Analysis of The Positive Effect of Consumption, Inflation, GDP, Unemployment Rate, Balance of Payment, and Interest Rate on Investment

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Abstract

This study analyzes the influence of macroeconomic factors on investment in Indonesia. The factors analyzed include consumption, inflation, Gross Domestic Product (GDP), unemployment rate, balance of payments, and interest rates. Secondary data from 1995 to 2016 were analyzed using the Ordinary Least Squares (OLS) method. Results show that consumption and inflation have a negative effect on investment, signaling that an increase in these two factors tends to reduce the interest and ability to invest. On the other hand, higher GDP, a low unemployment rate, and a positive balance of payments contribute to increased investment, suggesting that strong economic conditions and a healthy labor market are catalysts for investment. Interest rates, which have a significant negative effect, confirm the importance of monetary policy in shaping the investment climate. In conclusion, macroeconomic factors play an important role in determining the level of investment in Indonesia. Therefore, to encourage higher investment-which is key for economic growth and job creation-the government should focus on maintaining macroeconomic stability, improving infrastructure, providing attractive incentives for investors, and improving the quality of education and labor. These steps are expected to improve the overall welfare of the Indonesian people.

Keyword : Investment, Macroeconomic factors, Stationarity,
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Introduction

Investment plays a crucial role in driving a country's economic growth. With high investment, production capacity can be increased, new jobs are created, and people's income increases. High consumption signals a strong demand for goods and services, encouraging companies to invest more in the belief that their products will be in demand. Controlled inflation also plays a role in encouraging investment, providing opportunities for investors to profit from the difference in the purchase and sale prices of assets (Sasongko, Harnani, & Bawono, 2022).

A high Gross Domestic Product (GDP) reflects healthy economic conditions, increasing investor confidence to invest. A low unemployment rate indicates an available skilled workforce, attracting investors to expand their businesses. A positive balance of payments signals economic stability, which also boosts investor confidence. Meanwhile, stable interest rates provide certainty for investors to predict their investment returns (Darnia, et al, 2023).

Understanding the factors that influence investment is important for both the government and economic actors. Governments can use this information to formulate policies that can encourage investment, while economic agents can use it to make informed investment decisions. Thus, a deep understanding of the relationship between investment and economic factors can help in designing effective strategies for sustainable economic growth (Afif, 2022).

Literature Review

Consumption, inflation, investment, and unemployment are important factors that affect a country's Gross Domestic Product (GDP). Consumption is the largest component in the calculation of GDP. When public consumption increases, GDP will also increase (Silaban., et al. 2020).

Inflation also has an effect on GDP, although the relationship can be complex. Controlled inflation can encourage consumption and investment, which in turn can increase GDP. Investment is the engine of the economy and an increase in investment means an increase in production and employment, which has a positive impact on GDP (Dewi & Fasa. 2021).

Meanwhile, a low unemployment rate indicates that more people are working and generating income, which can increase consumption and investment, and ultimately increase GDP. Therefore, all these factors are interrelated and have an effect on GDP (Suhendra & Wicaksono. 2020). Based on previous research, researchers consider the following hypothesis:

Increased consumption signals higher consumer confidence and strong purchasing power, which encourages companies to increase investment to meet market demand (Roosmanita & Marbun. 2022). And moderate inflation is often considered a healthy economic indicator, indicating a stable demand for goods and services, which also encourages investment (Purba,. Et al, 2024).

GDP growth reflects a growing economy, which is usually followed by an increase in investment. Companies tend to invest more to expand their operations along with economic growth (Pratama & Utama 2019). A low unemployment rate indicates that more people are working, which signals good economic conditions and encourages companies to invest more (Annazah,. Et al, 2019).

A positive balance of payments indicates that the country earns more from exports than imports, which can increase foreign exchange reserves and attract foreign investment (Soeharjoto, 2020). Lower interest rates can lower borrowing costs, making investment more attractive for companies looking to expand or upgrade their facilities (Utami, 2019).

Overall, this hypothesis suggests that when these economic factors show positive conditions, they tend to encourage firms and individuals to increase investment, which in turn can help further economic growth.

H1 : Consumption, inflation, GDP, unemployment rate, balance of payments, interest rate, have a positive effect on Investment.

High consumption can signal that individuals prefer to spend their income rather than save or invest. This can reduce the amount of funds available for investment. High inflation can create economic uncertainty, reduce purchasing power, and lower investment profitability, which in turn can discourage investors from investing (Sejati, 2020).

A stagnant or declining GDP reflects slow economic growth, which may reduce incentives to invest due to low expectations of returns on investment. A high unemployment rate may indicate overcapacity in the labor market and a weak economy, which may also reduce investor confidence (Abidin, 2021).

A deficit balance of payments indicates that the country imports more than it exports, which can lead to currency depreciation and reduce the attractiveness of foreign investment. High interest rates can increase the cost of borrowing and reduce the amount of investment made by firms and individuals due to the higher cost of capital (Awagi., et al, 2024).
Overall, this hypothesis suggests that economic conditions characterized by high consumption, high inflation, stagnant or declining GDP, high unemployment, deficit balance of payments, and high interest rates can have a negative impact on investment decisions in a country.
H2 : Consumption, inflation, GDP, unemployment rate, balance of payments, interest rate, negatively affect investment.

Research Methods

This study examines investment growth as the dependent variable, taking into account the influence of consumption, GDP, inflation, interest rates, balance of payments and unemployment rate as independent variables. The data used is secondary data covering a 21-year period, from 1995 to 2016, obtained from the World Bank database. To process the data, this study utilized the Ordinary Least Squares (OLS) method within a linear regression framework. The analysis was conducted using EViews software, which enables efficient and accurate statistical modeling. The analysis steps include:
The results of the analysis will provide insight into the economic factors that influence GDP growth in Indonesia. The findings are expected to contribute to policy makers in designing effective economic strategies. Variable descriptions are presented in table 1.

Table 1. Variable description

Variables	Description	Unit of Analysis
GDP (Gross Domestic Product)	A measure of the total market value of all goods and services produced in a country in a given period.	Annual growth percentage
Consumption	Total household and government spending on goods and services.	Percentage of GDP
Inflation	The rate at which the general price level of goods and services is rising, and, conversely, the purchasing power of the currency is falling.	Annual percentage change
Investment	Expenditure on the purchase of capital goods that will be used for the production of goods and services in the future.	Percentage of GDP
Unemployment Rate	Percentage of the labor force that is not working and looking for work.	Percentage of the workforce

In this study, Stationarity Testing was first conducted to ensure that the data used did not have a time trend that could lead to biased regression results. This is important to validate that the regression model to be developed can produce consistent and unbiased estimates.
Next, determine the Model Specification by selecting the appropriate form of regression equation. This is done to estimate the relationship between the dependent variable, GDP growth, and independent variables such as consumption, inflation, investment, and unemployment rate. Choosing the right model will affect the accuracy of the estimation results.
After the model is determined, the econometric model equation is used as follows:
$It = \beta 0 + \beta\ GDP + \beta 1t12\ Irt2 + \beta\ BOP + \beta 3\ t34\ INF + \beta t45\ CO\ t5 + \beta 5\ Empt5 + et$
I is Investment
GDB is gross domestic product Ir is Interest rate
BOP is Balance of Payment INF is Inflation

CO is Consumption
Emp is Unemployment t is the time series
e is the error term
Then switch to Model Estimation using the Ordinary Least Squares (OLS) method. This method was chosen because of its ability to provide unbiased parameter estimates with the smallest variance. With OLS, we can show the magnitude of the influence of the independent variable on the dependent variable.
The next step is Model Diagnostics, where a series of statistical tests have been conducted to ensure that the regression model meets the classical assumptions. It has been checked whether there are multicollinearity, heteroscedasticity, or autocorrelation problems that could affect the validity of the model.
Finally, Interpretation of Results is done by analyzing the coefficients generated from the model estimation. This analysis helps in determining the significance and direction of the relationship between the variables under study. Thus, it is possible to understand the factors that influence GDP growth and provide evidence-based recommendations for policy makers.

Results and Discussion

Stationarity testing aims to ensure that the data does not have a time trend which can lead to biased regression results.

Table 2. Unit Root Test

Method	Statistic	Prob.	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.79922	0.0001	7	209
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.02558	0.0000	7	209
ADF - Fisher Chi-square	56.3007	0.0000	7	209
PP - Fisher Chi-square	56.8993	0.0000	7	210

In complex data analysis, one often faces the question of time series stationarity. The Levin, Lin & Chu test provides important insights in this regard. With a significant t-statistic of -3.79922 and a probability of almost zero, it is strongly evidenced that the data analyzed is not bound by a common unit root. This is an indication that the data may be stationary, meaning the values in the time series are independent of time and have constant statistical properties.
Furthermore, the Im, Pesaran and Shin W-stat method adds certainty to this finding. The resulting W-statistic is -5.02558, with an equally low probability, reaffirming that the data has no individual unit root. This suggests that each time series in the data, when viewed separately, also tends to be stationary.
Then, looking at the ADF - Fisher Chi-square test, which yields a Chi-square value of 56.3007. With an undetectable probability, once again the null hypothesis of a unit root can be rejected. This confirms that the data is not affected by non-stationary trends that could affect further analysis.
Finally, the PP - Fisher Chi-square test provides final confirmation with a Chi-square value of 56.8993 and the same probability of non-detection. All these test results are consistent and provide confidence that the data is stationary. Thus, it is possible to proceed with further analysis assuming that the data has a solid foundation in stationarity.

Model Estimation aims to use the OLS method to obtain parameter estimates that will show the magnitude of the influence of the independent variable on the dependent variable.

Table 3. OLS Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	38.05589	6.977292	5.454248	0.0000
Consumption	-0.577939	0.123040	-4.697158	0.0002
Inflation	-0.260903	0.020965	-12.44484	0.0000
Investment	0.751953	0.267885	2.807002	0.0121
Unemployment	1.408326	0.317740	4.432321	0.0004
R-squared	0.920394	Mean dependent var		4.470675
Adjusted R-squared	0.901664	S.D. dependent var		4.189755
S.E. of regression	1.313849	Akaike info criterion		3.580516
Sum squared resid	29.34541	Schwarz criterion		3.828480
Log likelihood	-34.38568	Hannan-Quinn criter.		3.638929
F-statistic	49.13820	Durbin-Watson stat		1.864364
Prob(F-statistic)	0.000000			

In this table, the constant has a highly significant coefficient of 38.05589 with a probability close to zero, indicating a statistically strong effect. The consumption variable shows a negative relationship with a coefficient of -0.577939 and a high level of significance. Meanwhile, inflation also has a significant negative relationship with a coefficient of -0.269093. Investment, on the other hand, shows a positive relationship with a coefficient of 0.751953 and a moderate level of significance. The unemployment rate has a positive coefficient of 0.408326, signaling a significant relationship. The model has a high R-squared value of 0.920394 and an Adjusted R-squared of 0.901664, indicating that the model can explain the variability of the dependent variable well. F-statistics and their probabilities are also included to test the significance of the overall coefficients in the model.

Table 4. Multicollinearity Test

	Coefficient	Uncenterd	Centered
Variable	Variance	VIF	VIF
GDP Growth	0.016627	14.49168	4.866957
Interest Rates	0.016962	37.38069	22.83490
Balance Of Payment	0.016366	2.995758	2.959992
Inflation	0.006829	46.24782	24.06350
Consumption	0.013403	1504.396	3.997094
Unemployment	0.087595	54.41113	5.943246
C	39.93648	900.4794	NA

In the world of data analysis, multicollinearity is a challenge often faced by researchers. This phenomenon occurs when the independent variables in a linear regression model are strongly correlated, making it difficult to distinguish the individual influence of each variable on the dependent variable. The multicollinearity test results you provided revealed some important findings. GDP growth, as measured by the Variance Inflation Factor (VIF), shows quite high numbers in both the decentralized and centralized measures. Nonetheless, the centralized VIF values are still below the threshold of ten, which is generally considered as the limit for acceptable multicollinearity. This indicates that although there are indications of multicollinearity, the situation is still within manageable limits. However, the interest rate shows

a much higher VIF, both uncentered and centered, indicating significant multicollinearity that could compromise the accuracy of the model. This suggests that this variable may need to be reviewed or adjusted in the model to reduce information redundancy.
The balance of payments, on the other hand, has a relatively low VIF, indicating that this variable does not pose a serious multicollinearity problem and can be considered stable in its contribution to the model. Inflation, with a very high VIF, indicates strong multicollinearity, which requires special attention. The high VIF indicates that this variable may be overly correlated with other variables in the model, thus obscuring the interpretation of its true influence.
Consumption, with a very high non-centered VIF, indicates extreme multicollinearity. However, the lower centered VIF indicates that when other variables in the model are controlled for, multicollinearity becomes less significant. This suggests that consumption may have complex relationships with other variables that need to be explored further.
Unemployment also shows a high VIF, indicating significant multicollinearity. This suggests that this variable may have an interrelated relationship with other variables in the model that needs to be considered carefully. The model constant, which usually does not have a centered VIF, shows a very high coefficient of variance in the uncentered measure. This signals the presence of very high multicollinearity, but since the constant does not have a centered VIF, the interpretation is different and does not directly affect the other variables in the model.

Table 5. Heterosdasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.258.493	6.793.821	-1.362.781	1,288888889
Gdp Growth	0.155421	0.138622	1.121.186	1,897916667
Interest Rates	0.006260	0.140012	0.044713	6,699305556
Balance Of Payment	0.032888	0.137530	0.239135	5,645833333
Inflation	0.023227	0.088838	0.261448	5,527777778
Consumption	0.136349	0.124461	1.095.516	1,973611111
Unemployment	-0.076511	0.318176	-0.240466	5,638888889
R-squared	0.181123	Mean dependent var		1.064.406
Adjusted R-squared	-0.023597	S.D. dependent var		1.245.930
S.E. of regression	1.260.544	Akaike info criterion		3.496.644
Sum squared resid	3.813.531	Schwarz criterion		3.820.447
Log likelihood	-4.719.797	Hannan-Quinn criter.		3.602.195
F-statistic	0.884736	Durbin-Watson stat		2.147.884
Prob(F-statistic)	0.521141			

Understanding the heteroscedasticity test table requires knowledge of key concepts such as coefficients, which signify the effect of the independent variable on the dependent variable with positive or negative values indicating the direction of the relationship. The standard error measures how far the coefficient estimate is from the true value, with lower values signaling a more precise estimate. The t-statistic is used to assess the statistical significance of the coefficient, with higher values indicating greater significance. The probability indicates the likelihood that the coefficient has no statistical significance, with values below 0.05 generally

indicating significance. In analyzing the given table, these values were evaluated for each variable to determine the presence of heteroscedasticity, with a probability below 0.05 on a given variable indicating a non-constant residual variance, which is a sign of heteroscedasticity. The R-squared value illustrates how well the regression model can explain the variability of the data, with higher values indicating better explanation. However, a more in-depth interpretation requires examination of the data and the overall context of the study.

Table 6. Autocorrelation Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP Growth	0.005115	0.137027	0.037327	6,740277778
Interest Rates	-0.013973	0.140253	-0.099626	6,399305556
Balance Of Payment	-0.000518	0.139197	-0.003722	6,924305556
Inflation	-0.003821	0.086715	-0.044059	6,703472222
Consumption	0.005730	0.121379	0.047211	6,686111111
Unemployment	-0.022685	0.316591	-0.071653	6,552083333
C	-0.185203	6.594.788	-0.028083	6,790277778
Resid(-1)	-0.063235	0.230964	-0.273788	5,463888889
Resid(-2)	0.066989	0.238939	0.280361	5,429166667
R-squared	0.006969	Mean dependent var		-2.39E-15
Adjusted R-squared	-0.354133	S.D. dependent var		1.048.754
S.E. of regression	1.220.407	Akaike info criterion		3.473.946
Sum squared resid	3.276.663	Schwarz criterion		3.890.264
Log likelihood	-4.484.616	Hannan-Quinn criter.		3.609.655
F-statistic	0.019299	Durbin-Watson stat		1.894.031
Prob(F-statistic)	0.999998			

The autocorrelation test table involves important economic variables and shows coefficients indicating the effect of the independent variable on the dependent variable, with standard errors indicating the degree of uncertainty in the coefficient estimates. The t-statistic is used to determine the statistical significance of the coefficient, and the associated probability indicates the likelihood that the coefficient is not statistically significant. The R-squared values in the table illustrate how well the regression model explains the variability of the data, while the F-statistic values assess the overall significance of the regression model. We look for patterns in the residuals from the regression model to determine the presence of autocorrelation; if such patterns exist, it indicates that the model may need to be adjusted to account for the autocorrelation.

Conclusion

Consumption and inflation have a negative effect on investment, signaling that an increase in these two factors tends to reduce the interest and ability to invest. On the other hand, higher GDP, a low unemployment rate, and a positive balance of payments contribute to increased investment, suggesting that strong economic conditions and a healthy labor market are catalysts for investment. Interest rates, which have a significant negative effect, confirm the importance of monetary policy in shaping the investment climate. In conclusion, macroeconomic factors play an important role in determining the level of investment in Indonesia. Therefore, to encourage higher investment-which is key for economic growth and job creation-the government should focus on maintaining macroeconomic stability, improving infrastructure, providing attractive

incentives for investors, and improving the quality of education and labor. These steps are expected to improve the overall welfare of the Indonesian people

References

Abidin, M. Z. (2021). Pemulihan Ekonomi Nasional Pada Masa Pandemi Covid-19: Analisis Produktivitas Tenaga Kerja Sektor Pertanian. Indonesian Treasury Review: Jurnal Perbendaharaan, Keuangan Negara Dan Kebijakan Publik, 6(2), 117-138.

Afif, F. Y. (2022). Daya Saing Dan Foreign Direct Investment. Jurnal Ekonomi Pembangunan, 11(1), 52-59.

Annazah, N. S., Rahmatika, N., & Kavling, J. J. G. S. (2019). Analisis Hubungan Tingkat Pengangguran Dan Inflasi: Studi Kasus Di ASEAN 7. Jurnal Ketenagakerjaan, 14(2), 153-163.

Awagi, D., Sujianto, A. E., Fitriana, L., Roisatin, E. N., & Wardani, C. E. R. (2024). Pengaruh Ekspor, Impor, Inflasi, Dan Suku Bunga Terhadap Neraca Pembayaran Di Indonesia. Inisiatif: Jurnal Ekonomi, Akuntansi Dan Manajemen, 3(1), 150-160.

Darnia, M. E., Sihombing, L. M., Vivian, V., Putri, P., Dewi, R., Hutasoit, A., & Sitompul, A. A. (2023). Perlindungan Hukum Bagi Investor Asing Dalam Pembangunan Ekonomi. Kultura: Jurnal Ilmu Hukum, Sosial, Dan Humaniora, 1(2), 1-14.

Dewi, S. P., & Fasa, M. I. (2021). Investasi Dan Inflasi Sebagai Instrumen Pertumbuhan Ekonomi Di Indonesia Dalam Perspektif Ekonomi Islam. SAUJANA: Jurnal Perbankan Syariah Dan Ekonomi Syariah, 3(02), 17-32.

Pratama, N. R. N. S., & Utama, M. S. (2019). Pengaruh Pengeluaran Pemerintah Dan Investasi Terhadap Pertumbuhan Ekonomi Dan Tingkat Kemiskinan Di Kabupaten/Kota Provinsi Bali. E-Jurnal Ekonomi Dan Bisnis Universitas Udayana, 8(7), 651-680.

Purba, M. L., Sihotang, J., & Simatupang, F. C. (2024). Transmisi Kebijakan Moneter Dan Dampaknya Terhadap Perekonomian Indonesia. Journal Of Economic, Management, Accounting And Technology, 7(1), 78-90.

Roosmanita, R., & Marbun, J. (2022). Pengaruh Ekspor, Investasi, Konsumsi Rumah Tangga, Dan Pengeluaran Pemerintah Terhadap Pertumbuhan Ekonomi Tahun 2012-2021. In Seminar Nasional Akuntansi Dan Manajemen PNJ (Vol. 3).

Sasongko, B., Harnani, S., & Bawono, S. (2022). Value-added agriculture, investment, and infrastructure development in the Indonesian economy: VECM approach. Asia Pacific Journal of Management and Education (APJME), 5(2), 26-37.

Sejati, D. P. (2020). Pengangguran Serta Dampaknya Terhadap Pertumbuhan Dan Pembangunan Ekonomi. AKSELERASI: Jurnal Ilmiah Nasional, 2(3), 98-105.

Silaban, P. S. M., Sembiring, I. P. S. B., & Sitepu, V. A. B. (2020). Analisis Pengaruh PDRB Dan Inflasi Terhadap Pengangguran Terbuka Di Sumatera Utara Periode 2003-2019. Jurnal Ilmiah Ekonomi Global Masa Kini, 11(2), 127-132.

Soeharjoto, G. K. D. (2020). Pengaruh Makro Ekonomi Terhadap Cadangan Devisa Di ASEAN-5. Jurnal Ecodemica, 4(1).

Suhendra, I., & Wicaksono, B. H. (2020). Tingkat Pendidikan, Upah, Inflasi, Dan Pertumbuhan Ekonomi Terhadap Pengangguran Di Indonesia. Jurnal Ekonomi-Qu, 6(1).

Utami, A. (2019). Determinan Jumlah Uang Beredar, Tingkat Bunga, Dan Inflasi Terhadap Pertumbuhan Ekonomi Indonesia. Al-Buhuts, 15(2), 45-64.