

Inflation, Economic Growth, Net Lending/Borrowing, General Government Final Consumption Expenditure (GGFCE), Exports, and Imports on Tax Revenue: A Panel Study of ASEAN Countries, 2014–2022

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ABSTRACT

Objective: This study aims to analyze the effects of inflation, economic growth, net lending/borrowing (NLB), general government final consumption expenditure (GGFCE), exports, and imports on tax revenue, measured by the tax-to-GDP ratio, across eight ASEAN countries. **Method:** Using annual panel data from 2014–2022 ($N=8$, $T=9$; 72 observations), the research applies panel regression supported by Chow, Hausman, and LM tests, which identify the Random Effects Model (REM) estimated through EGLS as the most appropriate specification. Hypotheses are examined using two-sided t -tests at a 5% significance level, with emphasis on p -values and R^2 statistics. **Results:** The findings indicate that NLB, GGFCE, and imports significantly influence tax revenue, whereas inflation, economic growth, and exports show no significant effects. The model demonstrates moderate explanatory power with R^2 of approximately 0.46 and Adjusted R^2 of 0.41. **Novelty:** This study contributes empirical insight into the fiscal dynamics of ASEAN by integrating macroeconomic, fiscal, and trade variables simultaneously and by identifying government financial behavior and import activity as key determinants of the regional tax base – an area underexplored in prior cross-country tax performance research.

INTRODUCTION

In the era of globalization, tax revenue is increasingly crucial as an instrument for financing development and fiscal stability [1]. Taxes are mandatory, compulsory contributions without direct compensation, and their performance is influenced by macroeconomic dynamics and fiscal policy design [2]. Consequently, governments in various countries continue to optimize tax potential by strengthening the tax base, increasing compliance, and structuring more targeted public spending [3]. This study examines the relationship between inflation, economic growth, net lending/borrowing (NLB), general government final consumption expenditure (GGFCE), exports, and imports, and tax revenue in the ASEAN region during the 2014–2022 period [4].

The Association of Southeast Asian Nations (ASEAN) countries, Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, play a strategic role in the global economy as centers of manufacturing and international trade through schemes such as the ASEAN Free Trade Area (AFTA) and various regional economic agreements [5]. Despite relatively rapid economic growth, the average tax-to-GDP ratio in many ASEAN countries remains below the Asia-Pacific average [6], indicating room for revenue optimization. This

situation underscores the importance of examining macroeconomic determinants and trade openness, including inflation, growth, net interest rate (NL/B), gross domestic product (GGFCE), exports, and imports, in explaining variations in tax revenue across ASEAN countries [7].



Figure 1. Tax-to-GDP Ratio

Source: Adapted from IMF (WoRLD), 2024 [8]

According to Figure 1, the tax-to-GDP ratios in ASEAN countries varied in 2022: Myanmar 5.45%, Laos 9.73%, Indonesia 10.39%, Malaysia 11.65%, Singapore 11.93%, Brunei Darussalam 12.51%, Vietnam 13.93%, Cambodia 14.74%, the Philippines 15.61%, and Thailand 15.78% [8]. This difference underscores the heterogeneity of tax capacity; therefore, strengthening administration, broadening the tax base, and increasing compliance, including addressing tax avoidance/evasion, need to be a policy focus [9].

Inflation is a determinant of tax revenue stability in ASEAN countries. Simply put, inflation is a general increase in prices that reduces the real value of money in the economy [10]. Referring to 2022 data, there is a wide range between countries: Myanmar (28%) and Laos (23%) are the highest; the middle group includes Singapore and Thailand (6.1%), the Philippines (5.8%), and Cambodia (5.3%). Relatively low rates are Indonesia (4.1%), Brunei Darussalam (3.7%), Malaysia (3.4%), and Vietnam (3.2%). [11] High inflation has the potential to weaken purchasing power and increase production costs, ultimately depressing the tax base and state revenue performance. Empirical findings vary: some studies find an effect of inflation on tax revenue, while others find no effect. [10].

Economic growth directly affects tax revenue in ASEAN countries. Measured by annual real GDP growth, expansion in economic activity broadens the tax base for income, consumption, and profits and generally increases tax buoyancy and compliance. [10] Based on 2022 data, real GDP growth rates varied: Malaysia 8.9%, Vietnam 8.5%, the Philippines 7.6%, Indonesia 5.3%, Cambodia 5.1%, Singapore 4.1%, Myanmar 4.0%, Thailand 2.6%, Laos 2.3%, and Brunei Darussalam -1.6% [12]. The model reflects that faster-growing economies tend to increase tax revenues through expanded recorded activity and strengthened compliance [13].

Net lending/borrowing (NLB) in 2022 highlights the diverse fiscal positions across ASEAN. On the surplus side: Brunei Darussalam (2.5% of GDP), Singapore (1.2%), Vietnam (0.7%), and Laos (0.1%). Cambodia was nearly balanced (-0.3%). Meanwhile, countries still running deficits include Indonesia (-2.3%), Myanmar (-2.8%), Malaysia (-4.6%), Thailand (-4.6%), and the Philippines (-5.5%) [14]. Conceptually, a healthier fiscal position, with a narrowing deficit or shifting to a surplus, is typically associated with stronger administrative capacity and tax effort, thus positively associated with tax revenues. Conversely, a deeper deficit indicates high financing needs and the potential for fiscal tightening, which can stifle formal economic activity and narrow the tax base [15].

General government final consumption expenditure (GGFCE) measures the share of general government consumption in GDP, particularly spending on goods/services and employee compensation. Therefore, because it only includes current expenditure, the figure is usually lower than fiscal indicators that also include capital expenditure and transfers [16]. Based on 2022 data, GGFCE levels in ASEAN vary: the Philippines 25.89%, Brunei Darussalam 20.12%, Thailand 17.72%, Myanmar 15.04%, Malaysia 11.59%, Singapore 9.24%, Vietnam 8.82%, Indonesia 7.69%, and Cambodia 5.90%; while Laos is not available [17]. This difference reflects variations in the scale of consumptive public services and public sector intensity across countries. Conceptually, effectively managed government consumption expenditure can boost aggregate demand and strengthen infrastructure and tax compliance [18]. Exports in this study are measured as annual growth (%) in the value of exports of goods and services. The 2022 snapshot shows sharp disparities between countries: Cambodia 21.34%, Indonesia 16.23%, Malaysia 14.51%, the Philippines 10.96%, Brunei Darussalam 7.16%, Thailand 6.16%, Singapore 4.92%, and Vietnam 3.90%; data for Laos and Myanmar are not available [19]. Mechanistically, export expansion increases corporate output and profits and deepens formal activities that form the basis of income tax/VAT, thus, theoretically, increasing tax revenue, although empirical evidence is not always in the same direction [10].

In the context of customs, imports mean the entry of goods into a country's customs territory [20]. In this study, the variable is expressed as annual growth (%) in imports of goods and services. The 2022 snapshot shows unequal import rates across ASEAN: Cambodia 18.60%, Malaysia 15.99%, Indonesia 15.00%, the Philippines 14.02%, Brunei Darussalam 11.53%, Singapore 5.85%, Thailand 3.43%, and Vietnam 1.34%; data for Laos and Myanmar are not available [21]. From a fiscal perspective, higher import growth broadens the collection base for VAT/PPnBM imports and import duties, thus theoretically potentially increasing tax revenue [22].

The grand theory of this research is the Tax Capacity and Tax Effort framework, where tax revenue relative to GDP is understood as the result of the interaction between tax capacity [23]. Tax capacity explains how large and structured economic activities can be taxed which generally increases when economic growth raises income, profit and consumption and when the economy becomes more open through exports and imports

so that collection points such as import VAT, import duties and formal transactions along the supply chain increase, while tax efforts describe the effectiveness of government policies and administration which are reflected in net lending or borrowing as a signal of fiscal attitude and in government consumption spending GGFCE which supports public services, compliance infrastructure and modernization of collection; inflation acts as a friction that can erode the real value of revenue due to administrative lags [7]. Adjustment behavior, although in the short term, can increase nominal figures so it needs to be controlled so as not to reduce the base; Historically, this framework evolved from the cross-country tax effort measurement pioneered by Lotz and Morss in the late 1960s, then formalized by Chelliah in the early 1970s through a tax function that derived potential taxes from determinants such as the level of development and openness. It was modernized by Pessino and Fenochietto in the 2010s through a stochastic frontier approach to estimate tax capacity and tax effort in many countries while incorporating the findings of the inflation-to-revenue path known as the Olivera-Tanzi effect. Thus, in the ASEAN context from 2014 to 2022, this framework directly maps the research variables of inflation, growth, NLB, GGFCE, exports, and imports to the tax-to-GDP formation mechanism through tax base expansion, increased compliance, and changes in economic structure [24].

The Keynesian approach as a supporting theory emphasizes that in the short term, the level of economic activity is primarily determined by aggregate demand, which consists of consumption, investment, government spending, and net exports. Therefore, fiscal policy can stimulate output, employment, and ultimately expand the tax base [25]. In this framework, the GGFCE acts as a fiscal stimulus instrument, operating through a multiplier effect on income and consumption, thus boosting VAT, income tax, and other tax revenues. The Non-Taxable Taxable Fund (NLB) reflects an expansionary or contractionary fiscal stance that increases or decreases these stimulus measures. A more open economy allows the net export component to channel the impact of policy to effective demand through its relationship with exports and imports, thus activating both indirect and direct tax channels [18]. At the same time, Keynesian theory recognizes that as demand approaches production capacity, inflationary pressures increase and can erode the real value of revenues if left unmanaged. Therefore, optimal tax performance occurs when fiscal stimulus strengthens growth while maintaining price stability. Thus, Keynesian theory provides a strong conceptual basis for incorporating the GGFCE, NLB, inflation, and their relationship to exports and imports as variables mediating the transmission of government policy from tax to GDP in studies of ASEAN countries [10].

This study analyzes the effects of inflation, economic growth, net lending/borrowing (NLB), general government final consumption expenditure (% GDP), exports, and imports on tax revenues in ASEAN countries. The study uses annual panel data for the 2014–2022 period with indicators standardized as a percentage of GDP for cross-country comparison. The NLB reflects the fiscal position (deficit/surplus), general government final consumption expenditure captures the intensity of government

spending, while exports–imports reflect the degree of trade openness relevant to the tax base [4], and [10]. The analysis aims to assess how strongly each variable influences tax revenue in the ASEAN region. The research results are expected to provide an empirical basis for formulating more effective and efficient fiscal policies, in order to increase tax revenue capacity in ASEAN countries [6].

Hypothesis Development

The Effect of Inflation on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, inflation is viewed as a friction that disrupts collection capacity and efforts through real value erosion and administrative lag. The Olivera–Tanzi approach explains the mechanism of this erosion, while the Keynesian framework posits price pressures as a consequence of aggregate demand dynamics that, if unmanaged, impact revenue performance. Accordingly, the literature has found mixed results: some studies report that inflation affects tax revenue [10] and [4], while others find no significant effect [26]. Based on the explanation above, the following hypothesis can be formulated:

H1: Inflation Affects Tax Revenue

The Effect of Economic Growth on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, growth is viewed as an expansion of the tax base through increases in income, profits, consumption, and the formalization of economic activity. Keynesian theory, through the multiplier effect, asserts that increased output drives consumption and profits, thus increasing the VAT/Income Tax channel. Consistent with the literature, some studies have found that economic growth influences tax revenue [13] and [27], while others have found no significant effect [28].

Based on the above explanation, the following hypothesis can be formulated:

H2: Economic Growth Affects Tax Revenue

The Effect of Net Lending/Borrowing (NLB) on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, NLB acts as a signal of fiscal stance and tax effort effectiveness. Credible fiscal performance tends to go hand in hand with better administration and higher compliance. Tax compliance/tax morale theory supports that good fiscal governance improves tax behavior and reduces leakage. Empirical evidence suggests a link between NLB/deficits and revenue mobilization in a number of countries and through specific fiscal arrangements [29] and [30], although in some studies or within specific deficit ranges, this relationship is not always strong [31]. Based on the explanation above, the following hypothesis can be formulated:

H3: Net Lending/Borrowing Affects Tax Revenue

The Effect of General Government Final Consumption Expenditure on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, GGFCE strengthens tax effort by funding public services, administrative infrastructure, and modernizing tax collection. From a Keynesian perspective, GGFCE increases effective demand, thereby increasing taxable economic activity. Several studies have found an effect on tax revenue,

government spending is related to revenue increases, and government spending is a determinant of tax revenue performance [32] and [33]. However, the evidence is not always consistent, and the effect of government spending on tax revenue is not strong in the main specification [27].

Based on the above explanation, the following hypotheses can be formulated:

H4: General Government Final Consumption Expenditure Affects Tax Revenue

The Effect of Exports on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, openness through exports acts as a driver of tax capacity by expanding formal production, profits, and registered supply chain networks. From the perspective of trade openness theory and the net export component within the Keynesian framework, exports serve as a policy transmission channel that activates the tax base. Consistent with the literature, some studies find that exports/trade openness affect tax revenue in the ASEAN panel [7] and [10], while others find no significant effect [27].

Based on the above explanation, the following hypotheses can be formulated:

H5: Exports Affect Tax Revenue

The Effect of Imports on Tax Revenue

Within the Tax Capacity and Tax Effort (TCE) framework, imports increase collection points (import VAT/PPnBM, import duties) while simultaneously encouraging documented downstream activities, increasing tax capacity. The literature on the border-tax channel and the Keynesian effective demand mechanism suggests that changes in import volumes affect trade and related tax revenues. The literature indicates that trade openness influences tax revenues [7] and [10]. However, cross-regional findings are not always directional, with some contexts showing no significant effect [27].

Based on the above explanation, the following hypothesis can be formulated:

H6: Imports Affect Tax Revenues

Conceptual Framework

The conceptual framework in this study can be illustrated as follows:

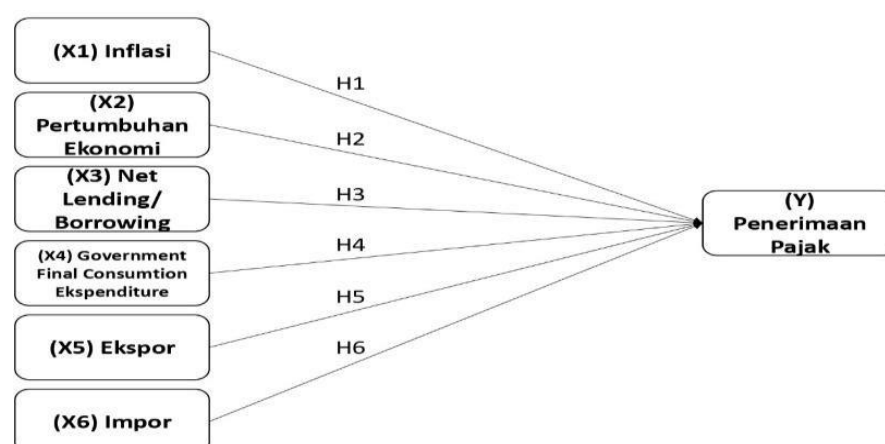


Figure 2. Conceptual Framework

RESEARCH METHOD

Research Type

This research approach is quantitative. Quantitative research is a systematic scientific study of components and phenomena and their causal relationships, which can be measured using statistical, mathematical, or computational techniques [34].

Data Type and Source

This research uses quantitative secondary data in the form of an annual panel (country-year) for ASEAN countries for the period 2014–2022, so that each observation represents one country in one year. The panel design was chosen because it combines cross-sectional and time-series variation, allowing for control of relatively constant unobserved heterogeneity within each country through fixed/random effects modeling [4].

The primary data sources were collected from two official portals: the IMF and the World Bank. The dependent variable is tax revenue, measured as a percentage of GDP (tax revenue, %GDP) [8]. Independent variables include inflation (annual price growth, %yoy) [11], real economic growth (real GDP growth, %yoy) [12], net lending/borrowing (%GDP as an indicator of fiscal stance) [14], general government final consumption expenditure (GGFCE, %GDP) [17], and exports and imports of goods and services (%yoy) [19] and [21]. All series are expressed as %GDP or %yearly for comparability across countries and time; unit adjustments and period consistency were made before panel estimation.

Population and Sample

The study population comprises all ASEAN member countries. Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam serve as the framework for the cross-country analysis. This population was chosen because it represents a region with strong regional economic and policy linkages, yet possesses sufficient diversity in economic, fiscal, and trade structures to identify variations in tax revenues [4]. The conceptual unit of observation is the country, while the analytical unit in data processing is country-year across the study period. By defining all ASEAN members as the population, the study achieved comprehensive coverage to assess the influence of macroeconomic, fiscal, and trade openness factors on tax revenue at the regional level [35].

The sample was determined using purposive sampling, with countries meeting the following criteria: (1) complete data available for all study variables (tax revenue, inflation, economic growth, net lending/borrowing, GGFCE, exports, and imports) for the period 2014–2022; (2) uniformity of definitions and units (expressed as a percentage of GDP or annual percentage) across countries; and (3) consistent ASEAN membership status throughout the observation period. Based on these criteria, a balanced panel was obtained with $N = 8$ countries and $T = 9$ years (2014–2022) [34].

The following is the sample selection table:

Table 1. Sample Selection

Criteria	Number
ASEAN countries	10
ASEAN countries with complete data (Inflation, Economic Growth, Net Lending/Borrowing, General Government Final Consumption Expenditure, Exports, Imports, and Tax Revenue) for 2014–2022	8
ASEAN countries without complete data for all variables in 2014–2022	2
Selected sample	8
Research period (2014–2022)	9
Total observations	72

Source: Processed by Author (2025)

Data Collection Techniques

This study used documentation as the data collection technique, collecting records or documents related to inflation, economic growth, net lending/borrowing, general government final consumption expenditure, exports, imports, and tax revenues in ASEAN countries for the period 2014–2022 [36].

Operational Definitions and Variable Measurement

The operational definitions in this study translate concepts into observable and measurable variables according to the study's objectives. Referring to the title, the variables are divided into independent variables: inflation (X1), economic growth (X2), net lending/borrowing (X3), general government final consumption expenditure (GGFCE) (X4), exports (X5), imports (X6), and the dependent variable, tax revenues (Y). The observation scope is ASEAN countries, measured in country-year units, for the period 2014–2022 [37].

Variable measurements are expressed in units that allow for comparison across countries and time: Tax Revenue is measured as a percentage of GDP [8]; Inflation is measured as annual price growth (% yoy) [11]; Economic Growth as annual real GDP growth (% yoy) [12]; Net Lending/Borrowing as a percentage of GDP (an indicator of fiscal stance) [14]; GGFCE as a percentage of GDP [17]; and Exports and Imports of goods/services as annual (% yoy) [19] and [21], respectively. Normalization to % GDP or % annual is performed to ensure consistent definitions and scales prior to panel estimation. The operational definitions and measurement methods for each variable are presented in the following table:

Table 2. Operational Definitions of Variables

Variable	Operationalization / Formula	Unit	Source
Inflation (X1)	$(\text{GDP Deflator tahun ini} \div \text{GDP Deflator tahun lalu} - 1) \times 100$	Ratio	[10], [11]

Variable	Operationalization / Formula	Unit	Source
Economic Growth (X2)	$(\text{PDB riil tahun ini} - \text{PDB riil tahun lalu}) \div \text{PDB riil tahun lalu} \times 100$	Ratio	[12], [13]
Net Lending/Borrowing - NLB (X3)	$\text{NLB} / \text{GDP} \times 100$	Ratio	[14], [15]
General Government Final Consumption Expenditure - GGFCE (X4)	$\text{GGFCE} / \text{GDP} \times 100$	Ratio	[17], [18]
Exports (X5)	$(\text{Nilai Ekspor Tahun Ini} - \text{Nilai Ekspor Tahun Lalu}) / \text{Nilai Ekspor Tahun Lalu} \times 100\%$	Ratio	[19], [20]
Imports (X6)	$(\text{Impor Tahun Ini} - \text{Nilai EImpor Tahun Lalu}) / \text{Nilai Impor Tahun Lalu} \times 100\%$	Ratio	[21], [22]
Tax Revenue (Y)	$\text{Tax revenue} / \text{GDP} \times 100$	Ratio	[8], [9]

Data Analysis Techniques

The data analysis technique in this study used panel data regression with the help of EViews software.

Panel regression is an econometric approach to test and measure relationships between variables in data across units and time. The analysis stages include: model selection (Chow Test, Hausman Test, and Lagrange Multiplier Test), REM model estimation using the Generalized Least Squares (GLS) method, which eliminates the need for classical assumption tests like the OLS model, and hypothesis testing using a partial t-test and coefficient of determination (R^2 and Adjusted R^2) to assess how much variation in the dependent variable can be explained by the independent variables in the panel regression model [38].

1. Model Selection Test (CEM, FEM, REM).

This test aims to determine the most appropriate panel regression framework, taking into account unobserved heterogeneity across units/times. The Common Effects Model (CEM/pooled OLS) assumes the same intercept and slope for all units and periods; Fixed Effects Model (FEM) allows for differences in intercept (unit/time) thereby controlling for heterogeneity correlated with the explanatory variable; Random Effects Model (REM) models differences in intercept as random components uncorrelated with the explanatory variable (more efficient when assumptions are met) [39].

Table 3. Model Selection Test.

Test	Result	Decision
Chow Test	Prob. > 0.05 Prob. < 0.05	CEM FEM
Hausman Test	Prob. > 0.05 Prob. < 0.05	REM FEM

Test	Result	Decision
Lagrange Multiplier Test	Prob. > 0.05 Prob. < 0.05	CEM REM

Source: Processed by the author (2025) [38]

a) Chow test (CEM vs. FEM).

H_0 : The pooled model (CEM) is adequate; no fixed effects are required. H_1 : The fixed effects model (FEM) is required.

Decision: If $p \geq 0.05$, H_0 is accepted (fails to reject H_0), choose CEM. If $p < 0.05$, H_0 is rejected, and H_1 is accepted, choose FEM.

b) Hausman test (REM vs. FEM).

H_0 : The random effects model (REM) is valid/consistent; there is no correlation between individual effects and the explanatory variables.

H_1 : The fixed effects model (FEM) is valid; there is a correlation, so REM is inconsistent.

Decision: If $p \geq 0.05$, H_0 is accepted, choose REM. If $p < 0.05$, H_0 is rejected and H_1 is accepted → choose FEM

c) Lagrange Multiplier Test / Breusch–Pagan LM (CEM vs REM).

H_0 : no random effect (effect variance = 0); CEM is adequate. H_1 : there is a random effect; REM is more appropriate.

Decision: if $p \geq 0.05$, H_0 is accepted, and CEM is chosen. If $p < 0.05$, H_0 is rejected and H_1 is accepted → choose REM.

2. Classical Assumption Test

The classical assumption test is essentially a prerequisite that must be met when conducting regression analysis using the Ordinary Least Squares (OLS) method. The relevance of this assumption test depends on the selected panel regression model. If the estimation uses the Common Effect Model (CEM) or the Fixed Effect Model (FEM) based on OLS, the classical assumption test is still necessary. Conversely, if the appropriate model is a Random Effects Model (REM), then classical assumption testing is no longer performed because REM relies on the Generalized Least Squares (GLS) estimation method. Commonly encountered classical assumption tests include normality, multicollinearity, heteroscedasticity, and autocorrelation [39].

3. Hypothesis Testing

Hypothesis testing in the REM panel data regression model (EGLS) is conducted using a t-test at the α level of 0.05. Decisions are made based on the p-value ($p < 0.05$ = influential; $p \geq 0.05$ = no influential). Reporting only displays the $|t|$ value and p-value. Furthermore, model fit is reported using R^2 and Adjusted R^2 , which measure the proportion of variation in the dependent variable explained by the model [39].

RESULTS AND DISCUSSION

1. Model Selection Tests

Model selection tests were conducted to determine the most appropriate panel regression model.

a) Chow Test

Table 4. Chow Test

Redundant Fixed Effects Tests – Equation: Untitled
Test for cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	8.365859	(7, 58)	0.0000
Cross-section Chi-square	50.253974	7	0.0000

Source: Processed using EViews 13 (2025)

Since the probability value of $0.0000 < 0.05$, the **Fixed Effects Model (FEM)** is preferred.

b) Hausman Test

Table 5. Hausman Test

Correlated Random Effects – Hausman Test, Equation: Untitled
Test for cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.750140	6	0.5762

Source: Processed using EViews 13 (2025)

Since the probability value of $0.5762 > 0.05$, the **Random Effects Model (REM)** is preferred.

c) Lagrange Multiplier (LM) Test

Table 6. Lagrange Multiplier Test

Tests for Random Effects
Null hypothesis: No effects

Test	Cross-section	Time	Both
Breusch-Pagan	6.376856 (0.0000)	–1.72941 (–0.9581)	3.28624 (–0.0005)
Honda	6.376856 (0.0000)	–1.72941 (–0.9581)	3.475585 (–0.0003)
King-Wu	6.376856 (0.0000)	–1.72941 (–0.9581)	3.475585 (–0.0003)
Standardized Honda	7.850194 (0.0000)	–1.45954 (–0.9278)	1.031553 (–0.1511)
Standardized King-Wu	7.850194 (0.0000)	–1.45954 (–0.9278)	1.265277 (–0.1029)
Gourieroux et al.	–	–	40.6643 (0.0000)

Source: Processed using EViews 13 (2025)

Since the probability value is $0.0000 < 0.05$, the **Random Effects Model (REM)** is preferred.

Model Selection Summary

Based on the three model selection tests – Chow, Hausman, and LM – the results show **one FEM** and **two REM**. Therefore, the **Random Effects Model (REM)** is selected as the final model.

2. Classical Assumption Tests

Classical assumption tests were not conducted because the selected model is the **Random Effects Model (REM)**. REM is estimated using the **Generalized Least Squares (GLS)** method, which inherently accounts for heteroskedasticity and autocorrelation issues. In contrast, Common Effect Model (CEM) and Fixed Effects Model (FEM) rely on Ordinary Least Squares (OLS), which requires classical assumption testing. As noted by Melati & Suryowati (2018), GLS already incorporates error variance structures; therefore, classical assumption tests are unnecessary for REM. Such tests are only relevant when applying CEM or FEM.

3. Hypothesis Testing

a) t-Test (Partial Test) – REM (Panel EGLS)

Table 7. t-Test Results

Hypothesis Testing Results ($\alpha = 5\%$)

Variable	t Value	p-value	Decision ($\alpha = 5\%$)
X1	0.1818	0.8563	No effect
X2	0.6983	0.4875	No effect
X3	6.7380	0.0000	Significant effect
X4	2.8245	0.0063	Significant effect
X5	1.2551	0.2139	No effect
X6	2.3373	0.0225	Significant effect

b) R² Test

Table 8. R² Results

Statistic	Value
R-squared	0.461541
Adjusted R-squared	0.411837
S.E. of regression	1.660450
F-statistic	9.285815
Prob(F-statistic)	0.000000

Source: Processed using EViews 13 (2025)

The R-squared (R^2) value of 0.461541 indicates that approximately 46.15% of the variation in tax revenue (Y) can be explained by the independent variables used in the model, while the remaining 53.85% is influenced by factors outside the research model. Meanwhile, the Adjusted R-squared value of 0.411837 indicates that after considering the number of independent variables, the model is still able to explain approximately 41.18%

of the variation in tax revenue. Thus, the panel regression model estimated using the Random Effects Model (REM) can be said to adequately explain the influence of the independent variables on the dependent variable, although there are still other external factors not included in this study.

1. The Effect of Inflation on Tax Revenue

Inflation (X1) has no effect on tax revenue ($p = 0.8563 > 0.05$) because Y is the tax-to-GDP ratio: when prices rise, nominal revenues increase, but nominal GDP also increases, leaving the ratio virtually unchanged. Furthermore, inflation in many ASEAN countries was relatively controlled during the 2014–2022 period, and differences in conditions between countries made the effect inconsistent, making it statistically insignificant [26].

2. The Effect of Economic Growth on Tax Revenue

Economic growth (X2) had no effect on tax revenue ($p = 0.4875 > 0.05$) because Y is the tax-to-GDP ratio; when the economy grows, taxes and GDP increase simultaneously, leaving the ratio virtually unchanged. Furthermore, much of the growth occurred in tax-exempt consumption, such as agricultural staples (rice, vegetables, meat), education, healthcare, public transportation, and basic utilities. Therefore, increased spending in these sectors did not automatically increase tax revenues during the observation period [28].

3. The Effect of Net Lending/Borrowing on Tax Revenue

Net lending/borrowing (X3) was shown to have an effect on tax revenue ($p = 0.0000 < 0.05$). The smaller the deficit or the larger the fiscal surplus, the higher the tax revenue. This condition reflects an improving fiscal position in line with increased collection capacity and a strengthening of the tax base. These results are consistent with the theory that fiscal consolidation and sounder budget management can increase state revenue from taxes [29] and [30].

4. Effect of General Government Final Consumption Expenditure on Tax Revenue

General Government Final Consumption Expenditure (GGFCE) (X4) has an effect on tax revenue ($p = 0.0063 < 0.05$). This means that increased government consumption spending contributes to increased tax revenue. Economically, government spending stimulates aggregate demand, expands formal economic activity, and creates taxable transactions. Furthermore, public spending can also improve compliance and the effectiveness of tax administration, thus impacting revenue [32] and [33].

5. Effect of Exports on Tax Revenue

Exports (X5) have no effect on tax revenue ($p = 0.2139 > 0.05$). Although theoretically, increased exports can broaden the tax base through growth in production and corporate revenue, the results of this study indicate that this relationship is not statistically strong enough. This could be due to the export incentive structure, the existence of an export VAT restitution policy, or the more dominant contribution of exports to sectors with tax benefits, such as bonded zones. Therefore, the increase in exports during the study period did not significantly increase tax revenue [7] and [10].

6. The Effect of Imports on Tax Revenue

Imports (X_6) have an impact on tax revenue ($p = 0.0225 < 0.05$). When imports increase or decrease, tax revenue also changes. Simply put, this is because some spending shifts to imported goods, which have different taxation patterns than local products; regulations and facilities (preferential tariffs, certain exemptions, and import VAT credits) alter net tax payments; imports affect domestic producers' sales and profits, which form the basis for income tax; and changes in global exchange rates and prices shift the value of levies at the border and tax calculations downstream [7] and [10].

CONCLUSION

Fundamental Finding : This study reveals that inflation and economic growth do not significantly influence tax revenue in ASEAN countries, while fiscal variables – net lending/borrowing and general government final consumption expenditure (GGFCE) – show significant effects, indicating that tax revenue in the region is more responsive to fiscal capacity than to macroeconomic fluctuations. Imports also significantly affect tax revenue, whereas exports do not, likely due to export incentives and tax facilities that reduce their direct contribution to the tax base. **Implication :** These findings underscore the importance of strengthening fiscal discipline, improving the quality of government expenditure, and enhancing tax administration to ensure a stable and sustainable tax base, while simultaneously harmonizing trade and fiscal policies to prevent erosion of taxable capacity. **Limitation :** This study is limited by its relatively small sample size of eight ASEAN countries and a nine-year observation period, which may restrict broader generalization; in addition, the model does not incorporate institutional, policy, or structural factors that may influence tax performance. **Future Research :** Subsequent studies should expand country coverage, lengthen the observation period, refine variable specifications, and integrate institutional quality, trade policy, and exceptional events to provide a more comprehensive understanding of tax revenue determinants in the ASEAN region.

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