



Factors Affecting Tax Collection in Luang Prabang Province

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Abstract

This study is a quantitative research that examines the relationship between international trade and tax revenue in Luang Prabang Province, Lao PDR. The study used secondary annual data from 2011 to 2024, collected from relevant government agencies, including provincial tax and trade authorities. The research aimed to analyze the short-run effects of exports and imports on tax revenue; To examine the long-run relationship between trade variables and tax revenue; and to assess the speed of adjustment toward long-run equilibrium following short-term economic shocks. To achieve these objectives, the study employs econometric techniques, including unit root tests, cointegration analysis, and an error correction model (ECM).

The results show that imports have a significant positive effect on tax revenue in the short run, while exports do not exhibit a significant short-run impact. In the long run, exports are found to have a positive and significant relationship with tax revenue, whereas imports do not show a significant long-run effect. In addition, the ECM results indicate a slow adjustment toward long-run equilibrium.

Overall, the findings suggest that imports play an important role in short-term revenue generation, while exports are a key driver of long-term tax revenue growth. These results provide useful implications for policymakers in designing trade and fiscal policies to support sustainable economic development in Luang Prabang Province.

Keywords: Tax revenue; exports; imports; Luang Prabang

1. Introduction

The government plays a vital role in maintaining national stability and promoting long-term socio-economic development. Its key

responsibilities include ensuring political and economic stability, safeguarding national security and public order, and investing in essential public infrastructure. Such infrastructure covering water, land, and air

transport systems, education, public health services, electricity, water supply, and other public utilities forms the foundation for sustainable economic growth and social welfare (Asian Development Bank, 2021; World Bank, 2020).

Achieving these development goals requires substantial and stable public financial resources. Although governments can access funding from multiple sources, taxation remains the most reliable and fundamental mechanism for mobilizing domestic revenue (International Monetary Fund, 2019; Musgrave & Musgrave, 1989). Effective and sustainable tax collection enables governments to finance infrastructure development, strengthen governance capacity, improve public service delivery, and enhance resilience to external economic shocks. As tax revenues increase, the government's capacity to support economic development, maintain social stability, and improve citizens' welfare also expands (Tanzi & Zee, 2001).

In Luang Prabang Province, tax revenue collection from 2017 to 2024 demonstrates significant fluctuations. The most substantial decline occurred in 2021, when tax revenue decreased by 2,370,154,500 kip, followed by a further reduction of 5,267,336,750 kip in 2022. These sharp declines were largely attributed to the economic disruptions caused by the COVID-19 pandemic, which severely affected business operations, cross-border trade, tourism, and service-sector activities. Similar impacts on

fiscal performance were widely observed across ASEAN economies during this period (Asian Development Bank, 2022; World Bank, 2021).

Tax revenue rebounded in 2023, reaching its highest level at 35,449,297,600 kip, before declining to 25,721,148,723 kip in 2024. The recovery in 2023 was primarily driven by reforms under the revised national tax collection framework and the implementation of a modernized tax administration system approved by the National Assembly of the Lao PDR (2021). In addition, enhanced training and capacity building for tax officers contributed to improved tax compliance and administrative efficiency. These developments align with public finance literature, which highlights administrative modernization as a critical factor in improving tax performance in developing economies (Bird & Zolt, 2015; International Monetary Fund, 2019).

Overall, the pattern of tax revenue collection in Luang Prabang Province between 2017 and 2024 reflects periods of both expansion and contraction. These fluctuations underline the importance of identifying the underlying factors that influence tax revenue performance. Understanding these determinants is essential for strengthening provincial fiscal management and ensuring sustainable revenue mobilization in the future. The primary objective of this study is to examine the factors influencing tax revenue collection in Luang Prabang Province. Specifically, the study

analyzes the impact of key economic variables particularly exports and imports on provincial tax revenue performance over the period 2011–2024.

The study has three main objectives were: 1) to analyze the short-run effects of exports and imports on tax revenue, 2) to examine the long-run relationship between trade variables and tax revenue, and 3) to assess the speed of adjustment toward long-run equilibrium following short-term economic shocks. To achieve these objectives, the study employs econometric techniques, including unit root tests, cointegration analysis, and an error correction model (ECM).

2. Materials and Methods

2.1 Data Collection

This study employs quantitative time-series data obtained from official government sources. Provincial tax revenue data (TAX) for Luang Prabang Province were collected from the Tax Department under the Luang Prabang Provincial Finance Department. Data on export (EXP) and import (IMP) values were sourced from the Provincial Department of Industry and Commerce, which is responsible for compiling and reporting trade statistics at the provincial level (Ministry of Industry and Commerce, 2023).

The dataset covers the period from 2011 to 2024 and was compiled to examine the relationship between trade-related economic activities and tax revenue performance in Luang Prabang Province.

2.2 Methods of Analysis

To analyze the factors influencing tax revenue collection, this study applies standard econometric techniques commonly used in time-series analysis. The analytical framework consists of three main approaches: (1) Ordinary Least Squares (OLS) regression analysis, (2) long-run relationship analysis using cointegration techniques, and (3) short-run dynamic analysis using Vector Autoregression (VAR) or Vector Error Correction Models (VECM), depending on the stationarity properties of the data.

First, OLS regression is used to examine the direct relationship between tax revenue and key economic variables, particularly exports and imports. This method provides initial insights into the magnitude and direction of the effects of independent variables on tax revenue (Gujarati & Porter, 2009).

Second, unit root tests are conducted to determine the stationarity of the variables. Variables that are non-stationary at levels but stationary after differencing are further analyzed using the Johansen cointegration approach to identify long-run equilibrium relationships among tax revenue, exports, and imports (Johansen & Juselius, 1990). The appropriate lag length is selected based on the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC), which are widely used to ensure model efficiency and parsimony (Akaike, 1970; Ivanov & Kilian, 2005).

When cointegration is confirmed, a Vector Error Correction Model (VECM) is employed to estimate both long-run relationships and short-run adjustments toward equilibrium. The VECM framework allows for the inclusion of deterministic components such as constants and trends, depending on the characteristics of the data (Johansen, 1995).

In cases where no cointegration relationship is detected, a Vector Autoregression (VAR) model is applied to analyze short-run dynamic interactions among tax revenue, exports, and imports. VAR models are widely used to capture the interdependence among macroeconomic variables without imposing strong theoretical restrictions.

Overall, this methodological approach enables a comprehensive assessment of both short-run and long-run effects of trade-related economic activities on tax revenue collection in Luang Prabang Province.

3. Results

This section presents the empirical findings according to the study's three research objectives. The results are organized to clearly reflect the short-run effects, long-run relationships, and dynamic adjustments between trade variables (exports and imports) and tax revenue in Luang Prabang Province.

3.1 Short-Run Effects of Exports and Imports on Tax Revenue

To examine the short-run effects of exports and imports on tax revenue, Ordinary Least Squares (OLS) regression was employed.

The results show that the overall model has a strong explanatory power, with an adjusted R^2 of 0.88, indicating that exports and imports jointly explain a large proportion of the variation in tax revenue. The F-statistic is statistically significant, confirming the model's validity, while the Durbin–Watson statistic (approximately 2.07) suggests no serious autocorrelation problem.

At the variable level, imports have a positive and statistically significant effect on tax revenue at the 10% significance level. This finding indicates that increases in imports are associated with higher tax revenue in the short run, reflecting the importance of import-related taxes such as customs duties and value-added tax. In contrast, exports do not show a statistically significant short-run effect on tax revenue, suggesting that export activities do not immediately contribute to provincial revenue collection.

3.2 Long-Run Relationship between Trade and Tax Revenue

To investigate the long-run relationship among tax revenue, exports, and imports, the Johansen cointegration test was applied.

The results confirm the existence of one cointegrating relationship at the 5% significance level, indicating a stable long-run equilibrium relationship among the variables.

In the long run, exports exhibit a positive and statistically significant relationship with tax

revenue. This suggests that sustained export growth contributes to increased tax revenue through economic expansion, higher income generation, and a broader tax base. Conversely, imports show a negative and statistically significant relationship with tax revenue in the long run, implying that increases in imports may reduce net tax revenue over time.

3.3 Short-Run Dynamic Adjustment toward Long-Run Equilibrium

To assess the speed of adjustment toward long-run equilibrium, a Vector Error Correction Model (VECM) was estimated.

The results indicate that when tax revenue is specified as the dependent variable, the error correction term is negative but statistically insignificant, suggesting no strong short-run adjustment toward long-run equilibrium. This implies that short-term fluctuations in exports and imports do not immediately influence tax revenue.

When exports are treated as the dependent variable, the error correction term is statistically significant but has an incorrect positive sign, indicating the absence of a meaningful adjustment mechanism.

In contrast, when imports are specified as the dependent variable, the error correction term is negative and statistically significant, confirming the presence of short-run adjustment. This finding suggests that past changes in tax revenue negatively affect current import levels, and that imports adjust gradually toward long-run equilibrium. However, the speed of adjustment is relatively slow.

3.4 The Relationship between Trade and Tax Revenue in Luang Prabang Province

Overall, the results demonstrate that trade variables influence tax revenue differently across time horizons. Imports play a more important role in short-term revenue generation, while exports are a key driver of long-term tax revenue growth. In addition, the limited short-run adjustment in tax revenue suggests the presence of structural constraints in fiscal responsiveness, whereas imports show a gradual adjustment to economic changes (Table 2).

4. Discussion

This study provides important insights into the relationship between trade activities and tax revenue in Luang Prabang Province, with implications for fiscal and trade policy in Lao PDR. The discussion is structured according to the three research objectives, covering short-run effects, long-run relationships, and dynamic adjustment mechanisms.

4.1 Short-Run Effects of Trade on Tax Revenue

The empirical results show that imports have a positive and statistically significant effect on tax revenue in the short run, whereas exports do not exhibit a significant short-run impact. This finding reflects the current structure of the Lao tax system, which relies heavily on import-related taxes, particularly customs duties and value-added tax collected at border points (International Monetary Fund, 2019).

In the context of Luang Prabang Province, where domestic production capacity and formal

sector activities remain relatively limited, import taxation represents a practical and efficient source of immediate revenue. Border taxes are generally easier to administer and enforce, allowing provincial authorities to collect revenue more consistently in the short term. This result is consistent with previous empirical studies in Lao PDR, which emphasize the importance of effective tax administration and taxpayer compliance in enhancing revenue performance (Phounnaly et al., 2025; Singthalanon et al., 2023).

However, the absence of a significant short-run effect of exports suggests that export activities do not directly contribute to tax revenue in the immediate term. This can be explained by the prevalence of export tax exemptions and incentive policies designed to promote international competitiveness, which reduce the direct fiscal contribution of export sectors.

4.2 Long-Run Relationship between Trade and Tax Revenue

In the long run, the findings indicate that exports have a positive and significant relationship with tax revenue, while imports exhibit a negative relationship. These results highlight the differing roles of trade components in shaping fiscal sustainability over time.

The positive long-run impact of exports suggests that export-led growth contributes indirectly to tax revenue through broader economic expansion. Increased exports

stimulate production, employment, and income generation, which in turn expand the domestic tax base through income taxes, corporate taxes, and consumption taxes. This finding is consistent with national development strategies of Lao PDR, which prioritize export promotion in sectors such as agriculture, hydropower, manufacturing, and tourism services (Government of Lao PDR, 2021). It also aligns with empirical evidence emphasizing the role of economic diversification and private sector development in strengthening long-term revenue capacity (Phounnaly et al., 2025; Singthalanon et al., 2023).

In contrast, the negative long-run relationship between imports and tax revenue suggests potential structural vulnerabilities. While imports generate revenue in the short term, their long-term contribution may decline due to tariff reductions under regional trade agreements, tax exemptions on essential goods, and increasing dependence on imported consumption. These factors may gradually erode the domestic tax base if not offset by stronger internal revenue mobilization (Asian Development Bank [ADB], 2021; Tanzi & Zee, 2001). Evidence from provincial-level studies further highlights that institutional capacity and tax management efficiency are critical in maintaining stable revenue amid such policy changes (Latthanaphoubai et al., 2025).

4.3 Short-Run Dynamic Adjustment toward Long-Run Equilibrium

The dynamic analysis reveals limited short-run adjustment toward long-run equilibrium, particularly for tax revenue and exports. The error correction mechanism is weak or statistically insignificant in these cases, indicating that short-term deviations are not quickly corrected.

This finding suggests the presence of structural rigidities in fiscal administration at the provincial level. Delays in tax assessment, compliance enforcement, and reporting systems may constrain the ability of tax revenue to respond promptly to changes in economic conditions. Similar challenges have been identified in previous studies, which emphasize the importance of strengthening tax administration systems and improving taxpayer compliance through digitalization and institutional reforms (Bird & Zolt, 2015; International Monetary Fund, 2019).

In contrast, imports exhibit a statistically significant short-run adjustment, indicating that trade flows are more responsive to fiscal and economic shocks than tax revenue itself. The negative relationship between past tax revenue and current imports suggests that fiscal conditions can influence import behavior, although the speed of adjustment remains relatively slow. Empirical evidence from Lao PDR supports the need for enhanced electronic tax systems and banking-based payment

mechanisms to improve responsiveness and efficiency in revenue collection (Latthanaphoubai et al., 2025; Singthalanon et al., 2023).

4.4 Policy Implications

The findings of this study suggest that achieving fiscal sustainability in Luang Prabang Province requires a balanced approach to trade and taxation.

First, while import-related taxes remain an important source of short-term revenue, over-reliance on this mechanism may increase vulnerability to external shocks and trade policy changes. Therefore, diversifying revenue sources is essential.

Second, promoting export-led growth should be a central strategy for long-term fiscal sustainability. Strengthening linkages between export sectors and the domestic economy can enhance the indirect contribution of exports to tax revenue.

Third, improving tax administration capacity is critical. Measures such as enhancing taxpayer compliance, expanding digital tax systems, and strengthening coordination between tax and customs authorities can improve revenue efficiency and responsiveness (Bird & Zolt, 2015; International Monetary Fund, 2019).

Finally, policy reforms should focus on rationalizing tax incentives, reducing informality, and strengthening domestic production capacity to ensure that economic

growth translates into sustainable tax revenue. The development of digital tax platforms, such as TaxRIS and electronic payment systems, is particularly important for improving tax collection efficiency at the provincial level (Phounnaly et al., 2025; Latthanaphoubai et al., 2025).

5. Conclusion

This study examined the effects of exports and imports on tax revenue in Luang Prabang Province, Lao PDR, focusing on short-run impacts, long-run relationships, and dynamic adjustment mechanisms.

First, the results show that imports have a positive and significant effect on tax revenue in the short run, while exports do not have a significant short-term impact. This indicates that tax revenue in the province is more immediately influenced by import-related activities.

Second, in the long run, exports have a positive and significant relationship with tax revenue, whereas imports show a negative relationship. This suggests that export growth contributes to sustainable revenue expansion over time, while reliance on imports may weaken the long-term tax base.

Third, the dynamic analysis reveals limited short-run adjustment of tax revenue toward long-run equilibrium, while imports exhibit some degree of adjustment. This indicates that tax revenue responds slowly to economic changes, whereas trade flows are more responsive in the short term.

In summary, the findings highlight that imports play an important role in short-term revenue generation, while exports are the key

driver of long-term tax revenue growth. These results imply the need to strengthen export development and improve the domestic tax system to ensure sustainable fiscal performance in Luang Prabang Province.

6. Conflict of Interest

The authors declare that they have no known competing financial or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1: Results of the Analysis Using the Ordinary Least Squares Method

Dependent Variable: ln(TAX)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-25.88314	12.18924	-2.123443	0.1238
ln(EXP)	0.144183	0.078817	1.829339	0.1648
ln(IMP)	11.71565	4.593420	2.550528	0.0839
R-squared	0.941068			
Adjusted R-squared	0.882136			
F-statistic	15.96868	Durbin-Watson stat		2.070564
Prob(F-statistic)	0.023853			

Note: ("ns" : No significant t, "*" : $\alpha = 0.1$, "**" : $\alpha = 0.05$, "***" : $\alpha = 0.01$).

Table 2: The Relationship between Trade and Tax Revenue in Luang Prabang Province

Objectives	Variable	Effect on Tax Revenue	Key Finding
Short run effects	Imports (IMP)	Positive and significant	Imports increase tax revenue in the short run
Short run effects	Exports (EXP)	Not significant	No immediate impact on tax revenue
Long run relationship	Exports (EXP)	Positive and significant	Exports drive long-term tax revenue growth
Long run relationship	Imports (IMP)	Negative and significant	Imports reduce tax revenue in the long run
Dynamic adjustment	Tax revenue	No adjustment	No short-run equilibrium adjustment
Dynamic adjustment	Imports	Adjustment exists	Imports respond to past tax revenue changes