



Unlocking Fiscal Potential in ASEAN: Cross-Country Evidence and Policy Reflections for Vietnam

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ABSTRACT

Amid deepening international integration and increasing fiscal stability challenges, identifying the determinants of tax revenue is crucial for Vietnam to improve fiscal efficiency and achieve sustainable socio-economic development. This paper investigates novel cross - country empirical evidence by investigating the determinants of tax revenue in seven ASEAN countries (2015 - 2023). Employing a Fixed Effects Model (FEM) for regression analysis, the study finds that agricultural development, trade openness, and the relative expansion of service sectors exert a positive influence on tax revenue across the region. In contrast, population growth is found to have a statistically significant negative impact on tax revenue during the examined period. The study's perspective offers new insights that contrast and complement current literature on Vietnam and ASEAN. Policy recommendations include strengthening green agriculture, high value services, trade facilitation, and efficient population management. In parallel, an enabling environment is needed to deepen value chain integration and expand domestic and export markets for green agricultural products, is expected not only to foster a modern, sustainable, and climate resilient agricultural sector, but also to create a more stable and expanding tax revenue for Vietnam and other emerging economies.

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INTRODUCTION

In the context of deep economic integration and continuous globalization, ASEAN member countries, particularly Vietnam, are facing increasing challenges in maintaining fiscal policy stability and sustaining continuous efforts to improve and secure government revenue sources. This task is of paramount strategic importance, as state revenue serves as the core element and financial foundation that enables the fulfillment of sustainable socio-economic development goals and the enhancement of citizens' quality of life.

Within the overall structure of government revenue, tax income consistently holds a dominant position, accounting for the largest proportion. This not only reaffirms the crucial role of taxation in the public finance system but also highlights that tax revenue serves as an essential indicator reflecting the performance of the economy and the administrative capacity of the state apparatus. However, despite the proactive participation of many countries in international trade organizations and their engagement in Free Trade Agreements (FTAs) as strategic steps to foster economic growth, strengthen international standing, and enhance the competitiveness of domestic goods, actual tax revenue in several nations has fallen short of expectations. Moreover, there exist significant disparities and unpredictable fluctuations among countries in the region, raising profound concerns regarding their financial capacity to fund national development projects and maintain macroeconomic stability.

For these reasons, identifying and comprehensively analyzing the economic, political, and social factors affecting tax revenue has transcended the boundaries of academic inquiry to become an urgent and fundamental necessity. A thorough investigation into this issue will provide solid theoretical arguments, empirical evidence, and multidimensional perspectives to assist policymakers in formulating timely, appropriate, and effective fiscal reforms. Consequently, this will help optimize state revenue, ensure national financial security, and build a resilient foundation for Vietnam's sustainable and prosperous development amid deepening global integration.

Against this backdrop, the identification and analysis of factors influencing tax revenue have become an urgent matter, supporting policymakers in designing suitable reform measures and improving the efficiency of tax administration. The study is undertaken with the objective of clarifying the relationships between factors such as per capita income (GDP), the sectoral composition of the economy (agriculture, industry, and services), trade openness, inflation, and population and their impact on tax revenue among ASEAN countries. Based on these findings, the research aims to propose specific policy recommendations for Vietnam to enhance and strengthen its fiscal revenue base.

This study contributes to the growing literature on tax revenue determinants in ASEAN by employing recent panel data and robust econometric techniques, filling the gap in comparative fiscal policy research for Vietnam. Unlike most prior studies focusing on a single country or limited factors, this work examines multidimensional influences, including sectoral composition, trade openness, and demographic factors across seven ASEAN nations. The results provide both novel theoretical perspectives and practical recommendations for enhancing Vietnam's tax base and regional fiscal resilience.

THEORETICAL BASIS OF FACTORS AFFECTING TAX REVENUE

Tax is a legal obligation imposed on all individuals and organizations within society, representing a portion of their income or assets collected by the State for public purposes. Although taxes do not yield direct personal benefits, they play a crucial role in maintaining and developing essential public services, thereby fostering social stability and development.

Taxes are characterized by two main features: compulsory payment and non-refundable nature. These features demonstrate the State's role in income redistribution, aiming to reduce inequality and promote social justice.

Tax revenue can be expressed as the formula:

$$\text{Tax Revenue} = \text{Tax Base} \times \text{Tax Rate} \quad (1)$$

Where:

1. Tax Base refers to the total value of taxable assets, income, or goods and services.
2. Tax Rate represents the percentage applied to the tax base to determine payable tax.
3. Tax rates can take various forms: (a) Marginal Tax Rate (MTR): the percentage change in tax liability relative to a change in the tax base, reflecting the additional tax due when the base increases by one unit, (b) Average Tax Rate (ATR): the ratio between total tax paid and total taxable income or revenue, showing the actual tax burden, (c) Progressive Tax Rate: a rate that increases as the taxable base rises, meaning higher income results in a higher tax rate, and (d) Regressive Tax Rate: a rate that decreases as the taxable base increases, implying lower average tax rates for higher incomes.

Determinants Of Tax Revenue And Research Hypotheses

Per capita GDP

Gross Domestic Product (GDP) represents the total value of goods and services produced within a country in a given year. GDP per capita measures a country's economic health and competitiveness. According to Gale & Samwick (2017), there is an inverse relationship between GDP and tax revenue, as tax cuts can stimulate consumption. Conversely, Nguyen Van Thuan et al. (2022) found a positive relationship between taxation and economic growth in developing Asian countries at a 1% significance level. Based on prior studies, the hypothesis is proposed as follows:

H1: Per capita GDP has an inverse effect on tax revenue.

Sectoral composition of GDP

The sectoral composition of GDP significantly influences tax collection, as some sectors are easier to tax than others. This study focuses on the shares of agriculture, industry, and services.

Agricultural sector share

Agriculture, though essential for many economies, is typically difficult to tax. Studies by Xuan Hang et al. (2021) and Pham Dinh Long et al. (2018) indicate a negative relationship between the agricultural sector's share and tax revenue.

H2: The share of the agricultural sector negatively affects tax revenue.

Industrial Sector Share

The industrial sector transforms raw materials into finished or semi-finished products and thus plays a crucial economic role. Tran Xuan Hang et al. (2021) and Tran Thi Anh Hong (2017) found a positive correlation between the industrial sector's share and tax revenue.

H3: The share of the industrial sector positively affects tax revenue.

Service Sector Share

The service sector, being intangible in nature, depends heavily on customer satisfaction and usage levels. Pham Thi Hong Quyen (2021) reported a negative effect of the service sector's share on tax revenue, whereas Suparna Wijaya et al. (2024) found the opposite. Following Pham Thi Hong Quyen (2021), this study proposes:

H4: The share of the service sector negatively affects tax revenue.

Trade Openness

Trade openness measures the extent of foreign trade relative to GDP:

$$\text{Trade Openness} = \frac{\text{Exports} + \text{Imports}}{\text{GDP}} \quad (2)$$

Gaalya et al. (2017), Gnanngnon & Brun (2019), and Nwosa et al. (2012) identified a positive impact of trade openness on tax revenue. In contrast, Loganathan et al. (2020) found insignificant short-term effects in Malaysia, while Abaneme et al. (2021) reported a negative relationship. Based on Tran Xuan Hang & Nguyen Thi Kim Chi (2019), this study hypothesizes:

H5: Trade openness negatively affects tax revenue.

Inflation

According to the IMF, inflation reflects the rate at which the general level of prices for goods and services rises over a specific period. Dukić et al. (2022) found a strong correlation between inflation and tax revenue. Similarly, Muttaqin & Halim (2020) demonstrated a significant positive effect of inflation on income tax and VAT in Indonesia. However, Nalyanya et al. (2020) found a negative relationship in Kenya. For the ASEAN context, this study follows Muttaqin & Halim (2020):

H6: Inflation positively affects tax revenue.

Population growth

Goudswaard & Van de Kar (1994) observed that tax revenue increases with population growth until 2010 but declines afterward due to aging populations. In Sub-Saharan Africa, Addison & Levin (2012) found that countries with smaller populations tend to have higher tax-to-GDP ratios. Conversely, Chukwunwike & Onyekachi David (2019) demonstrated a positive impact of population size on tax revenue in Nigeria, a comparable developing country to Vietnam.

H7: Population growth positively affects tax revenue.

LITERATURE REVIEW

Several studies have made significant contributions to the analysis of tax revenue determinants, despite differences in regions, countries, time periods, variables and methodologies.

Regarding studies on developing countries, a core commonality across these studies is the consistent identification of the contrasting impact of sectoral economic structure on tax revenue: the share of agriculture in GDP is consistently had a negative impact while the proportion of exports without mining had a positive impact on tax revenue but there is no statistically significant effect of per capita income on tax revenue (Chelliah, 1971; Chelliah et al., 1975; Gupta, 2007). However, Gupta's more comprehensive study (2007), covering a longer period and a larger number of countries, affirmed that per capita GDP significantly affects tax revenue performance (Basheer et al., 2018). Furthermore, Gupta (2007) found that additional factors, such as corruption, political stability, and the proportion of direct and indirect taxes, also play a role.

As for studies on economic factors affecting tax revenue in OECD countries and Iran, exchange rates, imports, and industrial value added positively influenced tax revenue, while agricultural value added and FDI proportion had a negative impact (Basirat et al., 2014; Castro & Camarillo, 2014).

Some studies are conducted across European countries. Anastasiou et al. (2022) investigate the determinants of tax revenue, using data from 26 European countries for the period 2015–2018 and applying the panel cointegration method and estimating panel-based Error Correction Models. The study indicates that GDP, public debt, and imports have a small positive effect on tax revenue as a percentage of GDP. In contrast, foreign direct investment (FDI), along with improvements in the Control of Corruption Index, Government Efficiency Index, and Tax Administration Efficiency, exerts a strong and significant positive impact on tax revenue. Additionally, an increase in corporate and individual tax rates also leads to a long-run rise in tax revenue. The study of Ristić Cakić et al. (2025) examines the influence of macroeconomic determinants on tax revenues in European countries for the period 2006–2023 revealed that GDPpc, industry value added, and trade openness positively influence the tax revenues, while inflation, unemployment and government debt have negative effects.

Other studies on other parts of the world with different methodologies also show different results.

Basheer et al. (2018) studying the impact of economic and financial factors on tax revenue in Middle East countries from 1990 to 2010 found that GDP growth, real interest rates, and cash surplus had a significant positive impact, and banking capital ratios and credit risk premiums had negative effects on tax revenue.

Boukbech et al. (2018) explored the determinants of tax revenues in lower-middle-income countries (2001-2014) and found that GDP per capita and the value added of agriculture are significantly and positively correlated with tax revenues. The degree of

openness has a positive but insignificant effect on tax revenues. The impact of the population growth rate is negative but not significant.

Nguyen Van Diep and Duong Tien Ha My (2022) studying on BRICS economies' tax revenue collection (2001-2017) found that control of corruption and governance index have a strong positive impact on tax collection, while the size of FDI, GDP per capita, and agriculture have a strong negative effect on these countries' tax revenue.

Tsaurai (2021) investigated the determinants of tax revenue in upper-middle-income countries (2007 - 2017) using dynamic generalized methods of moments (GMM). The results found that lag of tax revenue, financial development, FDI, economic growth, urbanization, human capital development, population growth, and the interaction between FDI and financial development to a greater extent were found to have a significant positive impact on tax revenue. Exchange rate and trade openness had a deleterious effect on tax revenue.

Saptono and Mahmud (2021) analyzed macroeconomic indicators that determine tax revenues in six Southeast Asian countries during 2008 - 2019. Using the FE model with Driscoll-Kraay standard errors, this study finds that GDP per capita income, manufacturing, and trade openness have positive and significant effects on the actual tax-GD-to-P ratio and tax effort. In contrast, inflation is considered an unnecessary factor because it has an insignificant effect on both measures of tax performance.

Nguyen Minh Ha et al. (2022) identified the determinants of tax revenue in Southeast Asia based on a balanced dataset of eight countries in 2017. By employing both static (pooled OLS, FE, RE models, and Driscoll-Kraay standard error) and dynamic panel data (system-GMM) regression techniques, this study showed that the openness of the economy, foreign direct investment (FDI), the ratio of foreign debt to the gross domestic product (GDP), the share of value added in industry to GDP have positive impacts on tax revenue, and official development assistance has a negative impact.

Nguyen Phuong Lien et al. (2022) analyzed the determinants of tax revenue between two groups of countries: ASEAN-7 plus China (called the Eastern) and eight European countries (called the Western) during 2000 - 2018, applying the Feasible Generalized Least Squares model. The results indicated that all countries have a positive association between tax revenue and the human capital and FDI variables. In addition, in the Eastern forest area, broad money has a statistically significantly positive impact on tax revenue, while gross savings has a negative one. Further, the Western witnessed the positive impact with gross savings, while broad money variables led to a decrease in tax revenue.

Keshab Khatri Chettri et al. (2023) examine the determinants of tax revenue across South Asian countries over the period 2008–2017 by employing static panel data techniques. The findings show a significant positive impact of trade openness and life expectancy, whereas a negative impact of infant mortality rate to determine tax revenue in South Asian countries. The results also revealed the importance of FDI and banking sector development in determining tax revenue. Gross domestic product per capita growth rate and agriculture showed positive relationships with tax revenue, although the relationships are not significant.

Giang Thi Cam Nguyen et al. (2024) analyzed the factors influencing tax revenue in ASEAN countries over the period 1991–2020 and proposed several policy recommendations to improve fiscal efficiency. The authors found that agricultural added value, industrial proportion, and time to pay tax had a positive effect on tax revenue, whereas the inflation rate was negatively associated with tax collection. The study also emphasized the importance of institutional reform, fiscal transparency, and the expansion of the tax base in enhancing the long-term sustainability of public finances.

In Vietnam, the study “Factors Affecting Tax Revenue: Empirical Evidence from ASEAN Countries and Implications for Vietnam” by Tran Xuan Hang & Nguyen Thi Kim Chi (2019) analyzed five independent variables—per capita income, agricultural share, industrial share, trade openness, and inflation using data from seven ASEAN countries (2007–2016). Their FEM and REM regression models revealed that industrial share and inflation positively influenced tax revenue, while agriculture and trade openness had negative effects.

Similarly, Pham & et al (2018) examined 25 developing Asian countries (1997–2015), finding that average tax rates, trade openness, GDP per capita, agricultural and industrial shares, inflation, corruption control, and exchange rates all affected the tax-to-GDP ratio. However, tax collection efficiency remained low across developing Asian economies.

RESEARCH GAP AND CONTRIBUTIONS

Research gap

The literature review reveals that numerous studies have investigated the determinants of tax revenue from various economic, fiscal, and macroeconomic perspectives. However, due to differences in time periods, geographic focus, and research methodologies, the empirical findings remain inconsistent.

In addition, most previous datasets lack temporal relevance, as the majority of studies focus on the period 2000–2018. This temporal limitation reduces the applicability of existing results to the current economic, political, and social environment, which has undergone profound changes in the post-pandemic era.

Furthermore, previous research has rarely incorporated sustainability-oriented perspectives, such as the role of green transition and structural transformation in production, trade, and agriculture, in explaining tax revenue dynamics. These omissions hinder a comprehensive understanding of how fiscal systems in developing economies adapt to global sustainability trends.

Therefore, these gaps highlight the need for a more contemporary and integrative analysis of how economic and institutional factors jointly influence tax revenue—particularly in developing regions like ASEAN, where tax structures and administrative capacities remain highly heterogeneous. Moreover, previous ASEAN-based studies have not jointly examined the interaction between economic structure and institutional quality on tax revenue using updated post-COVID data.

CONTRIBUTIONS

This study aims to clarify and analyze the positive and negative impacts of various factors on tax revenue in ASEAN countries. In doing so, it contributes to the global body of literature on the determinants of tax revenue, enriches theoretical foundations, and provides a scientific basis for further research in this field.

Using updated data, the study also offers policy implications to assist governments in making informed decisions to strengthen their tax collection capacity, taking into account each country's economic conditions, social structure, and external influences in the current global context.

METHODOLOGY

Research Model

Based on previous studies, the research team proposes a research model to assess the factors affecting tax revenue as follows:

$$Tax_{it} = \alpha + \beta_1 \times LNGDP_{it} + \beta_2 \times AGRI_{it} + \beta_3 \times INDU_{it} + \beta_4 \times SERV_{it} + \beta_5 \times OPEN_{it} + \beta_6 \times INPL_{it} + \beta_7 \times POPU_{it} + \varepsilon_{it} \quad (3)$$

Where:

1. Tax Revenue (TAX): Total government tax revenue as a percentage of GDP.
2. Per Capita Income (LNGDP): The natural logarithm of GDP per capita (ln GDP).
3. Agricultural Sector Share (AGRI): Total value added in the agricultural sector as a percentage of GDP.
4. Industrial Sector Share (INDU): Total value added in the industrial sector as a percentage of GDP.
5. Service Sector Share (SERV): Total value added in the service sector as a percentage of GDP.
6. Trade Openness (OPEN): The sum of exports and imports as a percentage of GDP.
7. Inflation Rate (INFL): Annual inflation rate (%).
8. Population Growth (POPU): National population growth rate (%).
9. ε_{it} : Error term for observation i at time t
10. α : constant
11. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$: Regression Coefficient
12. Expected signs of the variables: (a) $\beta_1, \beta_3, \beta_4, \beta_6, \beta_7 > 0$ (positive relationship), (b) $\beta_2, \beta_5 < 0$ (negative relationship)
13. $i = 1, 2, 3, \dots, 9$: Number of cross sections
14. $t = 1, 2, 3, \dots, 9$: Time period

Table 1: Data description

Symbol	Observe Variable	Formula	Expected Sign & Rationale	Supporting Literature	Source
LNGDP	GDP per Capita (VND)	$\frac{GPD \text{ per capita (VND)}}{Exchange \text{ rate (VND/USD)}}$	Positive (+), impact but statistically insignificant	Muttaqin, F., & Halim, R. E. (2020)	WDI - WB
AGRI	Share of Agriculture (%)	$\frac{Value \text{ Added of Agriculture}}{Total \text{ GDP (Current Price)}}$	Positive (+) impact	Chang, J. J et al., 2006	WDI - WB
SERV	Share of Services (%)	$\frac{Value \text{ Added of Services}}{Total \text{ GDP (Current Price)}}$	Positive (+) impact	Suparna Wijaya et al., 2024	WDI - WB
OPEN	Trade Openness (%)	$\frac{Total \text{ Export and Import Turnover}}{GDP}$	Positive (+) impact	Gaalya et al., 2017 Gnangnon & Brun (2019) Nwosa et al., 2012	WDI - WB

Symbol	Observe Variable	Formula	Expected Sign & Rationale	Supporting Literature	Source
INFL	Inflation Rate (%)	$\frac{CPI_t - CPI_{(t-1)}}{CPI_{(t-1)}}$	Negative impact (-), but statistically insignificant	Nalyanya et al., 2020	WDI - WB
POPU	Population Growth (%)	$\frac{Birth\ Rate - Mortality\ Rate}{10}$	Negative impact (-)	Tony Addison & Jörgen Levin (2012)	WDI - WB

Source: Results obtained by the research team

Research Data

The study utilizes a panel data set comprising seven ASEAN countries: Cambodia, Indonesia, Singapore, Malaysia, Philippines, Thailand, and Vietnam, spanning the period from 2015 to 2023. This specific selection of countries stems from their relative homogeneity in terms of development levels, transforming economic structures, and similarities in current tax policies, which facilitates meaningful comparison and analysis. The nine-year time span is considered sufficiently long to ensure data stability and allow for the observation of changes across economic cycles.

The data sources were collected from reputable international organizations such as the World Bank (World Development Indicators – WDI), along with various national statistical agencies. The variables incorporated into the model were chosen based on sound economic theory and a comprehensive review of prior research, encompassing both domestic and international studies.

The construction of this specific data set, including the aforementioned variables, not only ensures representativeness of the key macroeconomic factors but also enables a systematic and rigorous testing of the proposed model. Consequently, the research is positioned to draw accurate conclusions regarding the direction and magnitude of the influence of each factor on tax revenue within the selected ASEAN nations.

Research Methodology

To analyze the impact of the macroeconomic factors on tax revenue, the study employs three common estimation methods for panel data: Pooled Ordinary Least Squares (Pooled OLS), the Fixed Effects Model (FEM), and the Random Effects Model (REM). The simultaneous application of these three methods allows for the comparison and assessment of the relative suitability of each model within the specific context of the ASEAN data spanning 2015–2023.

The testing sequence follows a systematic approach. First, an outlier detection test is performed to identify and handle any extreme values, ensuring data cleanliness. Next, the F-test is applied to determine whether there is a statistically significant difference between the Pooled OLS and the FEM. If significance is found, the FEM is generally preferred over Pooled OLS due to its ability to control for potential bias arising from unobserved, time-invariant country-specific characteristics. Subsequently, the Breusch Pagan Lagrangian Multiplier (LM Test) is utilized to assess the appropriateness of the REM compared to the Pooled OLS. After the most suitable model is selected, tests for autocorrelation and heteroscedasticity are conducted, and appropriate corrective measures are implemented if these issues are detected.

The empirical test results in this study indicate that the Fixed Effects Model (FEM) is the optimal choice for estimating the impact of the macroeconomic variables on tax revenue. This model is deemed superior as it better captures the fixed, country-specific effects throughout the entire analysis period.

RESEARCH RESULTS

The compiled dataset consists of 63 observations derived from seven Southeast Asian countries (Cambodia, Indonesia, Malaysia, Thailand, the Philippines, Singapore, and Vietnam) over nine years, spanning 2015 to 2023. Laos, Myanmar, and Brunei were excluded from the regression model due to data unavailability. All data for the dependent and independent variables were pre-processed to mitigate the risk of outliers.

The results presented in Table 2 demonstrate the correlation coefficients among the independent variables. A correlation coefficient exceeding 0.8 is considered high, suggesting a need for variable exclusion to avoid multicollinearity. The results specifically indicate a strong correlation between the Share of Industry (INDU) and the Share of Services (SERV), as well as between the Share of Industry (INDU) and the Share of Agriculture (AGRI). Consequently, the INDU variable will be excluded from the final regression model.

Table 2: Descriptive statistics of variables

Variable Name	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
TAX	63	1.1060	0.0652	0.9196	1.2266
LNGDP	63	0.4099	0.4878	-1.0232	1.1572
AGRI	63	0.6839	0.9109	-1.5763	1.3041
INDU	63	1.5271	0.0752	1.3503	1.6173
SERV	63	1.7089	0.0888	1.5581	1.8600
OPEN	63	2.0620	0.2719	1.5181	2.5224
INFL	63	0.3244	0.3301	-0.7255	0.8036
POPU	63	-0.0305	0.4300	-1.9528	1.3385

Source: Results obtained by the research team using Stata software.

Table 3: Correlation matrix of independent variables

	LNGDP	AGRI	INDU	SERV	OPEN	INFL	POPU
LNGDP	1.0000						
AGRI	0.2956	1.0000					
INDU	0.2626	0.8367	1.0000				
SERV	-0.2984	-0.7264	-0.8309	1.0000			
OPEN	-0.1477	-0.6776	-0.5327	0.3651	1.0000		
INFL	0.0953	0.1192	0.0951	-0.2298	-0.1837	1.0000	
POPU	-0.1018	-0.0033	-0.0270	-0.0979	0.0159	0.1708	1.0000

Source: Results obtained by the research team using Stata software.

Table 4: Regression results by estimation methods

	OLS	FEM	REM	GLS
Variable Name	TAX	TAX	TAX	TAX
LNGDP	0.0148	0.0291**	0.0148	0.0062
AGRI	0.0764*	-0.1775	0.0764*	0.0917*
SERV	0.6283*	-0.7114***	0.6283*	0.7333*
OPEN	0.1949*	-0.2524	0.1949*	0.2157*
INFL	-0.0087	0.0121	-0.0087	-0.0162
POPU	-0.0212	0.0082	-0.0212	-0.0161***
_cons	-0.4256**	2.9507*	-0.4256**	-0.6452*
Lagrange test	P_value = 1.0000 => Pooled OLS is preferred over the Random Effects (RE) method.			
F-test	P_value = 0.0000 => Fixed Effects (FE) is preferred over the Pooled OLS method.			
Test for Heteroscedasticity	P_value = 0.0000 => The FE model suffers from heteroscedasticity (non-constant error variance).			
Test for Autocorrelation	P_value = 0.0809			

OLS	FEM	REM	GLS
=> The FE model does not exhibit autocorrelation (serial correlation).			

Source: Results obtained by the research team using Stata software.

*, **, *** and correspond to the 1%, 5%, and 10% significance levels, respectively.

Regression results using the FEM model:

$$Tax_{it} = -0.6452 + 0.0062 \times LNGDP_{it} + 0.0917 \times AGRI_{it} + 0.7334 \times SERV_{it} + 0.2157 \times OPEN_{it} - 0.0162 \times INPL_{it} - 0.0161 \times POPU_{it} + \varepsilon_{it} \quad (4)$$

After the regression, the variables Log of GDP per Capita (LNGDP) and Inflation Rate (INFL) showed high p-values, at 0.379 and 0.110 respectively. This indicates that the influence between these variables is not clear or is insignificant in the data and will not be analyzed further in the paper.

According to the research findings, the proportion of the agricultural sector (AGRI) has a positive impact on tax revenue. This contradicts the findings of Xuan Hang et al. (2021) and Pham Dinh Long et al. (2018), who suggested that these countries largely support agriculture through various forms, including tax incentives and reductions for agricultural products and income from agriculture, etc. Therefore, when the proportion of the agricultural sector increases due to agricultural development, tax revenue from agriculture in developing countries typically decreases. However, in many developing countries in the ASEAN region, agriculture accounts for a large proportion of GDP and is the main source of income for the population, thereby increasing the taxpaying capacity of the residents. Moreover, modern agriculture is no longer just crude production, but also expands into processing, packaging, transportation, and distribution both domestically and internationally. Each stage has its own components, and specialized companies even emerge for a single stage, which means an increase in the number of taxpayers. Furthermore, only a few of these steps are tax-exempt, thus creating new tax revenue sources from businesses. In addition, when agricultural products are commercialized, new taxes such as Value Added Tax (VAT) and Personal Income Tax arise. To serve agriculture, modern machinery is imported from abroad, thereby increasing import taxes and environmental taxes.

The author's study also shows that trade openness (OPEN) has a positive impact on total tax revenue. This result is consistent with the research of Gnanngnon & Brun (2019), Gaalya et al. (2017), and Nwosa et al. (2012), who argue that international trade increases tax revenue from imports and exports, while domestic trade generates tax revenue from product transactions and consumption.

According to the research paper, the proportion of the service sector (SERV) also brings about a positive growth in tax revenue. This is similar to the analysis results of Suparna Wijaya et al. (2024), who concluded that the service sector generates income from corporate and personal income tax, consumption tax, Value Added Tax (VAT), and other types of taxes. Moreover, the service sector also creates jobs, stimulates other industries, and contributes to overall economic growth, thereby increasing tax revenue for the government.

Conversely, when considering the impact of population growth (POPU) on tax revenue, the author's results show an inverse impact. The study by Tony Addison & Jörgen Levin (2012) yielded similar results, noting that population growth in developing countries can negatively affect tax revenue because it increases public expenditure, reduces the proportion of the workforce with stable income, and creates great demand for social support programs. Furthermore, reforming and expanding the tax system in a dense and inefficient population environment can lead to a decrease in tax revenue.

RECOMMENDATION FOR VIETNAM AND CONCLUSION

Recommendation For Vietnam

First, according to the research results, the proportion of the agricultural sector has a significant impact on tax revenue. To maximize the tax potential from agriculture, the economic pillar of Vietnam, the Government needs to implement a comprehensive strategy, focusing on three main pillars, while simultaneously strengthening value chain linkages and market development for green agricultural products. There is a need for comprehensive investment in agricultural infrastructure, including modern irrigation systems, connected rural transport, advanced logistics, and preservation infrastructure such as cold storage, distribution centers, along with digital infrastructure to provide market information and effective production management. This will help reduce input costs, enhance productivity, and quickly connect to markets. Moreover, the Government must build a clear and attractive preferential tax policy framework for green agriculture, including corporate income tax (CIT) and agricultural land use tax exemptions/reductions for projects and areas undergoing sustainable transition, along with preferential interest rate credit packages, credit guarantees, and import tax exemptions/reductions for organic equipment and materials. This policy will strongly encourage the shift to sustainable farming methods. Furthermore, it is necessary to promote research, technology transfer, and capacity building for farmers by increasing investment in R&D to develop well-adapted crop varieties and livestock and biological solutions, while strengthening the agricultural extension system, organizing specialized training on green farming techniques, smart management, and market knowledge. In parallel, the Government needs to create a favorable environment to strengthen value chain linkages from

production to consumption and develop broad markets for green agricultural products. The synchronous implementation of these solutions will not only establish a modern, sustainable, and effective climate-resilient agriculture but also serve as a strong impetus for stable and sustainable tax revenue growth for Vietnam.

Secondly, the research confirms that the development of the service sector has a positive correlation with tax revenue, indicating that when this sector expands, the economy is driven in both scale and productivity. Services play a bridging role between production and consumption, helping to form a broad and stable tax base. To exploit this potential, Vietnam needs to focus on developing high-value-added service sectors, encouraging innovation, and improving the quality of human resources. The transition from traditional services to modern, technology-applied, and digitalized services will help increase productivity, expand operations, and create additional revenue sources for the budget. Concurrently, it is essential to intensify digitalization in tax administration, especially for e-commerce, online advertising, and digital services. Completing the data system and connecting information between tax authorities and electronic payment platforms will help enhance transparency and reduce revenue loss. Furthermore, Vietnam should soon finalize the legal tax framework for cross-border services to ensure fairness and efficiency in budget collection.

Thirdly, the research has pointed out a positive correlation between trade openness and tax revenue, showing that promoting imports and exports not only contributes to economic growth but also expands the tax base. To realize this, Vietnam needs to implement policies to attract, develop, and maintain a highly specialized workforce in international trade, especially in export-import operations skills, foreign language proficiency, and knowledge of free trade agreements. Simultaneously, it is necessary to raise awareness and information accessibility for businesses, helping them effectively utilize support resources, market opportunities, and tax incentive policies. Additionally, improving production capacity, investing in technology, and ensuring the quality of export products are crucial factors to increase commodity value, expand markets, and thereby boost revenue from Value Added Tax (VAT), Corporate Income Tax (CIT), and import/export taxes. Furthermore, Vietnam should also set up tax management in the digital trade environment, especially cross-border e-commerce, to prevent revenue loss and ensure fairness among business entities.

Fourthly, the research results show that population growth has a negative impact on tax revenue, reflecting that the increase in population has not been accompanied by a corresponding expansion of the tax base or an increase in economic productivity. The rate of formal labor participation remains low, tax collection efficiency is limited, and the population structure is concentrated in the low-income group, which prevents budget revenue from increasing proportionally. Therefore, Vietnam needs to expand the tax base by strengthening tax management in the informal economy and e-commerce activities, requiring business households and individuals selling online to fully declare their income. Moreover, the tax sector needs to apply digital technology, Big Data, and Artificial Intelligence (AI) to monitor, analyze, and detect tax evasion behaviors, while simplifying tax declaration and payment procedures to enhance the level of voluntary compliance by the public. Vietnam needs to adjust social security policies to encourage people to actively participate in the labor market. Instead of extending unemployment support programs, the State should focus on retraining policies, job search support, and career change assistance, helping workers quickly return to work. This approach not only reduces the budget burden but also contributes to expanding the tax base through an increase in the number of employed people and taxable income.

CONCLUSION

Research results show that macroeconomic variables such as GDP per capita and the inflation rate have no clear influence or impact on tax revenue in ASEAN countries during the 9-year period from 2015-2023. Variables such as the proportion of the development of agriculture, services, and trade openness have a positive impact on tax revenue. This indicates that Southeast Asian countries can still focus on developing agriculture and services, along with expanding trade openness and increasing import-export activities, if they want to boost tax revenue for the state budget. Conversely, population has an inverse relationship with tax revenue in 7 ASEAN countries, from which it can be seen that population growth is not a suitable option for Southeast Asian countries to increase tax revenue, as it simultaneously necessitates addressing issues related to increasing budget expenditure on healthcare, education, and social security, thereby putting pressure on spending more than collecting.

The current study is limited by the inability to collect complete data for all 11 ASEAN nations, as the paper only utilizes data from 7 countries over the last 9 years. The 9-year time span is also relatively short and may not accurately reflect the relationship between variables, especially given the influence of the COVID-19 pandemic during this period. Furthermore, the study does not delve deeply into comparing the specific policy characteristics of individual countries within the region.

In the future, research should aim to extend the study period and incorporate new variables, such as national institutional quality, Foreign Direct Investment (FDI), and digital transformation in taxation. Additionally, employing new research methodologies like the Gaussian Mixture Model (GMM) would help to address endogeneity issues and enhance the reliability of the model results.

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