

## Analysis of The Effect of Tax Revenue on Economic Growth in Indonesia

Hendi Wibowo , Toto Gunarto, Marselina

Master of Economics, Faculty of Economics and Business, University of Lampung

### ABSTRACT

Taxes play an important role as one of the main sources of income for the country. The main objective of state financial policy in the field of domestic revenue is to explore, encourage and develop sources of revenue from within the country so that the amount increases in line with development needs. This research uses a quantitative descriptive research type. The data used is in the form of a Time Series (time series) spanning 33 years, with a research time range of 1990-2022, with the Indonesian observation area. The research method uses the OLS (Ordinary Least Square) least squares method and the Error Correction Model. Error Correction Model (ECM). Research Results Income Tax Revenue (PPH) has a positive and significant influence on the long-term relationship with gross domestic product (GDP), and has a positive and significant influence on the short-term relationship. Value added tax (VAT) has a positive and significant influence on the long-term relationship with gross domestic product (GDP), and has a positive and significant influence on the short-term relationship. Excise revenue (PC) has a positive and significant influence on the long-term relationship with gross domestic product (GDP), and has a positive and significant influence on the short-term relationship. Import duty receipts (PBE) have a positive and significant influence on the long-term relationship with gross domestic product (GDP), and have no influence on the short-term relationship in Indonesia throughout the 1990-2022 period.

**Keywords:** *Economics, Tax revenue, Error Correction Model*

#### **Corresponding author**

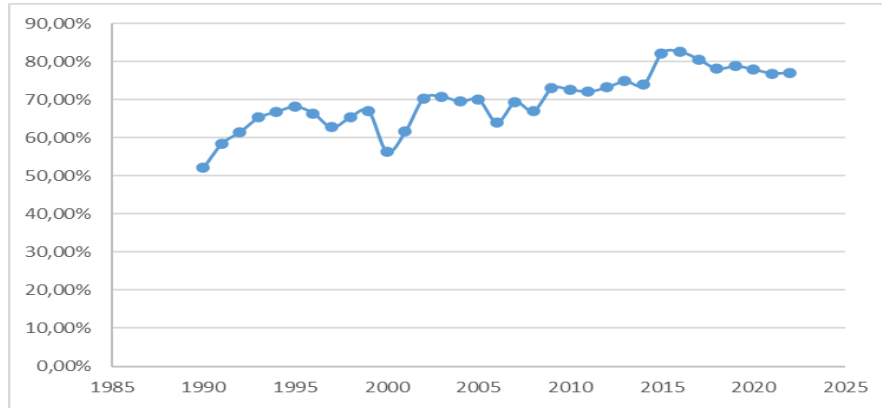
**Name:** Hendi Wibowo

**Email:** [hendi0110wibowo@gmail.com](mailto:hendi0110wibowo@gmail.com)

## INTRODUCTION

Taxes are an integral part of fiscal policy. This is because taxes are the largest contributor to state/regional revenues as seen in Figure 1. From 2009 to 2022, the contribution of tax revenues to state revenues and grants in Indonesia is more than 70%. Taxation is considered very important for a country, because it can affect economic growth. Several developing countries, including Indonesia, rely on sources of financing for state expenditure or expenditure from tax revenue (Halim et al., 2020). According to (Isnanto, A. 2021), one of the biggest sources of state revenue is from the tax sector, the implementation and improvement of development which is the practice of Pancasila which aims to increase the prosperity and welfare of society. Meanwhile, according to

(Mardikwati, K. N., 2021), taxes are contributions from the people to the state treasury based on the law by not getting reciprocal services that can be directly shown, and which are used to pay for public expenditures. The following is an illustration of the Contribution of Tax Revenue to Total State Revenue in Indonesia from 1990 to 2022:

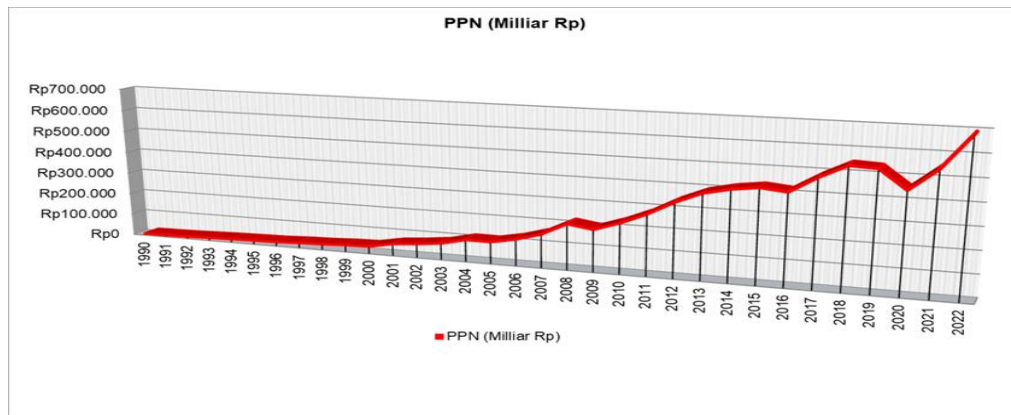


**Figure 1: Data on the Contribution of Tax Revenue to Total State Revenue in Indonesia from 1990 to 2022 (In %)**

Based on the data in Figure 1 above, it can be seen that tax revenue from 1990 to 2022 is the largest contributor to funding compared to other state revenues and grants for personnel expenditure, goods expenditure, capital expenditure, and other expenditures by the Government of Indonesia. The realization of tax revenue in Indonesia continued to increase from 1990 to 2022 as shown in Figure 1. However, there was a considerable decline of 16.88% in 2020 along with the Covid-19 pandemic. Then, in 2021 there was an increase again in line with the increase in commodity prices, especially coal and CPO, which became a source of foreign exchange in the commodity super cycle period that occurred after the Covid-19 pandemic.

The effect of tax revenue on economic growth has been carried out by many previous researchers, including by (Saragih, 2018) which states that the economic growth of a region is influenced by local tax revenue. The same results were carried out by (Adkisson & Mohammed, 2014) who found that there was a positive effect of tax revenue on economic growth. Other research on the relationship between taxes and people's prosperity was conducted by (Vatavu et al., 2019) which shows that tax revenue affects the level of welfare of a country's population.

Value Added Tax (VAT) revenue is the second largest contributor to state revenue after income tax. The large contribution of VAT to state revenue is inseparable from government support to facilitate the implementation of VAT collection. The policy can be in the form of improving tax regulations or issuing fiscal policies that can encourage economic transactions so as to spur the flow of goods and services that are VAT objects (Pujiwidodo, Hartanti Dwiymoko, 2018). The figure presents the realization of state revenue from the Value Added Tax and Sales Tax on Luxury Goods sectors in Indonesia from 1990-2022 as follows:

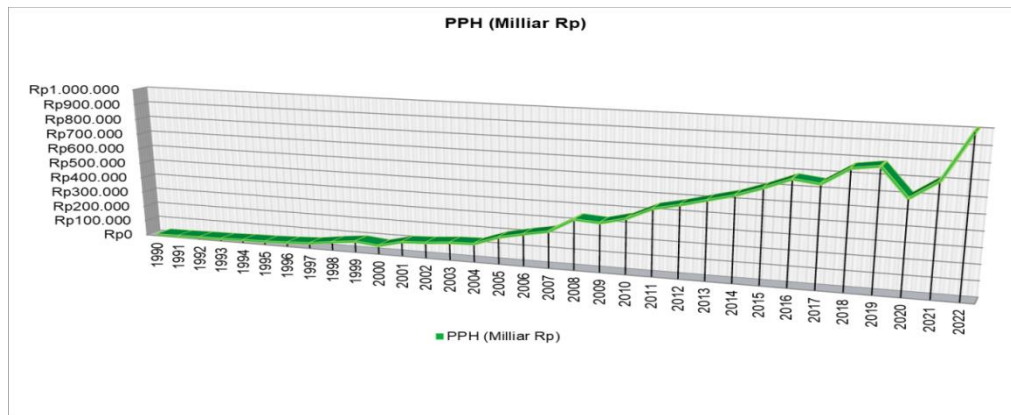


**Figure 2: Value Added Tax (VAT) Revenue from 1990 to 2022 (In Billion IDR)**

In Indonesia between the years: 1990-2022 Average VAT of IDR269,940 billion Highest Value: Rp687,609 billion in 2022 Lowest Value: IDR8,119 billion in 1990. There is a significant upward trend from 1990 to 2022. Although there are annual fluctuations, the overall amount of VAT continues to increase over time. 1998-1999, There was a significant increase in this period, probably as a result of the Asian financial crisis that affected the Indonesian economy at that time. Years 2004-2008, A steady upward trend occurred in this period, perhaps as a result of strong economic growth. Years 2020-2022: There were noticeable fluctuations and declines in 2020, likely influenced by the COVID-19 pandemic, followed by sizable spikes in 2021 and 2022.

In essence, Value Added Tax according to Law Number 42 of 2009 concerning Value Added Tax and Sales Tax on Luxury Goods (Law of the Republic of Indonesia, 2009) is a tax imposed on goods and services that are consumed and stratified in each production and distribution channel. This means that the more goods and services consumed, the more the tax revenue will increase. In line with Wijayanti in (Sinambela & Rahmawati, 2019) revealed that the main economic activity of people in developing countries such as Indonesia is consumption activities which have a close relationship with VAT revenue. It is believed that the more consumption activities carried out by the community, the more state revenue from the VAT sector will increase and vice versa.

The increase in PPH revenue can be used by the government to finance infrastructure projects or other development programs. This can trigger increased investment in the economy, create new jobs, and stimulate economic activity, which in turn will increase GDP in the short term. This can increase investor confidence, encourage long-term investment, and support sustainable economic growth. Taxes play a role in generating revenue needed to support government spending activities (Edame & Okoi, 2014); and have a significant impact on the performance of the production and consumption sectors as these sectors contribute significantly to government tax revenue and economic growth (Olufemi et al., 2018). The figure presents the realization of state revenue from the income tax sector in Indonesia from 1990-2022 as follows:

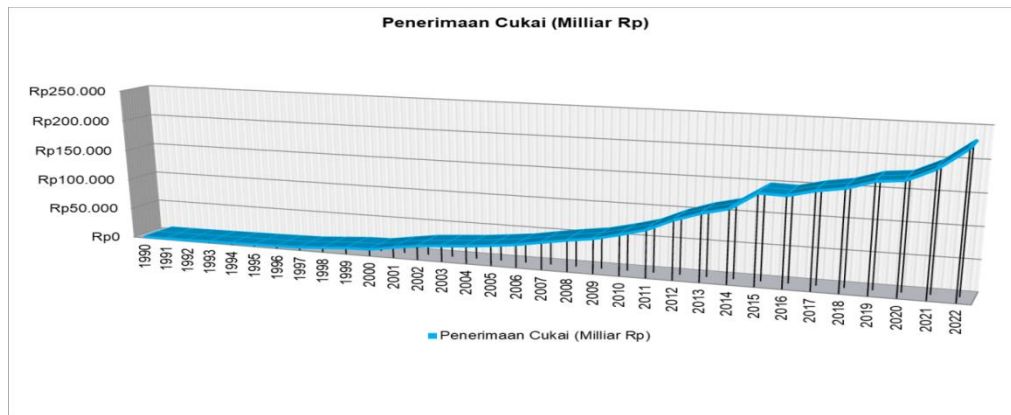


**Figure 3: Income Tax Revenue (PPH) in 1990 to 2022 (In Billion IDR)**

In Indonesia Year Range: 1990-2022 PPH has Average: IDR358,899 billion Highest Value: IDR998,214 billion in 2022 Lowest Value: IDR8,250 billion in 1990. there is a significant upward trend from 1990 to 2022. Although there are annual fluctuations, overall the amount of PPH has continued to increase over time. Specific Years: 1998-1999: There was a significant increase in this period, possibly in response to the Asian financial crisis. Years 2005-2008: A steady upward trend occurred in this period. Years 2020-2022: There were fluctuations in 2020, possibly due to the impact of the COVID-19 pandemic, followed by large spikes in 2021 and 2022. Steady economic growth can increase individual and corporate income, which in turn will increase the PPH tax base. Increases in salaries, corporate profits, and other income will lead to an increase in PPH receipts.

This study was conducted to prove the hypothesis: personal income tax has a positive effect on economic growth. In this case, economic growth as the dependent variable will be seen from the growth of GDP per capita (Elshani and Ahmeti 2017; Widmalm, 2001; Lee and Gordon 2005). progressive taxation policy changes on personal income that have been made several times by Indonesia are also done by other countries. (Focanti et al., 2013) even developed a comprehensive database of tax reforms (one of which is PPh OP) that have been carried out in Latin American countries. then draws a relationship between the tax reforms carried out with various economic variables. Not only (Focanti et al. 2013), (CanavireBacarreza et al. 2013) and (Barreix et al. 2017) also focused their studies on Latin American countries.

Excise is an indirect tax imposed only on the use of certain goods within the customs area. According to Law of the Republic of Indonesia Number 39 of 2007, excise is a State levy imposed on certain goods that have properties or characteristics stipulated in the Excise Law. Excise collection is one of the components of State revenue that contributes quite high in the tax sector and has a significant effect on State revenue, and revenue always increases or exceeds the set target. But on the one hand, the target set also always increases every year, the figure presents the realization of state revenue from the excise revenue sector in Indonesia from 1990-2022 as follows:



**Figure 4: Excise Revenue (PC) in 1990 to 2022 (In Billion IDR)**

In Indonesia for the Years: 1990-2022 Average Excise Revenue: IDR64,127 billion Highest Value: IDR226,881 billion in 2022 Lowest Value: IDR1,800 billion in 1990. There is a significant upward trend from 1990 to 2022. Although there are annual fluctuations, overall the amount of excise revenue has continued to increase over time. Particular Years: 1998-1999: There was a significant increase in this period, perhaps in response to the Asian financial crisis. Years 2005-2008: A steady upward trend occurred in this period. Year 2020-2022: There was a significant increase in this period, indicating that excise revenue is still an important source of revenue for the government. If public consumption increases from year to year, then excise revenue is also likely to increase as excise taxes are generally levied on consumer goods such as alcohol, tobacco and fuel. Steady economic growth and an increase in people's income may lead to an increase in consumption, thereby increasing excise revenue.

Consumers who are not fully rational may embark on the consumption of such goods without fully realizing the potential regret they could experience in the future. Conversely, however, an increase in excise tax rates on some goods can have a significant impact on state revenues (O'Donoghue and Rabin, 2006). Excise tax is a unique policy, where GDP growth in the long run does not significantly help in meeting budgetary needs. This suggests that consumption of the goods subject to the tax will not grow along with GDP, so the tax only acts as a correction for short-term needs. The long-term impact of the tax is generally greater than the growth of the tax base, signaling that the overall economy has great opportunities for further growth (Erstida Ulvidiené, 2023). Receipts from value-added and excise taxes have a positive and significant impact on gross domestic product per capita in the long run (Kalaš et al., 2020).

Import duties are calculated by multiplying the dutiable import value, i.e. the volume of goods subject to import duties, by the tariff and exchange rate. Import duty rates are compiled based on the classification of goods based on the Harmonized System as outlined in the form of a tariff list known as the Indonesian Import Duty Tariff Book. Based on PMK Number 19 Year 2009, the import duty rate on imported goods is set at a minimum

of 0% and a maximum of 15%. The value of import duties is strongly influenced by the exchange rate. The figure presents the realization of state revenue from the import duty sector in Indonesia from 1990-2022 as follows:



**Figure 5: Import Duty Revenue (PBE) from 1990 to 2022 (In Billion IDR)**

In Indonesia, it can be seen that import duty revenue fluctuates from year to year, but overall there is a significant upward trend from 1990 to 2022. At the beginning of the period, import duty revenue tended to be stable with little fluctuation. In the mid to late 1990s, there were greater fluctuations, possibly influenced by global and regional economic conditions, such as the Asian financial crisis in 1997. Starting in the 2000s, there was a significant upward trend, with consistent increases from year to year. The year 2022 recorded the highest Import Duty revenue in the observed time span. Fluctuations in import duty receipts in certain years may be due to factors such as currency exchange rate fluctuations, fiscal policy changes, or even geopolitical events affecting international trade.

In Indonesia, the growth of excise revenue has the highest growth rate compared to other revenue components. Specifically, revenue from excise against the APBN-Presidential Regulation No. 54/2020 until June 2020 reached 38.54 percent, with growth driven by an increase in tobacco products by 20.46 percent (year-on-year), ethyl alcohol by 226.99 percent (year-on-year), while Excise on Beverages Containing Ethyl Alcohol (MMEA) experienced negative growth. The significant increase in ethyl alcohol excise is due to the increased demand for ethyl alcohol for medical purposes (MoF, 2020).

According to (Andrew Kazora Okello, 2001), this study concludes that there are opportunities to generate additional revenue from excise taxes. Overall, the excise system does not require major changes: revenues from excise taxes account for 4.5% of GDP and have a revenue elasticity close to one, meaning that their effect on state revenues is positive and significant. The importance of excise taxes indicates the existence of a separate administrative unit, in addition to the Customs Department, and it also shows that GDP growth through excise taxes is an important proportion of state revenues (Christos Papageorgiou, 2021).

Based on the background described above and to be able to draw some conclusions about whether tax revenue affects and drives the Indonesian economy in the

long term and short term from 1990-2022. Then the problem formulation is described as follows:

1. What is the effect of Income Tax Revenue (PPH) on the Indonesian economy during 1990-2022?
2. What is the effect of Value Added Tax (VAT) revenue on the Indonesian economy during 1990-2022?
3. What is the effect of excise tax revenue (PC) on the Indonesian economy during 1990-2022?
4. What is the effect of import duty revenue (PBE) on the Indonesian economy throughout 1990-2022?

## **METHOD**

### **Data Type and Data Source**

This study uses a type of quantitative descriptive research and uses secondary data obtained indirectly from the Directorate General of Taxes (abbreviated as DGT) <https://pajak.go.id/id/realisasi-pendapatan>, Central Bureau of Statistics <https://www.bps.go.id/id>, and Bank Indonesia publication data <https://www.bi.go.id/id/publikasi/Default.aspx>, as well as various publications relevant to the data source. The data used is in the form of Time Series (time series) Periodic series or time series is a series of observation data arranged in order of time, observations made must be in the same time interval unit (Cryer, 1986). According to (Box and Jenkins, 1976) a time series is a group of observation values obtained at different time points with the same time interval and the data rows are assumed to be related to each other, so the time series model is a time series model in which observations are correlated with each other. This study uses a time series of 33 years, with a research time range of 1990-2022, with the observation area of Indonesia.

### **Stationary Test: Unit Root Test**

A time series is a set of observations obtained at different points in time with the same interval and the rows of data are assumed to be related to each other (Box and Jenkins, 1994). Stationarity Test To test the stationarity of time series data, the unit root test method is used. Testing on each variable begins with testing at the level order. If the data is not stationary at the level order, then testing the level of integration (1st difference) is carried out to see the stationary data at this order. The results of the test are compared with the McKinnon Critical Value. Data is said to be stationary if the Test critical values are greater than the Augmented Dickey Fuller (ADF) test statistic, meaning that  $H_0$  is rejected and  $H_a$  is accepted, and vice versa. The test results were analyzed with a significance level of 5 percent each. The hypothesis used in the stationary test is:

1.  $H_0 : \rho = 1$ , there is a unit root or data is not stationary, while
2.  $H_a: \rho < 1$ , no unit root or stationary data.

### **Cointegration Test**

The cointegration test is conducted to determine whether or not there is a long-term relationship in each variable. The main requirement of a long-term relationship is that all variables used in the model must be stationary in the same degree of integration. In order to conduct cointegration testing, the Augmented Eagle-Granger test is used, which also utilizes the ADF test. from each independent variable to the dependent variable (Satria, 2004) The cointegration test conducted in this study uses the Eagle-Granger (EG) test and to obtain the EG value the data used must be integrated at the same degree. with the hypothesis test as follows:

1.  $H_0 = \mu = \text{level (1)}$ , meaning there is no cointegration
2.  $H_a = \mu \neq \text{level (1)}$ , meaning there is cointegration

### Ordinary Last Square (OLS)

If the data is stationary at the level, then the Ordinary Least Square (OLS) method can be used to estimate the parameters of the multiple linear regression model. Regression is the study of how one dependent variable is affected by one or more of the independent variables with the aim of estimating and or predicting the average value of the dependent variable based on the known values of the independent variables. Multiple regression models are regression models that consist of more than one independent variable. The least squares method (Ordinary Least Square = OLS) is a method that can be used to get a good regression line that occurs if the predicted value is as close as possible to the actual data or the values of  $\beta_0$  and  $\beta_1$  which cause the residuals to be as small as possible (Widarjono. 2013). The econometric model with the OLS (Ordinary Least Square) method is as follows:

$$Y_t = \beta_0 + \beta_1 PPH_t + \beta_2 PPN_t + \beta_3 PC_t + \beta_4 PBE_t + e_t$$

Description:

<b>PDB</b>	: <b>Product Domestic Bruto</b>
<b>PPH</b>	: Income Tax Revenue
<b>PPN</b>	: Value Added Tax Revenue
<b>PC</b>	: Excise Revenue
<b>PBE</b>	: Import Duty Receipts
<b>t</b>	: Research period 1990-2022 (time series)
<b><math>\beta_0</math></b>	: Coefficient Constant intercept which is a scalar
<b><math>\beta_1, \beta_2, \beta_3, \beta_4</math></b>	: Regression coefficient or slope of each variable
<b><math>e_t</math></b>	: Standard error in the mathematical model (Error Term)

### Error Correction Model (ECM)

If the data is not stationary at the level, but stationary at the differential level and the two variables are cointegrated or in other words have a long-term relationship or equilibrium. In the short run there may be an imbalance. This means that what economic actors want is not necessarily the same as what actually happens. The difference between what economic agents want and what happens requires adjustment. The model that includes adjustments to make corrections for imbalances is called the Error Correction Model / ECM (Widarjono. 2013). ECM analysis is used to determine the effect of independent variables on the dependent variable. The econometric model with Error Correction Model (ECM) technique is as follows:

$$D(Y)_t = \beta_0 + \beta_1 D(\text{PPH})_t + \beta_2 D(\text{PPN})_t + \beta_3 D(\text{PC})_t + \beta_4 D(\text{PBE})_t + \text{ect}(-1)$$

Description:

<b>PDB</b>	: Product Domestic Bruto
<b>PPH</b>	: Income Tax Revenue
<b>PPN</b>	: Value Added Tax Revenue
<b>PC</b>	: Excise Revenue
<b>PBE</b>	: Import Duty Receipts
<b>t</b>	: Research period 1990-2022 (time series)
<b><math>\beta_0</math></b>	: Coefficient Constant intercept which is a scalar
<b><math>\beta_1, \beta_2, \beta_3, \beta_4</math></b>	: Regression coefficient or slope of each variable
<b>D</b>	: Short-term relationship Regression coefficient or slope of each variable
<b>ect</b>	: Error Correction term

## FINDING AND DISCUSSION

### Stationary Test Results

Stationarity or the presence of unit roots in the context of time series data movement is very important to determine its consistency. In this study, stationarity is tested using the Augmented Dickey-Fuller Test (ADF) method with the help of Eviews software. The unit root test results are evaluated by comparing the t-count value with the MacKinnon critical value. If the absolute t-count value exceeds the absolute MacKinnon critical value, then the null hypothesis (H0) is rejected, indicating that the time series data are stationary. Conversely, if the t-count value does not exceed the absolute MacKinnon critical value, then H0 is accepted, which means that the time series data is not stationary. In the case of negative t-count values, if the value is smaller than the MacKinnon critical value, H0 will be rejected, indicating that the time series data is stationary, and conversely, if the value is larger, H0 is accepted, indicating that the time series data is not stationary (Gujarati, 2008).

**Table 1. Stationary Test Results (Unit Root Test) at the Level Level**

Research Variable	t-count	Critical Value Mac kinnon (1%)	Critical Value Mac kinnon (5%)	Critical Value Mac kinnon (10%)	Probability	Description
Y	-3,1766	-3,6701	-2,9639	-2,6210	0,0315	Not Stationary
PPN	-1,7929	-3,6537	-2,9571	-2,6174	0,3771	Not Stationary
PPH	-3,3212	-3,6701	-2,9639	-2,6210	0,0227	Stationary
PC	-2,3506	-3,6537	-2,9571	2,6174	0,1633	Not Stationary
PBE	-0,6029	-3,6701	-2,96397	-2,6210	0,8555	Not Stationary

Source: Eviews data processed 2024.

Based on the results of the stationary test (unit root test) at the level in Table 5, it is known that there are no variables that are stationary at the level level, this can be seen from the t-count value that is smaller than the MacKinnon critical value of 1%, 5% and 10%, and the probability value of 4 variables, namely Y, PPN, PPH, PC and PBE is greater than 0.05. In this study, all variables must be stationary, so the next test is stationary at the first difference level, here are the test results:

**Table 2. Stationary Test Results (Unit Root Test) at the First Difference Level)**

Research Variable	t-count	Critical Value Mac kinnon (1%)	Critical Value Mac kinnon (5%)	Critical Value Mac kinnon (10%)	Probability	Description
Y	-5,5513	-3,6616	-2,9604	-2,6191	0,0001	Stationary
PPN	-5,4440	-3,6616	-2,9604	-2,6191	0,0001	Stationary
PPH	-6,0318	-3,6616	-2,9604	-2,6191	0,0000	Stationary
PC	-7,2340	-3,6793	-2,9677	-2,6229	0,0000	Stationary
PBE	-4,9909	-3,6616	-2,9604	-2,6191	0,0003	Stationary

Source: Eviews data processed 2024.

Based on the results of the stationary test (unit root test) at the first difference in Table 2, Gross Domestic Product (Y), (Independent Variable) Income Tax Revenue (PPH), Value Added Tax Revenue (VAT), Excise Revenue (PC) and Import Duty Revenue (PBE) are stationary at the first difference level, which can be evidenced from the t-count value greater than the MacKinnon critical value of 1%, 5% and 10% and the probability value of 4 variables namely GDP, VAT, PPH, PC and PBE is significantly smaller than 0.05, so it can be concluded that all variables used in the study are stationary at the first difference level.

### Cointegration Test Results

After the stationarity test is carried out, then the cointegration test is carried out, the purpose of the cointegration test is to see whether there is a long-term relationship between the independent variable and the dependent variable, Cointegration testing is carried out using the Engel-Granger (EG) cointegration test method, If the absolute t-count value is greater than the absolute MacKinnon critical value, In the case if the t-count value is negative, it can be said that if the t-count value is smaller than the MacKinnon critical value, then the residuals are cointegrated, meaning that there is a long-term relationship between the independent variable and the dependent variable, the following are the results of the Cointegration test:

**Table 3. Engel-Granger (EG) Cointegration Test Results**

Research Variable	t-count	Critical Value Mac kinnon (1%)	Critical Value Mac kinnon (5%)	Critical Value Mac kinnon (10%)	Probab ility	Description
Ect(-1)	-9,0174	-3,6616	-2,9604	-2,6191	0,000	Stationary

Source: Eviews data processed 2024.

Based on the results of the Engel Granger (EG) cointegration test, it can be seen that the residual Error Correction Term (-1) is stationary at the level level which can be seen from the t-count value greater than the MacKinnon critical value of 5%, and 10%, so the residuals are cointegrated, meaning that there is a long-term and short-term relationship between the independent variable and the dependent variable.

### Results of Long-Term Estimation of Ordinary Least Square Model (OLS)

Stationarity and cointegration testing states that the influence model can be carried out in two stages, namely long-term and short-term relationships. These regression results are to determine the direction of the relationship between the independent variable and the dependent variable and to see the real results of the coefficient magnitude obtained, these results are long-term influences. The following table shows the results of data estimation with the number of observations of Indonesia 33 years for the period 1990-2022, it can be concluded that the overall results of the Ordinary Least Square Model (OLS) regression equation are as follows:

**Table 3. Ordinary Least Square Model (OLS) Long-Term Estimation Results**

Variable	Coefficient	Std. Error	t-Count	Prob	Description
C	1,157117	0,076746	15,07730	0,0000	-
PPN	0,336048	0,027273	12,32152	0,0000*	significant
PPH	0,538315	0,024076	22,35884	0,0000*	significant
PC	0,064309	0,025677	2,504592	0,0184*	significant
PBE	0,057511	0,015976	3,599892	0,0012*	significant

Source: Eviews, Data processed 2024.

Notes:

[ ] : Shows t-count

\* : Based on 95% confidence level ( $\alpha=5\%$ )

R-squared = 0.999890 Durbin-Watson Stat = 1.199278

F-stat = 63505.08 Prob (F-stat) = 0.000000

Table 3, shows the results of regression calculations with and then transformed into mathematical form, the mathematical model by entering the equation value of the regression as follows:

$$Y_{it} = 1,157117 + 0,3360PPN_t + 0,5383PPH_t + 0,0643PC_t + 0,0575PBE_t$$

$$[15,077] \quad [12,321] \quad [22,358] \quad [2,5045] \quad [3,5998]$$

Based on the results of the Long-Term Estimation Ordinary Least Square Model (OLS) above, the probability value of each variable can be obtained. In this case, the R-squared is 0.999890, which indicates that your model explains about 99.989% of the variation in the data, which is almost perfect. R-square interprets the percentage amount of influence all independent variables have on the dependent variable. This means that in this study, 99% of the independent variables affect Gross Domestic Product (GDP), while the remaining 1% is influenced by other variables that are not included in the research model.

DW values range between 0 and 4. Values close to 2 indicate that there is no significant autocorrelation in the residuals. The DW value is 1.199278, which indicates that there is a slight positive autocorrelation in the residuals of your model, but the value is still quite close to 2, which can be ignored. Prob(F-statistic) is the p value associated with the F-statistic. It measures the global significance of the regression model. In this case, the F-statistic value is 63505.08, and the probability (Prob (F-statistic)) is 0.000000, which indicates that the model as a whole is highly statistically significant.

### Short-Term Error Correction Model (ECM) Estimation Results

After testing for data stationarity and cointegration, the results show that all variables used in the study are stationary at the first difference level and have cointegrated

residuals. This indicates the existence of a long-term equilibrium relationship between the independent and dependent variables. However, in the short term, there may be an imbalance that indicates a difference between what economic actors want and what reality is. Therefore, an adjustment is required. A model that incorporates adjustments to correct for these imbalances is known as an Error Correction Model (ECM). Below are the estimation results for the short run:

**Table 4. Short-Term Error Correction Model (ECM) Estimation Results**

Variable	Coefficient	Std. Error	t-Count	Prob	Description
<b>C</b>	-0,004127	0,004581	-0,900737	0,3760	-
<b>D(PPN)</b>	0,359592	0,027735	12,96506	0,0000*	significant
<b>D(PPH)</b>	0,527549	0,021023	25,09421	0,0000*	significant
<b>D(PC)</b>	0,097643	0,034573	2,824280	0,0090*	significant
<b>D(PBE)</b>	0,020803	0,015448	1,346605	0,1897	Not significant
<b>ECT(-1)</b>	-0,429529	0,183269	-2,343709	0,0270*	significant

Source: Eviews, Data processed 2024.

Notes:

[ ] : Shows t-count

\* : Based on 95% confidence level ( $\alpha=5\%$ )

R-squared = 0.990431 Durbin-Watson Stat = 1.942525

F-stat = 538.2211 Prob (F-stat) = 0.000000

In Table 4, all variables are differentiated in the ECM model to determine the short-term relationship, the short-term equation obtained is:

$$D(Y_{it}) = -0,004127 + D(0,359592)PPN_t + D(0,527549)PPH_t + D(0,097643)PC_t + D(0,020803)PBE_t + (-0,429529)ECT(-1)$$

$$[-0,9007] \quad [12,965] \quad [25,094] \quad [2,8242] \quad [1,3466] \quad [-2,3437]$$

Based on the results of the Short-Term Error Correction Model (ECM) Estimation above, the probability value of each variable can be obtained. In this case, the R-squared is 0.990431, which indicates that your model explains about 99.04% of the variation in the data, which is almost perfect. R-square interprets the percentage amount of influence all independent variables have on the dependent variable. This means that in this study, 99% of the independent variables affect Gross Domestic Product (GDP), while the remaining 1% is influenced by other variables that are not included in the research model.

DW values range between 0 and 4. Values close to 2 indicate that there is no significant autocorrelation in the residuals. The DW value is 1.942525, which indicates that there is a slight positive autocorrelation in the residuals of your model, but the value is still quite close to 2, which can be ignored. Prob(F-statistic) is the p value associated with the F-

statistic. It measures the global significance of the regression model. In this case, the value of the F-statistic is 538.2211, and the probability (Prob (F-statistic)) is 0.000000, which indicates that the model as a whole is highly statistically significant.

The Error Correction Term (ECT) coefficient shows the speed of adjustment, namely the speed of residuals/errors in the previous period to correct changes in variable Y towards equilibrium in the next period. The negative sign (-) on the ECT coefficient indicates the validity of the model specification. The ECM short-term estimation results show a negative ECT coefficient value, which is -0.429529 and significant at the 0.05 significance level, meaning that the requirements for ECM short-term estimation are met and the ECM model is declared valid. Fluctuations in short-term equilibrium (disequilibrium) towards long-term equilibrium will be corrected, where 42.95% of the adjustment process occurs in the first year, while the remaining 57.14% of the adjustment process occurs in the following year. The speed of adjustment from short-term to long-term takes  $1/0.42$  or 2.3 years. The difference between the actual value of GDP and its equilibrium value ( $\hat{Y}$ ) is 0.429529 and will be adjusted in about 2.3 years. The constant coefficient of 0.004127 indicates that in the short term if all independent variables that are thought to affect Gross Domestic Product (GDP) are 0, the value of GDP is 0.004127 billion Rupiah.

## **DISCUSSION**

### **Long-term and short-term effects of income tax revenue (PPH) on Gross Domestic Product (GDP) in Indonesia**

The results of the above analysis statistically show, in the long-term effect of income tax revenue (PPH) on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient value of 0.5383, if income tax revenue (PPH) increases by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.53 billion throughout 1990-2022, this is assuming other variables are *ceteris paribus*. The short-term effect of income tax revenue (PPH) on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient value of 0.5275, if income tax revenue (PPH) increases by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.52 billion throughout 1990-2022, this is assuming other variables are *ceteris paribus*.

The results of this study are in line with research, (Estro Dariatno Sihaloho, 2020) 1970 to 2010. This study shows that income tax and value added tax are the types of domestic taxes that have the largest ratio to total taxes compared to other types of taxes. Income tax has a positive and significant effect on government revenue and economic growth in Indonesia. This study also found that the level of government revenue has a positive impact on increasing the ratio of income tax to total Indonesian tax revenue, the ratio of value added tax to total Indonesian tax revenue, and Indonesian economic growth. (Nadhif Zulfa Agustina, 2021), has a positive and significant effect on GDP, the impact on

the macro economy, the policy of reducing corporate income tax rates can encourage economic growth in the long term even though private and government consumption and investment still show a decline in both the short and long term.

### **Long-term and short-term effects of value-added tax (VAT) revenue on Gross Domestic Product (GDP) in Indonesia**

The results of the above analysis statistically show, in the long-term effect of value-added tax (VAT) revenue on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient value of 0.3360, if the receipt of value-added tax (VAT) increases by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.33 billion throughout 1990-2022, this assumes other variables are ceteris paribus. The short-term effect of value-added tax (VAT) revenue on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient of 0.3595, if the receipt of value-added tax (VAT) increases by 1 billion, the Gross Domestic Product (GDP) in Indonesia tends to increase by 0.35 billion throughout 1990-2022, this is assuming other variables are ceteris paribus.

The results of this study are in line with research, (Mr. Liam P. Ebrill, 2021), It can be seen that countries with similar VAT measured by standard rates can have significantly different revenue performance as measured by the ratio of VAT revenue to GDP. In the Philippines and Fiji, the standard rate of VAT is 10 percent: yet in Fiji, VAT collects more than 6 percent of GDP while in the Philippines the tax generates less than 3 percent of GDP. In general, the "efficiency ratio", defined as the ratio of VAT revenue to GDP divided by the standard rate (expressed as a percentage), in developing countries has a positive and significant effect on the average income tax growth of the country's economy. (Jewel, J. S., 2022), This study examines the effect of value-added tax on Bangladesh's gross domestic product using a long data set from 1991-1992 to 2020-2021. This study uses the cointegration technique discovered by Johansen with V.A.R. restrictions named vector error correction model and has long-run and short-run results. found that value-added tax has a specific positive impact on gross domestic product that ensures good and sustainable economic growth for decades in Bangladesh.

### **Long-term and short-term effects of excise revenue (PC) on Gross Domestic Product (GDP) in Indonesia**

The results of the above analysis statistically show, in the long-term effect of excise revenue (PC) on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient value of 0.0643, if excise revenue (PC) increases by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.064 billion throughout 1990-2022, this is assuming other variables are ceteris paribus. The short-term effect of excise revenue (PC) on Gross Domestic Product (GDP) in Indonesia shows a positive and

significant effect with a coefficient of 0.0976, if excise revenue (PC) increases by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.097 billion throughout 1990-2022, this is assuming other variables are in a ceteris paribus situation.

The results of this study are in line with research, (Andrew Kazora Okello, 2001) This study found that there is room for additional revenue from excise taxes. Overall, the excise system does not require major changes: excise revenues account for 4.5% of GDP and have a revenue elasticity close to one, having a positive and significant effect on a country's revenue fund. The importance of excise taxes would justify the existence of a separate administrative unit, in addition to the Customs Department, indicating that GDP accretion through excise taxes is a very important proportion of the country's revenue. (Christos Papageorgiou, 2021), The purpose of this study is to examine the impact of excise taxes on state revenue. Increasing excise taxes can be a way to reduce the consumption of tobacco products and thus have a positive impact on public health and welfare. However, research shows a positive and significant impact of increasing excise taxes on state revenue. For example: specifically for Greece we found that during 2019 and 2020 there will be a decrease in state revenue from tobacco product excise taxes of €150-€200 million annually, but when excise taxes increase revenues tend to increase by a modest proportion but with an impact on revenue growth.

### **Long-term and short-term effects of import duty revenue (PBE) on Gross Domestic Product (GDP) in Indonesia**

The results of the above analysis statistically show, in the long-term effect of import duty receipts (PBE) on Gross Domestic Product (GDP) in Indonesia shows a positive and significant effect with a coefficient value of 0.0575, if import duty receipts (PBE) increase by 1 billion, then Gross Domestic Product (GDP) in Indonesia tends to increase by 0.057 billion throughout 1990-2022, this is assuming other variables are ceteris paribus. As for the short-term effect of import duty revenue (PBE) on Gross Domestic Product (GDP) in Indonesia does not show a positive and significant effect on Gross Domestic Product (GDP) throughout 1990-2022.

The results of this study are in line with research, (Indri Arrafi Juliannisa, Raden Parianom, Andi Abrianto, 2023) The results showed that this study was unbiased, GDP had a positive and significant effect as indicated by the percentage of GDP growth with an average of 7% during the study period. Customs income tax through exports has a positive and significant effect, control variables that have a positive-significant effect are M2 and XM, Increased GDP, M2 and XM revenues can support the creation of new tax revenue objects, this will support the development process, especially in terms of financing. To increase the financing of the development process, the government continues to look for sources of tax objects, not only from sectors in GDP, but also from export-import potential, and all transactions that can increase the money supply and the economy. (Yossinomita,

Febby Nanda Utami, Johni Paul Karolus Pasaribu, 2022), the results show. Tax revenue, exports and imports together have a significant effect on economic growth, both in the long and short term. Where the export variable has a significant effect on economic growth in the long and short term.

## CONCLUSION

Income tax revenue (PPH) has a positive and significant effect on the long-term relationship to gross domestic product (GDP), and has a positive and significant effect on the short-term relationship to gross domestic product (GDP) in Indonesia throughout the period 1990-2022. Value added tax (VAT) has a positive and significant effect on the long-term relationship to gross domestic product (GDP), and has a positive and significant effect on the short-term relationship to gross domestic product (GDP) in Indonesia throughout the period 1990-2022. Excise revenue (PC) has a positive and significant effect on the long-term relationship to gross domestic product (GDP), and has a positive and significant effect on the short-term relationship to gross domestic product (GDP) in Indonesia throughout the period 1990-2022. Import duty revenue (PBE) has a positive and significant effect on the long-term relationship to gross domestic product (GDP), and has no effect on the short-term relationship to gross domestic product (GDP) in Indonesia throughout the period 1990-2022.

Income Tax (PPH) Revenue: Extend and maintain policies that promote effective PPH collection. Regularly evaluate PPH rates and administrative procedures to ensure fairness and efficiency in taxation. Provide appropriate tax incentives to encourage long-term investment and economic growth. Value Added Tax (VAT): Strengthen VAT policy to increase tax revenue and support long-term growth. Pay attention to the social impact of VAT rate increases, especially on vulnerable groups. Increase law enforcement against VAT collection violations to ensure better compliance. Excise Revenue (PC): Maintain and renew excise policies that are effective in reducing the negative impact of consumption of harmful substances such as alcohol and cigarettes. Use excise revenue to support health and education programs that can improve people's welfare. Import Duty Revenue (DMR): Re-evaluate import duty policy to understand the reasons behind its lack of influence on short-term linkages to GDP. Review the tariff structure and trade policy to ensure that PBE does not become a drag on economic growth in Indonesia.

## REFERENCES

- Adkisson, R. V., & Mohammed, M. (2014). Tax structure and state economic growth during the great recession. *Social Science Journal*, 51(1). <https://doi.org/10.1016/j.soscij.2013.10.009>
- Agus Widarjono. (2013). *Ekonometrika: Pengantar dan aplikasinya*, Ekonosia,. Jakarta.

- Andrew Kazora Okello,(2001), An Analysis of Excise Taxation in Kenya, Journal EAGER Publications can be downloaded from [www.eagerproject.com](http://www.eagerproject.com) or through USAID's website at [www.dec.org](http://www.dec.org)
- Barreix A, Benítez JC, Pecho M. (2017). Revisiting personal income tax in Latin America: Evolution and Impact. OECD Development Centre. Working Paper No. 338.
- Canavire-Bacarreza G, Martinez-Vazquez J, Vulovic V. (2013). Taxation and Economic Growth in Latin America. IDB Working Paper Series No. IDB-WP-431.
- Christos Papageorgiou, Panagiotis Farlekas, Zacharias Dermatis, Athanasios Anastasiou, Panagiotis Liargovas, (2021), Assessing the impact of excise duties on a state's revenues: the case of Greece. *International Journal public sector economics* 45(3) 387-412 (2021).
- Dobbins, L. dan M. Jacob. (2016). Do Corporate Tax Cuts Increase Investments? *Accounting and Business Research* 46(7): 731–759. <https://doi.org/10.1080/00014788.2016.1192985>.
- Edame, G. E., & Okoi, W. W. (2014). The Impact of Taxation on Investment and Economic Development in Nigeria. *Academic Journal of Interdisciplinary Studies*, 3(4), 209-218. <http://dx.doi.org/10.5901/ajis.2014.v3n4p209>
- Elshani A, Ahmeti S. (2017). The Effect of Progressive Tax on Economic Growth: Empirical Evidence from European OECD Countries. *International Journal of Economic Perspectives*. 11(4): 18-25.
- Erstida Ulvidienė, (2023) An Investigation of the Influence of Economic Growth on Taxes in Lithuania. *Ekonomika* ISSN 1392-1258 eISSN 2424-6166 2023, vol. 102(1), pp. 41–59 DOI: <https://doi.org/10.15388/Ekon.2023.102.1.3>.
- Estro Dariatno Sihaloho, (2020), Analisis pengaruh penerimaan pajak terhadap pertumbuhan ekonomi indonesia: pendekatan vektor autoregressive. *JEBI JOURNAL FORUM EKONOMI* ISSN Print: 1411-1713 ISSN Online: 2528-150X. <http://journal.feb.unmul.ac.id/index.php/FORUM EKONOMI>
- Focanti D, Hallerberg M, Scartascini C. (2013). Tax Reforms in Latin America in an Era of Democracy. IDB Working Paper Series No. 457.
- Halim, A., I.R. Bawono, & A. Dara. (2020). *Perpajakan: Konsep, Aplikasi, Contoh dan Studi Kasus, Edisi 3*. Penerbit Salemba Empat, Yogyakarta.
- Indri Arrafi Juliannisa, Raden Parianom, Andi Abrianto, (2023) Does GDP Affect Tax Revenue?, *Ecces*, Volume 10 Number 1 Ed. June 2023 : page:69-8, p-ISSN: 2407-6635 e-ISSN : 2580-5570.
- Isnanto, A. (2021). Faktor-Faktor yang Mempengaruhi Penerimaan . *Jurnal Ilmiah Universitas Batanghari Jambi*, 832-836.
- Jewel, J. S. (2022). Impact Of Value Added Tax On Gross Domestic Product Of Bangladesh. *Indian Journal of Finance and Banking*, 10(1), 41-44. <https://doi.org/10.46281/ijfb.v10i1.1753>.
- Kalaš, B., Mirović, V., & Andrašić, J. (2020). Cointegration analysis of indirect taxes and economic growth in the Republic of Serbia. *Anali Ekonomskog Fakulteta u Subotici*, 35(44), 3–10. <https://doi.org/10.5937/anebsub2044003k>

- Mardikwati, K. N. (2021). Analisis Penerimaan Ppn Dan Ppnbm Untuk Meningkatkan. Media Riset Akuntansi , 17-42.
- Mr. Liam P. Ebrill , Mr. Michael Keen , and Ms. Victoria J Perry,(2021), Understanding the Revenue Performance of VATs. ISBN: 9781589060265 Publication Date: 05 Nov 2001 Publisher: International Monetary Fund DOI: <https://doi.org/10.5089/9781589060265.071> Pages: 242.
- Nadhif Zulfa Agustina, (2021), Dampak Perubahan Tarif Pajak Penghasilan Badan Dan Pajak Pertambahan Nilai Di Indonesia. Ekuitas: Jurnal Ekonomi dan Keuangan, p-ISSN 2548 – 298X Akreditasi No. 158/E/KPT/2021, e-ISSN 2548 – 5024 DOI: 10.24034/j25485024.y2022.v6.i4.5359.
- Olufemi, A. T., Jayeola, O., Oladele, A. S., & Naimot, A. O. (2018). Tax Revenue and Economic Growth in Nigeria. Scholedge International Journal of Management & Development, 5(7), 72-85. <https://doi.org/10.19085/journal.sijmd050701>.
- Pujiwidodo, Hartanti Dwiymoko. (2018). Pengaruh Pajak Pertambahan Nilai Terhadap Penerimaan Pajak Manajemen Keuangan BSI Jakarta, A., & Angel Nikita Sianturi. Sikap, 3(1), 63–73.
- Saragih, A. H. (2018). Pengaruh Penerimaan Pajak Terhadap Pertumbuhan Ekonomi Di Indonesia. Jurnal SIKAP (Sistem Informasi, Keuangan, Auditing Dan Perpajakan), 3(1). <https://doi.org/10.32897/jsikap.v3i1.103>.
- Sinambela, Tongam, & Rahmawati, Suci. (2019). Pengaruh Inflasi, Nilai Tukar Rupiah dan Jumlah Pengusaha Kena Pajak Terhadap Penerimaan Pajak Pertambahan Nilai. Jurnal Ekonomi Bisnis, 5(1), 83–97.
- Vatavu, S., Lobont, O. R., Stefea, P., & Brindescu-Olariu,D. (2019). How taxes relate to potential welfare gain and appreciable economic growth. Sustainability (Switzerland), 11(15). <https://doi.org/10.3390/su11154094>
- Yossinomita, Febby Nanda Utami, Johni Paul Karolus Pasaribu, (2022), The Effect of Tax Revenues, Exports and Imports on Economic Growth: Analysis using Error Correction Model (ECM). Jurnal Manajemen (JUMANAGE) Fakultas Ilmu Manajemen Dan Bisnis Universitas Dinamika Bangsa, Vol. 1 No. 1 Januari 2022.