

EFFECT OF VAT C-EFFICIENCY RATIO, VAT BUOYANCY, AND VAT ELASTICITY ON VALUE ADDED TAX (VAT) REVENUE RATIO IN INDONESIA*

P-ISSN: 2829-579X

Journal of Tax Law and Policy

E-ISSN: 2829-7636

pp. 107-113

Bonarsius Sipayung¹, Muhammad Zilal Hamzah², Yon Arsal³

¹Doctoral Economics of Public Policy Concentration, Trisakti University, Jakarta, Indonesia. Email: sipayungbonarsius.author@gmail.com

²Doctoral Economics of Public Policy Concentration, Trisakti University, Jakarta, Indonesia. Email: mhd_Zilal_Hamzah@trisakti.ac.id

³Directorate General of Taxes, Ministry of Finance of the Republic of Indonesia, Jakarta, Indonesia. Email: sahlikp2020@gmail.com

Article	Abstract
Keywords:	Value Added Tax (VAT) remains a cornerstone of tax revenue
Value Added Tax (VAT), C-Efficiency Ratio, Buoyancy, Tax Elasticity, VAT Revenue Ratio	for many countries, including Indonesia, especially in the context of declining corporate income tax rates amid global tax competition and the rising challenge of tax avoidance in the digital economy. Despite VAT's pivotal role, there has been limited research assessing its performance over an extended period, specifically from 1094 to 2022. This study aims to
History of Article	examine the effect of the VAT C-Efficiency Ratio, VAT Buoyancy.
Received: Maret 25,	and VAT Elasticity on the VAT Revenue Ratio (VRR) in
2024;	Indonesia. Utilizing the Structural Equation Model (SEM)
Reviewed: April 20,	approach, the findings reveal that the VAT C-Efficiency Ratio
2024;	has a positive and significant impact on the VRR, VAT Buoyancy
Accepted: April 23.	has a negative but insignificant effect, while VAT Elasticity
2024;	exhibits a negative and significant influence. Collectively, the
Published: August 31,	three variables have a substantial effect on the VRR. The study
2023;	prioritized to improve the VAT Revenue Ratio in Indonesia.
DOI: 10 5 (202 /ithe w2:2 404	
DOI 10.30202/Jup.V212.494	

A. INTRODUCTION

Value Added Tax (VAT), known in Indonesia as Pajak Pertambahan Nilai (PPN), is one of the major sources of tax revenue contributing significantly to the country's fiscal income. In the digital era, where corporate income tax (CIT) rates tend to decline due to ongoing tax competition among jurisdictions, and where modern societies face mounting challenges in addressing tax avoidance and its resulting erosion of government revenue,¹ many countries increasingly rely on VAT to meet their revenue

¹ Hana Paleka dan Vanja Vitezić, (2023), "Tax Compliance Challenge through Taxpayers' Typology" Economies 11, no. 9: 219, 2023, available at <u>https://doi.org/10.3390/economies11090219</u>.

needs². This reliance is further reinforced by the international consensus on adopting the destination principle in VAT implementation.

Various efforts have been undertaken by governments to increase VAT revenue, which must begin with a thorough understanding of the key indicators used to measure VAT performance. Commonly used indicators include the VAT C-Efficiency Ratio, VAT Buoyancy, VAT Elasticity, and the VAT Revenue Ratio (VRR). However, the use of these indicators to assess VAT performance in Indonesia remains limited, particularly in terms of their application over long-term periods. Most existing studies tend to focus solely on the magnitude of buoyancy and elasticity, which are generally linked to the effectiveness of tax policies. The majority of research on tax buoyancy and elasticity has merely served as part of broader studies analyzing the overall performance of tax systems, without specifically focusing on VAT. For instance, Strauss et al. (2021) found substantial inconsistencies and complexities in both direct and indirect tax reforms in response to the digital economy—such as inconsistencies in definitions and scope, tax-triggering thresholds, and varying tax rates. However, such studies did not examine VAT-specific indicators comprehensively or over extended periods, which limits their applicability in evaluating VAT policy effectiveness.³ However, previous studies have not employed a quantitative approach covering a long-term period—such as from 1984 to 2022. Furthermore, empirical research conducted by Lagravinese et al. (2020), Dudine and Jalles (2018), Risdiawan and Nurhidayati (2020), and Nurhidayati (2016) continues to focus primarily on tax buoyancy and elasticity as general factors influencing tax revenue, without specifically examining their impact on VAT revenue. The empirical study by Lagravinese et al. (2020), which analyzed 35 OECD countries over the 1995–2016 period, revealed that long-term tax buoyancy in those countries consistently remained below 1.⁴ However, these previous studies measured only the impact of tax buoyancy and did not extend their analysis to other important ratios that are essential for evaluating tax performance. For instance, Dudine and Jalles (2018), in their study of tax buoyancy across 107 countries over the 1980–2014 period, found, among other things, that the buoyancy of corporate income tax in advanced economies was higher during economic contractions than during expansions.⁵ Previous studies have focused solely on the impact of tax buoyancy and have not addressed other important ratios critical to measuring tax performance. Furthermore, Risdiawan and Nurhidayati (2020) and Nurhidayati (2016) found that based on sectoral VAT revenue data from 1985 to 2017, the estimated buoyancy was 1.081 and elasticity was 0.826⁶. Meanwhile, using the Divisia Index for the period 1984–2014, the buoyancy coefficient was 1.16 and the

² Muhamad Wildan, "Tren Kinerja VAT Gross Collection Ratio di Indonesia", 2023, available at https://news.ddtc.co.id/tren-kinerja-vat-gross-collection-ratio-di-indonesia-45509, accessed on May November 13, 2023.

³ Helena Strauss, Danie Schutte, & Tyson Fawcett, An evaluation of the legislative and policy response of tax authorities to the digitalisation of the economy, *South African Journal of Accounting Research*, Vol. 35, Issue 3, 2021, pp. 239-262.

⁴ Raffaele Lagravinese, Paolo Liberati, Agnese Sacchi, Tax buoyancy in OECD countries: New empirical evidence, *Journal of Macroeconomics*, Vol. 63, 2020, DOI: 10.1016/j.jmacro.2020.103189.

⁵ Paolo Dudine and Joao Tovar Jalles, How Buoyant Is the Tax System? New Evidence from a Large Heterogeneous Panel, *Journal of International Development*, 2017, DOI: 10.1002/jid.3332.

⁶ H. Risdiawan and Nurhidayati, Measuring Government Tax Effort: Value Added Tax Elasticity and Buoyancy, *Jurnal Pajak Dan Keuangan Negara (PKN)*, Vol. 2, No. 1, 2020, pp. 20–30. <u>https://doi.org/10.31092/jpkn.v2i1.817</u>. Available at https://jurnal.pknstan.ac.id/index.php/pkn/article/view/817/509.

elasticity coefficient was 1.⁷ Nevertheless, these prior studies assessed VAT performance only through buoyancy and elasticity, without incorporating other significant indicators such as the VAT C-Efficiency Ratio and the VAT Revenue Ratio (VRR).

The increasing trend of competitive corporate income tax rate reductions across countries in the digital era has positioned VAT as a key pillar of tax revenue. However, research on Indonesia's VAT performance remains limited, particularly in terms of the variables VAT C-Efficiency Ratio, VAT Buoyancy, VAT Elasticity, and VAT Revenue Ratio (VRR). Therefore, this study seeks to analyze and determine the influence of the VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity on the VRR in Indonesia.

B. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Key topics in public economics, particularly in taxation, are closely intertwined with tax theory, its impact on economic efficiency, the formulation of optimal taxation, taxation of capital, income taxation, and others.⁸ From an economic perspective, a tax system is considered optimal when it generates the most favorable economic outcomes or, at the very least, minimizes any negative economic effects.⁹ One area within tax systems that significantly influences economic outcomes is the measurement of Value Added Tax (VAT) performance, which includes indicators such as the VAT C-Efficiency Ratio, VAT Buoyancy, VAT Elasticity, and the VAT Revenue Ratio (VRR).

The VAT C-Efficiency Ratio measures the efficiency of VAT collection on total domestic consumption, with a theoretical maximum of 100%—a condition in which a uniform VAT rate is applied to the entire domestic consumption base without exemptions or preferential treatments. This ratio differs from VAT efficiency in general, as the latter provides insights into VAT compliance within a country.¹⁰ Higher VAT efficiency typically reflects a lower level of shadow economic activity and reduced corruption.

Tax buoyancy is an important parameter in assessing the resilience of a country's tax revenue system, as it evaluates the stability of the tax-to-GDP ratio over a certain period. Tax buoyancy is interpreted as the percentage change in tax revenue resulting from a 1% change in national income. A tax buoyancy coefficient greater than 1 indicates that a 1% increase in GDP leads to more than a 1% increase in tax revenue¹¹. In anticipation of a tax buoyancy coefficient falling below 1, governments must respond by identifying sectors that can significantly influence the improvement of the tax ratio. This can be achieved through discretionary policy adjustments aimed at enhancing tax revenue performance.¹²

 ⁷ Nurhidayati, Estimasi Elastisitas dan Buoyancypajak Pertambahan Nilai (PPN) di Indonesia, *Info Artha*, Vol. 3
2016, available at https://jurnal.pknstan.ac.id/index.php/JIA/article/view/51/39, accessed on January 12, 2024.
⁸ Ridwan dan Ihsan Suciawan Nawir (2021), Buku Ekonomi Publik, Yogyakarta: Pustaka Pelajar Press, 2021, pp. 87-88.

⁹ *Ihid*

¹⁰ Sulfan, Kinerja PPN di Indonesia Tahun 2011-2020, *Jurnal Pajak Indonesia (Indonesian Tax Review)*, Vol. 5 No. 2, 2021, pp. 206–216, DOI: <u>https://doi.org/10.31092/jpi.v5i2.1414</u>. Available at https://jurnal.pknstan.ac.id/index.php/JPI/article/view/1414/740.

¹¹ Wahyu Kartika Wijayanti and Y. Agus Bagus Budi N., Faktor-Faktor Yang Mempengaruhi Total Penerimaan Pajak Negara dan Efektifitas Peraturan Perpajakan, *Media Ekonomi*, Vol. 18 No. 1, April 2010, pp. 30-31.

¹² H.D.P. Sinaga and A.W. Hermawan, Tax Buoyancy for Sustainable Development: A Development Law Perspective in Indonesia, *Journal of Sustainable Development Issues*, Vol. 1, No. 2, 2022, pp. 55–64. DOI:https://doi.org/10.56282/jsdi.v1i2.470.

Tax elasticity, on the other hand, is an indicator that measures the responsiveness of tax revenue to changes in national income, assuming that no tax policy changes occur. In other words, tax elasticity relates the percentage change in tax revenue to the percentage change in Gross Domestic Product (GDP), while maintaining a constant tax base and legal framework over the observed period. Therefore, tax elasticity reflects what would happen to tax revenue in the absence of discretionary policy changes. A high elasticity value indicates that tax revenue grows faster than national income, signaling a responsive tax system—such as a progressive tax system. While tax elasticity is a static measure that excludes the effects of discretionary changes, a coefficient greater than one may serve as an early warning indicator for tax authorities to bridge potential gaps in economic resource mobilization.¹³

Subsequently, the Value Added Tax Revenue Ratio (VRR) is a VAT performance indicator introduced by the OECD to measure a tax authority's ability to effectively secure its potential tax base. VRR captures the gap between actual VAT revenues and the theoretical revenue that would be collected if the standard VAT rate were applied uniformly to the entire potential tax base.¹⁴ Since VRR reflects the extent to which the VAT base can be fully and effectively taxed without exemptions or exclusions, an ideal VRR should equal or closely approximate one.¹⁵

C. METHODS

To address the research questions, this study employs the Structural Equation Modeling (SEM) approach. SEM is commonly used to test complex theoretical models that involve both observed (manifest) and unobserved (latent) variables against empirical data.¹⁶ he use of SEM in this study is based on the need to test a comprehensive research model that includes multiple variables and indicators, consistent with the approach recommended by Hamid and Anwar (2019).¹⁷

The data used in this study are secondary data derived from calculated values of the VAT C-Efficiency Ratio, VAT Buoyancy, VAT Elasticity, and the Value Added Tax Revenue Ratio (VRR) in Indonesia for the period from 1984 to 2022. The application of SEM also supports the testing of the following hypotheses developed in this study:

- a) The VAT C-Efficiency Ratio has a positive effect on the VRR.
- b) VAT Buoyancy has a positive effect on the VRR.
- c) VAT Elasticity has a positive effect on the VRR.
- d) VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity collectively have a positive effect on the VRR.

D. ANALYSIS AND DISCUSSION

1. Secondary Data Processing

Based on the collected secondary data, the values of the VAT C-Efficiency Ratio, VAT Buoyancy, VAT Elasticity, and Value Added Tax Revenue Ratio (VRR) were

¹³ Henry D.P. Sinaga and Yudha Pramana, Tax Elasticity in Addressing Tax Avoidance in Indonesia: A Study of Responsive Law, *Journal of Public Administration and Policy Issues*, Vol. 1 No. 2, 2022, DOI: https://doi.org/10.56282/jpapi.v1i2.471.

¹⁴ Sulfan, *Ibid*.

¹⁵ *Loc.cit*.

¹⁶ Kevin J. Grimm, Nilam Ram, and Ryne Estabrook, *Growth Modeling: Structural Equation and Multilevel Modeling Approaches*, New York dan London: The Guilford Press, 2017.

¹⁷ Rahmad Solling Hamid and Suhardi M. Anwar, *Structural Equation Model (SEM) Berbasis Varian*, Jakarta: PT. Inkubator Penulis Indonesia, 2019.

obtained, as detailed in the appendix of this study. The VAT C-Efficiency Ratio was calculated using the following formula. $^{\rm 18}$

Rasio C efficiency PPN =
$$\frac{\text{Penerimaan PPN}}{\text{Konsumsi dalam PDB x Tarif PPN}}$$

The calculation of Tax Buoyancy (TB) is based on the following formula:19

$$TB = \% \Delta Revenue \div \% \Delta base$$

Next, Tax Elasticity can be expressed in the following form:²⁰

$$e_i = 1 + K_i / T_i$$

Where T refers to tax revenue and K refers to a precisely defined magnitude depending on the tax design. The aggregate elasticity for a group of taxes is the weighted average of the revenue shares of each individual tax elasticity.²¹

Furthermore, the Value Added Tax Revenue Ratio (VRR) is calculated using the following formula: $^{\rm 22}$

$$VRR = \frac{VR}{(FCE - VR)x r}$$

Where: VR is actual VAT revenue, FCE is final consumption expenditure as part of GDP, and r is the standard VAT rate.

2. Results and Discussion

The results of the Structural Equation Modeling (SEM) analysis on the variables VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity toward the Value Added Tax Revenue Ratio (VRR) (Y) produced outer loading values and significance levels as summarized in the diagram below.



¹⁸ Sulfan, *Op.cit.*, p. 209.

¹⁹ Jonathan Haughton, Estimating Tax Buoyancy, Elasticity, and Stability, 1998, available at https://pdf.usaid.gov/pdf_docs/Pnace024.pdf, accessed on 20 December 2023.

²⁰ John P. Hutton and Peter J. Lambert, Inequality and Revenue Elasticity in Tax Reform, *Scottish Journal of Political Economy*, Vol. 30, No. 3, 1983. DOI: 10.1111/j.1467-9485.1983.tb01015.x.

²¹ Loc.cit.

²² Sulfan, *Ibid.*

Figure: Outer Loading Weights of VAT Performance Variables



Based on the SEM analysis of the VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity variables, the following conclusions can be drawn:

- a) The VAT C-Efficiency Ratio has a positive effect (+0.970) and is statistically significant (T-statistic = 10.593 > 1.96) in its partial influence on VRR.
- b) VAT Buoyancy has a negative effect (-0.110) and is not statistically significant (T-statistic = 0.316 < 1.96) in its partial influence on VRR.
- c) VAT Elasticity has a negative effect (-0.667) and is statistically significant (T-statistic = 2.662 > 1.96) in its partial influence on VRR.
- d) The combined influence of the VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity is substantial (F-Square = 0.681) on VRR.

E. Conclusion

Based on the analysis and discussion above, the following conclusions can be made:

- The VAT C-Efficiency Ratio has a positive and significant effect on VRR.
- VAT Buoyancy has a negative but insignificant effect on VRR.
- VAT Elasticity has a negative and significant effect on VRR.
- Collectively, the VAT C-Efficiency Ratio, VAT Buoyancy, and VAT Elasticity have a strong simultaneous effect on VRR.

It is recommended that future improvements to the VRR should prioritize enhancing the VAT C-Efficiency Ratio, particularly through strengthening VAT law enforcement, including enhanced monitoring and audit mechanisms.

REFERENCES

- Dudine, Paolo, Jalles, Joao Tovar, How Buoyant Is the Tax System? New Evidence from a Large Heterogeneous Panel, *Journal of International Development*, 2017, DOI: 10.1002/jid.3332.
- Grimm, Kevin J., Ram, Nilam, and Estabrook, Ryne, *Growth Modeling: Structural Equation and Multilevel Modeling Approaches*, New York dan London: The Guilford Press, 2017.
- Hamid, Rahmad Solling dan Anwar, Suhardi M., *Structural Equation Model (SEM) Berbasis Varian*, Jakarta: PT. Inkubator Penulis Indonesia, 2019.
- Haughton, Jonathan, Estimating Tax Buoyancy, Elasticity, and Stability, 1998, available at https://pdf.usaid.gov/pdf_docs/Pnace024.pdf, accessed on 20 December 2023.
- Hutton, John P., and Lambert, Peter J., Inequality and Revenue Elasticity in Tax Reform, *Scottish Journal of Political Economy*, Vol. 30, No. 3, 1983. DOI: 10.1111/j.1467-9485.1983.tb01015.x.

- Lagravinese, Raffaele, Liberati, Paolo, Sacchi, Agnese, Tax buoyancy in OECD countries: New empirical evidence, *Journal of Macroeconomics*, Vol. 63, 2020, DOI: 10.1016/j.jmacro.2020.103189.
- Nurhidayati, Estimasi Elastisitas dan Buoyancypajak Pertambahan Nilai (PPN) di Indonesia, *Info Artha*, Vol. 3 2016, available at https://jurnal.pknstan.ac.id/index.php/JIA/article/view/51/39, accessed on January 12, 2024.
- Paleka, Hana and Vitezić, Vanja, "Tax Compliance Challenge through Taxpayers' Typology" Economies 11, no. 9, 2023, https://doi.org/10.3390/economies11090219.
- Ridwan, Ridwan and Nawir, Ihsan Suciawan Buku Ekonomi Publik, Yogyakarta: Pustaka Pelajar, 2021.
- Risdiawan, H., and Nurhidayati, nurhidayati, Measuring Government Tax Effort: Value Added Tax Elasticity and Buoyancy, *Jurnal Pajak Dan Keuangan Negara (PKN)*, Vol. 2, No. 1, 2020, pp. 20–30. <u>https://doi.org/10.31092/jpkn.v2i1.817</u>. Available at

https://jurnal.pknstan.ac.id/index.php/pkn/article/view/817/509.

- Sinaga, H.D. and Hermawan, A.W., Tax Buoyancy for Sustainable Development: A Development Law Perspective in Indonesia, *Journal of Sustainable Development Issues*, Vol. 1, No. 2, 2022, pp. 55–64. DOI:https://doi.org/10.56282/jsdi.v1i2.470.
- Sinaga, Henry D.P. and Pramana, Yudha, Tax Elasticity in Addressing Tax Avoidance in Indonesia: A Study of Responsive Law, *Journal of Public Administration and Policy Issues*, Vol. 1 No. 2, 2022, DOI: https://doi.org/10.56282/jpapi.v1i2.471.
- Strauss, Helena, Schutte, Danie & Tyson Fawcett, An evaluation of the legislative and policy response of tax authorities to the digitalisation of the economy, *South African Journal of Accounting Research*, Vol. 35, Issue 3, 2021, pp. 239-262.
- Sulfan, Sulfan, Kinerja PPN di Indonesia Tahun 2011-2020, *Jurnal Pajak Indonesia (Indonesian Tax Review)*, Vol. 5 No. 2, 2021, pp. 206–216, DOI: https://doi.org/10.31092/jpi.v5i2.1414. Available at https://jurnal.pknstan.ac.id/index.php/JPI/article/view/1414/740.
- Wildan, Muhamad, "Tren Kinerja VAT Gross Collection Ratio di Indonesia", 2023, available at https://news.ddtc.co.id/tren-kinerja-vat-gross-collection-ratio-di-indonesia-45509, accessed on May November 13, 2023.
- Wijayanti, Wahyu Kartika and Y. Agus Bagus Budi N., Faktor-Faktor Yang Mempengaruhi Total Penerimaan Pajak Negara dan Efektifitas Peraturan Perpajakan, *Media Ekonomi*, Vol. 18 No. 1, April 2010, pp. 30-31.