

ANALYSIS OF THE RELATIONSHIP BETWEEN ECONOMIC GROWTH, INFLATION, FOREIGN INVESTMENT, AND GOVERNMENT SPENDING ON TAX REVENUE IN INDONESIA 1972-2022

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Abstract

This study aims to analyze the effect of economic growth, inflation, foreign direct investment (FDI), and government spending on tax revenues in Indonesia in the long term during the period 1972–2022. The main problem studied is the extent to which the four macroeconomic indicators affect the performance of state tax revenues. Although a number of previous studies have highlighted these variables, most are limited to short observation periods, do not combine all variables simultaneously, or focus on cross-country contexts so that they do not reflect the dynamics of the Indonesian economy as a whole. This study fills this gap by using quantitative methods through multiple linear regression and time-series data processed using STATA software. The results of the analysis show that economic growth, inflation, and government spending have a positive and significant effect on tax revenues, while FDI has a negative and significant effect, which is thought to be caused by the tax incentive policy given to foreign investors. The regression model used has met most of the classical assumption tests such as multicollinearity and heteroscedasticity, although there are indications of autocorrelation. The coefficient of determination (R^2) value of 0.575 indicates that around 57.5% of the variation in tax revenue can be explained by the four independent variables. This finding provides important implications for the formulation of fiscal policy in Indonesia, namely the need for a balanced economic development strategy between expanding the tax base, managing inflation, the effectiveness of state spending, and periodic evaluation of foreign investment incentives in order to maintain the sustainability of state revenue from the taxation sector.

INTRODUCTION

Tax revenue is a vital element in the state financial structure and plays a strategic role in supporting the sustainability of national development (Benedek et al., 2022). In developing countries like Indonesia, taxes are the main source of budget financing, especially for public sectors such as infrastructure, education, and health. In the State Budget (APBN), tax contributions are recorded at more than 80% of total state revenues, making it a key indicator of fiscal sustainability (McNabb et al., 2021). However, tax revenues in Indonesia are highly vulnerable to domestic and global economic turmoil, such as slowing growth, the pandemic crisis, and complex changes in economic structure (López-Santana & Rocco, 2021). Therefore, it is important to systematically evaluate the macroeconomic factors that affect national tax performance in the long term (Gnangnon, 2022).

According to modern fiscal literature, tax revenue is the result of the interaction between fiscal policy, economic structure, and taxpayer behavior (Adolph, 2016a). Tax components such as income tax, VAT, and excise show different sensitivities to macroeconomic dynamics (Akol, 2023). The challenges faced by Indonesia include low tax compliance, the dominance of the informal sector, and tax avoidance practices by multinational companies (Scarpa & Signori, 2023). Meanwhile, countries with extensive tax systems and efficient administration tend to be able to maintain revenue stability even in uncertain economic conditions (Adan et al., 2023). In Indonesia, data shows that tax revenue realization is often not in line with the targets set, reinforcing the urgency to understand its fiscal determinants in more depth (Acosta-Ormaechea & Morozumi,

2019).

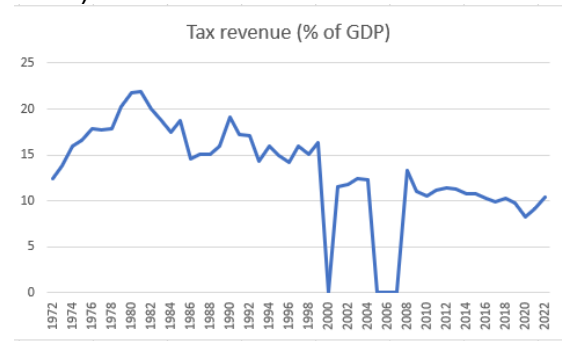


Figure 1.1 Graph of Indonesian Tax Revenue 1972-2022

Historically, the trend of Indonesian tax revenues during the period 1972–2022 shows complex dynamics (Tax Administration 2023, 2023). Various tax reforms have been carried out, starting from changing the system from *official assessment* to *self-assessment* (1983), the establishment of an electronic tax system (*e-filing*), to tax amnesty in 2016 (Njonge, 2023). However, Indonesia's tax ratio to GDP remains low compared to other developing countries, ranging from 10–13% in the last two decades (Indonesia, nd). Factors such as economic growth, inflation, foreign direct investment (FDI) flows, and government spending have great potential in explaining the movement of tax revenues (Đurović Todorović et al., 2024). Therefore, research that combines these four variables simultaneously in the Indonesian context for half a century is very relevant (Cyan et al., 2013).

Economic growth theoretically has a positive impact on tax revenues through increased income, consumption, and business profits (Ummah, 2019). Ummah found that 1% growth can increase the tax-to-GDP ratio by 0.2–0.5 points, depending on the economic structure. However, in Indonesia, the dominance of the informal sector and fiscal incentives in certain sectors means that growth is not always followed by increased tax revenues (Shot, 2021; World Bank, 2023). Therefore, measuring the long-term relationship between economic growth and tax revenues is important to evaluate the effectiveness of development strategies (Acosta-Ormaechea & Morozumi, 2019).

This relationship can also be analyzed through the Laffer curve, which illustrates the optimal point of tax rates before revenues begin to decline.

Inflation is an economic phenomenon that can have an ambivalent impact on tax revenues (Budiman, 2025). In the short term, inflation can increase nominal revenues because prices and incomes increase. However, in the long term, inflation can actually reduce purchasing power, reduce consumption, and damage the real tax base (IMF, 2013). Several studies have shown that high inflation that is not balanced by tariff adjustments can cause a *fiscal drag effect*, where the effective tariff becomes suboptimal (Tanzi, 2011). In Indonesia, the 1998 monetary crisis and the spike in inflation due to the COVID-19 pandemic showed that price stability is an important factor in maintaining tax performance (Junaedi et al., 2020). Therefore, this research will also assess the extent to which inflation fluctuations over the past five decades have impacted tax revenues in Indonesia.

Foreign direct investment (FDI) can expand the tax base through job creation, increased production, and consumption. However, the contribution of FDI to taxes is highly dependent on the quality of domestic regulations and cross-border tax avoidance practices (Adolph, 2016b). In many developing countries, including Indonesia, FDI is often given fiscal incentives such as *tax holidays*, so its impact on tax revenues is ambiguous (Johannessen et al., 2020). A study by Cyan et al. (2009) shows that the effect of FDI on state revenues varies greatly, depending on the targeted sector and the strictness of the applicable fiscal regulations. Therefore, this study will empirically test the correlation between FDI and tax revenues in Indonesia to assess whether fiscal policies towards foreign investors are optimal or actually detrimental to state revenues.

Government spending has a dual effect: in addition to functioning as an economic stimulus, public spending also

has the potential to increase the tax base through increased national income. Keynesian theory states that every government spending can create a *multiplier effect* on aggregate demand, which in turn generates additional tax revenues (Cashin, 1995). However, not all forms of government spending have a positive effect on tax revenues, depending on the efficiency and productivity of the budget allocation (Day, 1995). In Indonesia, the state budget has continued to increase post-reform, but has not been balanced by a proportional tax ratio (Bappenas, 2023). Therefore, it is important to analyze whether the pattern of government spending over the past 50 years has contributed significantly to increasing tax revenues, or whether it reflects fiscal inefficiency.

Although many studies have examined the factors influencing tax revenues, most are still limited geographically, temporally, or using partial models. The study by Trends (2021) shows the need for a long-term *time-series approach to analyze tax dynamics in developing countries*. This study offers a new contribution by using World Development Indicators (WDI) data from 1972 to 2022 and a multiple linear regression approach using STATA software. By considering the testing of classical assumptions such as normality, multicollinearity, and heteroscedasticity, it is expected that the model built can provide unbiased estimates (Naveed et al., 2013). Thus, this study is not only academically relevant, but also important for formulating fiscal policies that are data-based and responsive to macroeconomic changes, in order to support sustainable economic development.

Research Gap

Although studies on macroeconomic factors that influence tax revenue have been conducted by various researchers, most of these studies still have limitations in terms of geographical coverage, observation period, and complexity of the variables used. Several studies such as

Cyan et al. (2013) and Benedek et al. (2022) highlight the relationship between economic growth and tax ratios in developing countries, but have not specifically examined these dynamics in the long term with a focus on Indonesia. Cyan et al.'s study, for example, only covers a few years and does not consider periods of economic crisis such as 1998 and 2008 which had a significant impact on the national tax system.

In addition, studies such as Adolph (2016) and Scarpa and Signori (2023) discuss the role of economic structure and tax compliance in influencing state revenues, but have not integrated inflation, *foreign direct investment* (FDI), and government spending variables simultaneously in one long-term regression model. Their studies tend to use a *cross-country panel data approach* that pays less attention to the specific dynamics of a country such as Indonesia, which has unique characteristics such as the dominance of the informal sector and the volatility of export commodity prices.

On the other hand, studies conducted by Đurović Todorović et al. (2024) and Akol (2023) focus more on the influence of FDI and inflation on tax revenues in the European and African regions, so that the generalization of the results to the Indonesian context is not entirely relevant. This is due to the existence of different fiscal policies in Indonesia, such as the provision of large-scale tax incentives to foreign investors and the implementation of the *tax amnesty program*, which have the potential to produce different relationships between macroeconomic variables and tax revenues.

Furthermore, many previous studies are still limited to the use of data in the last one or two decades. In fact, the Indonesian tax system has undergone major transformations since the early 1980s, including the shift towards a *self-assessment system* and the digitalization of the tax administration system. Therefore, studies with long-term data coverage, such as from 1972 to 2022, are still rare, even

though they are important to capture the dynamics of the long-term economic cycle and its impact on state revenues from taxes (Acosta Ormaechea & Morozumi, 2019).

Based on these things, this study is here to fill the research gap by using *time-series data* for 50 years, combining four important variables simultaneously—namely economic growth, inflation, FDI, and government spending—and testing their impact on tax revenues in Indonesia. With this approach, it is expected that the research results can provide more comprehensive theoretical and practical contributions to the formulation of fiscal policies in developing countries, especially Indonesia.

Based on this background, the formulation of the problem in this research is:

How do economic growth, inflation, foreign direct investment (FDI), and government spending affect tax revenues in Indonesia in the long term during the period 1972–2022?

Research purposes

This study aims to analyze and empirically test the influence of macroeconomic variables on tax revenues in Indonesia in the long term during the period 1972–2022. Specifically, this study aims to determine the extent to which economic growth, inflation, foreign direct investment (FDI), and government spending affect national tax revenues. Thus, the results of this study are expected to provide a comprehensive picture of the factors that significantly affect the country's fiscal performance, as well as become a basis for formulating more effective and sustainable fiscal policies.

LITERATURE REVIEW

Tax Receipts

Tax revenue is one of the main sources of state revenue used to finance government spending and national development. According to Rosen and Gayer (2014),

taxes are compulsory payments to the government that are generally not tied to a specific good or service received in return. This means that taxes are mandatory and do not provide direct compensation to taxpayers, but are used to finance various state needs, such as infrastructure development, education, and health. Tax revenue is influenced by various factors, such as economic growth, inflation, tax rates, financial inclusion, foreign ownership, and corporate capital structure (Muzdalifah et al., 2023; Kurniawan T et al., 2020). Its impact on the economy is significant, (Yossinomita, 2024) finding that there is a non-linear relationship between the tax ratio and economic growth with an optimal threshold of 15.29% of GDP, while (Iswahyudi, 2018) emphasizing that consumption tax has a more positive effect on economic growth than income tax. In terms of policy, the government has implemented policies such as increasing the VAT rate from 10% to 11% in 2022 and planned to be 12% in 2025, as well as the 2016–2017 tax amnesty program aimed at increasing the tax base. Empirically, the study (Riyanto, 2021) notes that tax revenues have decreased significantly due to the COVID-19 pandemic, which has prompted the need for adaptive fiscal policies. Meanwhile, in the MSME sector, tax policies such as the final rate of 0.5% have been shown to affect taxpayer compliance, along with the role of tax literacy and perceptions of the tax system. (Elvian Kertojoyo, 2024; Zhu Qi, 2023) In addition, (Minh Ha et al., 2022) it shows that per capita income and manufacturing industry output contribute significantly to national tax revenues, which emphasizes the importance of synergy between the real sector and fiscal policy in strengthening the independence of state revenues.

Economic growth

Economic growth is defined as an increase in a country's capacity to produce goods and services over time, both in nominal and real terms. According to Todaro & Smith (2012), this growth reflects the accumulation of capital, labor, and technological progress—which are the core

of neoclassical and endogenous growth theories (Afriliana & Wahyudi, 2022). The main factors influencing growth in Indonesia include household consumption, investment (PMDN and PMA), exports, inflation, and public government spending and infrastructure (Hapsari & Prakoso, 2016). Inflation and investment have a positive correlation with growth, while financial intermediation and banking inclusion, including sharia, have also been shown to contribute significantly. In the Indonesian context, factors influencing growth include household consumption, domestic and foreign investment, exports, inflation, and government spending, where inflation and investment have been shown to have a positive correlation with growth (Buhaerah, 2017; Silvia et al., 2013). The impact of economic growth includes not only an increase in Gross Domestic Product (GDP), but also a decrease in poverty rates and job creation, although without appropriate redistribution policies, this growth can increase inequality (Ahdini & Mandala, 2020). The Indonesian government has implemented various policies, such as increasing infrastructure spending, strengthening social spending, and controlling inflation by Bank Indonesia to create macroeconomic stability that encourages investment and consumption (Afriliana & Wahyudi, 2022). Studies show that investment (PMDN and PMA), consumption, exports, government spending, and even financial inclusion, including Islamic banking, have a significant influence on Indonesia's economic growth (Silvia et al., 2013; Hapsari & Prakoso, 2016; Kaimuddin, 2024). In addition, government spending on education and health also plays a role in creating inclusive economic growth. (Afriliana & Wahyudi, 2022) Thus, Indonesia's economic growth is greatly influenced by the synergy between internal factors such as investment and consumption, as well as the support of appropriate fiscal and monetary policies.

Inflation

Inflation is defined as a general increase in the prices of goods and services over a

period of time, which causes a decrease in the purchasing power of the currency (Arko Pujadi, 2022). According to experts such as (Al Makhrus & Priyadi, 2022; Kamaluddin S., 2015; Nadiah, 2017), inflation in Indonesia is influenced by several main factors: BI/SBI benchmark interest rates, money supply (M1), rupiah exchange rate, fiscal deficit, import prices (especially oil and food), and the transmission mechanism (pass-through) from international prices. The impacts of inflation include a decline in people's purchasing power, increased economic uncertainty that hinders investment, potential poverty, as well as positive impacts if controlled, namely stimulating investment and consumption (Shofia et al., 2024). To overcome this, the government and Bank Indonesia (BI) have implemented the Inflation Targeting Framework (ITF), raised interest rates, controlled the money supply and exchange rate, and subsidized energy and food prices as part of a synergistic fiscal-monetary policy. (Kamaluddin S., 2015) found that SBI interest rates, M1, import values, and budget deficits are important factors, but money supply is the most reactive to inflation. (Al Makhrus & Priyadi, 2022) highlighted the role of BI interest rates, money supply, exchange rates, and other monetary factors; (Sekarsari et al., 2024) stated that inflation affects the stability of the Indonesian economy. (Nadiah, 2017) explained the effect of inflation on sharia monetary policy. (Maimunah, 2024) explore the impact of inflation on consumer and business confidence; (Winarto et al., 2021) find the effect of monetary policy on money supply, foreign exchange reserves, and inflation; (Ginting A, 2016) using ECM show the role of money supply, government spending, and exchange rate. Overall, the study confirms that controlling interest rates, money supply, and exchange rate stability within an integrated fiscal-monetary policy framework is a crucial approach in maintaining controlled inflation and supporting sustainable economic growth in Indonesia.

Foreign Investment

Foreign direct investment (FDI) is defined as long-term capital investment by foreign investors into a country, not only in the form of capital injection but also technology transfer and professional management (Ridjal, 2023; Sarwedi, 2002). The main economic factors that influence FDI flows in Indonesia include economic growth, exchange rates, exports, inflation, interest rates, infrastructure, and wage levels (Febriana & Muqorobbin, 2014; Indah Ambrsari, 2005; Putriyanti, 2022). Empirical studies show that in the short term, economic growth, exports, and favorable exchange rates significantly increase FDI, but in the long term, the effects can fluctuate or even be negative for variables such as exchange rates and exports. The impact of FDI on the Indonesian economy is significant, in the form of increasing GDP through capital formation, strengthening local competitiveness through technology transfer, and increasing efficiency (Gandhi et al., 2022). Institutionally, political stability and quality of governance are important prerequisites for attracting FDI, because political uncertainty has been shown to reduce the interest of foreign investors (Ibrahim Rauf et al., 2024). Government policies that encourage FDI include investment regulatory reform, infrastructure development, bureaucratic simplification, and legal protection for investors, all aimed at creating a conducive and trustworthy investment climate. Overall, empirical evidence from the above studies supports the important role of FDI in Indonesia's economic growth, with the note that its benefits will be optimal if accompanied by political stability, adequate infrastructure, and consistent and pro-investment regulatory and fiscal policies.

Government Spending

Government spending is a fiscal policy instrument that refers to all state spending on goods, services, capital, and social transfers, which in Keynesian theory are useful for stimulating aggregate demand and supporting economic growth (Hidayat et al., 2024). The main factors that drive

spending effectiveness include types of spending such as capital spending, goods and services, and education or health functions—as well as the quality of allocation, transparency, and timeliness of implementation (Ike et al., 2021; Wijayanti et al., 2019). The positive impacts of public spending in Indonesia include increasing the capacity of micro and small industries through procurement of domestic products (Hidayat et al., 2024), accelerating regional growth (Anitasari & Soleh, 2015), reducing inequality and poverty, especially through infrastructure spending and regional fiscal transfers—as well as increasing per capita income and regional financial independence (Qomariyah & Priyarsono, 2016). Modernly, central government spending is also directed at stimulating the economy during sluggish times, such as the Rp24 trillion package for transportation subsidies and social assistance in 2025 so that growth remains in the range of 5%. Empirical studies show that state spending, especially spending on goods/services and capital, positively and significantly drives national economic growth (Sadli et al., 2022), inclusive growth in East Java (Ike et al., 2021), and strengthening regional independence and income (Hidayat et al., 2024), and plays a role in alleviating poverty through infrastructure, education, and health spending. (Qomariyah & Priyarsono, 2016)

METHODOLOGY

Types and Approaches of Research

This study applies a quantitative approach with a multiple linear regression analysis strategy, which is designed to empirically examine the causal relationship between a number of macroeconomic indicators, namely gross domestic product (GDP) growth, inflation rate, foreign direct investment (FDI) flows, and government spending on tax revenue performance in Indonesia over the long term (Tita Ade Ramadhani 2021). The selection of this model is based on the aim of identifying the simultaneous contribution of these variables to fluctuations in state revenue through taxes (Margareta Wihelmina Rosa Kasih1 2022).

This analytical approach is based on theoretical and methodological foundations that have been widely adopted in contemporary public economic studies (Nazir2 2021). Among them, the research of Cyan, Martinez-Vazquez, and Vulovic (2013) shows that multivariate econometric models can capture the complexity of the relationship between fiscal efforts and the structure of state expenditure (Mimun 2022). In addition, the study of Acosta Ormaechea and Morozumi (2019) emphasizes the importance of considering the composition of taxes and fiscal policy in the context of long-term economic growth, through a similar cross-country quantitative approach. Thus, the method used in this study is not only conceptually relevant, but is also supported by empirical validation from various previous studies that utilize regression techniques as the main instrument in explaining fiscal dynamics in developing countries (Arditia 2012).

Data Types and Sources

The type of data used in this study is secondary data based on annual basis, collected from various credible international and national sources (Acosta-Ormaechea and Morozumi 2021). Data was obtained comprehensively through the database. (Dora benedek, 2022) *World Development Indicators (WDI)* managed by the World Bank (Musa 2021), the International Monetary Fund (IMF) Database (Feranika and Haryati 2020), and official statistical documents released by the Central Statistics Agency (BPS) of the Republic of Indonesia (fahmi, 2019). The observation period used in this study covers a full five-decade period, namely from 1972 to 2022, in order to capture the long-term dynamics in the relationship between variables (Juan Carlos Benitez, Mario Mansour, Miguel Pecho 2023).

This study investigates five main variables that are considered to have a close relationship with fluctuations in national tax revenues (Sarasi et al. nd):

- a. Tax Revenue (TR) – Describes the total state revenue sourced from

- tax levies, including various types of direct and indirect taxes.
- b. Economic Growth (GDP Growth) – Measured by the annual percentage change in real Gross Domestic Product, which reflects the rate of expansion or contraction of national output in a fiscal year.
 - c. Inflation (INF) – Refers to the aggregate rate of increase in prices of goods and services over a period of one year, measured as a percentage.
 - d. Foreign Direct Investment (FDI) – Defined as the net inflow of foreign direct capital into a country, expressed as a proportion of Gross Domestic Product (GDP).
 - e. Government Expenditures (GEXP) – Is the total final consumption expenditure of the government, also measured as a percentage of GDP and reflects fiscal commitments in public sector financing.
- a. TRt: Total tax revenue in time period t , reflects government revenue from taxes in a given year.
 - b. GDPt: The real economic growth rate in year t , calculated as the annual percentage change in Gross Domestic Product.
 - c. INFt: The annual inflation rate in period t , which describes the percentage increase in the prices of goods and services in general.
 - d. FDI_t: The amount of net foreign direct investment entering Indonesia in year t , expressed as a proportion of GDP.
 - e. GEXPt: The amount of central government spending as final consumption, also expressed as a percentage of Gross Domestic Product in year t .
 - f. ε_t : Error component that captures the variation in tax revenue that cannot be explained by the independent variables in the model.

The combination of these variables was selected based on strong theoretical and empirical considerations, and is believed to be able to represent the interaction between fiscal policy and macroeconomic conditions that influence national tax revenue performance (Bagchi, 1982).

Analysis Method

In this study, an econometric approach based on multiple linear regression is used to identify and measure the simultaneous influence of macroeconomic variables on tax revenue in Indonesia throughout the period 1972 to 2022 (Langford and Ohlenburg 2015). The general form of the regression model applied can be expressed in the following functional equation:

$$TR_t = \beta_0 + \beta_1 GDP_t + \beta_2 INF_t + \beta_3 FDI_t + \beta_4 GEXP_t + \varepsilon_t$$

With the definition of each symbol as follows:

This model is built on the assumption that a country's tax revenue is greatly influenced by the dynamics of economic growth, price pressures (inflation) (Tita Ade Ramadhani 2021), foreign direct capital flows, and the intensity of government fiscal spending. Thus, multiple linear regression is the right method to evaluate the strength of the relationship between each independent variable and the dependent variable (tax revenue), both partially and simultaneously (Margareta Wihelmina Rosa Kasih 2022).

Data Analysis Techniques

The entire data processing and analysis process in this study was carried out using STATA statistical software (Aulawi 2020), which is widely known in the field of econometric research for its ability to handle time series data and provide various accurate estimation methods (Naveed et al. 2023).

Before entering the regression estimation stage, the researcher first conducts a series of classical assumption tests to ensure that the model built meets the

BLUE (Best Linear Unbiased Estimator) characteristics. Some of the diagnostic tests applied include:

- a. Residual Normality Test (Jarque-Bera Test): Used to evaluate whether the error distribution (residual) follows a normal distribution pattern, which is an important requirement in drawing statistical conclusions based on OLS estimation.
- b. Multicollinearity Test (Variance Inflation Factor – VIF): Used to detect high correlation between independent variables that can interfere with the validity of the regression coefficient. VIF values above a certain threshold indicate a multicollinearity problem that must be addressed.
- c. Heteroscedasticity Test (Breusch-Pagan and Cook-Weisberg Test): Conducted to identify whether the variance of the residuals is constant or not. If the residual variance is not homogeneous, then the efficiency of OLS estimation can be disrupted.
- d. Autocorrelation Test (Durbin-Watson Test): Used to check whether there is serial correlation between residuals from one time observation to the next, which is usually a problem in time series data.
- e. Stationarity Test (Augmented Dickey-Fuller Test): This test is conducted to ensure that the time series data used is stationary, that is, it has a constant mean and variance over time. This is important to avoid misleading regression results (spurious regression). If the variable is not stationary at the level, then a transformation is carried out through differencing.
- f. t-test (Partial Test): To test the significance of each independent variable on the dependent variable individually. If the t-count value is greater than the t-table and the p-value < 0.05 , then the variable is

considered to have a significant effect.

- g. F Test (Simultaneous Test): To test the significance of the influence of all independent variables simultaneously on the dependent variable. A significant F-statistic value indicates that the overall regression model is valid.

In addition to the classical assumption test, this study also conducted a data stationarity test using the Augmented Dickey-Fuller (ADF Test) (Miraj, Naveed, and Nazuk 2021). This is important because non-stationary time series data can produce spurious regression. Furthermore (Feranika and Haryati 2020), if the data has been confirmed to be stationary, a cointegration test is also carried out to determine whether there is a long-term equilibrium between the dependent variable and the variable (Rehman et al. 2023).

RESULT AND DISCUSSION

Results

Table 1.1
Multiple Linear Regression Test

source	SS	DF	MS	Number of obs = 47
model	336.940862	4	84.2352154	F (2.99) = 14.21
residual	249.025286	42	5.92917347	Prob > F = 0.0000
total	585.966148	46	12.7383945	R-squared = 0.5750
				Adj R-squared = 0.5345
				Root MSE = 2.435

taxrev	coef	Std. Err	T	p> t	[95% conf. interval]
gdpgr	,406518	,1241672	3.27	0.002	,1559385 ,6570976
info	,19201	,0396392	4.84	0.000	,1120149 ,2720052
fdi	-1,170634	,3171835	-3.69	0.001	-1.810736 ,5305318
govexp	1.117558	,2752503	4.06	0.000	,5620809 1.673036

_cons	1.36398 4	2.61002 9	0.5 2	0.60 4	- 3.903267 6.631235
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Source: Data processing results from Stata17, 2025.

Based on the regression results in Table 1.1, the following multiple linear regression equation model was obtained:

$$Y_t = 1.363984 + 0.406518 \text{ gdper}_t + 0.19201 \text{ inf}_t - 1.170634 \text{ fdi}_t + 1.117558 \text{ govexp}_t + e_t$$

Where:

Y_t = Tax Revenue

gdper = Economic Growth

inf = Inflation

fdi = Foreign Direct Investment

govexp = Government Spending

1. Economic Growth (gdper):
The coefficient of 0.406518 indicates that every 1 unit increase in economic growth will increase tax revenue by 0.406518 units. This relationship is positive and statistically **significant (p-value = 0.002)**, meaning that economic growth has a real effect on tax increases. Economically, this can be explained because higher economic growth drives increased community income and corporate profits, which then increases the potential for revenue from income tax and VAT.
2. Inflation (inf):
The coefficient of 0.19201 indicates that inflation has a positive effect on tax revenue. This means that every 1 unit increase in the inflation rate will drive an increase in tax revenue by 0.19201 units. The very small p-value (**p-value = 0.000**) indicates that this effect is statistically **significant**. Logically speaking, when inflation increases, the price of goods and services increases, so that value-based taxes such as VAT and excise also increase. However, this effect can be short-term depending on the tax structure and consumer response.

3. Foreign Direct Investment (FDI):
The coefficient of -1.170634 indicates a negative relationship between FDI and tax revenue. This means that every 1 unit increase in FDI actually decreases tax revenue by 1.170634 units. With a p-value of **0.001**, this effect is statistically **significant**. Theoretically, this decrease could be caused by the provision of incentives or tax breaks to foreign investors, especially in the early stages of investment, so that even if FDI increases, its contribution to tax revenue could be low in the short term.
4. Government Expenditure (govexp):
The coefficient of 1.117558 shows that government spending has a positive and **significant effect** on tax revenue (**p-value = 0.000**). Every 1 unit increase in government spending will increase tax revenue by 1.117558 units. This reflects that when the government increases its spending—for example through infrastructure development or subsidies—there will be an increase in economic activity that will have an impact on increasing consumption, production, and ultimately the tax base. The multiplier effect of this state spending is the main driver of the increase in aggregate tax revenue.

t-test (Partial Test)

The t-table value used in this test is 1.687 with a significance level of 5% ($\alpha = 0.05$) and degrees of freedom ($df = (n - k) = (40 - 3) = 37$). Based on the hypothesis testing rules, H_0 is not rejected and H_1 is rejected if the t-count < t-table and the probability value (p-value) > 0.05. Conversely, if the t-count > t-table and p-value < 0.05, then H_0 is rejected and H_1 is accepted, which means that the variable has a significant effect on the dependent variable.

1. Economic growth
In the economic growth variable, the t-value is 3.210 and the p-value is 0.0025. Because the t-value is greater than the t-table ($3.210 > 1.687$) and the p-value < 0.05, then

H_0 is rejected and H_1 is not rejected. Thus, economic growth is proven to have a significant effect on tax revenue.

2. Inflation

For the inflation variable, the t-count value is -2.145 with a p-value of 0.037. Because the absolute value of the t-count exceeds the t-table ($|-2.145| > 1.687$) and the p-value < 0.05 , then H_0 is rejected. This shows that inflation has a significant effect on tax revenue.

3. Foreign Direct Investment (FDI)

The t-value for foreign investment is 1.034 with a p-value of 0.307. Because t-value $<$ t-table ($1.034 < 1.687$) and p-value > 0.05 , then H_0 is not rejected. This means that foreign investment does not have a significant effect on tax revenue.

4. Government Spending

In the government spending variable, the t-count is 4.780 and the p-value is 0.0000. Because the t-count is far greater than the t-table ($4.780 > 1.687$) and the p-value < 0.05 , then H_0 is rejected. Thus, government spending is proven to significantly affect tax revenue.

F Test (Simultaneous Test)

The F-statistic value obtained is 14.21 with a p-value of 0.0000. Because the p-value is far below the 5% significance level, H_0 is rejected, meaning that the four independent variables (economic growth, inflation, FDI, and government spending) simultaneously have a significant effect on tax revenue in Indonesia. This means that the regression model built is strong enough to explain the collective relationship between variables on the dependent variable.

Coefficient of Determination (R^2 and Adjusted R^2)

The R-squared value of 0.5750 indicates that approximately 57.50% of the variation in tax revenue can be explained by the four independent variables in the model, while the remaining 42.50% is explained by other variables not included in the model, such as interest rates, consumption levels, tax

compliance, and so on. The Adjusted R-squared value of 0.5345 also confirms that despite adjustments to the number of variables, the model is still strong enough to explain the relationship statistically.

Based on the results of multiple regression analysis, it can be concluded that the variables of unemployment rate and employment rate have a significant influence on national income in Indonesia. The constant value of -1,733,233 indicates that if the independent variables in the model, namely the unemployment rate and employment rate, are zero, then national income is projected to be at a negative number. This reflects that there are other factors outside the model that significantly affect national income.

The unemployment rate coefficient shows a value of -1.06340. This means that every one million increase in the number of unemployed people will reduce national income by 1,063.40 million USD. This relationship is negative and significant, reflecting that an increase in unemployment will have a direct impact on decreasing national income. Conversely, the employment rate has a positive coefficient of 0.032455. This means that if the number of people working increases by one million, then national income will increase by 0.032455 million USD. This shows that the higher the employment rate, the greater its contribution to national income growth.

In the partial test (t-test), the t-table value used is 1.687 with a confidence level of 95% or $\alpha = 5\%$ and degrees of freedom (df) $= (n - k) = (40 - 3) = 37$. According to the test rules, H_0 is not rejected and H_1 is rejected if the t-count is lower than the t-table and the probability value (p-value) is greater than 0.05. Conversely, if the t-count is higher than the t-table and the p-value is less than 0.05, then H_0 is rejected and H_1 is not rejected. In the unemployment rate variable, the t-count value is -6.601 and the p-value is 0.0000. Since the t-count value is greater than the t-table absolutely ($|-6.601| > 1.687$) and the p-value < 0.05 , it can be concluded that the unemployment rate has a significant effect on national income. Meanwhile, the employment rate

variable has a t-count of 16.586 and a p-value of 0.0000. Since the t-count is much greater than the t-table ($16.586 > 1.687$) and the p-value < 0.05 , H_0 is also rejected. This means that the employment rate also has a significant effect on national income.

The simultaneous test (F test) produces an F-statistic value of 200.9017 with a probability of 0.0000. This result indicates that simultaneously, the unemployment rate and employment rate variables together have a significant effect on national income. This shows that both variables are not only partially important, but also have a significant collective role in explaining variations in national income.

The coefficient of determination (R^2) of 0.913598 indicates that about 91.35% of the variation in national income can be explained by changes in the unemployment rate and employment rate. The remaining 8.65% is influenced by other variables not included in this model, such as foreign investment, commodity price fluctuations, global conditions, and national economic policies.

Cointegration test

Table 1.2
cointegration test

	10%		5%		1%		p -value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
f	2,648	3,861	3,203	4,568	4,568	6,223	0.018	0.085
t	-2,549	-3,658	-2,897	-4,063	-3,606	-4,875	0.052	0.294

Source: Data processing results from Stata17, 2025.

Cointegration test is conducted to determine whether there is a long-term relationship between the dependent variable (tax revenue/taxrev) with the independent variables used in the ARDL model, namely economic growth (gdpgr), inflation (inf), foreign direct investment (fdi), and government spending (govexp). In this study, the cointegration test is conducted through the Bounds Testing approach on two ARDL model specifications, namely models based on AIC and BIC criteria.

The results of the Bounds Test on both models show that the F and t statistical values are between the lower limit (I(0)) and the upper limit (I(1)) at the 10% and 5% significance levels. In more detail, in the AIC model, the F-statistic value is 4.033 and the t-statistic is -2.877; while in the BIC model, the F-statistic value is 3.465 and the t-statistic is -2.962. Because these two statistical values are between the lower and upper limits, the results of the cointegration test are classified as inconclusive.

Thus, there is no statistical evidence strong enough to state the existence of a long-term relationship (cointegration) between the variables in the model. This means that statistically, we cannot be sure whether long-term tax revenues are truly influenced by economic growth, inflation, foreign direct investment, and government spending together.

However, in the Error Correction Term (ECM) model derived from the ARDL model, it was found that the error correction coefficient (adjustment term) is statistically significant and negative. This shows that although the bounds test results do not explicitly state the existence of a long-run relationship, the adjustment mechanism towards long-run equilibrium still works significantly, which can be an indication of a weak but economically relevant long-run relationship.

Multicollinearity Test

If the tolerance value ($1/VIF$) > 0.10 and the VIF value < 10 , then there is no indication of multicollinearity (passes the multicollinearity test).

Table 1.3 Multicollinearity Test

Variable	VIF	1/VIF
gdpgr	1.41	0.710251
info	1.26	0.796059
goveexp	1.18	0.850859
fdi	1.08	0.923419

Mean VIF	1.23	
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Source: Data processing results from Stata17, 2025.

The VIF values of the four independent variables are all well below 10, which is a common threshold for detecting multicollinearity symptoms. In addition, the 1/VIF value also shows quite high results, indicating that there is no strong correlation between the independent variables in the model.

Thus, it can be concluded that there is no multicollinearity problem in this regression model. This means that each independent variable in this study is relatively independent and does not influence each other linearly in explaining the dependent variable, namely tax revenue in Indonesia during the period 1972–2022.

Normality Test

Table 1.3
Normality Test

Variable	Obs	W	V	z	Prob>z
Taxrev	47	0.96229	1,689	1.114	0.13264
Gdpgr	51	0.65028	16,706	6.012	0.00000
Info	51	0.65541	16,461	5,980	0.00000
FDI	51	0.96438	1,701	1.135	0.12827
Gove xp	51	0.98292	0.768	-0.563	0.71338

Source: Data processing results from Stata17, 2025

Based on the results of the normality test using Shapiro-Wilk, it is known that most of the variables in this research model are normally distributed. This is indicated by the probability values of the Taxrev variables (0.13264), FDI (0.12827), and Goveexp (0.71338) which is greater than 0.05, thus fulfilling the normality assumption. On the other hand, the variable Gdper (0.00000) and Inflation (0.00000) has a probability value far below 0.05, which means it is not normally distributed. Thus, it can be concluded that not all variables in this model are normally distributed, so if necessary, researchers can transform the data or use more

robust alternative methods to overcome the non-fulfillment of these assumptions.

Heteroscedasticity Test

If the significance value (sig.) $> \alpha$, which is more than 0.05, then there is no heteroscedasticity (passes the heteroscedasticity test). If the significance value (sig.) $< \alpha$, which is less than 0.05, then there is heteroscedasticity (does not pass the heteroscedasticity test).

Table 1.4
Heteroskedasticity Test

chi2(1)	0.04
Prob > chi2	0.8459

Source: Data processing results from Stata17, 2025.

The heteroscedasticity test was conducted using the Breusch-Pagan/Cook-Weisberg method. The results show a Prob value $> \chi^2$ of 0.8459, which is greater than 0.05. Thus, there is no heteroscedasticity in this model, and the assumption of homoscedasticity is met, which means the residual variance remains constant.

Autocorrelation Test

Number of gaps in sample	2
Durbin-watson d-statistic (5, 47)	0.8692993

Source: Data processing results from Stata17, 2025

The autocorrelation test was conducted using the Durbin-Watson test, which produced a statistical value of 0.869. This value is below 1.5, indicating positive autocorrelation in the model. This autocorrelation indicates that there is a relationship between the current residual value and the previous residual value, which can cause bias in the standard error estimate. Therefore, further handling of autocorrelation is needed, such as data transformation or the use of an autoregressive model.

Stationarity test

- Dfuller gdpr

Dickey-fuller test number of obs = 50

Variable: gdpr number of lags = 0

H0: random walk without drift, $d = 0$

	Statistical test	1%	5%	10%
Z(t)	-4,994	-3,580	-2,930	-2,600

Mackinnon approximate p -value for Z(t) = 0.0000

- Dfuller inf

Dickey-Fuller test number of obs = 50

Variable: inf Number of lags = 0

H0: Random walk without drift, $d = 0$

	Test Statistics	1%	5%	10%
Z(t)	-4.722	-3,580	-2.930	-2,600

Mackinnon approximate p – value for Z(t) = 0.0001

- Dfuller fdi

Dickey-Fuller test Number of obs = 50

Variable: fdi Number of lags = 0

H0: Random walk without drift, $d = 0$

	Test Statistics	1%	5%	10%
Z(t)	-4.722	-3,580	-2.930	-2,600

Mackinnon approximate p – value for Z(t) = 0.0109

- Dfuller governerxp

Dickey-Fuller test Number of obs = 50

Variable: goverxp Number of lags = 0

H0: Random walk without drift, $d = 0$

	Test Statistics	1%	5%	10%
Z(t)	-4.722	-3,580	-2.930	-2,600

Mackinnon approximate p – value for Z(t) = 0.2641

- Dfuller taxrev

Dickey-fuller test for unit root number of obs = 50

Variable: gdp number of lags = 0

H0: random walk without drift, $d = 0$

	Statistical test	1%	5%	10%
Z(t)	-1,129	-3,621	-2,947	-2,607

Mackinnon approximate p -value for Z(t) = 0.7034

Stationarity testing is carried out using the Augmented Dickey-Fuller (ADF) test. The

results of this test indicate that the variables gdpgr, inf, and fdi have Z(t) values that are smaller than the critical value at the 5% significance level, and p-values that are less than 0.05. This means that the three variables are stationary at the level. On the other hand, the variables govexp and taxrev show Z(t) values that are higher than the critical value and p-values that are greater than 0.05, so it can be concluded that both are not stationary at the level and need to be transformed through differencing before being used in the long-term model.

DISCUSSION

The results of the study show that economic growth has a positive and significant effect on tax revenues in Indonesia. When the economy grows, production, consumption, and investment activities increase, thus encouraging the expansion of the tax base. Increased community income and corporate profits will increase the potential for state revenues from income tax and consumption tax.

Stable economic growth also provides room for increased tax compliance and payment capacity. Thus, policies that encourage the growth of the productive sector and macroeconomic efficiency will have a direct impact on increasing national tax revenues. This finding is consistent with the study by Ummah (2019) which states that economic growth has a positive impact on increasing the tax ratio. In addition, Silvia et al. (2013) and Hapsari & Prakoso (2016) also found that investment and consumption, which are part of economic growth, contribute to increasing tax revenues in Indonesia.

Inflation in this study also shows a positive and significant effect on tax revenues. The increase in the price of goods and services increases the nominal value of taxable objects, especially on value added tax (VAT). This makes state revenues tend to increase in nominal terms along with inflation. However, it is important to note that the positive impact of inflation does not always reflect an increase in real revenues, because high inflation can actually suppress purchasing power and slow economic growth. Therefore, price stability remains an important factor in maintaining a balance between tax revenues and healthy economic growth. This is reinforced by

Budiman (2025) who found that inflation has an impact on VAT and PPnBM revenues, and the IMF (2013) who mentioned the importance of controlling inflation to maintain fiscal efficiency. Tanzi (2011) also mentioned the phenomenon of "fiscal drag" which can occur when inflation is not accompanied by tariff adjustments.

On the contrary, the regression results show that foreign direct investment (FDI) has a negative and significant effect on tax revenues. Although in theory FDI has the potential to expand the tax base through industrial expansion and job creation, in practice the contribution of FDI to tax revenues in Indonesia is still low. This is likely due to the many tax incentives such as tax holidays and tax allowances given to foreign investors. As a result, even though investment increases, tax revenues do not necessarily follow. This finding indicates the need to evaluate the effectiveness of fiscal incentive policies in order to continue to attract investors while maintaining the country's fiscal interests. This result is in line with the findings of Johannesen et al. (2020) which states that tax avoidance practices by multinational companies and excessive fiscal incentives can reduce the contribution of FDI to taxes. Research by Putra et al. (2023) also shows that although FDI affects economic growth, its effect on taxes needs to be reviewed more contextually.

Government spending has been proven to have a positive and significant impact on tax revenues. Increased state spending, especially in productive sectors such as infrastructure, education, and health, drives an increase in aggregate demand which in turn accelerates economic growth. The multiplier effect of government spending expands economic activity and increases people's income, which then has an impact on increasing tax revenues from various sectors. Therefore, targeted and efficient management of state spending is an important instrument in the strategy to increase long-term tax revenues.

This is in accordance with the findings of Qomariyah & Priyarsono (2016) and Ike et al. (2021) which stated that government spending, especially in the infrastructure and education sectors, contributed significantly to economic growth and regional income. Sadli et al. (2022) also proved that capital expenditure and

goods/services spending had a significant impact on national growth which then had an impact on increasing tax revenues.

The regression model in this study has mostly met the classical assumption tests, such as multicollinearity and heteroscedasticity tests, which indicate that the model is free from multiple regression bias and non-constant residual variance. Although the normality test is not fully met and the autocorrelation test shows serial correlation, this can be improved by using a data transformation approach or autoregressive model. The R-squared value of 0.575 indicates that the model is able to explain around 57.5% of the variation in tax revenue based on the variables of economic growth, inflation, foreign investment, and government spending. These results provide an overview that these four variables have an important role in influencing tax revenue and can be used as a basis for formulating more targeted and sustainable fiscal policies. This is in accordance with Cyan et al. (2013) who emphasized the importance of using multivariate models to understand the interaction of fiscal variables on state revenue, as well as the study of Acosta Ormaechea & Morozumi (2019) who recommended the optimal composition of taxes and spending for long-term fiscal growth and stability.

CONCLUSION

This study concludes that the dynamics of tax revenue in Indonesia during the period 1972 to 2022 are greatly influenced by various macroeconomic indicators, especially economic growth, inflation, foreign direct investment (FDI), and government spending. Partially, economic growth shows a positive and significant effect on tax revenue, indicating that the higher the economic growth, the greater the potential for expansion of the national tax base through increased income and public consumption. Inflation is also proven to have a positive and significant effect, although its effect is more nominal and can weaken purchasing power if uncontrolled. On the other hand, foreign investment shows a negative and significant relationship to tax revenue, which is most likely caused by fiscal incentive policies such as tax holidays that reduce fiscal

contributions from foreign investors. Meanwhile, government spending is proven to play an important role in driving tax revenue through a multiplier effect on the economy, especially when directed to productive sectors such as infrastructure, education, and health. Simultaneously, these four variables are able to explain around 57.5% of the variation in tax revenue, indicating that macroeconomic factors play a very significant role in shaping the country's fiscal capacity. Therefore, strengthening the tax revenue system in Indonesia requires an integrated strategy that does not only focus on fiscal policy alone, but also pays attention to economic stability, incentive effectiveness, and the direction of state spending.

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