

Tax revenue and deficit budget in Indonesia

FIBRIA ANGGRAINI PUJI LESTARI

Borobudur university, Jakarta, Indonesia

Email: fibria981@gmail.com

ARTICLE INFO

ABSTRACT

***Corresponding Author:**

***FIBRIA ANGGRAINI PUJI LESTARI.**

Borobudur university, Jakarta, Indonesia.

Email: fibria981@gmail.com

The research paper was conducted to clarify the influence between tax revenue and budget deficit in Indonesia. A sample of her 30 provinces in Indonesia was used in this study. The data used were secondary data from 1991 to 2021 and were analyzed using the EViews 12 application. Based on the results of this study, the rupiah exchange rate and crude oil price variables have a positive and significant influence on tax revenue in both the long and short term, whereas the poverty variable has a negative effect on tax revenue in both the long term and the short term. And tax revenue has a negative influence and is key to the budget deficit.

Keywords: Tax Revenue, Rupiah Exchange Rate, Crude Oil Price, Poverty, Budget Deficit

INTRODUCTION

There are sources of government revenue from both domestic and international sources. Domestic sources of income, including tax and non-tax. Taxes are one of the main branches of government revenue and play a major role in the economic growth of a country in financing government spending.

Taxes play a role in the composition of the State Budget. With these tax revenues reaching 82.8% in 2022. the Directorate General of Taxes must make a real effort to increase

government revenues from the tax sector through support measures such as Tax Amnesty. A fiscal deficit may occur, from which the amount of tax revenue will decrease.

In this study, the authors confined the poverty problem, the number of enterprises, and the rupiah exchange rate to government tax revenues.

LITERATURE REVIE

Tax Revenue

Tax is a mandatory contribution to the state, owed by an individual or company, mandated by law without direct remuneration, and used to finance government expenditures for the welfare of its citizens[1]. The relationship between taxes and national budgets, that is, taxes, is one of the financial sources for determining the size of the national budget. Related assessments such as 'Impact of Income Tax Changes on Economic Growth' have concluded that tax revenue changes can affect budget deficits [2]. Furthermore, a study titled "Indonesian Fiscal Deficits" concluded that tax revenues and world oil prices simultaneously affect fiscal deficits [3]. "State Budget Deficit: Massachusetts" says that increasing tax revenues can avoid budget deficits [4].

Rupiah Exchange Rate

The exchange rate is the local currency amount that must be paid to receive one unit of foreign currency. According to Adiningsih et al. (2017:60) Leverage value is the price of Rupiah against other country's currency. An exchange rate is said to appreciate when it appreciates against that country's currency. Conversely, it should depreciate when the exchange rate weakens against other countries' currencies. Among other things, a study related to the Rupiah exchange rate, namely "Inflation Impact, and the Rupiah Exchange Rate on VAT Recipients" concluded that inflation and the Rupiah exchange rate have a significant impact on his VAT receipts. [5]. Further, "Exchange rate volatility and tax revenue: Evidence from Ghana" concludes the short- and long-term impact of exchange rates on tax returns [6]. Taxable Taxpayers on VAT Receipts (Case Study of DGT Regional Office East Java I)" shows that simultaneous and partially fluctuating inflation, rupiah exchange rate and the number of taxable entrepreneurs affect the value of VAT receipts. [7].

Poverty

Poverty is the lack of access to all kinds of options and opportunities to meet basic needs such as:

Broadly speaking, poverty is a limitation of individual families, communities and even nations that makes

life uncomfortable and threatens the administration of justice. In developing countries, poverty can hinder tax revenue growth. A poverty-related study, "Poverty in Regional Tax Revenue with Level of Public Confidence and Per Capita Income Reduction and Audit Opinion with Level of Public Confidence as an Intervention Variable for Regional Tax Revenue of Provincial Governments Across Indonesia," found that poverty rates have a significant impact on tax revenue in Indonesia. said to give Indonesia [8]. Furthermore, a study titled "Comparing the impact of transfers, taxes and income on poverty in five OECD[9]. Furthermore, a study titled "Analysis of the impact of macroeconomic variables on tax revenue in Indonesia" found that poverty level had a negative and insignificant influence on tax revenue [10].

Crude Oil Price

Indonesia's prevailing crude oil price is the average price of crude oil produced in Indonesia on the international market and is used to calculate the price of petroleum products. This decision is made on a monthly and semester basis. Crude oil prices are determined at the beginning of each month by the Minister of Energy and Natural Resources of the Republic of Indonesia, from calculations based on the average price of international publications for the current day and the previous month, and internationally published prices for the same month. Indexing of price-sensitive crude oil and its derivatives[11]. Related studies, such as Factors Affecting National Budget Tax Revenue, conclude that Indonesian oil prices have no impact on income tax [12]. Another study entitled "Oil Prices, Government Revenues, Export Values and Economic Growth": The Indonesian 'case' concluded that there is a positive relationship between oil prices and government tax and non-tax revenues [13]. A study titled "The Impact of Prices" discusses the influence of oil prices on tax revenues[14].

METHODS OF RESEARCH.

Data sources and study variables

The data in this study are secondary data obtained from the official website of the National Statistics Office. The data collected are the realization of tax revenue, rupiah exchange rate, poverty and crude oil prices in her 30 provinces of Indonesia for the period from 1991 to 2021. In this study, there were five variables, three free variables like rupiah exchange rate (X_1), poverty (X_2), crude oil price (X_3), and an intermediate variable, namely tax revenue. (Y) and the constraint variable is the budget deficit (Z).

Analysis method

The study used multiple regression analysis using ordinary least squares (OLS) to test the effect of tax revenue on the budget deficit. Analytical data are classical assumption tests for determining the distribution of data, consisting of normality tests, autocorrelation tests, multicollinearity tests, and heteroscedasticity tests, at the first level of difference passed the stationarity test.

The research system is as follows.

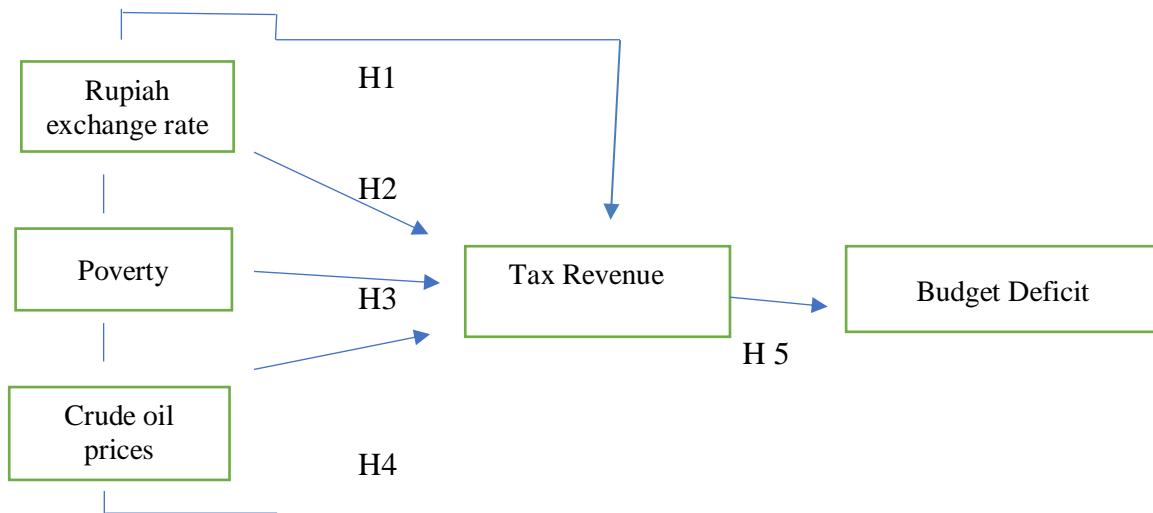


Figure 1. Research Framework Chart

To determine the effect of independent variables on the dependent variable used regression analysis.

The regression equation is:

$$Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + e \quad \dots\dots\dots (1)$$

$$Z = a + b \ln Y \quad \dots\dots\dots (2)$$

Description:

Y: Tax revenue

X₁: Rupiah exchange rate

X₂: Poverty

X₃: Crude oil prices

Z: Budget deficit

a and b are constants

Analysis and Consideration

The study was qualified by conducting a stationary test for initial variance and tests for classical

assumptions, multicollinearity, heteroscedasticity, and autocorrelation. A simultaneous integration test was also performed.

A. Stationery test

For stationary tests, the test variables were fit for the first level of difference.

Table 1. Test stationer ADF (*first difference level*)

Series	Prob	Lag	Max Lag	Obs
D (Budget _ deficit)	0.0002	0	7	31
D (Tax _ revenue)	0.0001	0	7	31
D (Rupiah _ exchange)	0.0002	0	7	31
D(Poverty)	0.0028	0	7	31
D (Crude _ oil _ price)	0.0000	0	7	31

Source: EViews 12 output (2023)

From the table above, all variables were stationary at the first level of difference, so a cointegration test

can be performed.

B. Cointegration Test

By conducting a cointegration test, it can be seen that there are long-term and short-term influences

between the independent variables on the dependent variable. In this study which was performed using the Johansen Cointegration test, the test result showed that:

Table 2. Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistics	Critical Value	Prob.**

Tax revenue and deficit budget in Indonesia

None *	0.763376	102.4258	47.85613	0.0000
At most 1 *	0.608570	62.06982	29.79707	0.0000
At most 2 *	0.540326	35.80728	15.49471	0.0000
At most 3 *	0.394435	14.04463	3.841465	0.0002
At most 4 *	0.443187	16.39474	3.841465	0.0001

Trace test indicates 5 cointegrating eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistics	Critical Value	Prob.**
None *	0.763376	40.35594	27.58434	0.0007
At most 1 *	0.608570	26.26255	21.13162	0.0087
At most 2 *	0.540326	21.76265	14.26460	0.0027
At most 3 *	0.394435	14.04463	3.841465	0.0002
At most 4*	0.443187	16.39474	3.841465	0.0001

Max-eigenvalue test indicates 5 cointegrating eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Output EViews 12 (2023)

The table above shows the results of the Johansen cointegration test performed to determine the presence of cointegration relationships. The test results showed that the Trace Statistics value was 102.4258, which is greater than the critical value of 47.85613 at the 5% significance level. The largest eigenvalue of 40.35594 is greater than the critical value of 27.58434 at the 5% significance level. This indicates that there is a cointegration or long-term relationship between the variables in the equation model.

C. Long Term Regression Testing (OLS)

In the long run, the use of free variables over bound variables. Below are the results of long-run estimates of the rupiah exchange rate variable, poverty, and oil price vs. tax revenue using the OLS test at the first level of difference.

Table 3. Result of Estimation of OLS Variable X to Y

Dependent Variable: Tax Revenue				
Method: Least Squares				
Sample: 1 31				
Included observations: 31				
Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.260.000	0.260578	8.673.028	0.0000
Ln _ Rupiah _ exchange	0.168500	0.078379	2.149.813	0.0407
Ln _ Poverty	-1.483.085	0.124904	-3.867.644	0.0006
Ln_ Crude_ oil _ price	0.273720	0.127931	2.139.583	0.0416

Source: Output EViews 12 (2023)

In the table above, we can see that over the long run the probability of the exchange rate variable is 0.0407, poverty is 0.0006 and oil price is 0.0416. So, the formula is:

$$Y = 2.260000 + 0.168500 X_1 - 1.483085 X_2 + 0.273720 X_3 + e$$

From this formula, it can be said that the rupiah exchange rate and crude oil price variables have a large positive impact on the tax revenue variable. On the other hand, poverty variables have a negative impact on tax revenue.

Additionally, here are the results of his OLS test of variable tax revenue against budget deficits:

Table 4. Estimation results for variables Y to Z

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.323.162	2.813.732	8.256.515	0.0000
Tax-Revenue	-2.508.679	0.551110	-4.552.046	0.0001

Source: Output EViews 12 (2023)

The table above shows that variable tax revenues have a significant negative impact on budget deficits. This is due to the analytical result of $0.001 < 0.001$ at a significance level of 0.05. So, the formula is:

$$Z = 23.23262 - 2.508679 (\text{tax revenue}) + e$$

D. Short-term regression testing of ECM Methods.

To determine the short-term impact of free variables on constrained variables and their rapid

Tax revenue and deficit budget in Indonesia

adjustment to long-term balance sheet earnings

Table 5. OLS variables X to Y estimation results

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	0.008482	0.042559	0.199301	0.8436
D (Ln _ Rupiah _ Exchange)	0.195065	0.085371	2.284.900	0.0311
D (Ln _ Poverty)	0.298238	0.114775	2.598.466	0.0155
D (Ln _ Crude Oil Price)	0.365531	0.115676	3.159.954	0.0041
ECT_1	0.822121	0.196175	4.190.755	0.0003

Source: Output EViews 12 (2023)

In the table above, we can see that the variables exchange rate, poverty and oil price affect tax revenue

in the short term. This is due to the importance of the exchange rate of $0.0311 < 0.05$, poverty rate $0.0155 < 0.05$ and oil price $0.0041 < 0.05$.

$155 < 0.05$ and oil price $0.0041 < 0.05$.

Table 6. Results of Estimation of OLS Variable Y to Z

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	0.169576	0.177893	0.953246	0.3489
D(Tax-revenue)	-0.263507	0.561686	-0.469136	0.0427
ECT_1	0.201809	0.110847	1.820.603	0.0298

Source: Output EViews 12 (2023)

The table above, the tax revenue variable has a significant value less than 0.0427 or 0.05. This means

that there is a short-term relationship between the tax revenue variable and the budget deficit.

E. Statistical test t

Used to test the effect of each independent variable on the dependent variable. If t counts $> t$ in the

table, we reject H_0 and say that the dependent variable influences the dependent variable. If t

counts $<$ then

the table accepts H_0 . This means that there is no real effect of the independent variable on the dependent

Tax revenue and deficit budget in Indonesia

variable. Here are the statistical t-test results:

Table 7. Partial test results (statistical test t) variables X to Y

Dependent Variable: Tax Revenue

Method: Least Squares

Sample: 1 31

Included observations: 31

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.260.000	0.260578	8.673.028	0.0000
Ln_ Rupiah _ Exchange	0.168500	0.078379	2.149.813	0.0407
Ln_ Poverty	-1.483.085	0.124904	-3.867.644	0.0006
Ln_ Crude _ oil	0.273720	0.127931	2.139.583	0.0416

Source: Output EViews 12 (2023)

In the table above, we can explain that:

1. Impact of rupiah exchange rate on tax revenue

Calculated using regression analysis, we find a t count of 2.149.813 and a table t value of 1,701. This means that the table t value is less than the calculated t with a probability value of 0.0407. This value is less than 0.05, meaning H0 was received. So that the Rupiah exchange rate has a large positive impact on tax revenue.

2. Impact of poverty on tax revenue.

Computed using regression analysis, we find a t count of -3.867.644 and a table t value of 1,701. This means that the table t value is less than the calculated t with a probability value of 0.0006. This value is less than 0.05, meaning H0 was received. So that poverty has a significant negative impact on tax revenue.

3. Impact of crude oil prices on tax revenue

Calculated using regression analysis, we find a t count of 2.139.583 and a table t value of 1,701. This means that the table t value is less than the calculated t with a probability value of 0.0416. This value is less than 0.05, meaning H0 was received. Thus, crude oil prices have a large positive impact on tax revenue.

Table 8. Results of Estimation of OLS Variable Y to Z

Tax revenue and deficit budget in Indonesia

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.323.162	2.813.732	8.256.515	0.0000
Pajak	-2.508.679	0.551110	-4.552.046	0.0001

Source: Output EViews 12 (2023)

The table above we can see that t is equal to -4.552. A table t value of 046, 1.69726 means in the calculated t value is less than the t table with probability value 0.001, less than 0.05, and H0 is accepted.

So that tax revenues have a significant negative impact on budget deficits.

F. Simultaneous Exam (Examination F)

Used to see if the independent variables together affect the dependent variable.

Table 8. F-test results

R-squared	0.829449	Average dependent variable	5.074.948
Adjusted R-squared	0.810499	S.D. dependent variable	0.567573
S.E. of regression	0.247074	Akaike information criterion	0.161658
Sum squared residue	1.648.233	Schwarz criterion	0.346689
Log likelihood	1.494.296	Hannan-Quinn criterion.	0.221974
F-stats	4.377.017	Durbin Watson stat	1.606.535
Probability(F-statistic)	0.000000		

Source: Output EViews 12 (2023)

The table above, the calculated F value for a = 5% of the 4.377.017 universe F table is 2.9603513,

with a probability value of 0.000000, below the significance level of 0.05, so H0 is rejected.

This means

that the variables rupiah exchange rate, poverty and oil prices, and tax revenue affect the budget deficit, so

we use a regression model to predict the dependent variables.

G. Decision Analysis (R-Squared)

Tax revenue and deficit budget in Indonesia

The coefficient of determination (Adjusted R-Square) is used to measure how far the model can go in

the study to account for the variation in the dependent variable.

Table 9. Judgment test result (R2)

R-squared	0.829449	Average dependent variable	5.074.948
Adjusted R-squared	0.810499	S.D. dependent variable	0.567573
S.E. of regression	0.247074	Akaike information criterion	0.161658
Sum squared resid	1.648.233	Schwarz criterion	0.346689
Log likelihood	1.494.296	Hannan-Quinn criterion.	0.221974
F-stats	4.377.017	Durbin Watson statistics	1.606.535
Probability(F-statistic)	0.000000		

Source: Output EViews 12 (2023)

In the above results, the R-adjusted R-squared (R2) value is 0.810499. This indicates the contribution of the independent variable's influence to the dependent variable is 81.04%. This means that the independent variables used in this study could explain 81.04% of the dependent variables. The remaining 18.96% were influenced by factors outside the regression model of this study.

DISCUSSION

Impact of Rupiah exchange rate on tax revenue

On the results of regression analysis, the impact of rupiah exchange rate on tax revenue is known to be positive and significant. This means that high rupiah exchange rate will affect tax revenue, especially the price of taxable goods or taxable service which requires capital goods from abroad. This affects public consumption and other tax revenues, namely his VAT. This is also evident from the regression test results, both in the long term and the short term, exchange rate fluctuations of the rupiah have a significant impact on tax revenue. Determining the exchange rate regime is therefore an important issue for a country's economy as it is a tool that can be used to promote economic growth and protect the country's economy from global economic turmoil. Consistent with the study titled "Inflation Impact and Rupiah Exchange Rate for VAT Recipients", it was concluded that inflation and Rupiah exchange rate have a significant impact on his VAT receipts [5].

Impact of poverty on tax revenue

Regression test results explain the significant negative impact of poverty variables on tax revenue. In other words, if the poverty rate falls, tax revenues will rise, and if the poverty rate rises, tax revenues will fall. This study is consistent with a study titled *Analysing the Effects of Macroeconomic Variables on Tax Revenues in Indonesia*, which found that poverty rates had only a small negative impact on tax revenues [10]. Therefore, poverty must be reduced. In addition to reducing the burden of spending, an important strategy to reduce poverty is to increase income from: relationship with. to increase tax revenue. Impact of crude oil prices on tax revenue. According to the results of regression analysis, it can be said that fluctuating crude oil prices have an impact on tax revenue. This means that tax revenues increase when oil prices rise in the international market, and conversely, tax revenues decrease when oil prices fall. Indonesian oil prices in the international market are high, including several factors such as the ongoing war in Ukraine, declining global oil supplies and the European Union's strategy to switch to renewable energy. the development of electric vehicles as a race to meet food and energy needs, but for Indonesia it is actually very good for the government revenue from the tax sector that comes from the export of crude oil. To increase oil exports, we need policies to regulate their numbers. The study, "Oil Prices, Government Revenues, Export Values, and Economic Growth: The Indonesian Case" concluded that there is a positive relationship between oil prices and government revenues from tax and non-tax [13].

Impact of Tax Revenue on Budget Deficits

Regression analysis shows that tax revenue has a large negative impact on the fiscal deficit. In another words, if tax revenue increases, the fiscal deficit will decrease, and conversely, if tax revenue decreases, the fiscal deficit will increase.

This study is consistent with a study titled 'Impact of Income Tax Changes on Economic Growth', which concluded that changes in tax revenues can affect budget deficits [2]. Furthermore, a study titled "Indonesian Fiscal Deficits" concluded that tax revenues and world oil prices simultaneously affect fiscal deficits[3]. "State Budget Deficit: Massachusetts" [4] state that higher tax revenues can avoid budget deficits.

CONCLUSION

The data analysis results explain that Indonesian crude oil rupiah exchange rate has a large positive impact on tax revenue, while poverty has a negative impact on tax revenue. Similarly, tax revenues have a significant negative impact on budget deficits.

REFERENCES

- [1] Direktorat Jendral Pajak, *Ketentuan Umum dan Tata Cara Perpajakan*. 2009.
- [2] G. G. William and A. S. Andres, “Effects of Income Tax Changes on Economic Growth,” *Econ. Stud. Brookings*, 2016, [Online]. Available: https://www.brookings.edu/wp-content/uploads/2016/06/09_effects_income_tax_changes_economic_growth_gale_samwick.pdf.
- [3] A. O. Sandra, Azwandi, and A. Yulianita, “Indonesia Budget Deficit,” *Sriwij. Int. J. Din. Econ. Business. Univ. Palembang*, vol. 2, no. 2, pp. 139–150, 2018, [Online]. Available: <https://media.neliti.com/media/publications/538819-indonesia-budget-deficit-99b70ea0.pdf>.
- [4] A. W. Bruce and D. Snow, “Budget Deficit in the State:Massachusetts,” *Public Budg. Financ.*, vol. 30, no. 1, 2010, doi: DOI:10.1111/j.1540-5850.2010.00950.x.
- [5] Y. Sapridawati, N. Indrawati, Zirman, and A. Sofyan, “Pengaruh Inflasi,dan Nilai Tukar Rupiah Terhadap Penerimaa Pajak Pertambahan Nilai,” *J. Tax.*, vol. 2, no. 1, 2021, [Online]. Available: <https://ejournal.uin-suska.ac.id/index.php/jot/article/view/14247%0A%0A>.
- [6] I. O. Kwesi, C. O. Kwasi, and M. A. Kojo, “Exchange rate volatility and tax Revenue: Evidence from Ghana,” *Gen. Appl. Econ. Artic. Econ. Financ.*, vol. 6, 2018, [Online]. Available: <https://www.tandfonline.com/doi/pdf/10.1080/23322039.2018.1537822%0A%0A>.
- [7] A. R. Herna, K. Hidayat, and B. Kaniskha, “Pengaruh Inflasi, Nilai Tukar Rupiah dan Jumlah Pengusaha Kena Pajak Terhadap Penerimaan Pajak Pertambahan Nilai (Studi Kasus pada Kantor Wilayah Djrp Jawa Timur I,” *J. Mhs. Perpajakan, Univ. bRawijaya*, 2016, [Online]. Available: <https://www.neliti.com/id/publications/193884/pengaruh-inflasi-nilai-tukar-rupiah-dan-jumlah-pengusaha-kena-pajak-terhadap-pen>.
- [8] M. Alwi, M. Su’un, and Amiruddin, “Pengaruh Tingkat Kemiskinan dan Pendapatan Perkapita Terhadap Penerimaan Pajak Daerah serta Opini Audit dengan Tingkat Kepercayaan masyarakat sebagai Variabel Intervening terhadap Penerimaan Pajak Daerah Pemerintah Propinsi se-Indonesia.,” *Econ. J. Ekon. dan Bisnis*, vol. 4, no. 1, 2021, doi: <https://doi.org/10.31850/economos.v4i1.780>.
- [9] S. Bibi and J. Yves Duclas, “A Comparison Of The Poverty Impact Of Transfers, Taxes and Income Across Five OECD Countries,” *Bull. Econ. Res.*, vol. 62, no. 4, pp. 387–406, 2010, doi: <https://doi.org/10.1111/j.1467-8586.2009.00339.x>.
- [10] I. S. Nandarima, “Analisis Pengaruh Variabel Makroekonomi Terhadap Penerimaan

- Pajak di Indonesia,” *Univ. Hasanudin*, [Online]. Available: [uri:%09http://repository.unhas.ac.id/id/eprint/13876%0D%0A%0A](http://repository.unhas.ac.id/id/eprint/13876%0D%0A%0A).
- [11] Menteri Energi dan Sumber Daya Mineral, *Peraturan Menteri Energi dan Sumber daya Mineral RI No.23 tahun 2012*. 2012.
- [12] A. Isnanto, Suharno, and Istiqomah, “Faktor-faktor Yang Mempengaruhi Penerimaan Pajak Penghasilan dalam APBN,” *J. Ilm. Univ. Batanghari Jambi*, vol. 21, no. 2, 2021, [Online]. Available: <https://media.neliti.com/media/publications/445856-none-4ccd995c.pdf>.
- [13] Y. Abimanyu, “Oil Price, Government Revenue, Export Value ,Economic Growth : Indonesia “s Case,” *Kaji. Ekon. dan Keuang.*, vol. 20, no. 3, 2016, doi: <https://doi.org/10.31685/kek.v20i3.194>.
- [14] A. Adamu, “The Impact of Global Fall in Oil Prices on the Nigerian Cruide Oil Revenue and Its Prices,” 2015, [Online]. Available: https://globalbizresearch.org/Dubai_Conference2015_May_2/conference/psd/D508.pdf.