**Analysis of the influence of economic factors on tax revenue in 1993–2022**

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**Abstract**

This study aims to analyze the influence of economic factors on tax revenue in Indonesia during the period 1993-2022. The method used is multiple linear regression analysis to identify the relationship between the dependent variable (tax revenue) and the independent variables (Gross Domestic Product, inflation, unemployment rate, and exchange rate). The results showed that GDP has a positive and significant influence on tax revenue, where each increase in GDP by one unit will increase tax revenue by 0.213 units. In contrast, inflation shows an insignificant negative effect, while the unemployment rate has a negative effect and is close to significance. This study brings novelty by enhancing the understanding of the relationship between macroeconomic variables and tax revenues. The advantages of this study lie in the use of comprehensive data spanning almost three decades, allowing for a robust analysis of long-term trends. However, this study has limitations, including the exclusion of other potential variables that may affect tax revenue, as well as the reliance on annual data, which may overlook short-term fluctuations. For future research, it is recommended to consider additional variables such as tax policy and international conditions, as well as using higher-frequency data to capture more granular insights into the factors influencing tax revenue.

**Keywords:** tax revenue, GDP, inflation, exchange rate, unemployment, investment

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1. **Introduction**

In the era of globalization and ever-evolving economic dynamics, the role of taxation has become increasingly vital in supporting national development. Taxation functions as a key fiscal policy instrument utilized by governments to manage public finances and to achieve various objectives, including economic growth and societal welfare (Aryani et al., 2024). Tax revenues serve as the primary source of income for many countries, funding infrastructure, education, healthcare, and other essential public services. However, optimizing tax revenue collection remains a persistent challenge for many developing countries, including Indonesia. Between 1993 and 2022, Indonesia experienced a wide range of economic fluctuations—from the 1997–1998 monetary crisis, fiscal policy reforms, to the disruptive impacts of the COVID-19 pandemic (Sari, 2020).

Macroeconomic conditions, particularly economic growth, are among the main factors influencing tax revenue. Gross Domestic Product (GDP), often considered the principal indicator of economic performance, also reflects the potential tax base. As GDP grows, so does the opportunity to increase tax revenue. However, other macroeconomic variables such as inflation, unemployment, and exchange rate also play critical roles. High unemployment rates reflect lower income levels among the population, which can significantly reduce income tax revenues. In parallel, inflation weakens purchasing power and may reduce tax compliance, while fluctuations in exchange rates affect economic stability and international trade sectors (Wijayanti, n.d.). Historical data from 1993 to 2022 show a positive trend in Indonesia’s economic development. GDP surged from 456 trillion in 1993 to 16,850 trillion in 2022, accompanied by increased investment and a marked rise in tax revenues—from 97 trillion in 1993 to 1,717 trillion in 2022—despite intermittent economic shocks.

**Table 1. Data Analysis of the Influence of Economic Factors on Tax Revenue**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Tahun** | **PDB** | **Inflasi** | **Nilai Tukar** | **Pengangguran** | **Investasi** | **Penerimaan Pajak** |
|  | 1993 | 456 | 8 | 2,050 | 3 | 1375 | 97 |
|  | 1994 | 514 | 9 | 2,160 | 3 | 716 | 115 |
|  | 1995 | 579 | 10 | 2,300 | 3 | 847 | 135 |
|  | 1996 | 649 | 8 | 2,380 | 4 | 1014 | 157 |
|  | 1997 | 710 | 6 | 2,950 | 5 | 1361 | 171 |
|  | 1998 | 1,273 | 58 | 10,000 | 6 | 1089 | 144 |
|  | 1999 | 1,477 | 21 | 7,100 | 6 | 1541 | 144 |
|  | 2000 | 1,689 | 4 | 8,400 | 6 | 2003 | 249 |
|  | 2001 | 1,951 | 12 | 10,400 | 8 | 1412 | 249 |
|  | 2002 | 2,180 | 10 | 9,300 | 9 | 1432 | 249 |
|  | 2003 | 2,398 | 5 | 8,500 | 10 | 1589 | 249 |
|  | 2004 | 2,778 | 6 | 9,290 | 10 | 1591 | 249 |
|  | 2005 | 3,339 | 17 | 9,830 | 11 | 1905 | 249 |
|  | 2006 | 3,950 | 7 | 9,020 | 10 | 2428 | 249 |
|  | 2007 | 4,548 | 7 | 9,419 | 9 | 2200 | 572 |
|  | 2008 | 5,271 | 11 | 10,950 | 8 | 1621 | 572 |
|  | 2009 | 5,606 | 3 | 9,400 | 8 | 1924 | 572 |
|  | 2010 | 6,446 | 6 | 8,991 | 7 | 2056 | 572 |
|  | 2011 | 7,258 | 5 | 8,773 | 7 | 2456 | 572 |
|  | 2012 | 8,229 | 4 | 9,419 | 6 | 2858 | 572 |
|  | 2013 | 9,546 | 8 | 11,563 | 6 | 2853 | 572 |
|  | 2014 | 10,569 | 8 | 11,800 | 6 | 2927 | 1060 |
|  | 2015 | 11,526 | 3 | 13,389 | 6 | 2900 | 1060 |
|  | 2016 | 12,407 | 3 | 13,309 | 6 | 3224 | 1060 |
|  | 2017 | 13,588 | 4 | 13,381 | 6 | 2931 | 1060 |
|  | 2018 | 14,838 | 3 | 14,250 | 5 | 2820 | 1060 |
|  | 2019 | 15,833 | 3 | 14,250 | 5 | 2890 | 1060 |
|  | 2020 | 15,434 | 2 | 14,577 | 8 | 3120 | 1072 |
|  | 2021 | 16,004 | 2 | 14,269 | 7 | 4560 | 1072 |
|  | 2022 | 16,850 | 6 | 15,352 | 6 | 5027 | 1717 |

Source: Secondary data from various official sources: (BPS), Ministry of Finance of the Republic of Indonesia, and BI.

According to Statistics Indonesia (BPS), GDP measures the total value of final goods and services produced within a country, reflecting economic structure and growth trends (Rosaliana, 2016). Inflation, as explained by Irving Fisher's Quantity Theory and Keynesian perspectives, arises when the money supply outpaces the availability of goods, or when demand persistently exceeds supply. In developing countries, inflation can stem from rigid market structures and excessive money supply (Oktaviani, Syafitri, & Munandar, 2024). The exchange rate, defined as the amount of local currency required to purchase one unit of foreign currency, influences consumption patterns. A depreciating exchange rate typically raises the cost of imported goods, affecting VAT revenues due to reduced consumption (Sapridawati, Indrawati, & Sofyan, 2021). Unemployment, as a major economic issue, has a direct negative impact on tax revenues by lowering the number of income-earning individuals (Habibi & Hasanah, 2023).

Investment, meanwhile, is crucial for stimulating economic activity. It entails allocating resources in anticipation of future returns and can be undertaken by individuals or institutions in various forms, including financial instruments and physical assets (Chrisdianto, 2019). Tax revenue itself, as defined under Law No. 6 of 1983 (amended by Law No. 16 of 2009), refers to compulsory contributions collected by the government without direct compensation, used for public benefit. Tax revenues are divided into domestic tax revenues and international trade taxes, encompassing income tax (PPh), value-added tax (VAT), land and building tax, excise, and other levies (Oktaviani, Syafitri, & Munandar, 2024).

Previous research has explored the relationship between macroeconomic variables and tax revenues. Kamara and Kamara (2023) emphasized the role of GDP growth as a driver of higher tax-to-GDP ratios in developing economies. Gaalya (2015) identified a negative correlation between unemployment and tax revenues. Singh (2015) found that exchange rate stability enhances tax collection from international trade. Novita Manda Sari Tanjung and Suyanto (2022) concluded that inflation positively influences tax revenues, although Mankiw (2007) noted that inflation can also erode tax receipts through reduced purchasing power.

This study aims to empirically analyze the effects of macroeconomic variables—GDP, inflation, exchange rate, unemployment, and investment—on tax revenues in Indonesia over the period 1993–2022. Based on the theoretical and empirical background, the following hypotheses are proposed:

H1 : There is an effect of GDP (X1) on tax revenues (Y)

H2 : There is an effect of inflation (X2) on tax revenues (Y)

H3 : There is an effect of exchange rate (X3) on tax revenues (Y)

H4 : There is an effect of unemployment (X4) on tax revenues (Y)

H5 : There is an effect of investment (X5) on tax revenues (Y)

H6 : There is a simultaneous effect of GDP (X1), inflation (X2), exchange rate (X3), unemployment (X4), and investment (X5) on tax revenues (Y)

1. **Research Design and Method**

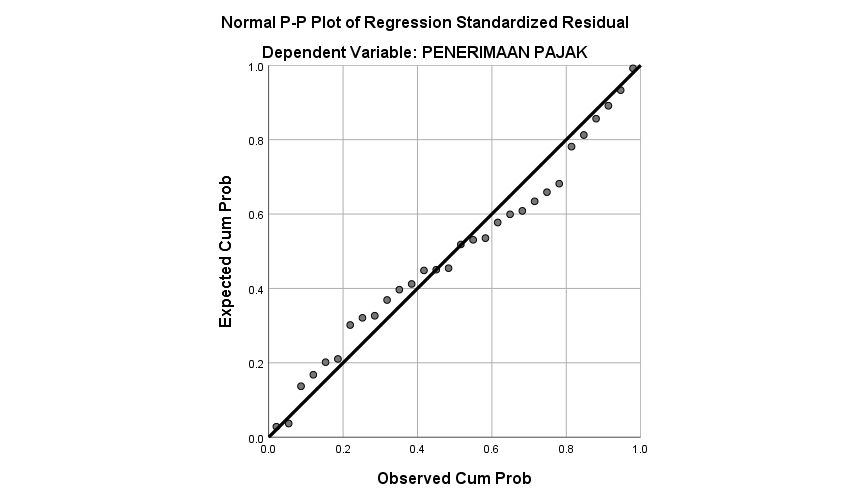
This study uses a quantitative method with a multiple linear regression approach to analyze the influence of economic factors on tax revenue in Indonesia during the period 1993-2022. The quantitative method was chosen because it allows researchers to measure the relationship between variables statistically and produce objective and measurable findings. Data collection techniques are the methods used by researchers to obtain the information they need. This study uses secondary data obtained from various official sources, including: the Central Statistics Agency (BPS), the Ministry of Finance of the Republic of Indonesia, and Bank Indonesia. Data collection was carried out by accessing annual reports and official publications published. Data analysis was carried out using multiple linear regression, which is a statistical technique used to identify the relationship between one dependent variable (tax revenue) and several independent variables (GDP, inflation, unemployment rate, and exchange rate). The population size in this study is all available Indonesian economic data from 1993 to 2022, so that the total sample analyzed was 30 (years). The sampling technique used is purposive sampling, where researchers select data that is relevant and in accordance with the research criteria, namely data that covers the specified time period and the variables analyzed.

1. **Results and Discussion**

***Research Data Analysis***

Normality test

Figure 1 shows the results of the residual normality test on the regression model with the dependent variable Tax Revenue. In this graph, the horizontal axis represents the observed cumulative probability, while the vertical axis shows the expected cumulative probability if the residuals are normally distributed. The diagonal line depicts the ideal normal distribution. Data points located around the diagonal line indicate that the residuals are close to the normal distribution. Based on the graph, the data points are mostly spread close to the diagonal line, so it can be concluded that the residuals meet the normality assumption. Small deviations at some points do not provide a strong indication of a violation of normality. These results indicate that the residual normality assumption in the regression model has been met.



**Figure 1. Normal P-Plot Graph**

Source: Data processed by researchers, 2025

Multicollinearity test

The purpose of this test is to determine whether there is a correlation between the independent variables in the regression model. In a good regression model, there should be no correlation between the independent variables. To determine whether or not there is multicollinearity in the regression model, it can be seen from the tolerance and factor (VIF) values. Which function as the basis of reference, can be found as follows: 1) if the tolerance value is > 10 percent and the VIF value is < 10, then it can be concluded that there is no multicollinearity between the independent variables in the regression model; and 2) if the tolerance value is < 10 percent and the VIF value is > 10, then it can be concluded that there is multicollinearity between the independent variables in the regression model.

**Table 2. Multicollinearity Test Results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
| **B** | **Std. Error** | **Beta** |
| 1 | (Constant) | 47.213 | 102.128 |  | .462 | .648 |
| PDB | .038 | .018 | .506 | 2.094 | .047 |
| Inflation | -2.743 | 3.230 | -.066 | -.849 | .404 |
| Exchange Rate | .027 | .022 | .250 | 1.229 | .231 |
| Unemployment | -27.801 | 19.758 | -.141 | -1.407 | .172 |
| Investment | .095 | .056 | .226 | 1.716 | .099 |

Source: Processed secondary data, 2025

From Table 2, if the Tolerance value of all variables is >0.10 and the VIF value of all variables is <10, then it can be concluded that the data meets the classical assumption test of multicollinearity.

Autocorrelation test

Table 3 shows that the DW is 1.735. Based on the assessment criteria for the DW test, this value is included in the category dU<DW<4-dU, namely 1.832<1.986<2.168, so the DW test hypothesis is rejected.

**Table 3. Autocorrelation Test Results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the estimate** | **Durbin-Watson** |
| 1 | .963 | .928 | .909 | 128.468 | 1.986 |

Source: Processed secondary data, 2025

Multiple Linear Regression Analysis

t-test

From Table 2, the influence of each variable can be seen as follows. GDP (Gross Domestic Product) variable with a coefficient of 0.038, t value of 2.094, Sig. Value of 0.047 (<0.05) Interpretation the GDP variable has a significant influence on tax revenue at a significance level of 5%. This means that an increase in GDP on average will significantly increase tax revenue.

Inflation variable (X2) on tax revenue with a coefficient of -2.473, t value of -0.849, Sig. Value of 0.406 (> 0.05) Interpretation The inflation variable does not have a significant influence on tax revenue. This means that changes in the inflation rate do not have a significant impact on tax revenue.

Exchange Rate variable (X3) on tax revenue, with a coefficient of 0.027, t value of 1.229, Sig. Value. 0.231 (> 0.05) Interpretation The exchange rate variable has no significant effect on tax revenue. This means that exchange rate fluctuations do not significantly affect tax revenue.

Unemployment variable (X4), with a coefficient of -27.801, t value -1.407, Sig. Value 0.173 (> 0.05) Interpretation The unemployment variable has no significant effect on tax revenue. This shows that the unemployment rate does not have a significant impact on tax revenue.

Investment variable (X5), with a coefficient: 0.095, t value 1.716, Sig. Value 0.099 (> 0.05), Interpretation The investment variable is not significant at the 5% level, but approaches significance at the 10% level (marginal significance). This shows that investment may have a small effect on tax revenue.

F test

**Tabel 5. ANOVA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Model** | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | 4908729.409 | 5 | 981745.882 | 61.525 | .000b |
| Residual | 382961.705 | 24 | 15956.738 |  |  |
| Total | 5291691.114 | 29 |  |  |  |

Source: Processed secondary data, 2025

Table 5 shows that the overall regression model is significant in explaining the variability of the dependent variable Tax Revenue. The F value of 61.525 with a significance level (Sig.) of 0.000 indicates that the regression model involving the predictors Investment, Unemployment, Inflation, Exchange Rate, and GDP has a significant relationship to tax revenue. Because the Sig. value is smaller than 0.05, we can reject the null hypothesis which states that all regression coefficients are equal to zero simultaneously. Thus, this regression model can be considered relevant and good enough to predict tax revenue based on the independent variables used.

R2 Test (Determination Coefficient Test)

Based on the R Square table of 0.928, it shows that 92.8% of the variability in tax revenue can be explained by independent variables, namely investment, unemployment, inflation, exchange rate, and GDP. The remaining 7.2% is explained by other factors outside the model.

**Table 6. R2 Test**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the estimate** | **Durbin-Watson** |
| 1 | .963 | .928 | .913 | 126.320 | 1.735 |

Source: Processed secondary data, 2025

The Adjusted R Square value of 0.913 indicates that after adjusting for the number of predictors and sample size, 91.3% of the variability in tax revenue can still be explained by the independent variables in the model. This shows that the model has very good predictive ability.

The Std. Error of the Estimate value of 126.320 shows the average deviation between the observed value and the value predicted by the model. The smaller this value, the better the accuracy of the model in predicting tax revenue.

The Durbin-Watson value of 1.735 is close to 2, which indicates that there are no serious problems related to autocorrelation in the residual model, so the assumption of residual independence is met.

Overall, this model is very good at explaining the variability of tax revenues, with a high degree of accuracy and the assumption of residual independence being met.

1. **Conclusions**

This study shows that there is a significant influence of economic factors on tax revenues in Indonesia during the period 1993-2022. Gross Domestic Product (GDP) is proven to have a significant positive effect on tax revenues, while the unemployment rate shows a negative effect that is close to significant. This study brings novelty by adding to the understanding of the relationship between macroeconomic variables and tax revenues. The advantages of this study lie in the use of comprehensive data for almost three decades and the multiple linear regression analysis methodology that supports the validity of the findings. However, this study has shortcomings, including not analyzing other variables that may affect tax revenues, as well as limitations on annual data that may miss fluctuations that occur on a smaller scale. For further research, it is recommended to consider additional variables such as tax policy and international conditions, as well as using data with higher frequencies

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