) and savings. This theory emphasizes the conditions necessary for steady economic growth (Todaro, 2006). Mankiw (2013) defines net exports as the value of exported goods and services minus imported goods and services. A positive net export indicates a trade surplus, while a negative value signifies a trade deficit. (Pindyck 2015), Salvatore (1997), notes that a trade surplus can positively impact economic growth.

Lewis' theory, by Todaro (2013), views excess workers as an opportunity rather than a problem. It posits that developing economies have two sectors: a modern capitalist sector and a backward subsistence sector. The latter, with its surplus labor and lower wages, can fuel growth in the modern sector.

Marx's theory ties labor value to the amount of work needed to provide for a worker's basic needs. The Solow model incorporates labor as a distinct production factor, allowing for substitution between physical capital and labor (Blanchard, 2013).

Keynesian theory challenges the classical view of full employment, arguing that market mechanisms don't always lead to equilibrium and full employment. (Mankiw, 2013).

Karl and Fair (2020), describes interest as a future payment for past money transfer. It is define the interest rate as the annual interest payment on a loan, expressed as a percentage. Classical theory views interest rates as a determinant of savings, with higher rates encouraging more savings. Keynes' liquidity preference theory, however, sees interest rates as a monetary phenomenon determined by money supply and demand.

3 Research Methodology

This study aimed to analyze investment, export-netto, labor, and interest rate on economic growth in South Sulawesi Province for the period 1995–2022. The research method: The data used in this study is quantitative data which are obtained from secondary sources of data. Such data are collected in specific period of time and generally collected as a time series. The main data sources consist of Central Bureau of Statistics (BPS), Bank Indonesia and relevant books and journals.

Library research method, this is the process of collecting information by reading and analyzing all available materials about the topic. The degree to which the independent variables Investment, exports-netto, labor and interest rates have an impact on economic development. In the regression analysis, authors have used Multiple Linear Regression Model by using EViews software. This analysis helps in identifying the direction and strength of the relationship between independent & dependent variables, and also used for prediction of value of dependent variables given changes in independent variables. The variables are Invesment (In), export-netto (Ne), labor (L), and interest rate (Ir) and economic growth (Y)

The model specification for the multiple linear regression analysis is as follows:

$$Y = f(\text{In}, \text{Ne}, \text{L}, \text{Ir}) \quad (1)$$

The equation is then transformed into multiple linear regression form:

$$\text{Ln } Y = \beta_0 + \beta_1 \text{Ln In} + \beta_2 \text{Ln Ne} + \beta_3 \text{Ln L} + \beta_4 \text{Ir} + \varepsilon \quad (2)$$

Where:

Y : Economic Growth

β_0 : Constant

β_1 : Coefficients of Investment

β_2 : Coefficients of Export Netto

β_3 : Coefficients of labor

β_4 : Coefficients of Interest rate

ε = Error Term

We use statistical tests to measure the level of significance between the independent and dependent variables. The t-test (partial test), F-test (simultaneous test), and coefficient of determination (R^2) are the methods used.

The t- test identifies the effect of each independent variable on the dependent variable. This approach assesses the individual contribution of each variable, providing a deeper insight into the factors influencing economic growth in South Sulawesi Province and the implications for future economic policy development. It also explains variations in the dependent variable.

The coefficient of determination (R^2) definitively measures the strength of the linear relationship between variables. This coefficient has a value that ranges from 0 to 1. If R^2 is close to zero, the independent variable has no significant effect on the variation in the dependent variable. Conversely, R^2 value close to one indicates that the independent variable contributes significantly to the variation in the dependent variable.

4 Results and Discussion

There is no doubt that between 1995 and 2022, investment showed considerable dynamism. Its growth trajectory continued to increase, reaching IDR 500 billion in 1996 and IDR 555.55 billion in 1997. The Asian economic crisis of the late 1990s brought major changes to the investment situation: in 1998, investment plummeted to Rp 502.04 billion. This decline was a clear indication that the crisis had negatively affected the investment climate.

However, the subsequent surge in investment was a clear indication of a significant recovery and a return of confidence in the economic environment. In the early 2000s, investment entered a period of volatility: in 2000, investment reached IDR 3,124 billion. However, this figure dropped to IDR 1,614 billion in 2001 and further to IDR 1,572 billion in 2001. This decline is a clear indication of continued economic uncertainty after the crisis. From 2003 onwards, there was a clear upward trend in investment, accompanied by a gradual increase: in 2006, total investment jumped to IDR 2,362.6 billion and continued to rise until it reached IDR 3,212.3 billion in 2010. The highest investment occurred in 2011, at IDR 3,986.3 billion. The following year, 2012, there was a decline. From 2014 onwards, there was a significant surge in investment, reaching IDR 4,949.6 billion and continuing to increase until 2022, with a peak in 2022, when investment reached IDR 14,258 billion. Despite the obstacles posed by the global economic crisis and pandemic, investor confidence and government initiatives led to sustained investment growth.

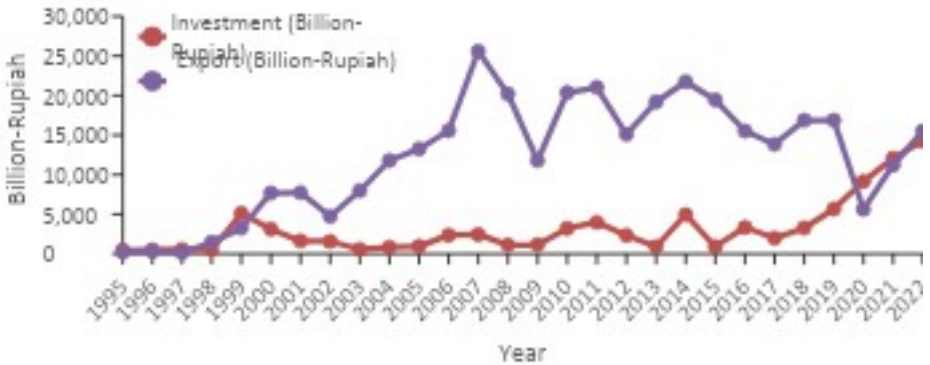


Fig. 1. Figure of Investment and Export South Sulawesi Province 1995-2022

Indonesia's export trends from 1995 to 2022 show significant fluctuations, reflecting the interaction between domestic economic conditions and global market forces. In 1995, total exports were recorded at IDR 240.00 billion. This figure increased to IDR 310 billion in 1996, showing a consistent positive growth pattern. In 1997, the export sector experienced a significant decline, with figures dropping to IDR 122.89 billion, a situation directly related to the Asian economic crisis. The rebound was due to a strong economic recovery and increased global demand. In the late 1990s and early 2000s, exports continued to increase, reaching IDR 3.23 billion in 1999 and jumping to IDR 7.68 billion in 2000. Exports remained steady at over 7 billion rupiah in 2001 and 2002, but dropped to 4.72 billion rupiah in 2000. 4.72 billion in 2002 due to global financial problems. From 2004 to 2008, Indonesia's exports increased significantly, reaching a peak of Rp 25,599.68 billion in 2007. In 2008, the export figure dropped to IDR 20,185.18 billion, which was a decline caused by the global financial crisis. After 2008, Indonesia's exports experienced a revival and peaked at IDR 21,025.61 billion in 2011. In the following years.

A review of the employment data for South Sulawesi reveals notable shifts from 1995 to 2022. The number of individuals in the labor force was recorded at 2,550,000 people. In 1995, the figure increased gradually until it reached 2,710,000 in 1996.

Nevertheless, the path was not without obstacles. In 1999, the impact of the crisis that affected Indonesia resulted in a decrease in the size of the labor force, which reached 2,683,071 people. Following this period of decline, the labor force experienced a notable recovery, increasing again to 2,875,099 individuals in 2000 and continuing to grow until it reached 3,136,111 individuals in 2008.

The data clearly demonstrates that the growth of the labor force persisted throughout the subsequent decade. The rate of increase in the number of workers demonstrated a positive trajectory, exhibiting consistent growth until 2017, reaching 3,598,663 individuals. The peak of labor force growth was reached after 2018, with a pronounced surge occurring in 2020, when the number of the labor force reached 4,276,437 individuals. This increase is the result of effective government programs designed to create jobs and increased investment in various sectors. The data on

interest rates in South Sulawesi from 1995 to 2022 reflect the response of monetary policy to the dynamic regional economic conditions that have prevailed during this period. In 1995, interest rates stood at 8.25%, indicating a relatively stable financial environment. There was a decline in interest rates in 1996 to 8.00%, which was in line with government efforts to encourage investment and consumption.

However, the economic situation underwent a significant transformation in 1997 when interest rates increased to 17.34% due to the impact of the Asian financial crisis. This spike reflects the economic uncertainty that affected South Sulawesi, where sectors of the local economy were subjected to the global crisis. Interest rates reached their peak in 1998 at 23.16%, reflecting the implementation of stringent measures in monetary policy to stabilize the economy. Following this period, interest rates began to decline gradually. In 2002, interest rates stood at 12.93%, indicating an attempt at economic recovery in South Sulawesi. The decline continued, and by 2010, interest rates stabilized at 6.50%, supporting real sector growth and investment. As the global economy grappled with the ramifications of the SARS-CoV-2 pandemic, interest rates reached a nadir of 3.75% in 2020. This policy was designed to invigorate economic growth, which had been constrained by the imposition of restrictive measures. In 2022, interest rates underwent a modest increase to 5.50%, reflecting a calibration to accommodate inflationary pressures and the nascent stages of economic recovery.

In summary, fluctuations in interest rates in South Sulawesi are indicative of the interplay between monetary policy and the prevailing economic conditions in the region. Adaptive adjustments in interest rates are a crucial element in maintaining economic stability and fostering sustainable growth in the area.

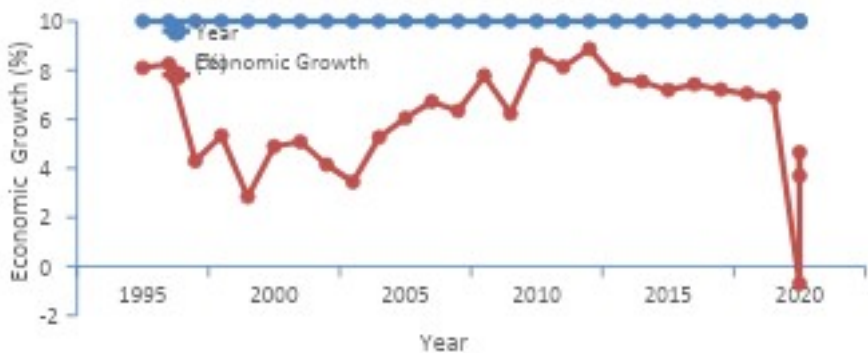


Fig. 2. Economic Growth of South Sulawesi Province

The following is a definitive account of South Sulawesi's economic growth from 1995 to 2022. South Sulawesi's economic growth data from 1995 to 2022 shows significant dynamics. In 1995, economic growth reached 8.10%, reflecting positive post-reform momentum. This figure increased to 8.25% in 1996, before declining in 1997 to 4.30%, due to the impact of the Asian financial crisis.

After a period of recovery in 1998, growth reached 5.33%. This was followed by relatively stable growth until 2008, when it peaked at 7.78%. In 2009, growth reached

6.23%. However, Indonesia, including South Sulawesi, faced global challenges. 2010 was a turning point with growth of 8.63%, followed by a positive trend that continued into 2012, where growth reached 8.87%. However, growth began to slow down in the following years, with figures below 8% until 2019. The year 2020 saw a significant negative impact on economic growth due to the pandemic, with figures reaching -0.71%. However, recovery was seen in 2021 with growth of 4.65% and 3.68% in 2022. South Sulawesi's economic growth demonstrates unwavering resilience and adaptability in the face of economic challenges. Despite fluctuations, the post-pandemic recovery trend offers a promising outlook for the region's economic future.

The objective of linear regression analysis is to estimate the magnitude of the influence between the dependent variable and the independent variable. In this case, the dependent variable is economic growth (Y), while the independent variables are investment (In), exports-Netto (Ne), labor (L), and interest rates (Ir) for the period 1995-2022. The estimation results using regression analysis can be shown in the following table. The estimation results using regression analysis can be shown in the following table.

Table 1. Regression Estimation Results

Variable	Coefficient	Std. Error	t-statistic	Prob
<i>C</i>	-57.8644	15.21275	-	0.0011
			3.802369	
<i>In</i>	0.820433	0.125961	6.434003	0.0000
<i>Ne</i>	1.377964	0.272951	5.015416	0.0000
<i>L</i>	2.886205	3.670826	0.805324	0.4201
<i>Ir</i>	-0.092339	0.074351	-	0.2142
			1.254178	

Referring to this table, the regression results are as follows.:

$$Y = - 57.8644 + 0.820433 In + 1.377964 Ne+ 2.886205X3L - 0.092339Ir$$

In this equation, Y represents the level of economic growth that is influenced by several independent variables, namely In, Ne, L, and Ir. The results of the meaning of each component in this equation are explained as follows:

The constant is -57.8644. This shows the value of economic growth when all independent variables are zero. Although this value appears negative, it provides the initial context that without the influence of the other variables, the economy is likely to contract. This reflects the structural challenges faced by the economy in question.

Variable In. The coefficient of 0.820433 clearly indicates that every one-percent increase in variable investment will increase economic growth by 0.820433 Billion Rupiah, assuming other variables remain constant. This illustrates that this variable has a significant positive effect on economic growth.

Variable Ne. With a coefficient of (1.377964), the Export-Netto variable makes a significant contribution to economic growth. Each unit (one-percent) increase in Export -Netto can increase economic growth by 1.377964 Billion Rupiah. This shows that Ne has a strong and positive impact, and it is clear that this factor is important in driving the economy.

Variable L. Prob (0.4201). Since this p value is greater than 0.05, we do not have enough evidence to reject the null hypothesis. This means that the L variable has no significant effect on Economic Growth

Variable Ir. Prob (0.2142). Just like variable L, this p value is also greater than 0.05. Therefore, we cannot reject the null hypothesis for the variable Ir. This shows that the Ir variable also has no significant effect on Economic Growth

This equation provides a comprehensive picture of the factors that influence economic growth. By paying attention to the positive contribution of Investment and Net Exports. However, labor and interest rates do not have a significant effect.

Table 2. Result of R-Square.

R-Squared	0.783
Adjusted R-Squared	0.751

The coefficient of determination (R²) test is used to measure the effectiveness of the independent variables—namely, investment, net exports, labor, and interest rates—in explaining variations in the dependent variable, namely, economic growth. Based on the analysis output, the adjusted value obtained is 0.751055, or 75.1%.

This clearly indicates that 75.1% of the variation in economic growth can be explained by the combination of these independent variables. The remaining 23.9% of the variation in economic growth is influenced by other factors outside the unobserved model. To determine the significance of the relationship between the independent and dependent variables, a t-statistic test was used.

Furthermore, the t-statistic test assesses the effect of each independent variable on the dependent variable. This test determines the significance of each variable's contribution to explaining variations in economic growth. By analyzing the t-statistic and p-value, we can identify whether the effect of each independent variable is significant.

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Table 3. Result of t-Test

Variables	t-Statistic	Prob.
C	-3.802369	0.0011
Invesment	6.434003	0.0000
Export Netto	5.015416	0.0001
Labor	0.805324	0.4201
Interest rate	-1.254178	0.2132

Based on the estimation results shown in the table, the following is the t-statistic test analysis for each independent variable:

In regard to the matter of investment, the t-count probability value is 0.0000, with a significance position of $\alpha = 0.05$. Given that the probability value of 0.0000 is less than 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. These results demonstrate that investment exerts a positive and statistically significant impact on profitable growth in the South Sulawesi Province. This finding is consistent with the existing literature, which posits that increased investment can facilitate profitable growth through enhanced product capacity and job creation. The t-count probability value for net import is 0.0001. With $\alpha = 0.05$, the probability value is also lower than 0.05, thus rejecting H_0 and accepting H_a . This suggests that net exports exert a positive and significant influence on profitable growth in the South Sulawesi Province. This finding lends support to the argument that an increase in net exports can lead to an increase in public income and a positive balance of trade. Regarding the variable of labor, the t-count probability value is 0.4201.

Given that this value is less than 0.05, the null hypothesis (H_0) is accepted, and the alternative hypothesis (H_a) is rejected. This suggests that the labor variable does not exert a significant influence on profitable growth in the South Sulawesi Province.

This discrepancy may be attributed to a disparity between the quantity of available labor and the requisite levels outlined in the aforementioned request, or it may be influenced by other factors that impact labor productivity. The t-count probability value for the interest rate is 0.2132, which is also less than 0.05. Consequently, the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected. This indicates that interest rates have no significant effect on profitable growth in the South Sulawesi Province. This finding may reflect that the financial policy transmission medium is not performing optimally, so changes in interest rates do not have a direct impact on profitable activity.

5 Conclusion

The study's findings suggest the following conclusions about the impact of investment, net exports, labor, and interest rates on economic growth in South Sulawesi:

Investment variable produces a positive and significant effect on economic growth. This finding identifies that an increase in investment will be followed by increased economic growth as well, and vice versa. how important it is for policies that support increased investment as a driving force for economic growth.

The value of exports also shows a positive and significant effect on economic growth. This result means that when exports increase, economic growth also increases. Thus, strategies that encourage exports and reduce imports can contribute to better economic growth.

Labor does not show a significant effect on economic growth.

This suggests that changes in labor do not have a direct impact on economic growth in the province.

Various other influencing factors such as labor productivity were not measured in this study.

The interest rate variable also showed no significant effect on economic growth in South Sulawesi Province. This indicates that economic growth is not directly affected by fluctuations in interest rates.

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