

Tax Revenue, Trade Openness, Government Effectiveness and Economic Growth: Evidence from Asean-6 Countries

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Abstract

This study analyses the relationship between tax revenue and economic performance in six major ASEAN economies, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, from 2000 to 2024. The study also examines whether trade openness and government effectiveness change the relationship between tax revenue and economic growth. Economic growth is represented by the natural logarithm of GDP per capita, while tax revenue is measured as a percentage of GDP. By applying a Fixed Effects panel model with robust standard errors, the results show that tax revenue does not have a statistically significant direct relationship with economic growth. The interaction between tax revenue and trade openness, as well as the interaction between tax revenue and government effectiveness, is also insignificant. This means that both moderating variables do not significantly change the tax revenue-growth relationship in the ASEAN-6 sample. However, government effectiveness, government expenditure, and foreign direct investment show positive and significant effects on economic growth. These findings suggest that institutional quality, effective public spending, and productive foreign investment are more important in explaining economic performance than tax revenue and trade openness alone. Therefore, ASEAN-6 policymakers should improve government effectiveness, strengthen tax administration, increase public spending efficiency, and attract productive foreign direct investment to support sustainable economic growth.

Keywords: Tax Revenue, Trade Openness, Government Effectiveness, Economic Growth, Asean-6

Introduction

Economic development remains a central policy objective for emerging economies, where fiscal policy serves as a fundamental mechanism for mobilizing resources to finance essential public goods, including infrastructure, healthcare, and education (World Bank, 2023; Stoilova, 2017). Nevertheless, the relationship between taxation and economic growth continues to generate substantial theoretical and empirical debate (Sakar et al., 2025). From a Keynesian perspective, tax-financed government expenditure can promote economic growth by

stimulating aggregate demand and supporting productive public investment. In contrast, neoclassical theories emphasize the potential distortionary effects of taxation, arguing that excessive tax burdens may weaken investment incentives, reduce economic efficiency, and ultimately constrain long-term growth (Barro, 1990; Macek, 2015).

This fiscal trade-off has become increasingly complex amid globalization and rising trade openness (Keho, 2017). Trade liberalization has played a significant role in facilitating industrialization, attracting foreign investment, and integrating the economies of the Association of Southeast Asian Nations (ASEAN) into global markets (Chen, 2017). However, greater economic openness also increases exposure to external shocks and intensifies competitive pressures on domestic tax systems. This creates a fiscal paradox whereby trade openness simultaneously increases the demand for government expenditure to enhance economic resilience while limiting policymakers' ability to rely on conventional revenue sources, particularly trade-related taxation (Karras, 2011; Gnanon & Brun, 2019).

Despite extensive research on taxation and economic growth, empirical findings remain mixed, suggesting that the growth implications of taxation may depend on broader economic and institutional conditions. Previous research has largely focused on the direct effects of taxation and trade openness on economic performance, with evidence suggesting that these relationships vary across countries and economic contexts (Nguyen & Bui, 2021; Abd Hakim & Karia, 2025; Dao, 2025). Unlike studies that focused mainly on direct relationships, Ho et al. (2023) used a dynamic panel data approach to examine the moderating role of trade openness in the relationship between tax revenue and economic growth in developing countries. Their findings showed that trade openness positively moderates the tax revenue–growth relationship, indicating that economies more integrated into international markets may derive greater economic benefits from taxation. However, Ho et al. (2023) also noted that differences in tax policy efficiency and administrative capacity may explain variations in outcomes across regions. This finding highlights the importance of considering institutional factors alongside trade openness when examining the growth implications of taxation.

While Ho et al. (2023) provide important evidence on the moderating role of trade openness, the relevance of this relationship to ASEAN-6 economies requires further investigation. These economies differ in their levels of trade integration, fiscal structures, economic development, and institutional capacity, which may influence the contribution of tax revenue to economic growth. Greater trade openness may strengthen the growth effects of taxation by expanding investment opportunities, facilitating technology transfer, and broadening the domestic tax base. In contrast, external economic shocks, international tax competition, and reduced reliance on trade-related taxation may weaken these benefits (Liberati, 2007; Gnanon & Brun, 2019). Therefore, the positive moderating effect identified by Ho et al. (2023) may vary across ASEAN-6 economies due to differences in their economic structures, fiscal capacity, and exposure to international markets. This highlights the need for further empirical investigation within this regional context.

Another institutional factor that may influence the relationship between tax revenue and economic growth is government effectiveness. According to endogenous growth theory, tax-financed public investment can support long-term economic growth through

improvements in infrastructure, human capital development, and productivity (Romer, 1986; Barro, 1990). However, the extent to which tax revenue generates these benefits may depend on the government's administrative capacity and efficiency in allocating public resources. Previous studies have shown that institutional quality influences tax mobilization, revenue collection, and public expenditure management (Bird et al., 2008; Ajaz & Ahmad, 2010). While government effectiveness may directly influence economic growth through better public administration and policy implementation, its moderating role lies in determining how efficiently tax revenue is translated into productive public expenditure. Stronger government effectiveness may increase the contribution of taxation to economic growth through more efficient resource allocation, productive public investment, and effective policy implementation, whereas weaker institutional capacity may limit these benefits. Therefore, government effectiveness is expected to influence not only economic growth directly but also the strength of the relationship between tax revenue and economic growth.

To address these research gaps, the present study extends the existing literature by examining trade openness and government effectiveness as moderating variables in the relationship between tax revenue and economic growth across ASEAN-6 economies. This approach provides a broader understanding of how external economic integration and institutional capacity may influence the growth effects of taxation. Specifically, this study aims to (i) analyze the direct effect of tax revenue on economic growth, (ii) investigate the moderating effect of trade openness on the relationship between tax revenue and economic growth, and (iii) examine the moderating effect of government effectiveness on the same relationship. Using panel data covering the period from 2000 to 2024, the study seeks to provide empirical evidence on these conditional relationships in ASEAN-6 economies. The findings are expected to improve our understanding of the conditions under which taxation supports economic growth, with implications for fiscal policy design, economic development, and fiscal sustainability.

Literature Review

In theoretical and empirical literature, the relationship between tax revenue and economic growth has been a subject of discussion for a long time. According to Endogenous Growth Theory, effective use of tax revenue for long-term economic growth depends on the efficient use of public funds for productive investments, including infrastructure, education, health care, technological innovation, and human capital development (Romer, 1986; Barro, 1990). From this view, taxation boosts economic performance by funding spending that raises productivity and improves the long-run growth potential of the economy. The efficiency of tax-financed public investment, however, relies on the quality of the institutions and the government must have adequate administrative capacity to raise taxes efficiently and direct them to productive activities. Thus, effective government is likely to enhance the role of tax revenue in economic growth. The Keynesian Fiscal Theory also states that governments can use tax revenue to increase public spending that boosts aggregate demand, especially in times of economic slowdown, but the impact of fiscal policy is determined by policy implementation and efficiency in the public sector (Keynes, 1936). Trade Liberalization Theory, on the other hand, argues that increased trade liberalization leads to economic efficiency, technology transfer and the availability of larger international markets, while it can also lead to lower tax revenues from traditional trade and higher fiscal pressure unless accompanied by good

institutions that strengthen domestic tax systems (Krugman et al., 2018; Frankel & Romer, 1999; Baunsgaard & Keen, 2010; Gnanngnon, 2021).

There is not yet enough empirical evidence to link tax revenues to economic growth. Some studies have found positive effects on economic growth of increased tax revenue, provided that the government uses the tax money for productive public spending. For instance, Maganya (2015), Onakoya et al. (2017) and Olufemi et al. (2018) reported that tax mobilization is a means of creating long-run economic growth by augmenting investment in public infrastructure and necessary services. Likewise, Grdinić et al. (2017) claimed that the structure of taxes is also of importance, and indirect taxes tend to have fewer distorting effects on economic performance. On the other hand, Abd Hakim and Karia (2025) found that overall tax burdens can have negative effects on economic growth in Asian economies, proving that the impact of taxation is not only due to tax revenue but also to the composition of taxes and fiscal policy design. The mixed results suggest that a combination of macroeconomic and institutional determinants of economic growth, rather than the revenue collected alone, is important for the relationship between taxation and economic growth.

The positive impact of trade openness on economic growth is generally accepted in the literature, especially for developing economies. Tahir and Khan (2014) and Idris et al. (2018) reported that openness has a positive impact on economic performance, including market access, technology transfer, foreign investment and productivity. Nguyen and Bui (2021) and Dao (2025) reported that higher openness levels were found to have a positive effect on economic performance, which can be explained by the positive effect of openness on market access, technology transfer, foreign investment and productivity. However, they tend to materialize in the longer term and rely on local resources such as institutions, education and technological advances. Likewise, research on the trade revenue linkage indicates that trade liberalization has an impact on fiscal structures, with implications that a more open economy decreases the tax burden on trade and increases the tax burden on domestic production. The overall findings of Karimi et al. (2016), Gaalya et al. (2017), Rahman and Islam (2023), Tsaurai (2024), Le et al. (2025), and Le and Tran (2024) were that increased openness of trade increases the domestic tax base and enhances revenue performance provided that the fiscal reforms are effective and tax administration is sound.

In recent years, the importance of institutional quality in the effectiveness of fiscal policy has been increasingly recognized. Bird et al. (2008) and Ajaz and Ahmad (2010) found that weak governance, corruption and ineffectiveness of public administration led to lower tax effort and less ability of governments to raise domestic revenues. The opposite, of course, is true of effective governments, which increase adherence to the tax laws, enhance revenue collection, and focus public funds more effectively on productive investment. Asamoah et al. (2019) and Gnanngnon (2021) also maintained that countries with higher institutional quality can reap the benefits of trade liberalization with ease due to their ability to restructure their fiscal systems and sustain their domestic revenues even in the face of a decrease in the collection of trade taxes. The results indicate that government effectiveness could improve the role of tax in economic growth in two ways:

by increasing the mobilization of tax revenue and by increasing the efficiency of government spending.

Despite the contributions of existing studies, several gaps remain in understanding the relationship between tax revenue and economic growth. First, the empirical literature has largely focused on the direct effects of taxation, trade openness, and institutional quality, with relatively less attention given to their conditional relationships. For example, Abd Hakim and Karia (2025) used trade openness as a control variable, while Nguyen and Bui (2021) and Dao (2025) mainly examined its direct relationship with economic growth. Ho et al. (2023) extended this literature by showing that trade openness positively moderates the relationship between tax revenue and economic growth in developing countries. However, their findings also suggest that differences in tax policy efficiency and administrative capacity may help explain variations in outcomes across regions. This indicates that trade openness alone may not fully capture the economic and institutional conditions influencing the growth effects of taxation. Second, although previous studies have highlighted the importance of institutional quality in tax mobilization and fiscal performance (Bird et al., 2008; Ajaz & Ahmad, 2010), relatively little attention has been given to government effectiveness as a moderator of the tax revenue–growth relationship. This distinction is important because government effectiveness may not only influence economic growth directly but also affect how efficiently additional tax revenue is translated into productive public expenditure. Therefore, the present study extends the work of Ho et al. (2023) by examining both trade openness and government effectiveness as moderating variables in the ASEAN-6 context. This approach allows the study to investigate whether the moderating effect of trade openness observed in developing countries also applies to ASEAN-6 economies and whether government effectiveness provides an additional explanation for the relationship between tax revenue and economic growth.

Methodology

The sample used in this study is the annual panel data of six ASEAN economies, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, from 2000 to 2024. The countries chosen were those with the largest economies in the ASEAN region and with relatively complete and consistent data over the study period. Secondary data were sourced from the World Bank Development Indicators (WDI), the Worldwide Governance Indicators (WGI) and the United Nations Conference on Trade and Development (UNCTAD).

Economic growth is represented by the natural log of gross domestic product (GDP) per capita in constant 2015 United States dollars (LGDP). Tax revenue (TR), measured as tax revenue as a percentage of GDP, serves as the main explanatory variable. Trade openness (TO), defined as the share of total exports and imports in GDP, has been used as an explanatory variable and a moderating variable. The second moderating variable, institutional quality, is represented by government effectiveness (GE), which is derived from the Worldwide Governance Indicators. To reduce the omitted variable bias, four control variables are added, such as government expenditure (GOV), foreign direct investment (FDI), inflation (INF), and population growth (POP). A summary of the variables of this study is shown in Table 1.

Table 1

Measurement of Variables

Variables	Notation	Measurement	Data Source
Economic Growth	LGDP	Natural Logarithm of Gross Domestic Product (GDP) per capita (constant 2015 USD).	World Bank
Tax Revenue	TR	Tax revenue (% of GDP)	World Bank
Trade Openness	TO	Trade (% of GDP)	World Bank & UNCTAD
Government Effectiveness	GE	Governance score (0-100)	World Bank (WGI)
Government Expenditure	GOV	% of GDP	World Bank
Foreign Direct Investment	FDI	% of GDP	World Bank
Inflation	INF	CPI annual growth (%)	World Bank
Population Growth	POP	Annual growth (%)	World Bank

The empirical specification is based on Ho et al. (2023) and is estimated in three stages. The baseline model investigates the direct impact of tax revenue, trade openness, and government effectiveness on economic growth, while other macroeconomic factors are controlled for. The second model adds the interaction between tax revenue and trade openness ($TR \times TO$) to the analysis to explore the moderating impact of trade openness. The final model includes both interaction terms ($TR \times TO$ and $TR \times GE$) to test the joint moderating effect of trade openness and government effectiveness in the tax revenue and economic growth link.

The baseline model is given by:

$$LGDP_{it} = \beta_0 + \beta_1 TR_{it} + \beta_2 TO_{it} + \beta_3 GE_{it} + \beta_4 X_{it} + \varepsilon_{it}$$

The single moderation model is specified as:

$$LGDP_{it} = \beta_0 + \beta_1 TR_{it} + \beta_2 TO_{it} + \beta_3 GE_{it} + \beta_4 (TR_{it}^* \times TO_{it}^*) + \beta_5 X_{it} + \varepsilon_{it}$$

The dual moderation model is expressed as:

$$LGDP_{it} = \beta_0 + \beta_1 TR_{it} + \beta_2 TO_{it} + \beta_3 GE_{it} + \beta_4 (TR_{it}^* \times TO_{it}^*) + \beta_5 (TR_{it}^* \times GE_{it}^*) + \beta_6 X_{it} + \varepsilon_{it}$$

where i denotes country, t denotes year, and ε_{it} is the error term.

The empirical analysis starts with the estimation of the Fixed Effects Model (FEM) and Random Effects Model (REM). The Hausman test is then used to decide which estimation method is to be used. The null hypothesis is rejected in the Hausman test, and the Fixed Effects Model will be used in the analysis. Diagnostic tests for multicollinearity, heteroskedasticity and serial correlation are conducted to ensure that the estimated coefficients are valid. Multicollinearity is examined using the Variance Inflation Factor (VIF), and heteroskedasticity and serial correlation are examined using the Modified Wald test and Wooldridge test, respectively. All regression models are estimated by the Fixed Effects estimator with robust standard errors clustered at the country level due to the detection of heteroskedasticity and serial correlation. In addition, the interaction terms are demeaned before estimation to minimize structural multicollinearity in the moderation models (Baltagi, 2021; Gujarati & Porter, 2009; Hausman, 1978; Stock & Watson, 2020; Wooldridge, 2010).

Results & Discussions

Table 2 presents the Fixed Effects regression results for the three estimated models. The baseline specification, Model 1, reports the baseline specification; Model 2 reports the specification that adds the interaction term between tax revenue and trade openness; and Model 3 reports the specification that adds the interaction term between tax revenue and government effectiveness. The Hausman test is used to test the Fixed Effects Model and is found to be valid for all specifications, with robust standard errors clustered by country to correct for heteroskedasticity and serial correlation.

Table 2
Fixed Effects Regression Results

Variables	Model 1 (Baseline)	Model 2 (TR × TO)	Model 3 (TR × TO & TR × GE)
Tax Revenue (TR)	-0.0423 (0.110)	-0.0424 (0.120)	-0.0471 (0.110)
Trade Openness (TO)	-0.0012 (0.547)	-0.0011 (0.590)	-0.0008 (0.726)
Government Effectiveness (GE)	0.0313*** (0.000)	0.0307*** (0.000)	0.0293*** (0.000)
TR × TO	—	0.0001 (0.702)	0.0002 (0.505)
TR × GE	—	—	-0.0008 (0.384)
Government Expenditure (GOV)	0.0655*** (0.007)	0.0667*** (0.005)	0.0722*** (0.006)
Foreign Direct Investment (FDI)	0.0163** (0.018)	0.0167** (0.022)	0.0172** (0.021)
Inflation (INF)	0.0084 (0.195)	0.0085 (0.183)	0.0086 (0.180)
Population Growth (POP)	-0.0200 (0.678)	-0.0210 (0.670)	-0.0194 (0.685)
Constant	6.7304*** (0.000)	6.7427*** (0.000)	6.7677*** (0.000)
Within R²	0.6835	0.6848	0.6869
Observations	150	150	150

Notes: The dependent variable is the LGDP. Values in parentheses are p-values. ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The regression results are consistent across the three estimated models. The results of all model specifications show that tax revenue (TR) has no significant direct effect on economic growth in the ASEAN-6 countries, as the value of the coefficient remains statistically insignificant and ranges from -0.0423 to -0.0471. Similarly, the coefficient of openness of trade (TO) is negative but not significant in any of the models. These results imply that either more tax revenue or more openness to trade is not enough to achieve economic growth during the period of study.

In contrast, all three models show a positive and statistically significant relationship between government effectiveness (GE) and economic growth. This coefficient is relatively stable, with a range of 0.0293 to 0.0313, indicating that the quality of institutions positively

affects economic performance. Government expenditure (GOV) and foreign direct investment (FDI) are also found to have a positive and statistically significant relationship with economic growth throughout the analysis, while inflation (INF) and population growth (POP) do not have any statistically significant relationship with economic growth. These findings suggest that institutional quality, productive public expenditure, and foreign direct investment are more important drivers of economic growth than tax revenue alone.

Also, a moderation analysis shows that the interaction terms are both non-significant. The coefficient of tax revenue and trade openness ($TR \times TO$) is 0.0001 (0.0002) in Model 2 (Model 3), respectively, which are not statistically significant. In the same way, the interaction of tax revenue and government effectiveness ($TR \times GE$) in Model 3 is negative but not statistically significant ($\beta = -0.0008$, $p = 0.384$). According to the results, there is no significant moderation between the effects of tax revenue and economic growth in the ASEAN-6 countries during the study period, in relation to trade openness and government effectiveness.

The results are consistent with the literature discussed. The positive impact of government effectiveness is consistent with the results of other studies such as Bird et al (2008), Ajaz and Ahmad (2010), Asamoah et al (2019), and Gnanngnon (2021) that both the quality of institutions and government effectiveness have a positive impact on economic performance through effective government and efficient public resource management. On the other hand, the negligible impact of tax revenue is in contrast with Maganya (2015), Onakoya et al. (2017), and Olufemi et al. (2018), but in agreement with Abd Hakim and Karia (2025), who suggested that an increase in tax revenue does not necessarily lead to economic growth. Similarly, the negligible moderating effects are inconsistent with the results of Ho et al. (2023), which indicate that the impact of taxation may not be solely determined by trade openness or government effectiveness but also by the fiscal frameworks, institutional capacities, and overall macroeconomic environments within a country.

Table 3

Summary of Diagnostic Tests

Diagnostic Test	Test Statistic	Result
Hausman Test	$\chi^2 = 34.15$	$p = 0.0000^{***}$
Mean Vif	4.39	Maximum VIF = 10.34
Modified Wald Test	$\chi^2 = 32.44$	$p = 0.0000^{***}$
Wooldridge Test	$F = 297.351$	$p = 0.0000^{***}$

Notes: ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The diagnostic tests provide evidence that the estimation procedure is appropriate. The Hausman test result rejects the null hypothesis, which means that the Fixed Effects Model is more suitable than the Random Effects Model. The Modified Wald and Wooldridge tests show that there is heteroskedasticity and serial correlation, but these are mitigated by using robust standard errors clustered at the country level. In addition, the mean VIF value of 4.39 suggests that there is no serious multicollinearity issue after demeaning the interaction terms, making the results of the estimated regression more reliable.

Conclusion

This study analysed the relationship between tax revenue and economic growth in ASEAN-6 countries from 2000 to 2024, and the moderating mechanism of trade openness and government effectiveness. Fixed Effects Model results show that tax revenue does not have a statistically significant direct impact on economic growth. Similarly, the impact of tax revenue on economic growth is not substantially affected by trade openness and government effectiveness. Government effectiveness, government expenditure, and foreign direct investment, however, are shown to have positive and significant effects on economic growth, reinforcing the positive role of institutional quality and productive public investment in long-term economic development.

The results of this study indicate that raising taxes is not enough to boost sustainable economic growth without effective governance and efficient public expenditure. Policymakers should thus continue to enhance tax administration, increase tax compliance, and ensure efficient use of public revenue for productive sectors like infrastructure, education, health, and technological development. Meanwhile, fostering conditions that facilitate productive FDI and improving institutional quality are crucial to ensure long-term economic development.

Future research may extend the analysis by including additional ASEAN member countries, comparing ASEAN with other regional blocs, or employing alternative measures of taxation and institutional quality. Different econometric methods may also be adopted to gain a wider understanding of the relationship between fiscal policy and economic growth.

In general, the study adds to the literature by providing recent empirical evidence of how tax revenue, trade openness, and government effectiveness affect economic growth in the ASEAN-6 countries. The results highlight that institutional quality and good fiscal management have a greater impact on sustainable economic growth than tax revenues, providing helpful policy guidance for the design of effective fiscal and economic policies.

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