

The Impact of Laos' Accession to the World Trade Organization

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Abstract

Accession to the World Trade Organization (WTO) has the potential to produce tangible benefits but is also fraught with costs, especially for transitional economies and Least Developed Countries (LDCs) like Laos. Despite these potential benefits and costs the issue of WTO accession, suffers from a lack of empirical studies. Therefore, the main objective of this paper is to attempt to quantify the economy-wide impact of Laos' WTO accession. We employ a standard the Global Trading Analysis (GTAP) model for this analysis. The simulation results show that Laos will gain from accession to the WTO, but these gains are quite small. The real GDP will increase by about 0.5% and welfare (equivalent variation) will increase by about US\$1 million. On the other hand, the trade deficit will increase and output in some sectors will be reduced. Therefore, it is difficult to conclude that Laos will benefit all-round from the WTO accession. Nonetheless, this study focusing on trade liberalization (tariff reduction) demonstrates that WTO accession would be a policy move in the right direction.

1. Introduction

The Lao Government (GOL) has identified trade liberalization as one of the most important means to accelerate economic growth and reduce poverty (GOL, 2004). Laos joined the ASEAN¹ Free Trade Area (AFTA) in 1998 and applied for WTO membership in 1997. Laos is expected to join the World Trade Organization (WTO) in the near future.

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¹ Laos and Myanmar joined Association of Southeast Asia Nation (ASEAN) in 1997. Now ASEAN has 10 members.

In order to qualify for the WTO accession, Laos has implemented a number of reforms such as removing tariff and non-tariff barriers and extending the coverage of trade and investment rules. WTO accession will be determined by market forces rather than by administrative decision.² However, Laos is categorized as a Least Developed Country (LDC)³ which has experienced transitional economy periods and faces twin fiscal and trade deficits; a significant economic development gap exists between Laos and most other WTO members. By reducing tariffs, import prices will decrease, and imports will therefore increase. As a result, Laos will incur bigger trade deficits in the short term and it may disappear in the long term due to structural adjustment. Some domestic Small and Medium Enterprises (SMEs) will be negatively affected due to lack of capacity to compete with import goods.⁴

Despite the positive and negative impacts of Laos' WTO accession, there are very few studies on this issue⁵. In a qualitative analysis, Anderson (1998) examined the implications of WTO accession for Laos' agricultural and rural development; this study found that the net benefits of WTO accession are overwhelmingly positive. Akkharath (2003) also conducted a qualitative study which showed that WTO accession will bring not only many opportunities but also various challenges. But to date, the impact of WTO accession on the Lao economy has not been assessed using the Computable General Equilibrium (CGE) approach. As a result, the impact of Laos' WTO accession is not well-understood from a quantitative perspective. Therefore, this study's main objective is to attempt to quantify the impact of Laos's WTO accession using the standard Global Trade Analysis Project (GTAP) model; this is the first such experiment in the Lao context.

² According to Winter (2004), who summarized previous studies on the relationship between trade and growth, trade improves growth due mainly to increased productivity, including improved policies and institutions. There are some characteristics of Laos specifically, which should be taken into account.

³ According to UNDP(2007/2008), in term of human development index, Laos was ranked as 130th out of 177 countries. GDP per capita of US\$580 in 2007 (World Bank, 2008). 34 percent of the population live below the poverty line (NSC, 2003).

⁴ As most of the SMEs in Laos lack competitiveness, the WTO accession might prove challenging for them. For a more detailed discussion on the impact of trade liberalization on SMEs see Kyophilavong (2008).

⁵ For a more detailed quantitative analysis of the impact of AFTA on the Lao economy, see Kyophilavong, 2004; 2007a.

2. Macroeconomic Situation

Since introducing the New Economic Mechanism (NEM) in 1986⁶, Laos has been in transition from a centrally planned economy to a more market-oriented economy. As a result, except during the Asian Financial Crisis of the 1990s, Laos has been achieving high rates of economic growth with low inflation. The average economic growth was about 6.53 % during 2001-2006, which increased from an average of about 6.18 % during 1996-2000⁷. The average inflation rate was maintained at one digit level during 2001-2006, which is a significant decline from the average rate of 57 % during 1996-2000. The exchange rate was also stable during 2001-2006 (Table 1).

Table 1. Key macroeconomic indicators

Macroeconomic indicators	2001-2006	1996-2000	1990-1995
Population (million. person)*	5.46	4.86	4.40
Population growth (%)	2.12	2.06	2.52
GDP (current million US\$) **	2,416	1,618	1,276
GDP growth (%)	6.53	6.18	6.46
GDP per capita (constant 2000 US\$) **	379	307	248
GDP per capita growth (%)	4.04	3.68	3.80
Reserve Money (M2) (million US\$)*	450,981	270,728	148,280
Money supply (M2) (%)*	21.14	65.99	30.92
Inflation -CPI (%)	9.73	57.00	15.27
Trade Deficit (million. US\$)***	-219.91	-263.21	-174.92
Trade Deficit /GDP (%)	-9.24	-16.06	-13.14
Foreign reserve (million. US\$)***	220	127	48
External debt (million US\$) *	2,640	2,410	1,965
External debt /GDP (%)	115	152	161
Budget Deficit (including grants)(million US\$)	-104	-58	-100
Budget Deficit /GDP (%)	-4.42	-3.60	-7.61
Budget Deficit (exclude grants)(million US\$)	-149	-121	-145
Budget Deficit /GDP (%)	-6.29	-7.58	-11.21
Exchange Rate (kip/US\$) Official Rate***	10,163	4,094	727

Sources:

* Asian Development Bank (ADB), *Key Indicators for Asia and the Pacific 2008* www.adb.org/statistics

** World Bank, *World Development Indicators CD-ROM (2005)* and

*** International Monetary Fund, *International Financial Statistics CD-ROM August 2008*

⁶ After establishing the Lao People's Democratic Republic in 1975, the GoL adopted a planned economy following socialist countries until 1986.

⁷ The engine of growth during this period is from capita inflows of Foreign Direct Investment (FDI) in mining and hydropower sectors and mining exports. For a more detailed discussion on the impact of FDI in the mining and hydro sectors on the Lao economy, see Kyophilavong and Toyoda (2008).

Laos has an agriculture-based economy; with a total GDP of 2.8 US\$ billion in 2005, the agriculture sector accounted for 44% of GDP, the industry sector for 30% and the service sector for 26% (World Bank, 2008). However, since 2003, the industry sector has grown more than 10%, which has caused the agricultural share of GDP to decline.

Even though Laos has been maintaining high economic growth with low inflation and a stable exchange rate, it still has serious macroeconomic issues to overcome. Firstly, Laos is basically facing twin deficits in both government spending (budget deficit) and international trade (current account deficit). The average ratio of budget deficit to GDP was 4.4% during 2001-2006. The average ratio of current account balance deficit to GDP was 9.24 % during the same period.

When the current account deficit exceeds the 6% benchmark some analysts regard it as “red light” of an impending slide into insolvency. These deficits are mainly financed by Official Development Assistance (ODA), Foreign Direct Investment (FDI), and remittances. The fiscal issue is particularly serious in Laos. If the budget deficit continues to expand, it will cause an accelerating inflation rate and devaluation of the kip (Lao currency), and could lead to economic instability like during the period of the Asian Financial Crisis (Okonjo et al, 1999). Secondly, there is a huge gap between savings and investment. The saving rate is low because of low average incomes - GDP per capita was about US\$580 in 2007 (World Bank, 2008) - and because financial sectors are underdeveloped. The banking sector is dominated by state commercial banks, which are unable to perform full banking functions.⁸ Thirdly, Laos is also facing a high burden of external debt. The external debt accumulation was more than 60% of GDP in 2007. If Laos becomes too dependent upon foreign finance, especially to service its debt obligations it could render the country vulnerable to capital flight and foreign debt crises when there is a downturn in the global economy. Therefore, pessimists could contend that the accession to the WTO could be unfavorable if the twin deficits are not managed by implementing sound fiscal and monetary policies.

⁸ More details of financial issues in Laos are discussed in Kyophilavong (2008).

3. Laos and the WTO

Under the planned economy, international trade had been controlled by government. At that time, Laos' main trading partners were socialist countries.

The managed or restricted trade policies pursued in Laos under the planned economy ran counter to conventional wisdom of proponents of free trade espoused by Adam Smith, embodied in David Ricarodo's principle of comparative advantage. The principle of comparative advantage postulates that both the nation and the global economy can benefit by specializing in the production and trading in goods in which it has a comparative advantage (i.e. could produce relatively cheaply). The "miracle economies" of Asia demonstrated clearly that by implementing free trade policies they could grow at a spectacular rate compared to those countries like Laos that followed inward looking trade policies. Therefore, it was logical for Laos to shift from a planned to a more market oriented open economy in 1986.

Table 2. Initial Ad Valorem tariff rate (%) for GTAP data base in 2004

	Oceania	East Asia	Southeast Asia	South Asia	North America	Latin America	EU	Sub-saharan Africa	Rest of the World
Grains and crops	4.0	27.9	22.6	0.0	0.0	0.0	5.0	26.4	2.7
Livestock and meat products	0.0	0.0	16.1	0.0	0.0	0.0	17.3	0.0	0.0
Mining and extraction	0.0	2.6	3.1	0.0	0.0	0.0	4.7	0.7	0.0
Processed food	14.9	34.5	19.2	0.0	18.1	0.0	15.3	0.0	11.1
Textiles and clothing	9.7	9.3	6.6	9.1	0.0	2.4	9.7	0.0	8.8
Light manufacturing	10.0	25.4	15.5	5.2	24.2	2.1	17.8	4.5	9.7
Heavy manufacturing	5.2	7.5	6.9	6.1	5.8	7.2	7.0	4.9	8.0
Utilities and construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and communication	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sources Compiled from GTAP database (version 7).

Trade liberalization has been one of the pillars of economic reforms in Laos (Martin, 2001); the tariff rate changes are shown in Table 2. In November, 2004, Laos was granted Normal Trade Relations status by the United States. Moreover, as mentioned

above, Laos plans to join the WTO by within a year or so. Laos applied for WTO membership in 1997; and by July Laos had made good progress towards becoming a WTO member.⁹ The Lao delegation discussed bilateral trade agreements with a number of WTO member states. They were also successful in reaching an agreement with the EU on open market access for goods. However, the service sector in Laos will be negotiated at the next meeting. In addition, many areas still require improvements such as laws related to trade, including standards, intellectual property rights, customs and enterprises.

These actions indicate that Laos is keen to participate more fully in the global economy in the near future. Both challenges and opportunities remain in order for Laos to gain the benefits of WTO membership.

Table 3. Exports by Country, (2001-2006)

Export	2001-2006		1996-2000		1990-1995	
	Value	share	Value	share	Value	share
	(1000US\$)	(%)	(1000US\$)	(%)	(1000US\$)	(%)
ASEAN	1,731,493	56.3	304,358	25.6	350,454	43
EU	937,474	30.5	534,506	44.9	204,614	25.1
ASIA	301,482	9.8	250,224	21	205,152	25.2
US	54,421	1.8	89,334	7.5	45,880	5.6
Oceania	27,056	0.9	1,441	0.1	263	0
Other	25,687	0.8	11,000	0.9	7,856	1
Total word	3,077,613	100	1,190,864	100	814,218	100
Thailand	1,127,454	65.1	287,440	94.4	334,529	95.5
Vietnam	529,853	30.6	-	-	-	-
Singapore	3,873	0.2	14,551	4.8	14,327	4.1
Malaysia	63,022	3.6	153	0.1	1,138	0.3
Cambodia	529	0	36	0	-	-
Indonesia	6,668	0.4	2,160	0.7	459	0.1
Philippine	83	0	19	0	-	-
Brunei	10	0	-	-	-	-
Total ASEAN	1,731,493	100	304,358	100	350,454	100

Source: Compiled from COMTRADE data in the WITS database.

⁹ For more detailed information see www.moic.gov.la

4. Trade Structure

Laos has been facing substantial trade deficits. However, trade deficits have been narrowing since 2003 due to increases export of mineral.¹⁰ The average trade deficit ratio to GDP was 9.24 % during 2001-2006, a decline from 16.06 % during 1999-2000. The average export growth during 2001-2006 was 20.4 %, an increase from 1.7 % during 1996-2000. On the other hand, the average growth of imports was 14.10 % during 2001-2006 (Table 1).

ASEAN members are Laos' main trading partners; they account for 56.3 % of Lao exports and 77.40 % of imports. In ASEAN, Thailand accounts for the highest share of exports to and imports from Laos. Thailand accounted for 65.1 % of total exports and 85 % of total imports during 2001-2006 (Tables 3, 4). Laos' main exports were Wood (31.44%), Apparel (28.55%) and Base metals and their products (15.31%) during 2001-2006. Base metals and their products have increased since 2001.

Laos imports various goods from other countries, from basic consumption goods to investment goods and fuel (Tables 5, 6). The top three import commodities were Electrical and mechanical machinery (19.08%), Oil and mineral products (18.63%), and Transport equipment (12.38%) during 2001-2006. Therefore, how WTO accession changes the terms of trade in Laos will be interesting to observe.

¹⁰ Increasing mining exports are the main cause of the narrowing trade deficit. One of the largest mining projects in Laos is the Sepon Mining Project; for more details of the project see <http://www.ozminerals.com/Operations/Mining-Operations/Sepon-Gold.html>.

Table 4. Exports by Commodity (share, %)

Commodity			2001-2006		1996-2000		1990-1995	
			Value	Share	Value	Share	Value	Share
			(1000US\$)	(%)	(1000US\$)	(%)	(1000US\$)	(%)
1	1-5	Animals & animal products	24,944	0.81	15,782	1.33	3,200	0.39
2	6-14	Vegetable products	162,192	5.27	85,476	7.18	40,182	4.94
3	15	Animal and Vegetable oils	27	0.00	61	0.01	20	0.00
4	16-24	Processed foods, drink & tobacco	18,883	0.61	7,936	0.67	3,056	0.38
5	25-27	Oil and mineral products	269,742	8.77	33,353	2.80	9,854	1.21
6	28-38	Chemical products	10,578	0.34	2,139	0.18	6,195	0.76
7	39-40	Plastics & rubber product	25,449	0.83	2,459	0.21	616	0.08
8	41-43	Skin, furs and their products	6,840	0.22	7,390	0.62	11,147	1.37
9	44-46	Wood	966,658	31.44	459,470	38.58	484,601	59.54
10	47-49	Wood products & paper	3,537	0.12	1,918	0.16	291	0.04
11.1	50-60	Textiles	7,145	0.23	2,991	0.25	829	0.10
11.2	61-63	Apparel	877,772	28.55	493,639	41.45	200,420	24.62
12	64-67	Shoes, hats, umbrellas, etc	43,627	1.42	35,325	2.97	1,165	0.14
13	68-70	Stone, ceramic & glass products	668	0.02	589	0.05	64	0.01
14	71	Jewelry & precious metal products	45,903	1.49	1,569	0.13	1,312	0.16
15	72-83	Base metals and their products	470,674	15.31	3,857	0.32	40,151	4.93
16	84-85	Electrical and mechanical machines	31,956	1.04	6,749	0.57	3,120	0.38
17	86-89	Transport equipment	55,014	1.79	2,644	0.22	716	0.09
18	90-92	Photographic, precision instruments	1,134	0.04	350	0.03	937	0.12
19	93	Arms & munitions	23	0.00	8	0.00	2	0.00
20	94-96	Furniture & assorted products	13,207	0.43	17,774	1.49	2,016	0.25
21	97-98	Objets d' art	618	0.02	190	0.02	435	0.05
22	99	Other	35,370	1.15	8,326	0.70	3,749	0.46
Total			3,071,962	100	1,189,997	100	814,077	100

Source: Compile from COMTRADE data in the WITS database (see www.wits.worldbank.org)**Table 5.** Imports by Country (share, %)

Import	2001-2006		1996-2000		1990-1995	
	value	Share	value	Share	value	Share
	(1000US\$)	(%)	(1000US\$)	(%)	(1000US\$)	(%)
1 ASEAN	4,281,062	77.4	2,087,341	79.3	1,173,624	68.5
2 Europe	278,011	5	191,122	7.3	113,934	6.6
3 ASIA	841,249	15.2	318,436	12.1	336,202	19.6
4 US	37,310	0.7	17,702	0.7	15,134	0.9
5 Oceania	79,704	1.4	14,412	0.5	74,070	4.3
6 Other	12,198	0.2	3,265	0.1	1,046	0.1
Total World	5,529,533	100	2,632,278	100	1,714,100	100
1 Thailand	3,637,465	85	1,910,061	91.5	1,083,996	92.4
2 Vietnam	413,394	9.07	–	–	–	–
3 Singapore	192,536	4.05	158,817	7.6	82,739	7
4 Malaysia	20,956	0.5	8,828	0.4	3,665	0.3
5 Cambodia	4,632	0.1	3,184	0.2	–	–
6 Indonesia	10,289	0.2	5,959	0.3	3,224	0.3
7 Philippine	1,643	0	482	0	–	–
8 Brunei	147	0	10	0	–	–
Total ASEAN	4,281,062	100	2,087,341	100	1,173,624	100

Source: Compiled from COMTRADE data in the WITS database.

Table 6. Imports by Commodity (share, %)

Commodity			2001-2006		1996-2000		1990-1995	
			Value	Share	Value	Share	Value	Share
			(1000US\$)	(%)	(1000US\$)	(%)	(1000US\$)	(%)
1	1-5	Animals & animal products	61,357	1.11	25,195	0.96	25,980	1.52
2	6-14	Vegetable products	114,419	2.07	62,558	2.38	45,469	2.65
3	15	Animal and Vegetable oils	15,503	0.28	10,060	0.38	4,843	0.28
4	16-24	Processed foods, drink & tobacco	596,643	10.79	316,297	12.02	186,380	10.87
5	25-27	Oil and mineral products	1,030,291	18.63	317,093	12.05	169,041	9.86
6	28-38	Chemical products	300,015	5.43	122,397	4.65	106,326	6.20
7	39-40	Plastics & rubber product	206,129	3.73	93,058	3.53	68,640	4.00
8	41-43	Skin, furs and their products	5,692	0.10	3,046	0.12	1,744	0.10
9	44-46	Wood	7,460	0.13	3,351	0.13	1,857	0.11
10	47-49	Wood products & paper	65,459	1.18	31,082	1.18	15,449	0.90
11	50-60	Textiles	487,822	8.82	198,930	7.56	103,809	6.06
11	61-63	Apparel	68,894	1.25	23,691	0.90	23,748	1.39
12	64-67	Shoes, hats, umbrellas, etc	22,537	0.41	10,359	0.39	16,941	0.99
13	68-70	Stone, ceramic & glass products	141,162	2.55	86,397	3.28	40,498	2.36
14	71	Jewelry & precious metal products	68,731	1.24	15,878	0.60	67,015	3.91
15	72-83	Base metals and their products	394,482	7.13	165,011	6.27	100,379	5.86
16	84-85	Electrical and mechanical machines	1,055,188	19.08	488,686	18.56	294,883	17.20
17	86-89	Transport equipment	684,292	12.38	572,809	21.76	387,199	22.59
18	90-92	Photographic, precision instruments	48,838	0.88	35,342	1.34	16,009	0.93
19	93	Arms & munitions	1,066	0.02	59	0.00	786	0.05
20	94-96	Furniture & assorted products	51,043	0.92	25,666	0.97	17,240	1.01
21	97-98	Objets d' art	598	0.01	71	0.00	112	0.01
22	99	Other	110,801	2.00	32,655	1.24	21,183	1.24
Total			5,529,386	100	2,632,368	100	1,714,100	100

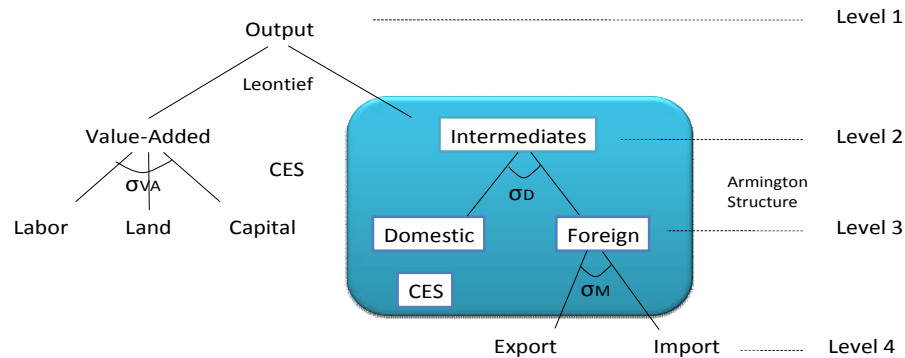
Source: Compile from COMTRADE data in the WITS database (see www.wits.worldbank.org)

5. The GTAP Model and database

The Global Trade Analysis Project (GTAP) model, a multi-region computable equilibrium (CGE) model, is one of the most popular models for analyzing the impact of trade policy. There are various advantages to the GTAP model. Firstly, since it is a multi-regional model of world production and trade, it can take into account the overall trade implications of Laos' WTO accession as well as third-party countries. Secondly, it contains a database for different sectors and thus can explore the trade implications for various sectors of interest.¹¹

¹¹ For more details, see Hertel (1997). A graphical presentation of the GTAP model with particular emphasis on the accounting relationships is given by Brockmeier (1996).

Fig 1: Production structure in the GTAP model



Source: Hertel (1997)

The GTAP model assumes perfectly competitive markets, where the zero profit condition holds, and that all the markets are cleared. The regional household allocates expenditures across three categories: private household, government, and savings. It derives income from the ‘sale’ of primary factors to the producers, which combines them with domestically produced and imported intermediate composites to produce final goods. These final goods are in turn sold both domestically to private households and the government, and exported to the rest of the world. Both government and private households also import final consumption goods from the rest of the world. A global bank intermediates between global savings and regional investments by assembling a portfolio of regional investment goods and selling shares in this portfolio to regional households in order to meet their savings demands. Finally, a global transport sector assembles regional exports of trade, transport and insurance services and produces composite goods used to move merchandise trade among regions (Hertel and Tsigas, 1997). The production structure in the GTAP model is illustrated in Figure 1.

Various studies have used the GTAP model to analyze the impact of trade policies. Tongzon (2001) used the standard GTAP model to assess the impact of China’s WTO membership on the exports of East Asian developing economies. Anderson and Strutt (1999) used a GTAP model to investigate the impact of the Asian crisis and trade reforms on Indonesia. While many studies have used the CGE model for developing countries, there are very few studies using CGE model building for the Lao economy. Fukase and

Martin (1999) built a simple CGE model to analyze the economic effect of joining the AFTA; their simulation results showed that AFTA accession is economically beneficial.

Using the CGE modeling, Warr and Menon (2006) studied the effect of rural road improvements on poverty incidence in Laos. Their simulation results showed that there is considerable scope for reducing poverty incidence in Laos by reducing rural transport costs through improving the quality of rural roads. Warr (2006) built a two-sector, multi-household CGE model to analyze the impact of the hydropower dam Nam Theun 2 (NT2). His simulation results showed that the project had significant effects on poverty incidence, but if poor households do not share directly in the proceeds of the project, poverty incidence is likely to rise. Stone et. al (2009) used a GTAP model to investigate the impact of transport infrastructure projects on socioeconomic characteristics in the Greater Mekong Subregion. However, the newest version of the GTAP 7 database includes Laos' input-output table, which might provide significant contributions to empirical studies of this issue.

The latest version of the GTAP database, version 7, is used for this study. To facilitate our analysis, we have aggregated 57 sectors to 10 sectors and the 113 countries into 10 regions¹². The breakdown of sectors and regions is shown in Tables 7 and 8.

Table 7. Sectors of model

No	Commodity code	Comprising	Description
1	GrainsCrops	pdr wht gro v_f osd c_b pfb ocr pcr	Grains and Crops
2	MeatLstk	ctl oap rmk wol cmt omt	Livestock and Meat Products
3	Extraction	frs fsh coa oil gas omn	Mining and Extraction
4	ProcFood	vol mil sgr ofd b_t	Processed Food
5	TextWapp	tex wap	Textiles and Clothing
6	LightMnfc	lea lum ppp fmp mvh otn omf	Light Manufacturing
7	HeavyMnfc	p_c crp nmm i_s nfm ele ome	Heavy Manufacturing
8	Util_Cons	ely gdt wtr cns	Utilities and Construction
9	TransComm	trd otp wtp atp cmn	Transport and Communication
10	OthServices	ofi isr obs ros osg dwe	Other Services

Source: the authors compiled from GTAP database

¹² The GTAP model uses GEMPACK software for solving and simulation.

Table 8. Regions of model

No	Region code	Comprising	Region description
1	Oceania	AUS NZL XOC	Australia, New Zealand
2	EastAsia	CHN HKG JPN KOR TWN XEA	East Asia
3	SEAsia	KHM IDN MMR MYS PHL SGP THA VNM XSE	Southeast Asia
4	SouthAsia	BGD IND PAK LKA XSA	South Asia
5	NAmerica	CAN USA MEX XNA	North America
6	LatinAmer	ARG BOL BRA CHL COL ECU PRY PER URY VEN XSM CRI GTM NIC PAN XCA XCB	Latin America
7	EU_25	AUT BEL CYP CZE DNK EST FIN FRA DEU GRC HUN IRL ITA LVA LTU LUX MLT NLD POL PRT SVK SVN ESP SWE GBR	European Union 25
8	SSA	NGA SEN XWF XCF XAC ETH MDG MWI MUS MOZ TZA UGA ZMB ZWE XEC BWA ZAF XSC	Sub-Saharan Africa
9	LAOS	LAO	Laos
10	RestofWorld	CHE NOR XEF ALB BGR BLR HRV ROU RUS UKR XEE XER KAZ KGZ XSU ARM AZE GEO IRN TUR XWS EGY MAR TUN XNF	Rest of World

Source: the authors compiled from GTAP database.

6. Simulation designs

Laos will gain various benefits from WTO accession. Firstly, WTO accession will give Laos opportunities to improve the trade and investment environment. Secondly, WTO members would be more secure and less discriminatory in terms of market access for Lao exports. Thirdly, WTO accession will increase FDI in Laos¹³.

Arms (EBA) initiative from the EU, and the Generalized System of Preferences (GSP) from Australia, Belarus, Canada, Japan, New Zealand, Norway, Russia, Switzerland, and Turkey. Moreover, Laos is granted unilateral preferential treatment by the original ASEAN members under the ASEAN Integrated System of Preferences (AISP) and also gets Special and Preferential Treatment (SPT) from China and the Republic of Korea. This shows that Laos already has good market access opportunities, but under the WTO Multilateral Trade System, these preferential tariffs will be eroded as in principle they are tariff barriers. Secondly, under the Agreement on Textiles and Clothing (ATC) and cheap labor, Lao garment exports were expanded to the EU and USA. If it joins the WTO, Laos will have to remove textile and clothing quotas and compete with large suppliers likes China, India and other countries. Thirdly, as some SMEs in Laos are small in scale and not competitive, WTO accession may have a

¹³ The benefits of WTO accession for Laos are discussed in more detail in Anderson (1998).

negative impact on their development. Fourthly, WTO accession may raise current budget and Despites the benefits of WTO accession, Laos will also experience costs. Firstly, as an LDC, Laos receives unilateral preferences from some 48 developed and developing countries. Laos has received duty-free, quota-free market access under the Everything But trade deficits, which might lead to macroeconomic instability.

However, by phasing out the preferential tariffs and subsidies Laos will be exposed to the fresh winds of competition and it will be able to restructure its economy with the aid of the ‘magic package’ of technology, management and marketing skills that MNCs will bring through foreign direct investment. Therefore, the trade liberalization that will accompany the accession to WTO has costs and benefits. Astute policies need to be implemented to ensure that the benefits outweigh the costs so that national welfare is enhanced

Though WTO accession involves various costs and benefits, we focus on tariff reductions. The base case scenario represents Laos without WTO accession, which is referred to as no shock in the model. The simulation scenario represents Laos’ accession to the WTO through reduced tariff rates. We assume that with WTO accession Laos’ final tariff rate commitment in agriculture, non-agriculture and services is the same as the Common Effective Preferential Tariff (CEPT) Scheme for AFTA. The simulation scenario cuts tariff rate to Laos by 2.5 % in seven sectors which exclude service sector from nine regions including Southeast Asia.

7. Simulation Results

Following are the simulation results showing the impact of Laos’ WTO accession.

Impact on macroeconomic variables

Laos will gain minor benefits from WTO accession. WTO accession has positive impact on increasing real GDP, but the percent change is small: about 0.5% (table 9). In addition, WTO accession increases equivalent variation (EV) about 1 \$US million. The

increased EV comes mostly from the allocative efficiency effect,¹⁴ specifically in *Processed Food, Light Manufacturing* and *Grains and Crops* (table 9). The main reason WTO accession has such a slight positive impact is that the economy of Laos is small and tariff rates are already low.

Table 9. Impact on macroeconomic variables

Macroeconomic variables	Impact of WTO accession
Real GDP (%)	0.53
Equivalent Variation	0.96
Export volumes (%)	5.65
Import volumes (%)	7.91
Trade balance (US\$ million)	-42.70
Terms of trade (%)	-0.97

Source: Authors' simulation from GTAP model.

Impact on industry output

Only the output of *Textiles and clothing, Utilities and construction, Transportation and communication* and *other services* increase from WTO accession. Other sectors face declining output. Therefore, most of the output of Lao products might decline due to WTO accession (table 10).

Impact of trade balance

Only two sectors, *Mining and extraction* and *Textiles and clothing*, show a trade surplus from WTO accession. The net gain from *Mining and extraction* is US\$ 3 million and from *Textiles and clothing* is US\$ 5 million. Laos experiences losses in other sectors; the losses in *Processed food* are especially high, accounting for about US\$ 30 million. As the simulation results show, Laos will face losses in the agriculture and food sectors. This could have a potentially significant influence on the food security of Laos. Therefore, it is important that those policy makers carefully consider the impact of WTO accession on food security (Table 11).

¹⁴ There are basically 4 major sources for any welfare change: Allocative efficiency effect, endowment effect, technology effect and terms of trade effect (Huff and Hertel, 2000; Hanslow, 2000; Adams, 2005).

Table 10. Impact on industry output

Sector	Impact on industry output (%)
Grains and crops	-0.41
Livestock and meat products	-0.07
Mining and extraction	-0.31
Processed food	-4.74
Textiles and clothing	5.63
Light manufacturing	-1.81
Heavy manufacturing	-3.27
Utilities and construction	4.85
Transportation and communication	0.52
Other services	1.01

Source: Authors' simulation from GTAP model.

Impact on exports and imports

As expected, WTO accession leads to an increase in export and import volumes. The exports of *Textiles and clothing* and *Light manufacturing* increase by about 8% and *Heavy manufacturing* by about 7%. Other sectors show much smaller increases: *Grains and crops* increase by about 0.5%, *Livestock and meat products* by about 2% and *Mining and extraction* by about 2 % (Table 12).

Table 11. Impact on trade balance

Sector	Impact on trade balance (US\$ million)
Grains and crops	-5.13
Livestock and meat products	-0.65
Mining and extraction	3.14
Processed food	-30.87
Textiles and clothing	5.66
Light manufacturing	-6.75
Heavy manufacturing	-14.18
Utilities and construction	0.78
Transportation and communication	0.48
Other services	4.85

Source: Authors' simulation from GTAP model.

On the other hand, imports in many sectors increase. In some sectors, this increase is significant: imports of *Grains and crops* and *Livestock and meat products* increase

about 30%, and *Processed food* increases about 20%. Imports of *Textiles and clothing*, *Light manufacturing* and *Heavy manufacturing* also increase, but the percentage change is much smaller: imports in *Light manufacturing* increase about 10%, *Textiles and clothing* about 8%, and *Heavy manufacturing* about 3% (Table 13).

Table 12. Impact on export volumes

Sector	Impact on export volumes (%)
Grains and crops	0.58
Livestock and meat products	1.87
Mining and extraction	2.17
Processed food	0.2
Textiles and clothing	8.82
Light manufacturing	8.53
Heavy manufacturing	6.78
Utilities and construction	9.61
Transportation and communication	0.62
Other services	5.16

Source: Authors' simulation from GTAP model.

Impact of demand for labor

Demand for most *Unskilled labor* declines from WTO accession, except in *Textiles and clothing*, *Utilities and construction*, *Transportation and communication*, and *other services*. The demand for labor in *Textiles and clothing* and *Utilities and construction* increase by about 5%. However, demand for *Unskilled labor* in *Livestock and meat products*, *Mining and extraction*, *Processed food*, *Textiles and clothing*, *Light manufacturing*, and *Heavy manufacturing* decline.

Out of six sectors, the demand for *Skilled labor* in *Textiles and clothing* and *Utilities and construction* also increase 4%. The simulation results show that except in *Textiles and clothing* and *Utilities and construction*, demand for unskilled and skilled labor will decline, causing unemployment problems in some sectors (Table 14).

Table 13. Impact on import volumes

Sector	Impact on import volumes (US\$ million)
Grains and crops	36.15
Livestock and meat products	33.4
Mining and extraction	-7.32
Processed food	23.86
Textiles and clothing	7.79
Light manufacturing	10.19
Heavy manufacturing	3.58
Utilities and construction	-4.43
Transportation and communication	-0.63
Other services	-2.72

Source: Authors' simulation from GTAP model.

Table 14. Impact on demand for primary factors of production (%)

Sector	Land	Unskill labor	Skill labor	Capital	Natural Resource
Grains and crops	-0.1	-0.7	-0.9	-0.7	0.0
Livestock and meat products	0.4	-0.5	-0.9	-0.7	0.0
Mining and extraction	0.1	-0.4	-0.5	-0.4	0.0
Processed food	-1.0	-4.4	-5.4	-4.8	0.0
Textiles and clothing	3.8	6.0	4.9	5.5	0.0
Light manufacturing	0.5	-1.5	-2.6	-1.9	0.0
Heavy manufacturing	-0.2	-2.9	-4.0	-3.4	0.0
Utilities and construction	3.4	5.3	4.1	4.8	0.0
Transportation and communication	1.6	1.0	-0.5	0.4	0.0
Other services	1.8	1.6	0.4	1.1	0.0

Source: Authors' simulation from GTAP model.

8. Conclusion

This paper has attempted to quantify the impact of Lao's WTO accession using a standard GTAP model. It is important to note that these are preliminary results, and the long-term benefits of WTO accession are likely to be underestimated in this type of

GTAP simulations. The simulation results reveal that the benefits of WTO accession by Laos when measured in real GDP is relatively small as it will increase only about 0.5% and household welfare (EV) will increase by US\$ 1 million. In addition, except from *Textiles and clothing* and *Utilities and construction*, the output of most Lao products will fall; many sectors will experience trade deficits; and the demand for skilled and unskilled labor will fall. Therefore, we can conclude that overall Laos will gain minor benefits from WTO accession.

However, this study is characterized by several weaknesses. First, it uses a static GTAP model, which does not reflect the real impact of Laos' WTO accession. Second, trade liberalization bestows various benefits such as doing business and investment climate improvement, productivity/technical change (Meijl and Tongeren, 1999 and 2002; Das, 2002 and 2008) and trade facility improvement (Hertel, Walmsley, and Itakura, 2001; Minor and Tsigas, 2008; Stone and Strutt, 2009), Liberalization of service sector (Dee, 2005), and others. But this simulation focuses only on tariff cuts, and so the impact of WTO accession might be underestimated. Thirdly, it is important to investigate the impact of WTO accession on poverty and income distribution.

References

- Adams, P.D. (2005). Interpretation of results from CGE models such as GTAP, *Journal of Policy Modeling*, 27, 941-959.
- Anderson, K. (1998). *Lao PDR and WTO accession: Implications for agriculture and rural development*. University of Adelaide, Australia: School of Economics and Centre for International Economic Studies.
- Akkharath, I. (2003). *The agricultural development policy and WTO accession of Lao PDR*. World Trade Organization.
- Bandara, J. (1991). Computable general equilibrium models for developing policy analysis in LDCs. *Journal of Economic Survey*, 5.
- Brockmeier, M. (1996). A graphical exposition of the GTAP model. *GTAP technical paper*. Purdue University: Center for Global Trade Analysis.
- Brown, D. (1987). Tariffs, the terms of trade and national product differentiation. *Journal of Policy Modeling*, 9 (3).

- Das, G. G. (2002), Trade-Induced Technology Spillover and Adoption: A Quantitative General Equilibrium Application, *Journal of Economic Development*, Vol 27, No 2, pp.21-44.
- Das, G. G. (2008), Does trade and technology transmission facilitates convergence? The role of technology adoption in reducing the inequality of nations, *Journal of Economic Policy Reforms*, Vol 11, Issue 1, pp. 67 – 92.
- Dee, P. (2005), A compendium of barriers to services trade, *Asia-Pacific School of Economics and Government*, Australian National University.
- Government of Laos. (2004). *National growth and poverty eradication strategy*. Vientiane, Laos: Author.
- Hanslow, K.J. (2000). A General Welfare Decomposition for CGE Models, *GTAP Technical Paper No. 19*.
- Hertel, T. (Ed). (1997). *Global trade analysis: Modeling and application*. New York: Cambridge University Press.
- Hertel, T. & Tsigas, M. (1997). Structure of GTAP. In T. Hertel (Ed.) *Global trade analysis: Modeling and application*. New York: Cambridge University Press.
- Hertel, T., Walmsley, T., and Itakura, K. (2001), “Dynamic Effects of the “New Age” Free Trade Agreement between Japan and Singapore.”, *Journal of Economic Integration* 24, pp. 1019-1049.
- Huff, K. M and Hertel, T. W. (2000). Decomposing Welfare Changes in the GTAP Model, *GTAP Technical Paper No.5*.
- Huff, K., Hanslow, K., Hertel, T., & Tsigas, M. (1997). GTAP behavioral parameters. In T. Hertel (Ed.) *Global trade analysis: Modeling and application*. New York: Cambridge University Press.
- International Monetary Fund. (2008). *IMF executive board concludes 2008 article IV consultation with the Lao People's Democratic Republic*. Retrieved from <http://www.imf.org/external/np/sec/pn/2008/pn08109.htm>
- National Statistic Center. (2003). The households of Lao PDR: Social and economic indicators. In NSC (Ed.) *Lao Expenditure and Consumption Survey 1997/98*. Vientiane, Laos: National Statistic Center.
- Meijl, H., and Tongeren, F. (1999), Endogenous International Technology

- Spillovers and Biased Technical Change in Agriculture, *Economic Systems Research*, Vol 11, No 1, pp.31-48.
- Meijl, H., and Tongeren, F. (2002), Endogenous International Technology Spillovers and Biased Technical Change in the GTAP Model, *GTAP Technical Paper*, Purdue University.
- Minor, P., and Tsigas, M. (2008). "Impacts of Better Trade Facilitation in Developing Countries", Conference Paper, GTAP 11th Annual Conference, Helsinki, Finland.
- Okonjo-Iweala, N., Kwakwa V., Beckwith A., & Ahmed Z. (1999). Impact of Asia's financial crisis on Cambodia and the Lao PDR. *Finance & Development*.
- Pholsena, K., Isacson, G., Douangboupha L., Vilavong B., & Phounesavath S. (2007). *Addressing the impact of the phasing out of textiles and clothing quotas in Lao PDR (4)*. Vientiane, Laos: National Statistic Centre.
- Srinivasan, T. & Whalley, J. (Eds.). (1986). *General equilibrium trade policy modeling*. Cambridge: MIT Press.
- Stone, F.S., Strutt, A. & Hertel, T. (2009). *Assessing socioeconomic impacts of transport infrastructure projects in the Greater Mekong Subregion*, 1st and 2nd Asian Development Bank (ADB) Workshop on Trade and Logistics and Transnational Network, 12 May 2009.
- Stone, S and Strutt, A. (2009). "Transportation Infrastructure and Trade Facilitation in the Greater Mekong Subregion", ADBI Working Paper Series, No. 130, Asian Development Bank (ADB), Tokyo.
- Strutt, A. & Anderson, K. (2000). Will trade liberalization harm the environment? The case of Indonesia to 2020. *Environmental and Resource Economics* 17, 203-232.
- Tongzon, J 2001, 'China's membership in the World Trade Organization (WTO) and the exports of the developing economies of East Asia: a computable general equilibrium approach,' *Applied Economics*, 33.

- Kyophilavong, P. (2004). Analyzing the effect of AFTA on Lao economy: Macroeconomic model approach. *Lao Journal of Economic and Management*, 1 (2).
- Kyophilavong, P. (2007a). Can Laos gain benefit by joining AFTA? How much?: A CGE (Computable General Equilibrium) model approach. *Academic Journal of National University of Laos*, 1(1).
- Kyophilavong, P. (2007b). *Monetary and exchange rate policies in the Lao PDR*. Paper presented at Asian Development Bank's Monetary and Exchange Rate Policies in Cambodia, Lao PDR and Vietnam: The Scope for Regional Cooperation Conference, Bangkok, Thailand.
- Kyophilavong, P. (2008). SMEs development in Lao PDR. In Hank Lim (Ed.), *Asian SMEs and globalization. ERIA Research Project Report 2007*. Economic Research Institute for ASEAN and East Asia (ERIA).
- Kyophilavong, P. & Toyoda, T. (2008) *Foreign capital inflows in the natural resources sectors: Impacts on the Lao economy*. Paper presented at The Future of Economic Integration in Asia Conference, Bangkok, Thailand.
- United Nations Development Programme. (2007/2008). *Human development report 2007/2008- Fighting climate change: Solidarity in a divided world*. United Nations Development Programme.
- Winter, L, A. (2004). "Trade Liberalization and Economic Performance: an overview", *the Economic Journal* 114, F4-F21.
- World Bank. (2008). *Lao PDR economic monitor*. Vientiane: Author.

