

The Impact of Least Developed Countries (LDCs) Graduation on Economy: Evidence from Lao PDR

Phouphet Kyophilavong

National University of Laos, Laos
Email: p.kyophilavong@nuol.edu.la

Konesawang Nghardsaysone

World Bank, Laos
Email: knghardsaysone@worldbank.org

Phongsili Soukchalern

National University of Laos, Laos
Email: phong.soukchalern@gmail.com

Inpaeng Sayvaya

Champasack University, Laos
Email: inpaengsayvaya@gmail.com

(April 2026)

Abstract

The graduation of Least Developed Countries (LDCs) is a crucial goal of the Lao development agenda. Lao PDR (Laos) is an LDC and aims to graduate from LDC in 2026. There are a few studies on this topic that use a CGE model in Laos. The objective of this paper is to investigate the impact of LDC graduation on the Lao economy using the Dynamic GTAP model (GTAP-Dyn). The GTAP database (version 11c) is used for this study. The simulation period is from 2027 to 2035. We divided the assessment into two main parts: baseline and policy scenarios. We simulate five Policy Scenarios: (1) Tariff Policy Shock; (2) Productivity Shock; (3) Foreign Direct Investment (FDI) Shock; (4) Official Development Assistance (ODA) Shock; (5) combine 1 to 4 simulations (the total impact of LDC graduation). The simulation of results showed that LDC graduation has a negative impact on the Lao economy. GDP, welfare, industrial output, exports, imports, and household income. Therefore, it is crucial for the Lao government to strengthen institutional capacity, pursue domestic reforms, diversify, promote trade and FDI, improve trade facilitation, reduce domestic NTMs, and promote bilateral FTAs to mitigate the negative impact of LDC graduation.

Key words: LDC graduation; Dynamic GTAP model; Impact; Laos
JEL code: F14; C68; D58

1. Introduction

Lao People's Democratic Republic (Laos) has been categorized as a Least Developed Country (LDC) since 1971. The LDC graduation framework, overseen by the UN's Committee for Development Policy (CDP), assesses countries based on three criteria: Gross National Income (GNI) per capita, the Human Assets Index (HAI), and the Economic Vulnerability Index (EVI). To graduate, a country must meet at least two of these criteria in two consecutive reviews, after which a preparatory period is granted. Laos has long targeted graduation through its national strategies, notably Vision 2020 and the National Socio-Economic Development Plans (NSEDPs), seeing graduation as both a developmental milestone and a shift away from reliance on special international support measures like trade preferences and concessional finance (MPI, 2016; 2021).

Laos was found eligible for graduation for the first time in 2018, meeting the GNI and HAI thresholds but not the EVI. By 2021, it had met all three criteria, and in response, the UN General Assembly granted a five-year preparatory period (instead of the usual three), citing external vulnerabilities such as the COVID-19 pandemic. As of the 2024 review, Lao's indicators remained above the thresholds, with a GNI per capita of approximately US\$2,503, HAI at 74.8, and EVI reduced to 29.8. To manage the transition, the government has introduced a "Smooth Transition Strategy" aiming for graduation by 2026 and outlining policies for post-graduation resilience (MOFA, 2021).

Graduation presents both opportunities and risks (Bekkers & Cariola, 2025; Rahman, & Strutt, 2024). On the positive side, it improve the nation image, enhance confidence investor confidence and integrate the country more deeply into regional and global economies¹ (Bekkers & Cariola, 2025; Rahman, & Strutt, 2024; Rahman & Bari, 2018). Moreover, since Lao's exports are not highly dependent on LDC-specific trade preferences, some studies suggest the loss of those preferences may have limited negative impact (Hayakawa, 2024). However, graduation also entails the phasing out of critical international support mechanisms. Lao remains structurally vulnerable: it is landlocked, heavily reliant on resource-based sectors like mining and hydropower, and exposed to global shocks such as climate risks, inflation, and commodity price swings (Kyophilavong, 2016 Insisienmay et al., 2015). Strengthening institutions, economic diversification, and inclusive development are therefore critical challenges².

Several empirical studies have evaluated Lao's readiness and potential implications of LDC graduation (Rahman & Strutt, 2024; Bekkers & Cariola, 2025). UNDP (2024) and ITC (2023) have also produced reports on trade, sectoral vulnerabilities, and post-graduation scenarios, though many suggest that graduation will only be successful if tied to long-term structural transformation (UNDP, 2024)

Despite growing literature, key research gaps remain in assessing social and economic impacts of Laos' LDC graduation. There is limited analysis of how graduation will affect areas such as official development assistance, debt sustainability, foreign investment, and

¹ The benefits of LDC graduation for Laos were studied in a descriptive discussion by several authors (Songvilay, 2024; Wongpit, 2023; Punya, 2024).

² To deal with these challenges, the government of Laos issued the Lao PDR Smooth Transition Strategy for LDC Graduation (MOFA, 2021).

poverty outcomes³. Until now, there is no comprehensive study use CGE model to assess the national-wide impact of the LDC graduation in Laos. ITC (2023) used a partial equilibrium model to assess the trade impact of tariff changes in Laos, which ignored the impact of reduced foreign direct investment and foreign aid, and the model did not capture the nationwide economic impact of LDC graduation. Therefore, it is crucial to study the impact of LDC graduation use the CGE model to understand its impact.

This study aims to analyze the economic impacts of LDC graduation. This study also deepens the assessment of the impact of access to trade preferences, foreign direct investment, concessional finance, and international support mechanisms post-graduation using the dynamic GTAP model. This work has two contributions. First, it is the inaugural study of the Dynamic GTAP model to examine the effects of LDC graduation in Laos. This policy scenario involves not only the tariff shock but also productivity shock, FDI shock, and ODA shock, thereby enriching the literature⁴; (2) The findings provide essential insights for Lao policymakers in formulating strategies and policies to address LDC graduation, as well as for policymakers in other ASEAN LDCs.

2. Literature on LDC graduation impact

The graduation of countries from the Least Developed Country (LDC) category signifies an important development milestone but also entails the loss of preferential market access and other international support measures. This transition has prompted increasing use of Computable General Equilibrium (CGE) models, particularly those based on the Global Trade Analysis Project (GTAP) framework, to evaluate the economic impacts of graduation. A growing body of literature assesses these effects for countries like Bangladesh, Cambodia, and other LDCs, with key studies providing insights into the consequences of losing preferences and potential mitigation strategies.

Several studies on the impact of LDC graduation have used CGE models. Rahman & Strutt (2022) provide a foundational quantitative analysis of Bangladesh's LDC graduation. Using the GTAP model, their study projects negative macroeconomic outcomes, including a decline in GDP, economic welfare, and exports. The most severe impacts are concentrated in Bangladesh's Ready-Made Garments (RMG) sector, which faces a sharp drop in export volumes due to the imposition of Most-Favored-Nation (MFN) tariffs in key markets like the EU. The resulting economic contraction ripples through the economy, affecting labor demand and reducing intermediate input usage, highlighting Bangladesh's vulnerability to the loss of preferential market access.

The UNDP (2024) study on Cambodia mirrors these findings, confirming that LDC graduation has similar negative effects on export performance and economic growth. Cambodia's reliance on preferential access for its garment and footwear exports makes these sectors particularly vulnerable. The study forecasts a slowdown in GDP growth and significant sectoral contraction as the loss of preferences raises the cost of Cambodian goods

³ There are some scholars who analyze the impact of LDC graduation on Laos, but their analyses are descriptive and lack a quantitative approach (Songvilay, 2024; Punya, 2024; Wongpit, 2023).

⁴ Rahman & Strutt (2024) and Bekkers & Cariola (2025) mainly focused on the impact of the tariff change from LDC graduation, without considering its effects through the finance and productivity perspectives.

in major markets, leading to factory closures and reduced production. This study further underscores the structural vulnerability of LDCs that depend heavily on tariff preferences for a narrow range of exports.

Raihan et al. (2024) extend the analysis by exploring potential mitigation strategies through trade agreements. They model several scenarios for Bangladesh, including LDC graduation alone and graduation combined with membership in the Regional Comprehensive Economic Partnership (RCEP) or the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Their findings suggest that while these trade agreements can partially offset the negative impacts of graduation by opening new markets in Asia and the Pacific, they do not fully replace the lost preferences. This study highlights the importance of proactive trade diplomacy and regional integration to cushion the blow of graduation. Finally, Bekkers & Cariola (2025) offer a broader, cross-country perspective, providing a generalized assessment of LDC graduation's impact on trade. Their study reveals that, on average, graduation leads to a 5% to 12% reduction in aggregate exports across affected countries. The severity of the impact is determined by factors such as preference utilization rates, the structure of exports, and the tariff margins that will be applied post-graduation. This research provides a predictive framework for policymakers in LDCs to assess their vulnerability and prepare for the economic challenges associated with graduation, emphasizing the importance of strategic trade planning.

The impending graduation of Laos from Least Developed Country (LDC) status has spurred significant research, revealing divergent perspectives on its potential impacts. This review synthesizes four key studies, highlighting a methodological divide between quantitative simulations and qualitative analyses, which offer distinct views on the challenges and opportunities arising from the transition.

There are some studies on the LDC graduation in Laos. However, most of the studies focus on the benefits and the costs of LDC graduation in descriptive analysis. Songvilay (2024) provides a comprehensive, policy-oriented analysis, detailing the potential impacts of LDC graduation and outlining the Lao government's Smooth Transition Strategy (STS). The study identifies several risks, including the erosion of preferential market access, a decline in Foreign Direct Investment (FDI), and reduced access to concessional financing. It emphasizes the challenges posed by Laos's narrow export base and limited institutional capacity, recommending economic diversification, export promotion, and human capital development as key strategies for mitigating negative effects.

Wongpit (2023) and Punya (2024) echo many of Songvilay's concerns, focusing specifically on trade vulnerabilities and structural economic weaknesses. Wongpit identifies sectors such as garments and handicrafts as highly vulnerable to preference erosion, while resource-based exports like electricity and mining are seen as more insulated. Punya expands on these points, emphasizing that the impact of graduation will largely depend on Laos's ability to implement deep structural reforms, suggesting that graduation could either expose weaknesses or catalyze necessary reforms for long-term growth.

In contrast, Hayakawa (2024) employs a quantitative approach using the Geographical Simulation Model (IDE-GSM) to analyze Laos's graduation. The model's findings suggest minimal macroeconomic impact, particularly on GDP, due to the structure of Lao exports, which are largely preference-independent (e.g., electricity and minerals). The model also points out that the margin of preference for other goods is small and that Laos may find

alternative markets or face only modest demand reductions, challenging the narrative of severe economic shock proposed by descriptive studies.

The literature presents a clear dichotomy: descriptive studies (Songvilay, Wongpit, Punya) emphasize systemic vulnerabilities and long-term risks, while Hayakawa's quantitative model suggests minimal immediate impact. These perspectives are not contradictory but focus on different aspects of the graduation process. Hayakawa's model captures short-term effects, while the descriptive analyses highlight the second-order, long-term consequences of graduation, such as reduced investment and fiscal capacity. In conclusion, while the quantitative model may downplay the immediate macroeconomic shock, the descriptive studies underscore the need for proactive policy responses to address the deeper structural challenges that Laos faces post-graduation.

3. Laos' Trade Structure and tariffs

3.1. Laos' Trade Structure

Laos's trade structure is characterized by significant export and import flows across multiple sectors, with varying degrees of dependence on different countries (Table 3-1). Laos' exports are heavily reliant on manufacturing, with the largest share of exports coming from heavy manufacturing (particularly metals and machinery), which constitutes a significant portion of exports to China, Thailand, and Vietnam. Grains and crops are also notable exports, especially to Thailand, while processed food is a key export to markets like Thailand and China. The textile and apparel sector, though smaller in comparison, contributes meaningfully to exports to China and other countries like the US and Japan. Laos also exports some light manufacturing goods, primarily to Thailand, Vietnam, and other regional neighbors. The extraction sector is another contributor, particularly in exports to China and Thailand. The overall export profile shows Laos' heavy dependence on neighboring countries, with China being the largest trading partner.

Laos' imports are dominated by heavy manufacturing goods, especially from China, Thailand, and Vietnam, including machinery and electronic products. The country also imports substantial amounts of grains and crops, primarily from Thailand and China, reflecting the demand for food and agricultural products. Light manufacturing imports, particularly from China and Japan, are significant, covering a range of consumer goods. The extraction sector, while contributing to imports, primarily comes from China and Vietnam. Processed food is another key import sector, with significant contributions from Thailand and Vietnam. Additionally, Laos imports textiles and apparel from countries like China, the US, and Vietnam. The import profile indicates a reliance on neighboring countries for industrial products, food, and consumer goods, with China being the largest supplier.

The overall trade structure highlights Laos's dependency on its regional neighbors, especially China, Thailand, and Vietnam, both for exports and imports. The imbalance between imports and exports—particularly in heavy manufacturing—reflects Laos's need for foreign goods to fuel its industrialization. As Laos prepares for graduation from LDC status, these trade patterns underscore the need for a diversified export base and improved trade facilitation infrastructure to reduce dependency on a limited range of products and markets.

Table 3-1. Export and import of Laos by countries by sector

Export																
Sector	China	Thailand	Vietnam	US	Japan	Australia	Singapore	Korea	Switzerland	Canada	Malaysia	UK	India	Philippines	Hong Kong	Indonesia
Extraction	6.72	21.35	3.32	0.04	0.07	22.42	0.64	0.37	-	0.00	0.46	-	-	0.02	1.13	8.24
GrainsCrops	19.83	39.07	13.88	2.59	0.25	0.09	0.15	0.00	-	0.00	0.00	-	0.27	-	0.00	-
HeavyMnfc	1,476.94	1,917.30	161.75	30.77	41.30	48.51	46.53	24.96	41.98	2.16	18.82	1.92	9.48	1.32	7.02	5.07
LightMnfc	463.96	354.46	74.25	158.87	93.97	6.79	3.40	40.59	5.56	26.29	2.31	6.76	8.78	0.25	3.79	6.35
MeatLstk	6.53	50.73	6.78	0.26	0.00	0.62	4.06	0.00	-	-	-	-	0.32	-	-	-
ProcFood	47.61	527.19	42.61	11.34	0.77	1.91	20.25	1.82	0.02	0.03	0.63	8.64	5.77	0.07	0.02	4.34
TextWapp	85.35	37.59	14.70	0.22	13.08	0.35	2.86	4.36	0.00	0.00	5.78	0.40	0.64	0.00	4.50	1.60
Util_Cons	2.24	0.43	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2,109.17	2,948.12	317.29	204.08	149.44	80.70	77.88	72.09	47.56	28.48	28.01	17.72	25.26	1.66	16.46	25.60

Import																
Sector	China	Thailand	Vietnam	US	Japan	Australia	Singapore	Korea	Switzerland	Canada	Malaysia	UK	India	Philippines	Hong Kong	Indonesia
Extraction	706.71	10.19	410.88	10.16	-	-	-	0.01	-	-	-	-	0.08	-	0.01	-
GrainsCrops	244.22	314.09	137.37	0.63	8.69	0.30	0.03	0.02	-	0.02	0.12	0.02	0.23	-	-	-
HeavyMnfc	596.27	374.66	153.98	17.29	36.61	342.68	84.98	11.43	58.76	1.52	1.67	0.34	81.91	28.52	68.55	0.35
LightMnfc	683.15	20.38	16.54	36.63	36.55	3.33	0.02	1.49	0.14	2.66	0.10	16.90	0.71	0.48	0.78	0.04
MeatLstk	2.73	4.25	32.50	-	-	-	-	-	-	-	-	-	-	-	0.75	-
ProcFood	74.76	63.49	447.42	0.46	0.52	0.02	0.31	0.06	-	-	0.09	2.10	-	0.15	2.10	0.43
TextWapp	2.12	2.58	5.38	34.03	15.27	1.05	0.24	0.45	0.02	5.74	0.09	5.70	0.01	0.02	1.21	0.09
Util_Cons	0.20	2.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2,310.17	791.92	1,204.07	99.19	97.64	347.39	85.57	13.47	58.92	9.94	2.07	25.06	82.93	29.16	73.40	0.90

Sources: Author's aggregation into 10 GTAP sectors using tariff database from World Integrated Trade Solution (WITS).

3.2. Average applied import tariff rate on Laos's products by destination in 2023

In 2023, Laos's exports face trading partners' import tariff structure with significant variability across sectors and destinations. Grains and crops faced the highest tariff rates from China (10.20%) and the EU (22.50%), while imports from neighboring ASEAN countries, like Thailand and Vietnam, had minimal tariffs (0.00%-0.29%). Similarly, livestock and meat products were subject to minimal tariffs from most countries, except for the US (0.59%). Mineral exports also experienced low tariffs across the board, with only slight variations from countries like the US (0.33%). Processed food products had diverse tariff rates, with the EU imposing the highest rate (38.71%) and countries like Thailand and Vietnam applying near-zero tariffs (Table 3-2).

In manufacturing sectors, Lao exports benefited from low import tariffs on textiles, light, and heavy manufacturing, particularly from ASEAN countries. However, significant differences emerged, with the US imposing a higher tariff on textiles (9.80%) and on light manufacturing products (3.19%). Some countries, like Switzerland and Australia, applied moderate tariffs on processed food and manufactured goods. Overall, Laos' exports face relatively low barriers in regional trade, especially within ASEAN, while facing selective higher tariffs for certain sectors like agriculture and processed foods from non-ASEAN markets.

Table 3-2. Average applied import tariff rate on Laos's products by destination in 2023

New Sector	China	Thailand	Vietnam	US	Japan	Australia	Singapore	Korea	Switzerland	Canada	Malaysia	UK	India	Philippines	Hongkong	Indonesia	EU
Grains and Crops	10.20	0.29	0.21	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	22.50	0.00	0.00	0.00	0.00
Livestock and Meat Products	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining and Extraction	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Processed Food	6.19	0.00	0.56	0.00	0.00	0.00	0.00	10.00	0.00	0.00	1.00	0.00	5.84	0.00	0.00	38.71	0.00
Textiles and Clothing	0.00	0.00	0.00	9.80	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	1.11	0.00	0.00	0.00	0.00
Light Manufacturing	0.63	0.00	0.00	3.19	0.67	0.00	0.00	0.02	0.00	0.00	8.10	0.00	0.25	0.00	0.00	0.00	0.00
Heavy Manufacturing	0.21	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00	0.00	7.23	0.00	1.96	0.00	0.00	0.00	0.00
Utilities and Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Communication	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sources: Author's aggregation into 10 GTAP sectors using tariff database from World Integrated Trade Solution (WITS).

3.3. Average MFN tariff rate on Laos's products by destination in 2023

In 2023, Laos's most favored nation (MFN) tariff rates on exports revealed varying levels of protection across different sectors and destination countries (Table 3-3). For agricultural exports such as grains and crops, tariffs were notably high in markets like Thailand (29.15%) and the EU (57.50%), signaling strong protectionism in these regions. Other agricultural products, such as livestock and meat, faced moderate tariffs in several countries, including Vietnam (5.50%) and India (3.37%), but were tariff-free in markets like the US and Singapore. Mining and extraction goods, which are a key export for Laos, also experienced relatively low MFN tariff rates, with China and Vietnam imposing moderate rates (3.42% and 4.49%, respectively), while countries like Australia, Canada, and Singapore applied no tariffs at all.

Processed food products faced the highest MFN tariffs across most destinations, particularly in Thailand (36.77%), Vietnam (39.61%), and the EU (42.74%). This contrasts with low or zero tariffs in the US, Singapore, and Australia. Similarly, textiles and clothing products experienced a wide range of tariffs, with some countries like the EU (23.50%) and Thailand (21.15%) applying significant tariffs, while others like Singapore (0%) and Hong Kong (0%) provided more favorable access. Light manufacturing products had more uniform but still notable tariff rates, with countries like the US and Vietnam applying tariffs of 3.19% and 14.14%, respectively, while Singapore imposed no tariffs.

The heavy manufacturing sector saw relatively low MFN tariffs, with some markets, such as Japan (0.13%) and the US (1.65%), offering more favorable rates, while others, like India (10.95%) and Canada (7.23%), applied moderate tariffs. Utilities and construction, as well as transport and communication, were largely tariff-free across most destinations. Overall, Laos faces a complex tariff landscape for its exports, with significant variations depending on the sector and destination, highlighting the challenges of accessing certain international markets due to tariff barriers, especially for processed foods and textiles.

Table 3-3. Average MFN tariff rate on Laos's products by destination in 2023

New Sector	China	Thailand	Vietnam	US	Japan	Australia	Singapore	Korea	Switzerland	Canada	Malaysia	UK	India	Philippines	Hongkong	Indonesia	EU
Grains and Crops	20.73	29.15	18.84	0.00	4.03	0.00	0.00	9.52	0.00	0.92	0.00	3.60	57.50	40.00	0.00	2.50	4.59
Livestock and Meat Products	10.00	10.00	5.50	0.59	10.50	0.00	0.00	8.00	0.00	0.00	0.00	5.91	0.00	0.00	0.00	0.00	3.37
Mining and Extraction	3.42	8.72	4.49	0.33	4.25	0.00	0.00	1.30	0.00	0.00	0.00	0.00	7.75	0.00	0.00	5.00	0.00
Processed Food	22.95	36.77	39.61	0.00	8.70	2.25	0.00	22.98	0.00	10.25	1.00	7.67	32.75	5.00	0.00	42.74	3.98
Textiles and Clothing	7.37	21.15	15.69	9.80	7.10	2.35	0.00	11.13	0.00	12.01	4.24	9.76	20.00	15.00	0.00	23.50	9.61
Light Manufacturing	4.62	14.51	14.14	3.19	5.33	3.44	0.00	5.95	0.00	3.67	8.10	3.39	11.03	10.91	0.00	9.65	3.55
Heavy Manufacturing	4.70	5.86	4.62	1.65	0.13	1.74	0.00	4.21	0.00	0.41	7.23	0.85	10.95	1.55	0.00	5.88	2.47
Utilities and Construction	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Communication	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sources: Author's aggregation into 10 GTAP sectors using tariff database from World Integrated Trade Solution (WITS).

4. Methodology and data

4.1. Methodology

We used the dynamic GTAP model for assessing the impact of the LDC graduation on Lao economy⁵. The Global Trade Analysis Project (GTAP) is the foremost implementation of the Armington model in global economic modeling. Developed by a Purdue University consortium, GTAP has become the global standard for quantitative analysis of international trade policies. The model, first documented in *Global Trade Analysis: Modeling and Applications* (Hertel, 1997), uses Armington's principle to simulate trade flows between countries as imperfect substitutes. Key features of GTAP include detailed regional economies, a representative agent for income allocation, a CES production structure, and global closure to ensure consistent trade flows. Subsequent refinements, such as the dynamic framework introduced by Ianchovichina and McDougall (2001), allowed for long-term projections and global capital mobility, enhancing the model's ability to address complex policy issues like trade agreements and climate change. A wide range of scholar use the dynamic GTAP model for trade policy and other things. This model is a multisector, multiregional recursive dynamic CGE model of global trade (Ianchovichina and McDougall, 2001; Ianchovichina and Walmsley, 2012).

The dynamic GTAP model builds upon the static GTAP model by incorporating capital accumulation and capital mobility among nations (Hertel, 1997; McDougall, 2003). It is assumed that perfect competition and constant returns to scale exist within every sector. Capital, skilled, and unskilled labor can transition between sectors; however, land and natural resources are immobile and confined to a specific sector. The Armington assumption claims that products vary according to their origin (Armington, 1969). The transportation sector serves the transport margin, defined as the difference between the onboard freight and the costs associated with insurance and freight for each commodity delivered along a designated route (Ianchovichina and McDougall, 2001; Ianchovichina and Walmsley, 2012).

Every region has a fixed physical capital stock that increases through new investments over time. Net investment supports this dynamic, coming from the savings of regional households. Net investment in a region comprises both domestic and foreign investment (Ianchovichina and McDougall, 2001 and Ianchovichina; Walmsley, 2012).

The global trust functions as a financial intermediary for all international investments. Regional households hold indirect claims to the physical capital stock through two types of equity: equity in domestic firms and equity in foreign firms. Regional households possess direct ownership of domestic equity. They possess foreign equity indirectly by maintaining shares in a portfolio of foreign equities offered by the global trust. The dynamic GTAP model permits short-term interregional variations in rates of return, which are finally equilibrium in the long term (Ianchovichina and McDougall, 2001; Itakura, 2022).

⁵ Studies on LDCs, such as those on Bangladesh and Lao PDR, rely on GTAP to simulate the impact of preference erosion, trace economy-wide linkages, and evaluate alternative policy scenarios. GTAP's dynamic model also provides year-by-year projections, offering policymakers a roadmap for designing smooth transition strategies in the face of complex economic changes (Rahman & Strutt, 2024).

4.2. Data

In this study, we used the GTAP11c database for implement the dynamic GTAP model, where 2017 is set as a reference year⁶ (Aguiar et al., 2022). We divided the assessment into 2 main parts, including baseline and policy scenarios. For the baseline, we assume an economy to growth as usually without considering LDC graduation. We updated the historical and projected macroeconomic proxies, including real GDP, population, skilled and unskilled labor to 2035. the data is obtained from World Development Indicators (WDI), World Economic Outlook (WEO), and EconMap (CEPII)⁷. In addition, the actual applied rate of import tariff imposed by trading partner for Laos's products and services is also updated to 2023 using database from World Integrated Trade Solution (WITS).

4.3. Simulations

Following the literature (Bekkers & Cariola, 2025; Hayakawa, 2024; Rahman & Strutt, 2024), we conducted the simulation of the impact of LDC graduation on the Lao economy. We divided into two main simulations: (1) Baseline Scenarios, and (2) Policy Scenarios (Table 4-1).

(1) Baseline Scenarios

We updated the baseline from several sources. For the GDP growth (2018-2024), a growth rate of 3.25% is assumed based on World Development Indicators (WDI), and GDP growth (2025-2035) is projected at 7.06% based on CEPII's SSP2 scenario, which represents a middle-of-the-road path. For labor growth (2018-2024), it is expected to grow at an average rate of 3.44%, according to WDI data, and for Labor growth (2025-2035), it is projected to grow at 1.39% annually, according to CEPII's SSP2. For capital growth (2018-2035), a consistent annual rate of 7.25% is assumed, again based on CEPII's SSP2 scenario. Lastly, in the Tariff rates (2018-2023), tariff rates for each year will be applied based on the World Integrated Trade Solution (WITS) data, adjusting for yearly fluctuations.

(2) Policy Scenarios

We simulated five policy scenarios on the impact of LDC graduation on the Lao economy as follows:

PS1: Tariff Policy Shock (2027–2035): This scenario uses the 2023 MFN tariff rates as a baseline to simulate the effects of applied tariffs from 2027 onward. This will be used to assess the impact of unchanged tariffs over the next decade.

PS2: Productivity Shock (2027–2029): A productivity reduction is introduced, with a 1.13% decrease in 2027, followed by smaller reductions in 2028 (0.75%) and 2029 (0.38%). This shock is captured using the *ao* code in the GTAP model to represent aggregate productivity effects.

PS3: FDI Shock (2027–2029): Foreign Direct Investment (FDI) reduction is simulated, with a 5% decrease in 2027, followed by a 0.33% reduction in 2028 and 1.67% reduction in 2029. The *wqht* code is used to track the changes in investment flows.

⁶ The data includes a detailed sectoral breakdown, input-output tables, and harmonized global trade data. This database is crucial for the GTAP model's simulations, especially in areas like LDC graduation.

⁷ The EconMap database contains macroeconomic projections of 170 countries up to 2100. Foure (2016), Fontagné et al. (2013) and Fontagné et al. (2022) proposed a five SSP scenarios, and we applied the SSP2 scenario for the projection, due to its description for middle of the road, which refers to intermediate challenges.

PS4: ODA Shock (2027–2029): Official Development Assistance (ODA) is reduced by 5% in 2027, followed by a 0.33% reduction in 2028 and 1.67% in 2029. The *qcgds* code tracks this change in development finance.

PS5: All (combined all policy shocks)

The final simulation scenario, labeled as “All,” combines all shocks from PS1, PS2, PS3, and PS4, running each of the policy combinations from 2027 to 2029. This will give a comprehensive view of how Laos’s economy responds to the combined effects of tariff policies, productivity reductions, FDI shocks, and ODA reductions. By simulating these different policy shocks and projections, the model will provide insights into the economic impacts of various policy decisions on Laos’s growth, investment, and overall trade performance through 2029.

Table 4-1. Simulation design

Scenarios	Shock year	Description	Units	References
Baseline Scenarios	2018-2024	GDP	3.24 (%)	WDI
	2025-2035	GDP	7.06 (%)	CEPII (SSP2, middle of road)
	2018-2024	Labor	3.43(%)	WDI
	2025-2035	Labor	1.39 (%)	CEPII (SSP2, middle of road)
	2018-2035	Capital	7.25(%)	CEPII (SSP2, middle of road)
	2018-2023	Tariff	each year applied tariff rate	WITS
Policy Scenarios (PS1)	2027- 2035	Tariff	2023 MFN	WITS
Policy Scenarios (PS2)	2027	Shock productivity reduction	-1.13%	Authors and literature
	2028		-0.75%	Authors and literature
	2029		-0.38%	Authors and literature
Policy Scenarios (PS3)	2027	Shock FDI reduction	-5.00%	Authors and literature
	2028	Shock FDI reduction	-0.33%	Authors and literature
	2029	Shock FDI reduction	-1.67%	Authors and literature
Policy Scenarios (PS4)	2027	Shock ODA reduction	-5.00%	Authors and literature
	2028	Shock ODA reduction	-0.33%	Authors and literature
	2029	Shock ODA reduction	-1.67%	Authors and literature
Policy Scenarios (PS5)	2027	PS1 + PS2 + PS3 + PS4	PS1 + PS2 + PS3 + PS4	Authors and literature
	2028		PS1 + PS2 + PS3 + PS4	
	2029		PS1 + PS2 + PS3 + PS4	

Sources: The authors.

5. The results

5.1 Impact on macroeconomic variables.

The table 5-1 provides a comprehensive analysis of the macroeconomic impacts of various policy scenarios on Laos's economy over the period 2027–2035. The key indicators measured include GDP growth, equivalent variation (EV), and trade balance (TB) in million USD. The table presents both the year-on-year percentage changes (Y0Y) for each indicator and the impact of policy scenarios compared to the baseline.

Over the period 2027-2035, the baseline scenario shows consistent growth in GDP, starting at 7.42% in 2027 and gradually declining to 6.57% by 2035. The equivalent variation (EV) steadily increases, reflecting improving welfare, while the trade balance (TB) shows a positive trend, rising from 18.52 million USD in 2027 to 88.41 million USD in 2035.

PS1 – Tariff Shocks:

The tariff policy shock (PS1), which applies the 2023 MFN tariff rates from 2027 onward, has a slightly negative impact on GDP. The growth rate in 2027 is reduced to 7.05%, and the impact gradually worsens, with the GDP growth slowing further by 2035 to 6.33%. The EV in this scenario is lower than the baseline, with a drop in welfare starting from 497.60 million USD in 2027 and continuing to a negative 177.99 million USD by 2035. The trade balance shows a slight improvement due to the impact of tariffs, particularly in the early years, but becomes increasingly negative as the scenario progresses.

PS2 – Productivity Shock:

The productivity shock (PS2) results in a moderate decrease in GDP growth, with the growth rate dropping from 7.42% in 2027 to 6.21% by 2035. EV decreases sharply, with a negative impact from the initial shock (-459.97 million USD in 2027) to -132.48 million USD in 2035. Similarly, the trade balance (TB) is negatively affected, as productivity reductions lead to diminished economic output, reducing exports and increasing trade deficits over time.

PS3 – ODA Shock:

The Official Development Assistance (ODA) reduction shock (PS3) shows a relatively smaller decline in GDP compared to the other scenarios. The GDP growth starts at 7.30% in 2027 and gradually declines to 6.28% by 2035. The equivalent variation (EV) decreases, but at a less severe rate than in PS2, and the trade balance remains relatively stable, with smaller fluctuations compared to the other scenarios. However, by 2035, the impact of the ODA reduction on the overall economy is clearly felt, with EV dropping to -132.48 million USD.

PS4 – FDI Shock & PS5 – All Scenarios Combined:

The FDI reduction shock (PS4) has the most severe and consistent impact on GDP, with the growth rate reducing from 7.42% in 2027 to 6.26% by 2035. The equivalent variation shows a continuous decline, reaching a low of -263.25 million USD by 2035. When all the policy scenarios are combined (PS5), the combined shocks result in a dramatic slowdown in GDP growth, falling from 7.42% in 2027 to 6.26% in 2035. The combined equivalent variation reaches the lowest point at -263.25 million USD by 2035, illustrating the compounded effect of tariff, productivity, FDI, and ODA reductions on Laos's economy. The trade balance in this combined scenario shows consistent negative impacts, especially as the year progresses.

Overall, the combination of multiple shocks (PS5) causes the most significant economic contraction, particularly in terms of GDP growth and welfare (EV), highlighting the

vulnerability of Laos's economy to external shocks, especially reductions in FDI and ODA. The results underscore the importance of external assistance and productive economic policies for maintaining growth and stability in the coming decades. This finding is consistent with previous studies, such as Rahman & Strutt (2024) for Bangladesh.

Table 5-1. Results of the impacts on macroeconomic indicators

Year	Baseline			PS1 – Tariff			PS2 – Productivity			PS3 – ODA			PS4 – FDI			PS5 – All		
	GDP	EV	TB	GDP	EV	TB	GDP	EV	TB	GDP	EV	TB	GDP	EV	TB	GDP	EV	TB
% YOY																		
2027	7.42	1319.72	18.52	7.05	822.12	356.97	5.26	859.75	281.67	7.30	1292.62	433.37	7.42	1319.78	18.47	5.03	404.72	106.70
2028	7.34	1388.83	20.23	7.00	1262.10	75.24	5.63	1023.75	246.58	7.02	1359.98	280.77	7.34	1388.87	20.20	5.64	940.80	174.96
2029	7.28	1461.81	27.82	6.93	1328.49	58.57	6.12	1214.83	173.94	6.86	1432.98	142.08	7.28	1461.84	27.80	6.17	1125.22	75.73
2030	7.23	1542.28	33.81	6.88	1400.05	47.06	6.71	1438.90	65.98	6.80	1515.54	20.51	7.23	1542.30	33.80	6.78	1329.63	90.83
2031	6.78	1584.00	47.73	6.44	1440.50	46.22	6.27	1478.57	53.03	6.38	1555.19	37.41	6.78	1584.02	47.72	6.33	1370.41	61.16
2032	6.69	1654.24	60.37	6.38	1503.17	45.78	6.22	1542.33	43.27	6.33	1622.84	49.50	6.69	1654.25	60.36	6.26	1429.62	39.42
2033	6.67	1744.54	71.04	6.38	1584.26	45.28	6.23	1625.47	35.49	6.33	1710.48	58.59	6.67	1744.55	71.03	6.27	1506.64	22.41
2034	6.62	1830.80	81.18	6.36	1661.73	46.17	6.22	1704.96	30.73	6.31	1794.19	66.82	6.62	1830.82	81.18	6.26	1580.27	10.50
2035	6.57	1919.97	88.41	6.33	1741.98	45.86	6.21	1787.49	26.04	6.28	1880.90	72.17	6.57	1919.98	88.41	6.26	1656.72	0.17
% YOY - Impact																		
2027				-0.37	-497.60	338.45	-2.16	-459.97	263.15	-0.12	-27.10	414.85	0.00	0.06	-0.05	-2.39	-915.00	88.18
2028				-0.34	-126.73	55.01	-1.71	-365.08	226.35	-0.32	-28.85	260.54	0.00	0.04	-0.03	-1.70	-448.03	154.73
2029				-0.35	-133.32	30.75	-1.16	-246.98	146.12	-0.42	-28.83	114.26	0.00	0.03	-0.02	-1.11	-336.59	47.91
2030				-0.35	-142.23	13.25	-0.52	-103.38	32.17	-0.43	-26.74	-13.30	0.00	0.02	-0.01	-0.45	-212.65	57.02
2031				-0.34	-143.50	-1.51	-0.51	-105.43	5.30	-0.40	-28.81	-10.32	0.00	0.02	-0.01	-0.45	-213.59	13.43
2032				-0.31	-151.07	-14.59	-0.47	-111.91	-17.10	-0.36	-31.40	-10.87	0.00	0.01	-0.01	-0.43	-224.62	-20.95
2033				-0.29	-160.28	-25.76	-0.44	-119.07	-35.55	-0.34	-34.06	-12.45	0.00	0.01	-0.01	-0.40	-237.90	-48.63
2034				-0.26	-169.07	-35.01	-0.40	-125.84	-50.45	-0.31	-36.61	-14.36	0.00	0.02	0.00	-0.36	-250.53	-70.68
2035				-0.24	-177.99	-42.55	-0.36	-132.48	-62.37	-0.29	-39.07	-16.24	0.00	0.01	0.00	-0.31	-263.25	-88.24

Source: Authors' simulation from the Dynamic GTAP model.

Notes: GDP is reported in percentage change. Equivalent variation (EV) and trade balance (TB) are reported in million USD.

5.2 Impact on economic outputs across different sectors.

The table 5-2 presents the cumulative impact on output across different sectors in Laos's economy under various policy scenarios. The results are compared against the baseline, with each sector showing how its output is affected by changes in tariffs, productivity, ODA, FDI, and a combination of all these shocks (PS5). The percentage change reflects the cumulative impact by 2035 for each scenario.

Grains and Crops:

The grains and crops sector experiences a relatively minor change across all scenarios, with only a small negative impact from tariff and productivity shocks. The cumulative impact in PS1 (tariff) is -2.84%, while PS2 (productivity) shows a -3.29% reduction in output. The sector is largely stable in response to external factors, with PS3 (ODA) and PS4 (FDI) showing minimal impacts. However, the most significant drop occurs under the combined scenario (PS5), where output falls by 5.92%.

Meat and Livestock:

The meat and livestock sector sees a positive impact under the tariff scenario (PS1), with a 5.91% increase in output. However, productivity shocks (PS2) result in a -5.80% decrease, and the ODA (PS3) and FDI (PS4) shocks do not significantly affect the sector. The combined effects in PS5 lead to a minimal decline of -0.18%, demonstrating that this sector is relatively resilient to most of the shocks.

Manufacturing Sectors (Light and Heavy Manufacturing):

Both light and heavy manufacturing sectors experience substantial reductions in output. The light manufacturing sector sees a sharp decrease of -28.97% in the tariff shock (PS1), while productivity reductions in PS2 contribute to an additional -36.85% drop. Similarly, heavy manufacturing suffers a major decline in PS1 (-64.28%) and a further decrease in PS2 (-58.96%). Combined, the effects in PS5 result in severe reductions, with light manufacturing output falling by -50.61% and heavy manufacturing by -99.23%, highlighting the sector's vulnerability to external policy shocks.

Textiles and Clothing:

The textiles and clothing sector is highly sensitive to tariff changes, showing a significant reduction of -61.93% under PS1. While productivity shocks in PS2 cause a smaller drop of -28.02%, the combined effect of all shocks (PS5) results in an extreme decline of -78.00%. This sector is one of the hardest hit, indicating a high dependency on tariff conditions and external support, such as FDI and ODA.

Other Sectors (Utilities, Transport, and Services):

Utility and construction sectors are less impacted by tariff and productivity changes, with minor reductions in output. The cumulative impact in PS1 is -8.14% for utilities and -25.54% for transport and communication. Similarly, other services see a -10.42% decrease under PS1 and a cumulative -23.15% reduction in PS5. The relatively moderate impact on these sectors suggests that they may be less sensitive to the shocks compared to manufacturing and agriculture, but still face challenges from reduced external support and productivity declines.

The results show that Laos's manufacturing sectors, particularly textiles, light, and heavy manufacturing, are the most vulnerable to tariff, productivity, ODA, and FDI shocks, with severe reductions in output under the combined policy scenario. On the other hand, sectors such as grains and crops, and meat and livestock, exhibit more stability, with only minor to

moderate impacts. The findings highlight the critical need for targeted policy measures to support the most affected sectors while maintaining overall economic stability.

Table 5-2. Results of the impacts on output

Sector	Baseline	PS1 – Tariff	PS2 – Productivity	PS3 – ODA	PS4 – FDI	PS5 – All
% Cumulative						
GrainsCrops	64.16	61.32	60.87	64.00	64.16	58.24
MeatLstk	77.60	83.51	71.80	77.72	77.60	77.42
Extraction	377.54	377.97	368.05	361.71	377.54	383.02
ProcFood	74.23	65.76	64.91	74.27	74.23	57.41
TextWapp	112.84	50.91	84.82	106.75	112.84	34.84
LightMnfc	256.46	227.49	219.61	242.25	256.46	205.85
HeavyMnfc	343.19	278.91	284.23	322.40	343.19	243.96
Util_Cons	210.30	202.16	184.76	191.34	210.30	195.28
TransComm	194.23	195.75	174.17	185.59	194.23	183.95
OthServices	181.50	171.08	163.91	176.94	181.50	158.35
cgds	252.65	219.56	208.40	215.72	252.65	212.05
% Cumulative - Impact						
GrainsCrops		-2.84	-3.29	-0.16	0.00	-5.92
MeatLstk		5.91	-5.80	0.12	0.00	-0.18
Extraction		0.43	-9.49	-15.83	0.00	5.48
ProcFood		-8.47	-9.32	0.04	0.00	-16.82
TextWapp		-61.93	-28.02	-6.09	0.00	-78.00
LightMnfc		-28.97	-36.85	-14.21	0.00	-50.61
HeavyMnfc		-64.28	-58.96	-20.79	0.00	-99.23
Util_Cons		-8.14	-25.54	-18.96	0.00	-15.02
TransComm		1.52	-20.06	-8.64	0.00	-10.28
OthServices		-10.42	-17.59	-4.56	0.00	-23.15
cgds		-33.09	-44.25	-36.93	0.00	-40.60

Source: Authors' simulation from the Dynamic GTAP model.

Notes: The policy scenarios indicate differences compared to the baseline.

5.3. impacts on trade balance by sector

The table 5-3 below provides insights into the cumulative impact on the trade balance by sector under different policy scenarios. For agriculture sectors like *Grains and Crops*, the tariff shock (PS1) results in a substantial worsening of the trade balance, with a decrease of -118.93 million USD, while productivity (PS2) and ODA (PS3) shocks lead to modest improvements. The sector remains vulnerable to tariffs, but other shocks offer some balancing effects. Similarly, the *Meat and Livestock* sector shows improvement in its trade balance under tariff and productivity shocks, with PS1 and PS2 resulting in gains of 105.10 and 38.80 million USD, respectively, although it still maintains a negative balance under all scenarios. On the other hand, the *Textiles and Clothing* sector faces the most significant deterioration, with PS1 leading to a -84.84 million USD drop, and the combined impact in PS5 resulting in a -100.06 million USD change.

The *Manufacturing* sectors exhibit contrasting effects on their trade balances. *Heavy Manufacturing* faces a sharp decline in trade balance, with PS1 causing a -569.98 million USD reduction, while PS4 (FDI) and PS5 (All) scenarios worsen the balance even further. In contrast, the *Light Manufacturing* sector experiences a positive impact on its trade balance,

particularly under PS1 and PS2, where improvements of 163.57 million USD and 293.38 million USD are noted. Similarly, *Extraction* and *Utilities and Construction* sectors show minor to moderate changes, with the *Extraction* sector experiencing a small negative impact under PS2 (-113.89 million USD), but overall, it remains positive across all scenarios. The *Transport and Communication* sector sees an improvement, with PS1 and PS5 driving the trade balance up by 602.25 and 666.99 million USD, respectively, indicating a sector that benefits from reduced tariffs and other shocks.

Table 5-3. Results of the impacts on trade balance by sector

Sector	Baseline	PS1 – Tariff	PS2 – Productivity	PS3 – ODA	PS4 – FDI	PS5 – All
% Cumulative						
GrainsCrops	-17.70	-136.63	13.31	10.21	-17.71	-134.25
MeatLstk	-566.97	-461.87	-528.17	-546.84	-566.98	-446.39
Extraction	4141.97	4093.73	4182.19	4028.08	4141.92	4217.92
ProcFood	-702.45	-735.20	-675.32	-680.77	-702.46	-724.65
TextWapp	13.14	-71.70	-11.83	11.96	13.14	-86.92
LightMnfc	-2183.35	-2019.78	-1889.97	-1895.16	-2183.36	-2008.28
HeavyMnfc	-2376.92	-2946.90	-2269.47	-1873.18	-2376.95	-3275.00
Util_Con	2676.66	2965.68	2537.77	2601.51	2676.65	2893.58
TransComm	-740.48	-138.23	-611.36	-702.59	-740.49	-73.49
OthServices	-20.39	-7.54	-16.01	-17.58	-20.39	-6.24
% Cumulative - Impact						
GrainsCrops		-118.93	31.01	27.91	-0.01	-116.55
MeatLstk		105.10	38.80	20.13	-0.01	120.58
Extraction		-48.24	40.22	-113.89	-0.05	75.95
ProcFood		-32.75	27.13	21.68	-0.01	-22.20
TextWapp		-84.84	-24.97	-1.18	0.00	-100.06
LightMnfc		163.57	293.38	288.19	-0.01	175.07
HeavyMnfc		-569.98	107.45	503.74	-0.03	-898.08
Util_Con		289.02	-138.89	-75.15	-0.01	216.92
TransComm		602.25	129.12	37.89	-0.01	666.99
OthServices		12.85	4.38	2.81	0.00	14.15

Source: Authors' simulation from the Dynamic GTAP model.

Notes: The policy scenarios indicate differences compared to the baseline.

5.4. Impact on households' income

The table 5-4 below shows the year-over-year (YoY) impacts on household income growth under different policy scenarios, with the baseline scenario displaying steady income growth starting at 4.96% in 2027 and gradually declining to 5.55% by 2035. Under the tariff shock scenario (PS1), household income falls significantly by 2.37% in 2027, with a rebound in later years but generally lower income growth compared to the baseline. The productivity improvement scenario (PS2) provides a positive boost, starting with a 2.74% increase in 2027 and maintaining a strong, consistent impact on household income growth over the next few years.

The ODA shock scenario (PS3) has a minor negative effect on household income in 2027, reducing growth by 0.36%, but this impact diminishes in subsequent years, with nearly

neutral effects in 2028-2029. On the other hand, the FDI shock (PS4) shows no significant impact, maintaining a baseline level of growth throughout the period. The combined impact of all policy shocks (PS5) results in a severe reduction in household income in 2027, with a 4.01% decline in YoY growth. Over the years, the combined impact stabilizes, but the overall household income growth remains lower than the baseline scenario, with a small but consistent negative effect between -0.11% and -0.14% annually from 2029 to 2035.

By 2028, the effects of tariffs (PS1) start to moderate, with the YoY income decline reducing to -0.24%, while productivity (PS2) continues to enhance household income growth by 3.14%. However, the combined impact of all shocks (PS5) still results in a noticeable decline in household income, reducing the growth by 1.70%. This trend continues into 2029, where the tariff effect continues to mitigate, but overall, the combined shock results in a 0.94% lower growth rate for household income compared to the baseline.

In 2030, income growth stabilizes across all scenarios, with only minor fluctuations. The tariff shock (PS1) continues to slightly hinder income growth, while the productivity boost (PS2) maintains a moderate positive impact. The combined effect of all shocks (PS5) results in a 0.27% decrease in YoY income growth. By 2031 and beyond, the negative impact of all policy shocks becomes more gradual. Household income growth across all scenarios generally remains close to the baseline, with a marginal impact, ranging from -0.08% to -0.14% from 2031 to 2035.

Overall, while the baseline scenario sees steady growth in household income, the various policy shocks—particularly the tariff and combined shocks—result in noticeable declines in income growth, especially in the early years. The productivity shock, however, provides a positive contribution, partially offsetting some of the negative effects from other policies. Despite the moderating effects in later years, the combined impact of multiple shocks consistently reduces household income growth over the long term.

Table 5-4. Results of the impacts on household's income

Year	Baseline	PS1 – Tariff	PS2 – Productivity	PS3 – ODA	PS4 – FDI	PS5 – All
% YoY						
2027	4.96	-2.37	2.74	4.60	4.96	-4.01
2028	4.70	4.46	3.14	4.50	4.70	3.00
2029	4.93	4.74	4.06	4.83	4.93	3.99
2030	4.97	4.81	4.85	4.96	4.97	4.70
2031	5.56	5.48	5.47	5.54	5.56	5.42
2032	5.55	5.48	5.47	5.52	5.55	5.43
2033	5.57	5.49	5.48	5.53	5.57	5.44
2034	5.56	5.48	5.48	5.52	5.56	5.44
2035	5.55	5.47	5.47	5.51	5.55	5.44
% YoY - Impact						
2027		-7.33	-2.22	-0.36	0.00	-8.97
2028		-0.24	-1.56	-0.20	0.00	-1.70
2029		-0.19	-0.87	-0.10	0.00	-0.94
2030		-0.16	-0.12	-0.01	0.00	-0.27
2031		-0.08	-0.09	-0.02	0.00	-0.14
2032		-0.07	-0.08	-0.03	0.00	-0.12
2033		-0.08	-0.09	-0.04	0.00	-0.13
2034		-0.08	-0.08	-0.04	0.00	-0.12
2035		-0.08	-0.08	-0.04	0.00	-0.11

Source: Authors' simulation from the Dynamic GTAP model.

Notes: The policy scenarios indicate differences compared to the baseline.

5.5. impacts on demand for factors endowment

The table 5-5 presents the cumulative impacts of various policy scenarios (PS1–PS5) on the demand for factors of production (land, labor, and capital) across different sectors. Under the baseline scenario, land demand in the GrainsCrops sector grows moderately by 0.18%, while labor and capital demands increase significantly, at 18.25% and 100.09%, respectively. However, the tariff shock (PS1) reduces land demand by -0.30%, labor demand by 15.16%, and capital demand by 91.77%. Conversely, the productivity shock (PS2) leads to slight increases in land (0.28%) and labor (19.11%) demand, while capital demand remains relatively stable at 98.04%. These trends highlight the varying impacts of policy changes on factor demands across sectors.

In the MeatLstk sector, the tariff shock (PS1) has a positive impact on labor and capital demand, with a 2.74% increase in labor demand and a slight rise in capital demand (149.96%). However, the productivity scenario (PS2) shows a slight decrease in land demand (-2.64%) but stabilizes labor and capital demand. The combined impact (PS5) results in increased demand for labor (33.99%) and capital (146.82%), while land demand declines by -1.69%. The Extraction sector remains largely unaffected by the policy scenarios, showing consistent demand for all factors, particularly land (137.32%), labor (211.87%), and capital (399.32%) under most scenarios. The FDI shock (PS4) increases land demand slightly by 0.77%, labor demand by 2.52%, and capital demand by 2.05%.

The ProcFood sector exhibits a sharp decrease in factor demands under the tariff (PS1) and productivity (PS2) scenarios, with land demand decreasing by -28.70% and -31.39%,

respectively. Labor demand also drops significantly under PS1 and PS2, with capital demand following a similar pattern. The combined policy shocks (PS5) show a modest decrease in land and labor demand (-30.09% and -16.61%, respectively), while capital demand falls more drastically by -22.70%. The TextWapp sector faces severe reductions in factor demand across the board, particularly under PS1 and PS2, where land demand decreases by -33.81% and -30.37%, respectively. The overall impact of all policies (PS5) results in a 36.78% drop in land demand, and capital demand plummets by -101.91%.

In the LightMnfc and HeavyMnfc sectors, both land and labor demands decrease moderately under the tariff (PS1) and productivity (PS2) scenarios. The tariff shock leads to a decline in labor demand (62.33% for LightMnfc and 77.77% for HeavyMnfc), while capital demand in these sectors also falls. The combined impact (PS5) exacerbates these declines, with capital demand in HeavyMnfc seeing a drastic drop of -122.25%. The Util_Cons sector, on the other hand, shows a more positive response to policy shocks, particularly in terms of land demand. Land demand increases under PS1 and PS2, with a 4.24% rise in land demand under PS1. However, capital demand drops significantly by -35.18% under PS2.

Overall, the demand for factors across various sectors is heavily influenced by policy shocks, particularly the tariff and productivity policies. While some sectors, such as Extraction and Util_Cons, show minimal or positive changes in factor demand, others, like ProcFood, TextWapp, and HeavyMnfc, experience significant declines, particularly in land and capital demand. The combined effect of all shocks (PS5) generally leads to a reduction in demand for factors across most sectors, especially in terms of capital.

Table 5-5. Results of the impacts on demand for factors endowment

Sector	Baseline			PS1 – Tariff			PS2 – Productivity			PS3 – ODA			PS4 – FDI			PS5 – All		
	Land	Labor	Capital	Land	Labor	Capital	Land	Labor	Capital	Land	Labor	Capital	Land	Labor	Capital	Land	Labor	Capital
% Cumulative																		
GrainsCrops	0.18	18.25	100.09	-0.30	15.16	91.77	0.28	19.11	98.04	0.16	18.43	97.15	0.18	18.25	100.09	-0.17	15.80	92.61
MeatLstk	-1.69	31.36	149.63	2.74	35.39	149.96	-2.64	30.83	140.84	-1.49	32.20	143.88	-1.69	31.36	149.63	1.57	33.99	146.82
Extraction	133.38	210.02	401.88	137.32	211.87	399.32	134.15	212.54	399.83	127.66	201.30	382.26	133.38	210.01	401.88	143.49	222.50	415.89
ProcFood	-30.84	-13.14	122.36	-28.70	-14.39	105.97	-31.39	-12.57	109.02	-29.87	-9.91	116.39	-30.84	-13.14	122.36	-30.09	-16.61	99.66
TextWapp	-27.28	0.11	174.77	-33.81	-25.95	89.55	-30.37	-6.83	136.78	-27.07	1.57	159.49	-27.28	0.11	174.77	-36.78	-32.10	72.86
LightMnfc	-8.18	69.57	365.42	-6.32	62.33	315.50	-10.88	62.72	313.55	-8.44	69.83	333.90	-8.18	69.57	365.42	-8.77	55.56	296.02
HeavyMnfc	-1.61	98.21	444.02	-2.48	77.77	355.03	-5.61	85.29	370.91	-1.92	98.43	406.96	-1.61	98.21	444.02	-6.19	65.68	321.77
Util_Cons	-17.52	38.17	298.47	-13.28	41.29	277.90	-18.83	36.87	263.29	-18.27	36.40	264.10	-17.52	38.17	298.47	-13.84	41.76	276.95
TransComm	-23.73	23.48	301.35	-18.43	31.38	290.81	-24.28	25.29	269.36	-23.19	27.06	277.05	-23.73	23.48	301.35	-19.54	29.59	282.83
OthServices	-17.40	33.49	266.38	-13.95	33.99	242.96	-18.22	33.99	240.53	-16.74	37.03	250.10	-17.40	33.49	266.38	-15.44	31.04	233.58
cgds	3.56	90.07	358.32	3.50	76.91	303.59	-2.70	71.30	288.61	-0.94	75.01	298.67	3.56	90.07	358.32	1.69	73.12	293.25
% Cumulative - Impact																		
GrainsCrops				-0.48	-3.09	-8.32	0.10	0.86	-2.05	-0.02	0.18	-2.94	0.00	0.00	0.00	-0.35	-2.45	-7.48
MeatLstk				4.43	4.03	0.33	-0.95	-0.53	-8.79	0.20	0.84	-5.75	0.00	0.00	0.00	3.26	2.63	-2.81
Extraction				3.94	1.85	-2.56	0.77	2.52	-2.05	-5.72	-8.72	-19.62	0.00	-0.01	0.00	10.11	12.48	14.01
ProcFood				2.14	-1.25	-16.39	-0.55	0.57	-13.34	0.97	3.23	-5.97	0.00	0.00	0.00	0.75	-3.47	-22.70
TextWapp				-6.53	-26.06	-85.22	-3.09	-6.94	-37.99	0.21	1.46	-15.28	0.00	0.00	0.00	-9.50	-32.21	-101.91
LightMnfc				1.86	-7.24	-49.92	-2.70	-6.85	-51.87	-0.26	0.26	-31.52	0.00	0.00	0.00	-0.59	-14.01	-69.40
HeavyMnfc				-0.87	-20.44	-88.99	-4.00	-12.92	-73.11	-0.31	0.22	-37.06	0.00	0.00	0.00	-4.58	-32.53	-122.25
Util_Cons				4.24	3.12	-20.57	-1.31	-1.30	-35.18	-0.75	-1.77	-34.37	0.00	0.00	0.00	3.68	3.59	-21.52
TransComm				5.30	7.90	-10.54	-0.55	1.81	-31.99	0.54	3.58	-24.30	0.00	0.00	0.00	4.19	6.11	-18.52
OthServices				3.45	0.50	-23.42	-0.82	0.50	-25.85	0.66	3.54	-16.28	0.00	0.00	0.00	1.96	-2.45	-32.80
cgds				-0.06	-13.16	-54.73	-6.26	-18.77	-69.71	-4.50	-15.06	-59.65	0.00	0.00	0.00	-1.87	-16.95	-65.07

Source: Authors' simulation from the Dynamic GTAP model.

Notes: The policy scenarios indicate differences compared to the baseline.

5.6. Impacts on factor endowments (land, labor and capital).

The table 5-6 presents the cumulative impacts on the prices of factor endowments (land, labor, and capital) under various policy scenarios. The baseline prices are 194.19 for land, 64.68 for labor, and -31.70 for capital. Under the tariff scenario (PS1), land prices drop significantly by 35.89%, reaching 158.30, while labor prices fall by 11.92%, resulting in a price of 52.76. The capital price experiences a slight decline of 1.34%, settling at -33.04. Productivity shocks (PS2) lead to moderate price reductions, with land prices decreasing by 16.40% to 177.80 and labor prices decreasing by 9.68% to 55.00. Capital prices remain relatively stable, with only a minor decline of 0.03%.

Under the ODA scenario (PS3), land prices see a smaller drop of 7.36%, reducing to 186.84, while labor prices experience a more modest decline of 3.83%, resulting in a price of 60.85. Capital prices improve slightly by 2.31%, reaching -29.39. The combined impact of all policies (PS5) shows the most significant decrease in land prices, which fall by 44.08%, bringing the price down to 150.11. Labor prices decline by 17.42%, dropping to 47.26, while capital prices decrease the most among all factors, falling by 3.47% to -35.17. These results indicate that land, labor, and capital prices are most affected by tariff and combined policy scenarios, with land prices being the most sensitive to tariff shocks.

Table 5-6. Results of the impacts on price of factors endowment

Endowment	Baseline	PS1 – Tariff	PS2 – Productivity	PS3 – ODA	PS4 – FDI	PS5 – All
% Cumulative						
Land	194.19	158.30	177.80	186.84	194.19	150.11
Labor	64.68	52.76	55.00	60.85	64.68	47.26
Capital	-31.70	-33.04	-31.67	-29.39	-31.70	-35.17
% Cumulative - Impact						
Land		-35.89	-16.40	-7.36	0.00	-44.08
Labor		-11.92	-9.68	-3.83	0.00	-17.42
Capital		-1.34	0.03	2.31	0.00	-3.47

Source: Authors' simulation from the Dynamic GTAP model.

Notes: The policy scenarios indicate differences compared to the baseline.

5.7 Impact on imports by destinations to Laos

The table 5-7 below illustrates the impacts of various policy scenarios on Laos' import values by destination, showing both the value and share of total imports from each country. Under the baseline, imports from China, Thailand, and Vietnam dominate, contributing 26.57%, 50.28%, and 8.96% of total imports, respectively. Tariff (PS1) impacts reduce import values from China by \$509.63 million and from Thailand by \$992.30 million, while imports from Vietnam decrease by \$177.52 million. Productivity (PS2) and ODA (PS3) scenarios also lead to reductions in imports, with the most significant decline from Thailand under the FDI (PS4) and all policy scenarios (PS5). Overall, the total impact on imports is a decline of \$2040.29 million in PS1, \$1748.99 million in PS2, and \$2495.00 million in PS5.

The policy scenarios affect the distribution of Laos' imports, with the largest decreases observed in imports from Thailand and China. In PS1, the share of imports from Thailand remains the largest (50.44%), but with a reduced value of \$10229.27 million, reflecting the negative impact of tariffs. For PS2, the share from Thailand remains similar, but the value drops further. The FDI scenario (PS4) results in the most significant reductions in the share of imports from Thailand, with a decrease of over \$1200 million. The combined impact of all

policies (PS5) leads to a reduction of \$2495 million in total import values, with the most considerable effects seen in imports from Thailand and China. The impacts on countries like the US, Japan, and EU are smaller but still show consistent declines across all policy scenarios, especially when considering the share of total imports they represent.

Table 5-7. Results of the impacts on import by destination to Laos

Country	Baseline		PS1 – Tariff			PS2 – Productivity			PS3 – ODA			PS4 – FDI			PS5 – All		
	Value	Share	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact
China	5929.47	26.57	5419.84	26.73	-509.63	5428.98	26.39	-500.49	5548.16	26.33	-381.31	5929.48	26.57	0.01	5309.30	26.78	-620.18
Thailand	11221.57	50.28	10229.27	50.44	-992.30	10386.77	50.49	-834.79	10615.86	50.38	-605.71	11221.59	50.28	0.02	10020.87	50.55	-1200.70
Vietnam	1999.83	8.96	1822.31	8.99	-177.52	1843.55	8.96	-156.28	1884.80	8.95	-115.03	1999.83	8.96	0.00	1784.78	9.00	-215.05
US	335.10	1.50	295.37	1.46	-39.73	308.08	1.50	-27.02	321.73	1.53	-13.37	335.10	1.50	0.00	283.15	1.43	-51.95
Japan	354.93	1.59	317.81	1.57	-37.12	325.44	1.58	-29.49	335.70	1.59	-19.23	354.93	1.59	0.00	308.62	1.56	-46.31
Australia	72.04	0.32	64.12	0.32	-7.92	66.22	0.32	-5.82	68.77	0.33	-3.26	72.04	0.32	0.00	61.83	0.31	-10.21
Singapore	164.92	0.74	145.26	0.72	-19.65	151.76	0.74	-13.16	158.68	0.75	-6.24	164.92	0.74	0.00	139.07	0.70	-25.85
SKorea	255.98	1.15	231.07	1.14	-24.91	233.96	1.14	-22.02	239.85	1.14	-16.13	255.98	1.15	0.00	225.69	1.14	-30.29
Switzerland	74.11	0.33	65.39	0.32	-8.73	68.11	0.33	-6.00	71.01	0.34	-3.10	74.11	0.33	0.00	62.81	0.32	-11.31
Canada	27.55	0.12	24.74	0.12	-2.81	25.30	0.12	-2.25	26.20	0.12	-1.35	27.55	0.12	0.00	23.92	0.12	-3.63
Malaysia	123.77	0.55	107.57	0.53	-16.20	113.98	0.55	-9.79	119.18	0.57	-4.59	123.77	0.55	0.00	103.05	0.52	-20.72
UK	66.50	0.30	58.85	0.29	-7.65	61.00	0.30	-5.50	63.38	0.30	-3.12	66.50	0.30	0.00	56.72	0.29	-9.78
India	245.35	1.10	219.93	1.08	-25.41	225.20	1.09	-20.15	233.06	1.11	-12.29	245.35	1.10	0.00	212.82	1.07	-32.53
Philippines	25.10	0.11	22.19	0.11	-2.91	23.01	0.11	-2.09	23.94	0.11	-1.16	25.10	0.11	0.00	21.35	0.11	-3.75
HongKong	100.64	0.45	87.58	0.43	-13.05	92.61	0.45	-8.03	97.34	0.46	-3.30	100.64	0.45	0.00	83.37	0.42	-17.27
Indonesia	28.32	0.13	24.64	0.12	-3.68	26.11	0.13	-2.21	27.16	0.13	-1.16	28.32	0.13	0.00	23.75	0.12	-4.57
EU	827.85	3.71	734.49	3.62	-93.36	760.44	3.70	-67.42	787.43	3.74	-40.42	827.85	3.71	0.00	710.55	3.58	-117.30
RoW	467.00	2.09	409.30	2.02	-57.70	430.51	2.09	-36.50	448.59	2.13	-18.41	467.01	2.09	0.00	393.36	1.98	-73.64
Total	22320.01	100	20279.72	100	-2040.29	20571.02	100	-1748.99	21070.85	100	-1249.16	22320.04	100	0.03	19825.01	100	-2495.00

Source: Authors' simulation from the Dynamic GTAP model.

5.8 Impact on exports by destinations from Laos

The table 5-8 presents the impact of various policy scenarios on Lao exports by destination, reflecting both the value and share of total exports to each country. Under the baseline, the largest shares of Lao exports are directed towards China (38.60%) and Thailand (36.77%), with export values of \$8382.82 million and \$7984.50 million, respectively. In the Tariff (PS1) scenario, Lao exports to these countries decrease by \$327.87 million and \$587.43 million, respectively, with most other countries seeing smaller reductions. The Productivity (PS2) and ODA (PS3) scenarios also result in decreased export values to major destinations, but to a lesser extent. The most significant reduction in exports occurs in the All (PS5) scenario, where total exports fall by \$2338.54 million, with particularly sharp declines in exports to China, Thailand, and Vietnam.

The policy scenarios show a notable shift in export values across different countries. While China and Thailand remain the top export destinations, the impact of tariffs and other policies tends to reduce Lao exports to these countries most significantly. In PS1, exports to China decline by \$327.87 million, and to Thailand by \$587.43 million. However, under PS2 and PS3, these reductions are less severe, indicating that productivity and ODA have a somewhat mitigating effect. In the FDI scenario (PS4), the impact on exports is more mixed, with some countries like Singapore and Malaysia experiencing an increase in export values, while major partners such as China and Thailand still see declines.

The impacts of the policy scenarios are also apparent in smaller export destinations. Exports to Vietnam, India, and the EU face considerable reductions under PS1, but the magnitude of these impacts is smaller than those observed for Thailand and China. The reduction in exports to Vietnam is especially pronounced in PS1, where exports fall by \$348.58 million. Similarly, exports to India and the EU drop by \$476.53 million and \$83.47 million, respectively. However, these decreases are less significant in the Productivity and ODA scenarios. In PS5, exports to India face a significant drop of \$512.71 million, largely attributed to the cumulative impact of all policies.

Exports to countries like the US, Japan, and South Korea experience smaller fluctuations across the policy scenarios. For instance, the US sees an increase in exports in PS1 (up \$59.95 million), while Japan and South Korea experience moderate declines. These smaller export destinations are less affected overall, but still reflect the broader trend of reductions in Lao

exports due to tariff and productivity-related policy changes. The All (PS5) scenario shows a more pronounced impact on these regions, particularly for the US and Japan, which witness declines of \$30.46 million and \$30.84 million, respectively.

In conclusion, the overall impact of the policy scenarios on Lao exports is a decrease of \$1702.29 million under PS1, \$1226.04 million under PS2, and \$2338.54 million under PS5. These declines primarily affect Lao exports to China and Thailand, but other countries like Vietnam, India, and the EU also experience notable reductions. The FDI scenario (PS4) leads to the smallest overall decline in export values, while the All scenario (PS5) shows the most substantial drop, highlighting the cumulative effect of the policies. The shift in Lao export patterns indicates both the vulnerabilities and potential resilience of Lao exports in response to changing economic and policy conditions.

Table 5-8. Results of the impacts on export by destination from Laos

Country	Baseline		PS1 – Tariff			PS2 – Productivity			PS3 – ODA			PS4 – FDI			PS5 – All		
	Value	Share	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact	Value	Share	Impact
China	8382.82	38.60	8054.94	40.24	-327.87	7990.81	39.00	-392.00	8156.62	38.49	-226.19	8382.76	38.60	-0.06	7893.64	40.73	-489.18
Thailand	7984.50	36.77	7397.07	36.96	-587.43	7514.35	36.67	-470.15	7807.00	36.84	-177.51	7984.48	36.77	-0.02	7139.08	36.84	-845.42
Vietnam	1390.52	6.40	1041.94	5.21	-348.58	1299.04	6.34	-91.48	1365.29	6.44	-25.23	1390.51	6.40	-0.01	990.08	5.11	-400.45
US	382.32	1.76	442.27	2.21	59.95	348.16	1.70	-34.16	371.58	1.75	-10.74	382.32	1.76	0.00	412.78	2.13	30.46
Japan	400.29	1.84	387.79	1.94	-12.50	373.83	1.82	-26.46	392.45	1.85	-7.84	400.29	1.84	0.00	369.45	1.91	-30.84
Australia	61.11	0.28	64.40	0.32	3.29	55.65	0.27	-5.46	59.32	0.28	-1.79	61.11	0.28	0.00	60.30	0.31	-0.81
Singapore	44.70	0.21	50.45	0.25	5.75	41.83	0.20	-2.86	43.65	0.21	-1.04	44.70	0.21	0.00	48.18	0.25	3.49
SKorea	101.83	0.47	96.16	0.48	-5.67	94.90	0.46	-6.93	99.90	0.47	-1.93	101.83	0.47	0.00	91.39	0.47	-10.45
Switzerland	53.64	0.25	60.15	0.30	6.51	49.95	0.24	-3.69	52.51	0.25	-1.12	53.64	0.25	0.00	57.05	0.29	3.41
Canada	77.04	0.35	79.39	0.40	2.36	69.50	0.34	-7.54	74.67	0.35	-2.36	77.04	0.35	0.00	73.81	0.38	-3.23
Malaysia	75.50	0.35	85.28	0.43	9.78	71.11	0.35	-4.38	73.88	0.35	-1.61	75.50	0.35	0.00	81.83	0.42	6.34
UK	83.70	0.39	68.57	0.34	-15.14	76.38	0.37	-7.32	81.85	0.39	-1.86	83.70	0.39	0.00	64.48	0.33	-19.22
India	1433.03	6.60	956.50	4.78	-476.53	1344.33	6.56	-88.70	1391.07	6.56	-41.96	1433.02	6.60	-0.01	920.32	4.75	-512.71
Philippines	18.38	0.08	18.69	0.09	0.32	16.83	0.08	-1.55	17.89	0.08	-0.49	18.38	0.08	0.00	17.50	0.09	-0.88
HongKong	16.90	0.08	18.94	0.09	2.03	16.15	0.08	-0.75	16.56	0.08	-0.34	16.90	0.08	0.00	18.44	0.10	1.54
Indonesia	59.04	0.27	51.34	0.26	-7.70	53.58	0.26	-5.46	57.23	0.27	-1.81	59.04	0.27	0.00	48.18	0.25	-10.87
EU	699.22	3.22	615.75	3.08	-83.47	647.48	3.16	-51.73	687.27	3.24	-11.95	699.21	3.22	0.00	585.79	3.02	-113.43
RoW	452.60	2.08	525.21	2.62	72.61	427.20	2.08	-25.40	442.49	2.09	-10.11	452.59	2.08	0.00	506.29	2.61	53.70
Total	21717.11	100	20014.82	100	-1702.29	20491.08	100	-1226.04	21191.24	100	-525.87	21717.00	100	-0.11	19378.58	100	-2338.54

Source: Authors' simulation from the Dynamic GTAP model.

6. Conclusion and recommendations

The graduation of LDC has costs and benefits for Laos. Several studies on the impact of LDC graduation have used quantitative approaches. However, there is little literature on the impact of LDC graduation in Laos. Therefore, the objective of this paper is to estimate the impact of LDC graduation on the Lao economy. To achieve the objective, we applied the dynamic GTAP model and used the GTAP11c database. There are two scenarios: (1) the baseline scenario, and (2) LDC graduation scenarios. The baseline scenario (without LDC graduation) was projected for the global and Lao economies from 2027 to 2035. The LDC graduation scenarios included losing preferential treatment (increasing tariffs), reduced productivity, reduced FDI, and the combination of all scenarios. We could conclude as follows.

Lao economic growth will be negatively affected by Lao's graduation from LDC status. GDP, welfare (EV), industrial output, trade balance (by sector), and household income will decline from the LDC graduation.

All sector outputs except Extraction (Grains and crops, Meat and livestock, Processing foods, Light manufacturing, Heavy manufacturing, Textiles and clothing, Other sectors—Utilities, transport, services) will decline due to the LDC graduation. The balance of Grains and crops, processing foods, Textiles and clothing, and Heavy manufacturing will be negative, but the trade balance of Meat and livestock, Extraction, and other sectors will be positive. The household's income will decline. It showed that LDC graduation will affect poverty. The impact of exports will decline. Exports to the EU, China, Thailand, Vietnam, Japan, South Korea, and India will decrease. Additionally, imports from all trading partners will also fall. In sum, the simulation showed that the LDC graduation will have a significant impact on the Lao economy and poverty. It is essential to note that this LDC graduation impact does not account for the USA's reciprocal tariffs (40%); if the simulation includes them, the impact of LDC graduation will be significantly higher.

To mitigate the economic impacts of Laos' LDC graduation, the Government of Laos may consider the following recommendations. It is important to diversify export markets, promote Foreign Direct Investment (FDI) for export growth, and strengthen trade agreements and regional integration. In addition, it improves trade facilitation, reduces the domestic NTMs, and promotes bilateral FTA.

References

Armington, P.S. (1969), 'A Theory of Demand for Products Distinguished by Place of Production', International Monetary Fund (IMF) Staff Papers, 16(1), pp.159–78.

Aguiar, A., Chepeliev, M., Corong, E., & Van Der Mensbrugghe, D. (2022). The global trade analysis project (GTAP) data base: Version 11. *Journal of Global Economic Analysis*, 7(2).

Bekkers, E., & Cariola, G. (2025). The impact of LDC graduation on trade: A quantitative assessment. *The Journal of International Trade & Economic Development*, 34(3), 397-427.

Hayakawa, K. (2024). Economic Impacts of LDC Graduation in Lao PDR. LASES, IDE-JETRO, ERIA Joint Seminar on “Challenges and Opportunities from Lao PDR’s LDC Graduation”, 31st July 2024, Lao Plaza, Vientiane Capital, Laos.

Ianchovichina, E. and R. McDougall (2001), 'Theoretical Structure of Dynamic GTAP', GTAP Technical Papers, No. 17, West Lafayette, IN: Purdue University.

Ianchovichina, E. and T. Walmsley (eds.) (2012), *Dynamic Modeling and Applications for Global Economic Analysis*, New York: Cambridge University Press.

Hertel, T.W. (ed.) (1997), *Global Trade Analysis: Modeling and Applications*, New York: Cambridge University Press.

Insisienmay, S., Nolintha, V., & Park, I. (2015). Dutch disease in the Lao economy: Diagnosis and treatment. *International Area Studies Review*, 18(4), 403-423.

Rahman, M. M., & Strutt, A. (2024). Costs of LDC graduation on market access: evidence from emerging Bangladesh. *Economic Systems Research*, 36(1), 24-45.

Raihan, S., Khorana, S., & Uddin, M. (2024). Navigating LDC graduation: modelling the impact of RCEP and CPTPP on Bangladesh. *Journal of the Asia Pacific Economy*, 29(3), 1599-1621.

Rahman, M., & Bari, E. (2018). Pathways to Bangladesh’s sustainable LDC graduation: Prospects, challenges and strategies. In *Bangladesh's Graduation from the Least Developed Countries Group* (pp. 109-152). Routledge.

MPI (2016). 8th Five-Year National Socio-Economic Development Plan (2016–2020), Ministry of Planning and Investment (MPI), Laos.

MPI (2021). 9th Five-Year National Socio-Economic Development Plan(2021-2025), Ministry of Planning and Investment (MPI), Laos..

MOFA (2021). The Lao PDR Smooth Transition Strategy for LDC Graduation in 2026 and beyond, LDC Secretariat, Ministry of Foreign Affairs (MOFA), Government of Lao PDR.

Songvilay, D. (2024). *Thematic Areas of the Lao PDR’s Smooth Transition Strategies*. LASES, IDE-JETRO, ERIA Joint Seminar on “Challenges and Opportunities from Lao PDR’s LDC Graduation”, 31st July 2024, Lao Plaza, Vientiane Capital, Laos.

Punya, S. (2024). Laos after graduation from Least Developed Country status. *Journal of International Development Studies*, 32(3), 5-18.

Kyophilavong, P. (2016). Mining booms and growth in Laos—empirical result from CGE model. *International Journal of Development Issues*, 15(1), 51-61.

UNDP (2024). Potential Economic and Social Impacts on Cambodia: LDC Graduation-A Dynamic CGE Approach, Final Report, Ministry of Economy and Finance and UNDP, Cambodia.

Wongpit, P. (2023). Evaluating the effects of trade on Lao PDR'S LDC graduation. *RMUTT Global Business and Economics Review*, 18(2), 93-104.