

## LONG-TERM EFFECT OF TAXATION AS A FISCAL POLICY INSTRUMENT FOR NATIONAL ECONOMIC RECOVERY

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### ABSTRACT

*Taxation is a fiscal policy instrument that has a nearly 70% influence on the state budget and has a positive effect on the country's economy. The foundation for implementing state tax collection procedures is tax reform. Because of the pandemic situation, the government has been forced to implement tax reform (Law No. 7 of 2021) in order to prepare for the slowing national economy. The primary goal of this research is to determine how GDP responds to changes in tax instruments. GDP, government spending, the ratio of tax revenues, PPn, PPh, and government spending were used as samples from 1990 to 2020. The VAR approach was used because it can show how each variable responds to shocks from other variables. The findings indicate that the causality test occurs between the VAT variable and the tax-to-GDP ratio variable. The IRF output represents the overall GDP's positive response to shocks in each variable. Suggestions for increasing tax revenue, the government should optimize PPn and PPh as policy instruments to improve the economy in the face of the Covid-19 Pandemic.*

*Keywords: Covid-19, tax ratio, GDP, Fiscal, Indonesia*

### ABSTRAK

Perpajakan merupakan instrumen kebijakan fiskal yang pengaruhnya hampir 70% terhadap APBN dan berpengaruh positif terhadap perekonomian negara. Landasan pelaksanaan prosedur pemungutan pajak negara adalah reformasi perpajakan. Karena situasi pandemi, pemerintah terpaksa melakukan reformasi perpajakan (UU No. 7 Tahun 2021) dalam rangka mempersiapkan ekonomi nasional yang melambat. Tujuan utama dari penelitian ini adalah untuk mengetahui bagaimana PDB merespon perubahan instrumen pajak. PDB, pengeluaran pemerintah, rasio penerimaan pajak, PPn, PPh, dan pengeluaran pemerintah digunakan sebagai sampel dari tahun 1990 hingga 2020. Pendekatan VAR digunakan karena dapat menunjukkan bagaimana masing-masing variabel merespon guncangan dari variabel lain. Temuan menunjukkan bahwa uji kausalitas terjadi antara variabel PPn dan variabel rasio pajak terhadap PDB. Keluaran IRF mewakili respons positif keseluruhan PDB terhadap guncangan di setiap variabel. Saran untuk peningkatan penerimaan pajak, sebaiknya pemerintah mengoptimalkan PPn dan PPh sebagai instrumen kebijakan untuk meningkatkan perekonomian dalam menghadapi Pandemi Covid-19.

*Kata kunci: Covid-19, rasio pajak, PDB, Fiskal, Indonesia*

### Introduction

The consequences of this spread affect the economy in a variety of ways. The economic recession poses a risk to countries affected by COVID-19, which has impacted the economic situation. This is due to regional restrictions (lockdowns) imposed in each country to prevent the virus from spreading (Junaedi & Salistia, 2020). The International Monetary Fund (IMF) predicts that the global economy will contract by 3%. (Puspasari, 2020). Economic growth slowed in response to the increase in COVID-19 cases, particularly in export-import commodity prices, which mirrored the decline in global demand (Murdo & Affan, 2020). The presence of COVID-19 in Indonesia, combined with the improving conditions of the global

economic recovery, will undoubtedly have an impact on the Indonesian economy. In July 2021, Bank Indonesia forecasted 3.5–4.3 percent year-on-year economic growth in 2021. (Lativa, 2021). This represents a significant increase over the situation in 2020, when growth was slow and negative. Indonesia will have a fiscal deficit of up to 6.14 percent of GDP in 2020 and a decrease of 4.65 percent of GDP in 2021, supported by improved state revenue performance (Junaedi & Salistia, 2020).

Tax is a fiscal policy instrument that has an influence on almost 70% of the state budget, so the Directorate General of Taxes needs to make real efforts to achieve the target of increasing state revenue from the tax sector (Desideria & Ngadiman, 2019). Tax reform in Indonesia began with the issuance of Law Number 6 of 1983, dated December 31, 1983, concerning general provisions and tax procedures (Saragih, 2018). The performance of state revenues in the context of the National Economic Recovery (PEN) has prompted the government to issue Law No. 7 of 2021 concerning Harmonization of Tax Regulations (HPP). Several tax instruments, namely income tax (PPH) and value-added tax (PPn), have a positive and significant impact on government revenues and Indonesia's economic growth (Sihaloho, 2020a). As supported by Saragih (2018), taxes have a positive effect on improving the country's economy. Under current conditions, one of the state revenues in the context of economic recovery comes from taxes; therefore, this research examines how the shock effect of tax instruments (*PPH and PPn*) affects tax revenues and Indonesia's economic growth.

## Literature Review

Tax is a legal contribution made by individuals or entities who do not receive direct compensation and is used by the state for the benefit of society. There are 5 types of taxes that are used as a reference in carrying out collection: income tax, individual tax, corporate tax, wealth tax, and foreign tax (Gruber, 2015). Taxes have a very important function in the ongoing development of a country because taxes are a source of state revenue that is used to pay for all state expenditures, one of which is government expenditure financing. Taxes have several functions in a country, namely budget, regulation, distribution, and stabilization (Desideria & Ngadiman, 2019). Statistically, there is a positive effect between tax revenues and regional revenues (Mononimbar et al., 2017; Saragih, 2018), economic growth (Sihaloho, 2020a), and government spending (Sihaloho, 2020b). In addition, there is a negative relationship between taxes and economic growth because taxes can reduce income and reduce consumption (Bahari & SBM, 2019). To test tax shocks on economic growth, you can use the Vector Autoregression (VAR) method.

The Vector Autoregression (VAR) analysis method is used to correct imbalances in long-term and short-term relationships derived from time series data (Saputra & Sukmawati, 2021). The VAR model with a simultaneous equation model can produce recommendation results based on the model's output in response to an economic shock, but it does so through a theoretical model and can see long-term responses based on historical data (Gujarati & Porter, 2009). The VAR model is intended for stationary variables with no trend. The stochastic trend in the data indicates that the time series data has both long-run and short-run components. Research on stochastic trends in economic variables continues to grow, so that in 1981 (Sulistiana et al., 2017), where Granger developed the concept of cointegration.

This model considers the cointegration relationship between the variables used; if cointegration occurs, the VAR model can be used to perform a first difference analysis (Faizin, 2021). For modeling data using VECM analysis, there are several procedures available: (1) Unit Root Test, (2) cointegration test, (3) model estimation, (4) causality test, and (5) structural

forecasting (Mahadevan & Asafu-Adjaye, 2007; Sinay, 2014). This test is used to determine the influence of variables in a time series.

### Material and Methode

This study is included in the quantitative analysis and seeks to determine the long-term and short-term effects of the tourism industry on economic growth. Gross Domestic Product (GDP), Income Tax Ratio (PPH), Value Added Tax (VAT) Ratio, and Government Expenditures are the variables used in this study. The research sample makes use of time-series data from 1990 to 2020. Data sources include the Central Statistics Agency (BPS, 2021), the official website of Bank Indonesia (BI), and the Ministry of Finance's official website.

The VAR analysis method was used in research to estimate models. The testing of the causal relationship between economic growth (GDP) and tax revenues is divided into three stages according to established procedures. First, the order of integration in GDP, VAT ratio, PPH ratio, and Government Expenditures is tested. In addition, the panel cointegration test is used to test the long-term relationship between variables. Finally, a causality test is employed to assess short-term cointegration as well as the direction of causality between variables. This study's equation model is founded on Equation 1-5 (Gujarati & Porter, 2009):

$$PDB_t = \alpha_1 + \sum_{j=1}^k \beta_{1j} PDB_{t-j} + \sum_{j=1}^k \delta_{1j} PPn_{t-j} + \sum_{j=1}^k \gamma_{1j} PPh_{t-j} + \sum_{j=1}^k \sigma_{1j} Gov_{t-j} + \sum_{j=1}^k \varphi_{1j} Tax_{t-j} + \varepsilon_{1t} \quad (1)$$

$$PPn_t = \alpha_2 + \sum_{j=1}^k \beta_{2j} PDB_{t-j} + \sum_{j=1}^k \delta_{2j} PPn_{t-j} + \sum_{j=1}^k \gamma_{2j} PPh_{t-j} + \sum_{j=1}^k \sigma_{2j} Gov_{t-j} + \sum_{j=1}^k \varphi_{2j} Tax_{t-j} + \varepsilon_{2t} \quad (2)$$

$$PPh_t = \alpha_3 + \sum_{j=1}^k \beta_{3j} PDB_{t-j} + \sum_{j=1}^k \delta_{3j} PPn_{t-j} + \sum_{j=1}^k \gamma_{3j} PPh_{t-j} + \sum_{j=1}^k \sigma_{3j} Gov_{t-j} + \sum_{j=1}^k \varphi_{3j} Tax_{t-j} + \varepsilon_{3t} \quad (3)$$

$$Gov_t = \alpha_4 + \sum_{j=1}^k \beta_{4j} PDB_{t-j} + \sum_{j=1}^k \delta_{4j} PPn_{t-j} + \sum_{j=1}^k \gamma_{4j} PPh_{t-j} + \sum_{j=1}^k \sigma_{4j} Gov_{t-j} + \sum_{j=1}^k \varphi_{4j} Tax_{t-j} + \varepsilon_{4t} \quad (4)$$

$$Tax_t = \alpha_5 + \sum_{j=1}^k \beta_{5j} PDB_{t-j} + \sum_{j=1}^k \delta_{5j} PPn_{t-j} + \sum_{j=1}^k \gamma_{5j} PPh_{t-j} + \sum_{j=1}^k \sigma_{5j} Gov_{t-j} + \sum_{j=1}^k \varphi_{5j} Tax_{t-j} + \varepsilon_{5t} \quad (5)$$

The GDP variable represents economic growth (Real GDP in billions of Rupiah), VAT is the percentage of PPn to GDP, PPh is the percentage of PPh to GDP, Gov is government spending (in billions of Rupiah), and Tax is the realization of total tax revenue ( billion rupiah). Data stationarity is required during VAR testing. Granger Causality statistical test results were invalid due to the test's non-stationary data (Pradhan & Ghosh, 2021). Stationary testing on VAR starts with a unit root test. Spurious regression is caused by variables that are not stationary or have unit roots (Gujarati & Porter, 2009). Table 1 displays the unit root test estimation results.

**Table 1. Unit Root Test**

Variable	Unit Root ( <i>intercept</i> )		
	Level	First difference	Second difference
GDP	-1.275286 (0.6272)	-1.689671 (0.4257)	-3.439891 (0.0179)
Gov	3.795435 (1.0000)	-3.344029 (0.0219)	-8.671798 (0.0000)
PPn	-1.681198 (0.4302)	-5.418013 (0.0001)	-10.10680 (0.0000)
PPh	-3.031971 (0.0432)	-6.043221 (0.0000)	-7.663687 (0.0000)
Tax	-0.353731 (0.9046)	-8.710548 (0.0000)	-4.687320 (0.0012)

Table 1 provides an alternative solution for variable data that is non-stationary at the level stage. When the tested variable is non-stationary at the level stage, an alternative solution is to take the first or second difference by comparing the data to the previous period (Palupy & Basuki, 2019). Table 2 shows how the stability test is used to determine whether the VAR estimation results are acceptable.

**Tabel 2. VAR Stability Test**

Root	Modulus
-0.040691 - 0.918977i	0.919877
-0.040691 + 0.918977i	0.919877
-0.775004 - 0.294262i	0.828988
-0.775004 + 0.294262i	0.828988
-0.147679 - 0.603010i	0.620830
-0.147679 + 0.603010i	0.620830
-0.526745 - 0.297707i	0.605053
-0.526745 + 0.297707i	0.605053
0.433258	0.433258
0.005103	0.005103

No root lies outside the unit circle.  
 VAR satisfies the stability condition.

The output results show that there are no Root and Modulus values that are more than 1, meaning that the VAR estimation is considered stable. The VAR model is said to be stable if all the roots have a modulus smaller than 1 (Gujarati & Porter, 2009). The cointegration test is intended to reveal the existence of a long-term equilibrium relationship between variables. The lack of cointegration indicates that the variable does not have a long-term equilibrium relationship. The estimation model for cointegrity testing can be seen in equations 6 and 7.

$$Y_{trace} = -T \sum_{i=r+1}^n \log(1 - \gamma_i) \tag{6}$$

$$Y_{max} = -T \log(1 - \gamma_{r+i}) \tag{7}$$

Cointegration testing is carried out using the Johansen test through testing trace statistics and the maximum eigenvalue statistics. The measurement is based on a comparison between the trace statistical value that is greater than the critical limit at the 5% confidence level and has a value greater than the eigenvalue. Table 3 shows the critical limit between eigenvalue and trace statistics.

**Table 3. Cointegrity Test**

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.818479	108.2727	69.81889	0.0000
At most 1 *	0.700767	63.90677	47.85613	0.0008
At most 2 *	0.537179	32.53696	29.79707	0.0236
At most 3	0.364386	12.50619	15.49471	0.1342
At most 4	0.027460	0.723946	3.841466	0.3949

Trace test indicates 3 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 No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.818479	44.36591	33.87687	0.0020
At most 1 *	0.700767	31.36981	27.58434	0.0155
At most 2	0.537179	20.03076	21.13162	0.0707
At most 3	0.364386	11.78225	14.26460	0.1191
At most 4	0.027460	0.723946	3.841466	0.3949

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

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

Equations 6 and 7 show that  $\gamma_{r+1}, \dots, \gamma_n$  is the smallest value (n-r) estimated by eigenvalue statistics, and hypothesis testing is performed on the cointegration factor r+1. According to the results of Johansen's test, the two estimated equations have a trace statistical value and an eigenvalue greater than the critical value. The table contains at least two significant levels that support the VAR stability test. Table 3 shows that the VAR model employed has a long-term relationship.

## Result and Discussion

When the time series data used is stationary, VAR testing is performed. Because stationary data has a high level of cointegrity, the results of the variable cointegrity test will be affected. Furthermore, testing stationary data serves as the foundation for conducting causality tests, ensuring that the model used is not clumsy (Gujarati & Porter, 2009). Table 1 shows the stationary test results, which show that the variables GOV, TAX, GDP, PPn, and PPh are stationary at the second difference. The Johansen test is used to determine the cointegration relationship after the model has been integrated (Arvin et al., 2021). The results of the cointegration tests (ltra and lmax) show that the time series variables of the five variables are statistically cointegrated (Table 2), and thus a long-term equilibrium relationship between the two variables may exist.

**Table 4. Granger Causality**

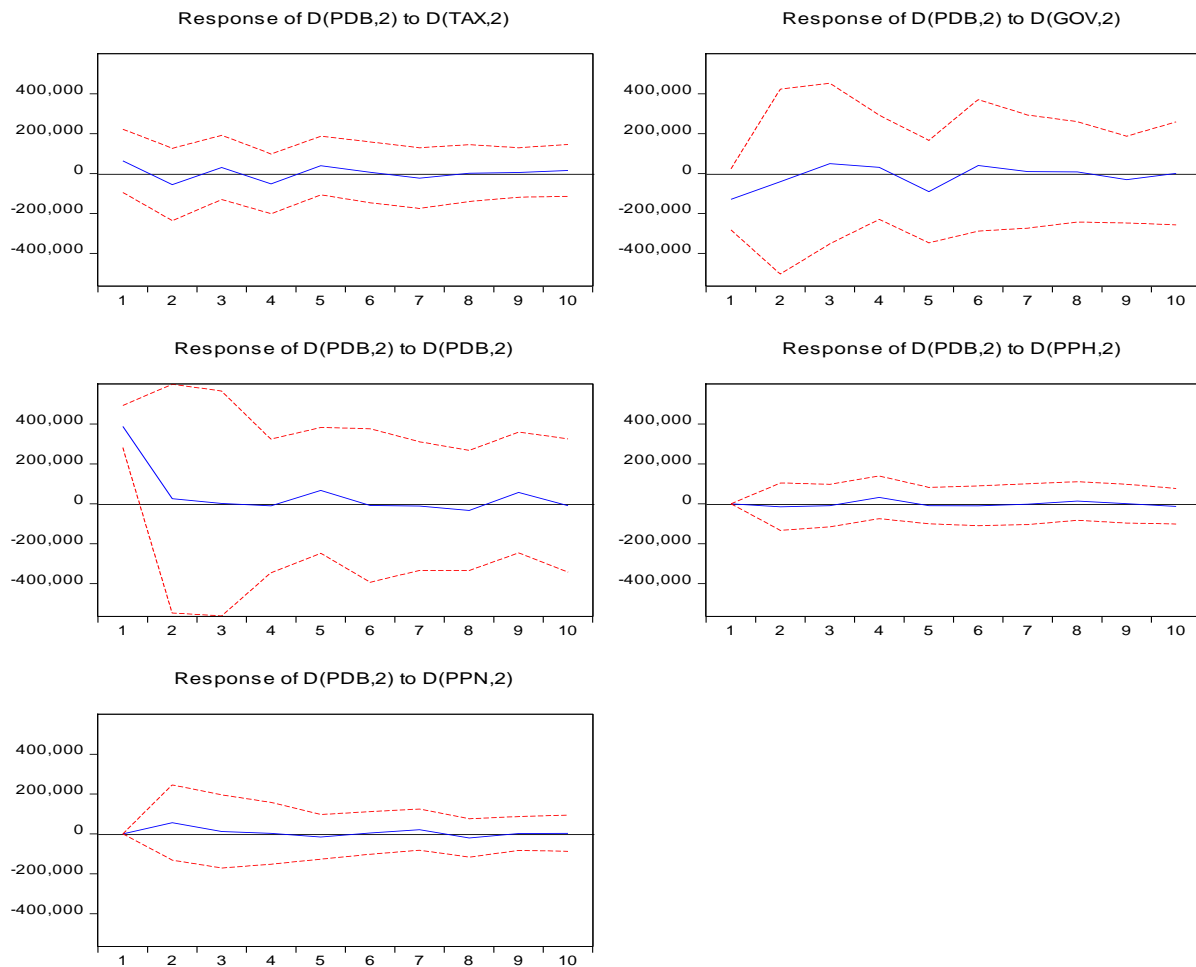
Null Hypothesis:	Obs	F-Statistic	Prob.
D(GDP,2) does not Granger Cause D(GOV,2)	27	0.47875	0.6259
D(GOV,2) does not Granger Cause D(GDP,2)		0.39943	0.6755
D(PPH,2) does not Granger Cause D(GOV,2)	27	1.03984	0.3702
D(GOV,2) does not Granger Cause D(PPH,2)		0.05513	0.9465
D(PPN,2) does not Granger Cause D(GOV,2)	27	0.03621	0.9645
D(GOV,2) does not Granger Cause D(PPN,2)		0.45682	0.6392
D(TAX,2) does not Granger Cause D(GOV,2)	27	1.35543	0.2785
D(GOV,2) does not Granger Cause D(TAX,2)		1.92719	0.1693
D(PPH,2) does not Granger Cause D(GDP,2)	27	0.28944	0.7515
D(GDP,2) does not Granger Cause D(PPH,2)		1.01431	0.3790

D(PPN,2) does not Granger Cause D(GDP,2)	27	0.57721	0.5697
D(GDP,2) does not Granger Cause D(PPN,2)		0.59608	0.5596
D(TAX,2) does not Granger Cause D(GDP,2)	27	0.30256	0.7419
D(GDP,2) does not Granger Cause D(TAX,2)		1.01538	0.3786
D(PPN,2) does not Granger Cause D(PPH,2)	27	0.00032	0.9997
D(PPH,2) does not Granger Cause D(PPN,2)		0.09134	0.9131
D(TAX,2) does not Granger Cause D(PPH,2)	27	1.94394	0.1670
D(PPH,2) does not Granger Cause D(TAX,2)		4.90591	0.0173
D(TAX,2) does not Granger Cause D(PPN,2)	27	0.50770	0.6088
D(PPN,2) does not Granger Cause D(TAX,2)		0.72670	0.4947

Taxation is a fiscal policy instrument that all Indonesian citizens must implement. According to the causality analysis model in Table 4, there is no reciprocal relationship between tax revenue and economic growth in general. Taxes have an indirect effect on economic growth because they affect people's consumption patterns and are used to pay for budget deficits (Gruber, 2015). The income tax (PPn) ratio influences the tax revenue to GDP ratio. Income Tax (PPn) is a positive-value tax collection instrument used to increase tax revenue (Sihaloho, 2020a). It is also worth noting that taxes are linked to inflationary conditions that occur from time to time. Inflationary conditions reduced the value of money held by the public, resulting in a decrease in the value of government revenue from taxes for government spending (inflation tax) (Hayman, 2010). An Impulse Response Function (IRF) test will be conducted in the future to see how economic growth responds to shocks caused by tax revenues and government spending.

**Figure 1. Impuls Response Function (IRF)**

Response to Cholesky One S.D. (d.f. adjusted) Innovations  $\pm 2$  S.E.



Because of the shocks/errors that occur in each variable, IRF is an important VAR output to use in viewing the response and/or impact of each variable (Sihaloho, 2020a). Figure 1 depicts the overall results of the IRF test. The GDP variable responds differently to the shocks of each variable. The shock to the variable ratio of tax revenues (TAX) boosts GDP, and the response lasts until the tenth period. As can be seen in the graph, when the fourth period increased, so did the GDP response. This is similar to the variable income tax and value added instruments, where when the fourth period increases, GDP responds positively to these conditions.

Overall, shocks caused by PPn, PPh, tax ratios, and government spending variables have a positive response effect on GDP. Despite the fact that tax instruments have an indirect effect on economic growth, taxes are an important component of financing state expenditures. National spending is divided into two categories: public spending and government spending. With an increase in government revenue, the government will have more funds for government spending, which will encourage an increase in national spending.

## Conclusion

The government's efforts to collect taxes to fund government spending have no correlation with national income (GDP). The causality test results show that there is no causal relationship between PPn, PPh, government spending, and the tax revenue ratio and GDP. The

IRF test results show that GDP responds positively to each shock in each variable. Suggestions for the government: In order to increase tax revenue, the government should optimize PPN and PPh as tax collection policy instruments used to fund national expenditure. Furthermore, in order to carry out justice in tax collection procedures, it is necessary to identify the basis for imposing taxes; this also applies to reducing people's tax evasion because there is no justice in tax collection procedures. Suggestions for next research, preferably using spatial effects to test the effects of taxes on GDP growth in the context of public policy financing..

## Reference

- Arvin, M. B., Pradhan, R. P., & Nair, M. S. (2021). Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy*, 70, 468–489. <https://doi.org/10.1016/j.eap.2021.03.011>
- Bahari, F., & SBM, N. (2019). Analisis Instrumen Kebijakan Fiskal Terhadap Pertumbuhan Ekonomi Di 35 Kabupaten / Kota Provinsi Jawa Tengah Tahun 2013 - 2017. *Jurnal Litbang Provinsi Jawa Tengah*, 17(1), 1–8. <https://doi.org/10.36762/litbangjateng.v17i1.759>
- BPS. (2021). Statistik Indonesia 2021. In *Badan Pusat Statistik*. [www.bps.go.id](http://www.bps.go.id)
- Desideria, E., & Ngadiman. (2019). Faktor-Faktor Yang Mempengaruhi Penerimaan Pajak Dari Wajib Pajak Badan Tahun 2016-2017. *Jurnal Multiparadigma Akuntansi*, 1(2), 355–363. <https://doi.org/10.24912/jpa.v1i2.5003>
- Faizin, M. (2021). Penerapan Vector Error Correction Model pada Hubungan Kurs, Inflasi dan Suku Bunga. *E-Journal Ekonomi Bisnis Dan Akuntansi*, 8(1), 33. <https://doi.org/10.19184/ejeba.v8i1.18810>
- Gruber, J. (2015). Public Finance and Public Policy. In *Worth Publishers*. Worth Publishers.
- Gujarati, D. N., & Porter, D. C. (2009). Basic Econometrics. In *McGraw-Hill* (5th ed.). Douglas Reiner.
- Hayman, D. N. (2010). *Public Finance: A Contemporary Application of Theory to Policy* (10th ed.).
- Junaedi, D., & Salistia, F. (2020). Dampak Pandemi Covid-19 Terhadap Pertumbuhan Ekonomi Negara-Negara Terdampak. <https://jurnal.bppk.kemenkeu.go.id/snkn/article/view/600>
- Lativa, S. (2021). Analisis Kebijakan Fiskal Indonesia Pada Masa Pandemi COVID-19 dalam Meningkatkan Perekonomian. *Jurnal Ekonomi*, 2021(3), 15.
- Mahadevan, R., & Asafu-Adjaye, J. (2007). Energy consumption, economic growth and prices: A reassessment using panel VECM for developed and developing countries. *Energy Policy*, 35(4), 2481–2490. <https://doi.org/10.1016/j.enpol.2006.08.019>
- Mononimbar, R. W., Walewangko, E. N., & Sumual, J. (2017). Pengaruh Pajak Daerah Dan Retribusi Daerah Terhadap Pertumbuhan Ekonomi Melalui Belanja Daerah Sebagai Variabel Intervening Di Kabupaten Minahasa Selatan (2005-2014). *Jurnal Berkala Ilmiah Efisiensi*, 17(02), 48–59.
- Murdo, I. T., & Affan, J. (2020). Dampak Covid-19 Terhadap Perekonomian Indonesia Dari Sisi Pendapatan Nasional Pendekatan Pengeluaran. *Kajian Ekonomi Dan Bisnis*, 15(2), 111–134. <https://doi.org/10.51277/keb.v15i2.73>



- Palupy, H. E., & Basuki, M. U. (2019). Analisis Pengaruh Investasi Dan Budget Deficit Terhadap Pertumbuhan Di Indonesia. *Diponegoro Journal of Economics*, 1(1), 67. <https://ejournal2.undip.ac.id/index.php/dje>
- Pradhan, B. K., & Ghosh, J. (2021). COVID-19 and the Paris Agreement target: A CGE analysis of alternative economic recovery scenarios for India. *Energy Economics*, 103, 105539. <https://doi.org/10.1016/j.eneco.2021.105539>
- Puspasari, R. (2020). *Pemerintah Waspada Dampak Pandemi Covid-19 Terhadap Ekonomi Indonesia*. Kementerian Keuangan. <https://www.kemenkeu.go.id/publikasi/siaran-pers/siaran-pers-pemerintah-waspada-dampak-pandemi-covid-19-terhadap-ekonomi-indonesia/>
- Saputra, D. D., & Sukmawati, A. (2021). Pendekatan Analisis Vector Error Corretion Model (VECM) dalam Hubungan Pertumbuhan Ekonomi dan Sektor Pariwisata. *Seminar Nasional Official Statistics*, 2021(1), 120–129. <https://doi.org/10.34123/semnasoffstat.v2021i1.787>
- Saragih, A. H. (2018). Pengaruh Penerimaan Pajak Terhadap Pertumbuhan Ekonomi Di Indonesia. *Jurnal SIKAP (Sistem Informasi, Keuangan, Auditing Dan Perpajakan)*, 3(1), 17. <https://doi.org/10.32897/jsikap.v3i1.103>
- Sihaloho, E. D. (2020a). Analisis pengaruh penerimaan pajak terhadap pertumbuhan ekonomi indonesia : pendekatan vektor autoregressive Analisis pengaruh penerimaan pajak terhadap pertumbuhan ekonomi indonesia : pendekatan vektor autoregressive. *Forum Ekonomi*, 22(2), 202–209.
- Sihaloho, E. D. (2020b). Dampak Covid-19 Terhadap Perekonomian Indonesia Dampak Covid-19 Terhadap Perekonomian Indonesia. *Jurnal Ilmiah Mahasiswa Ekonomi Syariah*, 1(1), 7–12. <https://doi.org/10.13140/RG.2.2.13651.94241/1>
- Sinay, L. J. (2014). Pendekatan Vector Error Correction Model untuk Analisis Hubungan Inflasi, Bi Rate dan Kurs Dolar Amerika Serikat. *BAREKENG: Jurnal Ilmu Matematika Dan Terapan*, 8(2), 9–18. <https://doi.org/10.30598/barekengvol8iss2pp9-18>
- Sulistiana, I., Hidayati, & Sumar. (2017). Model Vector Auto Regression (Var) and Vector Error Correction Model (Vecm) Approach for Inflation Relations Analysis, Gross Regional Domestic Product (Gdp), World Tin Price, Bi Rate and Rupiah Exchange Rate. *Integrated Journal of Business and Economics*, 1(2), 17–32. <https://doi.org/10.5281/zenodo.1147673>