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**Analysis of Lao PDR's Comparative
Advantage and Its Implication for
Export Competitiveness in
Industrialization Era (2006-2015)**

A Thesis Presented by

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**Graduate Program in International Commerce
For the degree of International Studies**

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Implication for Export Competitiveness in Industrialization
Era (2006-2015)

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Analysis of Lao PDR's Comparative Advantage and
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ABSTRACT

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This research analyzes Lao PDR's comparative advantage and its implication for export competitiveness in industrialization era. The purpose of this research were 1) to study Lao PDR's export competitiveness during the period from 2006-2015 by using RCA, 2) to the competitiveness of manufactured goods to compare with two ASEAN countries which are Thailand and Vietnam and 3) to propose Lao PDR's policy implication for industrialization. Generally, Lao PDR is the developing country and has importation more than exportation while compared with other ASEAN countries.

The result shows that Lao PDR has strong RCA in some commodities, especially electricity generation and wood processing industry. At the same time, manufactured goods in Lao PDR have higher RCA than two countries. For instance, Lao PDR has comparative advantage in both an electricity generation and wood processing industry compared to Thailand and Vietnam during 2006-2015. However, Lao PDR currently still lacks clear and detailed policy on industry so the country should promote more facilities of trade, strive to promote on law of investment promotion clearly. Particularly, the government must focus on protect and preserve about Lao PDR's forest efficiently due to wood processing industry which has both positive and negative impact for the country stringent.

Keyword: Comparative advantage, manufactured goods, electricity industry, wood manufacturing, competitiveness, industrial policy.

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CHAPTER 1 INTRODUCTION

1.1 Background

In 1986, the new economic reform was initiated, aimed to move expansion from a central-planned economy to market-oriented under NEMs (The New Economic Mechanism), which turned from socialist economic management system into the market oriented system. Moreover, at the same period, Lao PDR has become one of the open economies and was an official member of ASEAN in 1997. Since that time, Lao PDR's economy has played a different role in ASEAN's economic development. According to the government plan, the country will exert more effort on boosting dominant sectors that affect the internal and external economy. The main focus was on exportation and importation of the commodities among the ASEAN countries and others. Therefore, in 1998, Lao PDR has participated in AFTA (ASEAN Free Trade Agreement). Under AFTA, Lao PDR was to complete the Common Effective Preferential Tariff (CEPT) scheme, which was designed to cut down tariffs on manufactured and processed agricultural products to 0-5%, by 2008 (Souksavanh, 2014). In 2010, Lao PDR officially signed the ASEAN Trade in Goods Agreement (ATIGA); in 2013, Lao PDR became an official member of the World Trade Organization (WTO). Besides, participating the trade cooperation is one of the significant ways for the attraction of the trade liberalization throughout the world.

After joining the ASEAN Trade in Goods Agreement (ATIGA), Lao PDR can benefit from trade preference in the form of tariff exemption or tariff

reduction under the ATIGA. Recently, the Lao economy has increasingly expanded from a slow economic growth to the fastest economic growth in Southeast Asia. Moreover, Lao PDR's trade sector had many achievements between 2010 and 2014, showing that Lao PDR's merchandise export had been growing at an average rate, 35 percent per year with resource and 30 percent per year with non-resource exports; especially, an average annual growth of export is 7.8 percent. More significantly, Lao PDR's export transferred to these market countries are 0% of tariff rates since 2010, included most agricultural and industrial goods and some of the products under excepted items list as well as the Sensitive List (SL). Additionally, Lao's export to newer ASEAN members (Cambodia, Myanmar and Vietnam) will be cut to 0% tariff rate by 2018 (Sussangkarn, 2006). Besides, Lao PDR has still exported the commodities to both Intra-ASEAN and Extra-ASEAN countries. Particularly, trade development and trade liberalization have created a new era and have increasingly driven GDP per capital.

- The current status of Lao PDR's economy

Basically, Laos is a developing country with the population of 6,492,400 million (Lao Statistic Bureau, 2015), located in an area of 236,800 square kilometers with diverse ethnic groups. The Gross Domestic Product (GDP) is divided by economic sectors such as agriculture 23.15%, industry 32.42%, and services 37.87%; and GDP per capita is \$1,725 (Lao Statistic bureau, 2014). Regarding the Economy Complexity Index (ECI), in 2015, Laos is the 115th largest export economy in the world and Laos also has exported \$3.81 billion, imported \$6.54 billion, which leads to a negative in the balance of

trade with \$2.73 billion in net imports (OEC Website).

In addition, the main export products of Laos are electricity, mineral, manufactured and handicraft, agriculture products, wood and wood products and metals; however, the main imported products are vehicles and vehicle equipment, fuel and gas, construction equipment, electrical equipment, food, luxury goods, medicines and medical equipment and so on (Leebouapao & Lao, 2014).

1.2 Trade Liberalization

For the top countries that Lao PDR has exported and imported throughout both Intra-ASEAN and Extra-ASEAN with a share of total export including a share of the total import (Table 1 and 2) as below:

Table 1: Export Value and Import Value by regions in 2012-2014

Th.USD

No	Regions	Export value			Import value		
		2012	2013	2014	2012	2013	2014
Intra-ASEAN		894,343	1,233,908	1,009,148	1,424,438	2,494,955	3,158,323
1	Brunei Darussalam	–	–	69	25	–	6
2	Cambodia	1,692	642	4,263	2,249	136	62
3	Indonesia	100	13,271	16,988	1,076	7,208	11,315
4	Malaysia	905	668	4,556	1,457	8,730	6,875
5	Myanmar	3317	3,082	142	3,228	–	426
6	Philippines	–	57	10,020	378	913	811
7	Singapore	5,207	2,994	682	11,690	6,224	9,200
8	Thailand	686,639	890,364	687,166	1,042,809	2,182,895	2,754,164
9	Vietnam	196,483	322,831	285,261	361,526	288,849	375,465
Extra-ASEAN		611,453	1,322,366	895,758	832,806	778,672	780,407
1	Australia	441,959	721,195	102,348	11,801	15,507	15,353
2	Canada	1,160	635	3,412	12,541	316	1,595
3	China	105,933	363,404	695,876	505,998	511,213	537,706
4	EU 27	30,646	202,885	51,973	178,900	37,460	36,628
5	India	56	514	428	4,006	14,274	3,786
6	Japan	22,239	24,424	18,510	61,434	94,833	79,442
7	Korea Republic	8,125	1,969	2,990	46,239	91,188	76,753
8	New Zealand	304	629	1,026	2,138	292	332
9	Pakistan	166	97	–	250	665	609
10	Russia	–	131	22	2,407	3,055	318
11	United States	866	6,483	9,920	7,091	9,869	14,017
12	Rest of the world	10,991	36,536	9,254	15,691	18,412	21,440
Total		1,516,786	2,592,810	1,904,905	2,272,934	3,292,039	3,960,170

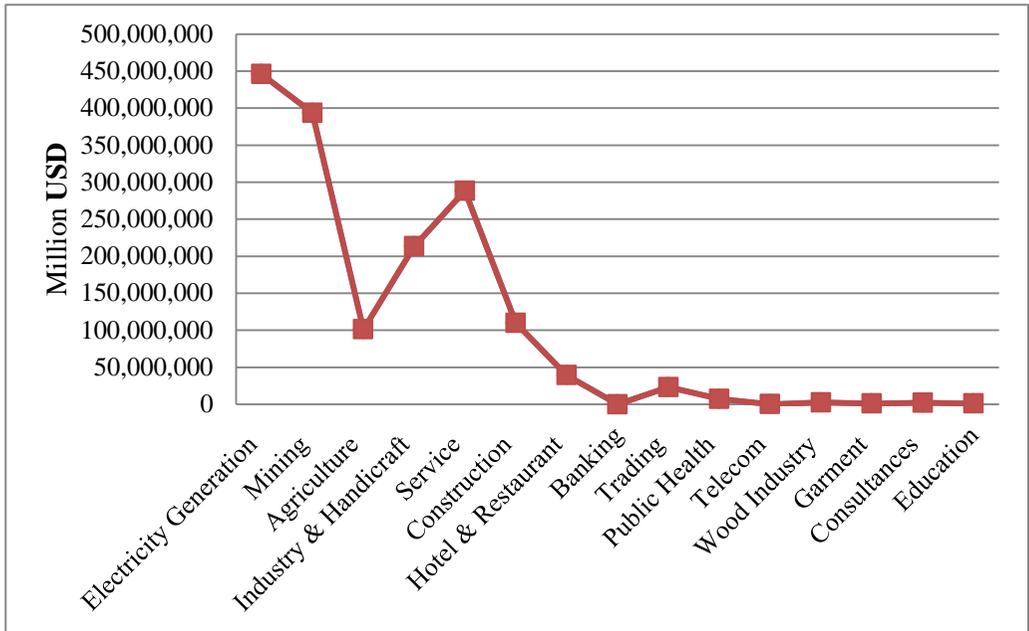
Source: Department of Economic Statistics, Lao Statistics Bureau, MPI. The data based on Department of Customs, Ministry of Finance.

Table 2: Share of Total Export and total Import by regions in 2012-2014

No	Regions	Share of total Export (%)			Share of total Import (%)		
		2012	2013	2014	2012	2013	2014
Intra-ASEAN		58.96	47.59	52.98	62.67	75.79	79.75
1	Brunei Darussalam	–	–	0	0	–	0
2	Cambodia	0.11	0.02	0.22	0.1	0	0
3	Indonesia	0.01	0.51	0.89	0.05	0.22	0.29
4	Malaysia	0.06	0.03	0.24	0.06	0.27	0.17
5	Myanmar	0.22	0.12	0.01	0.14	–	0.01
6	Philippines	–	0	0.53	0.02	0.03	0.02
7	Singapore	0.34	0.12	0.04	0.51	0.19	0.23
8	Thailand	45.27	34.34	36.07	45.88	66.31	69.55
9	Vietnam	12.95	12.45	14.98	15.91	8.77	9.48
Extra-ASEAN		40.31	51	47.02	36.64	23.65	19.71
1	Australia	29.14	27.82	5.37	0.52	0.47	0.39
2	Canada	0.08	0.02	0.18	0.55	0.01	0.04
3	China	6.98	14.02	36.53	22.26	15.53	13.58
4	EU 27	2.02	7.82	2.73	7.87	1.14	0.92
5	India	0	0.02	0.02	0.18	0.43	0.45
6	Japan	1.47	0.94	0.97	2.7	2.88	2.01
7	Korea Republic	0.54	0.08	0.16	2.03	2.77	1.94
8	New Zealand	0.02	0.02	0.05	0.09	0.01	0.01
9	Pakistan	0.01	0	–	0.01	0.02	0.02
10	Russia	–	0.01	0	0.11	0.09	0.01
11	United States	0.06	0.25	0.52	0.31	0.3	0.35
12	Rest of the world	0.72	1.41	0.49	0.69	0.56	0.54
Total		100	100	100	100	100	100

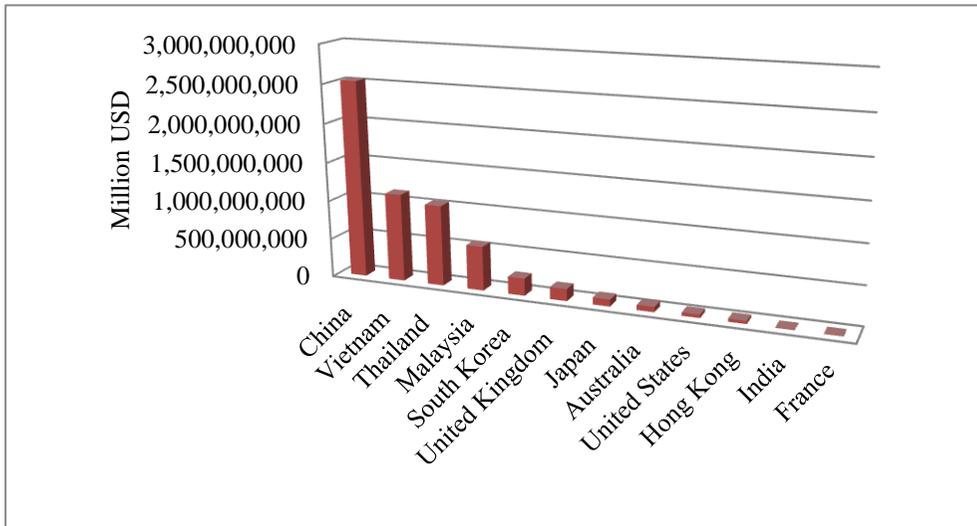
Source: Department of Economic Statistics, Lao Statistics Bureau, MPI The data based on Department of Customs, Ministry of Finance.

Figure 1: Value of FDI in Lao PDR by sector (2011-2015)



Source: Investment Promotion Department, MPI, 2017.

Figure 2: Value of FDI in Lao PDR by Country (2011-2015)



Source: Investment Promotion Department, MPI, 2017

1.3 Research Question

The aims of this research are:

- 1) To study Lao PDR's export competitiveness during the period from 2006 to 2015.
- 2) To study the competitiveness of manufactured goods comparison with two ASEAN countries which are Thailand and Vietnam.
- 3) To propose Lao PDR's policy implication for industrialization.

CHAPTER 2 THEORETICAL RESEARCH

According to Ricardian Model, it's a classical model for using into the global trade. Thus, consider two countries (X,Y), two goods (A,B) and one factor of production is labor. In particularly, the based on trade in the world is labor productivity difference, between two countries; they will export the products that it has higher comparative advantage (lower opportunity cost to produce) to another country and import the products that it has higher comparative disadvantage (higher opportunity cost to produce). As we can see Ricardian theory will calculate by using opportunity cost which the opportunity cost can be estimated by using unit of labor requirement.

Based on the H-O theory or H-O model is a modern one or specific model. As well known that it was estimated by 2 countries (X,Y), 2 goods (A,B) and 2 factors (K,L) or called Capital and Labor, which is resource endowments to trade). In fact, 2 countries have the same technology for production in various goods. However, there are different resources endowments in home country such as one country is capital abundant nevertheless another is labor abundant and beside that it has perfect competition in market. Specifically, one good is more labor intensive and another one is more capital intensive in trade between two countries.

However, Comparative Advantage is derived from various major theories such as H-O theory to apply in the measurement of comparative advantage index: RCA will be employed. This method is widely used and known as "Balassa" which is developed by Balassa, 1965. Basically, the revealed

comparative advantage (RCA) index is defined as the ratio between the share of a country's commodity exports in the commodity exports of the world, and the share of the country's total exports in the total exports of the world.

RCA is formed in this formula:

$$RCA_{i,j} = \frac{X_{i,j}/X_{w,j}}{X_{i,t}/X_{w,t}} = \frac{X_{i,j}/X_{i,t}}{X_{w,j}/X_{w,t}}$$

$RCA_{i,j}$ is the revealed comparative advantage index of country i in commodity categories j . Where $X_{i,j}$ respectively country i 's exports of commodity categories j , $X_{w,j}$ denotes the world's exports of commodity categories j , $X_{i,t}$ represents for country i 's total exports, and $X_{w,t}$ shows that total exports of the world.

$$-1 \leq RCA \leq +1$$

- a) When $RCA > 1$, it means that country i has a revealed comparative advantage on commodity j .
- b) When $RCA < 1$, it means that country i has a revealed comparative disadvantage on commodity j .

2.1 Literature Reviews

Nunthiya SENANUA (2010) conducted an analysis on the revealed comparative advantage of Thailand and Vietnam textiles and clothing export to The United States of America. Regarding this research has determined the time period from 2001 to 2009 by using RCA formula. The aims of this research were to calculate comparative advantage index (RCA) of Thailand and Vietnam textiles and clothing export to The United States of America from 2001 to 2008 and to examine comparative advantage of textiles and clothing between Thailand and Vietnam textiles and clothing export to The United States of America during 2001-2009. The research revealed that revealed comparative advantage (RCA) indexes of both Thailand and Vietnam were rather than one ($RCA > 1$), it has shown that the two countries had a comparative advantage even though Vietnam's garment industry sector had bigger size than Thailand's. It has also elicited another result of factor production conditions that Vietnam's advantage was more competitive than Thailand's because the wages of workers in the garment industry in Vietnam is lower than that in Thailand. However, demand conditions in Vietnam had competitive disadvantage compared to Thailand due to Thailand had expenditure on clothing consumption per capita and gross domestic product (GDP) per year which were larger than Vietnam. Moreover, the sizes of the domestic demand's Thailand were also bigger than Vietnam. In terms of supporting and related industry, Vietnam was found to have competitive disadvantage compared to Thailand as Vietnam had number of factories this

were less basic factor of production than that in Thailand.

PopkarnArwatchanakarn and PitiSrisangnam (2011) studied about revealed comparative advantage, case study: Thailand and Indonesia product export in ASEAN from 2005 to 2009 by using RCA index. The purposes of this research were to investigate comparative advantages of Thai and Indonesia's products that are exported to ASEAN by employing revealed comparative advantage (RCA) index. The results showed that the most of the commodities of Thai have more comparative advantage than the commodities of Indonesia. Especially, Thailand has RCA for 42 out of the 62 commodity groups in 2009. The most commodities reveal are a group of foods and live animal (SITC 001), crude materials, inedible, export fuels (SITC 002), Chemicals and related products (SITC 005) and so on.

Bela Balassa and Marcus Noland (1989) did a research on revealed comparative advantage in Japan and the United States. The paper figured out the changes in the comparative advantage of Japan and the United States over the time frame from 1967 to 1983. At the same time, the trade patterns in high technology products of the two countries were also examined. The methodology was based on calculating two trade specialization indexes including the export index of revealed comparative advantage (XRCA) and the net export index (NX). The results showed that Japan's comparative advantages had changed overtime from unskilled-labor intensive commodities to human-capital intensive goods whereas the comparative disadvantages increased in natural resources products. By contrast, the United States had increased its the comparative advantages in natural resources products and

retained its strength on physical capital and human capital intensive goods. In terms of high technology industry, both Japan and the United States underwent the increasing specialization but incomparable to each other. While the former were excelled at large sunk cost industries, the latter chose to develop lower entry costs categories. The differences in strategic trade consideration and strengths in R&D development between the two players could be accounted for explaining this pattern.

Similarly, Vildan Serin and Abdulkadir Civan (2008) studied the revealed comparative advantage and competitiveness by a case study for Turkey towards the EU. The research figured out the changes in the comparative advantage of Japan and the United States over the time frame from 1967 to 1983. At the same time, the trade patterns in high technology products of the two countries were also examined. The methodology was based on calculating two trade specialization indexes including the export index of revealed comparative advantage (XRCA) and the net export index (NX). The results showed that Japan's comparative advantages had changed overtime from unskilled-labor intensive commodities to human-capital intensive goods whereas the comparative disadvantages increased in natural resources products. By contrast, the United States had increased its the comparative advantages in natural resources products and retained its strength on physical capital and human capital intensive goods. In terms of high technology industry (Serin & Civan, 2008), both Japan and the United States underwent the increasing specialization but incomparable to each other. While the former were excelled at large sunk cost industries, the latter chose to develop lower

entry costs categories. The differences in strategic trade consideration and strengths in R&D development between the two players could be accounted for explaining this pattern.

Finally, Seung Jin Kim (2012) did a research on South Korea's trade intensity with ASEAN Countries and Its Changes over Time. According to research paper was conducted to depict how intensively Korea traded with five major ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) and its trade pattern changes over the search's period from 2003 to 2005. The results reveal that, among five countries, Indonesia had the strongest trade intensification with Korea, which could be proved by the highest trade intensify index, special country bias index and the increase in its complementarily trade index. However, the slight fall of the two former indexes indicated that the trade intensification between the two countries intended to reduce. The pattern for the four countries exactly showed the contrast. On the other hand, this paper also figured out Korean's comparative advantages had changed from exporting labor intensive-product to capital/technology intensive goods which were mostly still manufacturing products. At the end, there were some recommendations for promoting trade intensifies between Korea and these five players through enhancing special country bias index by increasing capital investment, reducing discriminatory tariff and other trade restrictions (Kim, 2012).

CHAPTER 3 METHODOLOGY AND DATA

This research used primary and secondary data from various sources from theoretical books, published government reports, related published journals, official websites (LTP), and other reports by various institutions, private sectors and public organizations and it is calculated by revealed comparative advantage (RCA, Balassa, 1965). In addition, this research used the commodity trade value which is available in the database by The United Nations Comtrade (UN Comtrade) from the period 2006-2015. Because there are no trade data that reported by Lao PDR regarding to commodity trade values due to troubles with availability and reliability of statistical information. Thus, the data for analyzing in this study was reported by the whole trading partners of Lao PDR from UN Comtrade data base, and the number will use only with two digits in general. Furthermore, Lao PDR's trade value in each year is downloaded from UN Comtrade.

CHAPTER 4 EMPIRICAL ANALYSIS

4.1 Lao PDR's export competitiveness during the period from 2006-2015

These are the evidence evaluation of Lao PDR's export on commodities for 2006-2015 by using revealed comparative advantage (RCA) index. It found that Laos has RCA strong in some commodities out of several commodities (table 3).

Table 3: Lao PDR's competitiveness selected commodities for 2006-2015

SITC	DESCRIPTIONS	RCA	SITC	DESCRIPTIONS	RCA
2006			2007		
351	Electric current	54.31	247	Jute,oth.textl.bast fiber	64.94
248	Wood, simply worked wood	44.76	682	Copper	48.59
247	Wood rough, rough squared	40.95	248	Wood, simply worked wood	36.03
682	Copper	37.16	351	Electric current	30.3
264	Jute,oth.textl.bast fiber	29.49	071	Coffee, coffee substitute	17.39
045	Other cereals, unmilled other	14.23	841	Mens, boys clothing,x-knit	15.38
843	Mens,boys clothing, knit	12.76	245	Fuel wood, wood charcoal	13.02
841	Mens, boys clothing,x-knit	12.13	843	Mens,boys clothing, knit	10.54
245	Fuel wood, wood charcoal	9.59	231	Natural rubber, etc	9.51
044	Maize unmilled	9.21	273	Stone, sand and gravel	7.57
2008			2009		
247	Wood rough, rough squared	70.28	283	Copper ores, concentrates	76.15
248	Wood, simply worked wood	51.88	247	Wood rough, rough squared	52.27
682	Copper	48.21	248	Wood, simply worked wood	43
245	Fuel wood, wood charcoal	30.97	682	Copper	37.33
351	Electric current	30.3	245	Fuel wood, wood charcoal	18.13
283	Copper ores, concentrates	18.93	351	Electric current	24.42
071	Coffee, coffee substitute	18.66	045	Other cereals, unmilled other	18.13

843	Mens,boys clothing, knit	18.33	264	Jute,oth.textl.bast fiber	15.99
841	Mens, boys clothing,x-knit	14.34	843	Mens,boys clothing, knit	15.89
264	Jute,oth.textl.bast fiber	12.85	273	Stone, sand and gravel	14.67
2010			2011		
247	Wood rough, rough squared	71.17	247	Wood rough, rough squared	116.93
283	Copper ores, concentrates	70.74	351	Electric current	66
351	Electric current	58.91	283	Copper ores, concentrates	61.46
248	Wood, simply worked wood	44.43	248	Wood, simply worked wood	53.86
245	Fuel wood, wood charcoal	33.64	245	Fuel wood, wood charcoal	48.12
682	Copper	26.42	682	Copper	27.31
273	Stone, sand and gravel	14.32	071	Coffee, coffee substitute	14.11
843	Mens,boys clothing, knit	13.29	045	Other cereals, unmilled other	11.77
841	Mens, boys clothing,x-knit	12.57	841	Mens, boys clothing,x-knit	10.45
071	Coffee, coffee substitute	11.27	843	Mens,boys clothing, knit	10.25
2012			2013		
247	Wood rough, rough squared	132.79	247	Wood rough, rough squared	150.58
351	Electric current	68.28	245	Fuel wood, wood charcoal	84.06
283	Copper ores, concentrates	61.08	351	Electric current	82.66
248	Wood, simply worked wood	54.87	248	Wood, simply worked wood	58.3
245	Fuel wood, wood charcoal	49.48	264	Jute,oth.textl.bast fiber	38.86
264	Jute,oth.textl.bast fiber	31.7	283	Copper ores, concentrates	36.73
682	Copper	29.81	682	Copper	25.94
071	Coffee, coffee substitute	15	231	Natural rubber, etc	20.27
045	Other cereals, unmilled other	12.21	071	Coffee, coffee substitute	11.96
841	Mens, boys clothing,x-knit	12.02	841	Mens, boys clothing,x-knit	8.76
2014			2015		
247	Wood rough, rough squared	253.48	247	Wood rough, rough squared	164.49
245	Fuel wood, wood charcoal	97.68	245	Fuel wood, wood charcoal	94.6
351	Electric current	68.85	351	Electric current	82.55
248	Wood, simply worked wood	65.67	248	Wood, simply worked wood	44.67
283	Copper ores, concentrates	33.101	283	Copper ores, concentrates	37.95
231	Natural rubber, etc	26.52	231	Natural rubber, etc	34.45
682	Copper	20.58	682	Copper	20.66
264	Jute,oth.textl.bast fiber	11.02	286	Uranium,thorium ores, etc	14.42
071	Coffee, coffee substitute	10.46	562	Fertilizer, except grp	11.42
841	Mens, boys clothing,x-knit	7.43	685	Lead	11.26

Source: Author compiled (data are from UN Comtrade online database).

The table3 shows that over the ten years (2006-2015), Lao PDR was strong with revealed comparative advantage (RCA) index among the primary products such as:

- The wood industry was the most mainly exporting commodity over the period (2006-2015). It is the competitiveness of Lao's export. The wood industry included fuel wood and charcoal (SITC 245), wood in chips or particles (SITC 246), wood rough, rough squared (SITC 247), wood simply worked (SITC 248) and so on. Basically, Lao PDR is rich in natural resources and its nature's products become the major income of the country. Currently, Lao PDR has still exported the natural products to other countries around ASEAN and non-ASEAN countries (Vostroknutova et al., 2011).

- Electric current (SITC 351)^①, Laos has exported to ASEAN countries such as Thailand, Cambodia, and Vietnam. Currently, Thailand remains as a major electricity importers from Lao PDR (Greacen & Palettu, 2007).

- Coffee, coffee substitute (SITC 071), other cereals, unmilled (SITC 045) was represented agricultural sector and it was also high RCA in Lao PDR every year due to this is a traditional and popular export item. It has been exported to many countries such as intra-ASEAN (Thailand, Vietnam...) and extra-ASEAN (Japan, USA, and EU members). Nevertheless, coffee is still an agricultural item which has the comparative advantage of country export and is among the top ten items for the whole RCA study period. On the other hand,

^① Electricity was not included in UN comtrade until revision 3 of the SITC, so the author uses the data for electric current (SITC 351) in RCA analysis.

live animals (SITC 001) has retained an export product to another country but is not listed in the (table 1) because of the data based on UN Comtrade.

- The representative for Garment industry are men's, boy's clothing, x-knit (SITC 841, 842), knitted men's and women's clothing (SITC 843, 844) and textile clothing accessories (SITC 846). Lao PDR has been exporting its garment products to Europe. Currently, Lao PDR has significant trade partners for this sector such as Germany with the high total export value over US\$221.31 million in garment items during the period of 2013-2015 while agricultural product was also another exporting sector to Germany (Nolintha & Jajri, 2016). Besides, Lao PDR also has exported garment products to European countries along with United Kingdom, Italy, France, Portugal, Spain, and Denmark. However, the country always imported the important products from other European countries and ASEAN countries, for instance, vehicle parts, machinery, and agricultural vehicles.

- The mining industry stood for copper (SITC 682), copper ores, concentrates (SITC 283) and lead (SITC 685). For both of them, RCA is as high as the others products during study period. It was exported to China, Japan, Malaysia, Poland Singapore, Thailand, and Vietnam. Meanwhile the mining sector gained more income for the country because there are a lot of foreign direct investment (FDI) projects. For example, in Savannakhet Province, the natural resource in Lao PDR is a boost with large FDI inflows, significant investment from Chinese and Vietnamese investors. However, they are both positive and negative for Lao people and the environment there (Greacen & Palettu, 2007).

Electricity generation, wood processing industry, mining and garment industry has exported increasing and those were Lao PDR's export competitiveness during the period.

Basically, revealed comparative advantages of Lao PDR have no changed importantly over this period of time. In fact, the country needs a lot of imported commodities from other countries and it lose RCA in large commodities and competitiveness in some commodities in general.

4.2 The competitiveness of manufactured goods comparison with two ASEAN Countries which are Thailand and Vietnam

Overall, Manufactured products processing in Lao PDR include hydropower generation, coal industry, mining industry, agricultural tools, cement industry, machinery, electronics and information technology, chemical industry, textile and clothing, beverage, tobacco, cooking oil, dairy industry and plastic products (Mustonen, 2010). Because of some manufacturing are steadily increasing over the period until now, thus it will shoes two case of its significant manufacturing such as: electricity generation and wood processing industry case.

4.2.1 Electricity Generation Case

As the first result (table 3), those are some important export sectors and then, this part will compare some of manufactured goods that Lao has competitiveness with Thailand, Vietnam into specific commodities; overall

those countries are strong closely trade and both countries is the main partner trading of Lao PDR (table 4).

Table 4: Comparison Lao's competitiveness of electricity industry with two ASEAN countries (Thailand and Vietnam)

Electricity Industry			
RCA			
Year	Lao PDR	Thailand	Vietnam
2006	54.31	0.08	0
2007	30.3	0.12	0
2008	30.31	0.15	0
2009	24.42	0.19	0.07
2010	58.91	0.32	0.35
2011	66	0.29	0.36
2012	68.28	0.31	0.11
2013	82.66	0.52	0.71
2014	68.85	0.38	0.36
2015	82.55	0.49	0.31

Source: Author compiled and Calculated with Balassa Index (data are from UN Comtrade online database) and using 2 digits.

Regarding to the results, electricity generation is an essential of the manufactured goods in Lao PDR when compared with two countries, electricity has been steadily increasing in each year and electricity is the main export competitiveness so country has higher RCA than Thailand and Vietnam. Furthermore, Thailand is the biggest importer electricity market for Lao PDR. Since 1972 under the commission, Lao PDR and Thailand has started electricity trade with the first dam built^②. The country has phenomenal hydropower resource as the major source of energy generation and abundant

^② A hydroelectric dam on the Nam Ngum river is the first dam built in Lao PDR, 1968.

in energy resources, the largest plant in Lao PDR is Nam Theun 2 (NT2) hydropower project which is enable export 995 MW to Thailand, accounting for 75 MW for supply in country. In addition, 10 percent of GDP in Lao PDR is from export electricity to Thailand (World Bank, 2012).

Moreover, Vietnam has imported 250 MW by the Xekhaman III hydropower plant from Lao PDR and Vietnam currently is considering importing more electricity from Lao PDR for supplying their domestic demand of Vietnamese used electricity. In 2015, the country exported electricity to Vietnam with the total amount was US\$19.8 million and was expected to increase in this year (Vientiane times, 2016).

According to hydropower consumption, the Asian Development Bank (ADB) has projected electricity demand to rise by an average for 7.7 percent from now until 2030, it is expected to grow faster at average 12.1 percent. Lao PDR has strived to become as “Battery of Asia” by hydropower development plant in the future (Thaksin Shinawatra, Thai Former Prime Minister). And by 2030, Lao PDR’ power production capacity is expected to rise further to 20,000MW, which will be in excess of domestic demand and set for export to its neighbors (Ng & Yeats, 2003).

In the Hydropower electricity is the main income that makes country has been economic growth increasingly and it has driven to achieve the goals of social-development successfully. Thus, Lao PDR has been superior comparative advantage among ASEAN counties; due to over the four years (2013-2016), Lao PDR received around US\$2.75 billion of electricity sales

from Thailand and more than US\$23 million of it from Cambodia^③. According to the Ministry of Energy and Mines reported, Myanmar will import electricity from Lao PDR. Thus, The Lao government strongly believes that increasing electric power generation in Lao PDR will help supply electricity to other ASEAN countries for mutual benefit. Particularly, Lao PDR now has 42 operational power plants with an installed capacity of 6,391MW that generate about 33,822.4GWh annually (Vostroknutova et al., 2011). Currently, the number of power plants will increase from 42 to 50 as the government and private energy developers seek to complete the construction of 12 new power plants which will start to generate electricity this year, by this reasons it makes Laos competitive with electric power. On the other hand, Lao PDR is not only exporting to neighboring country as Thailand, Vietnam, and Cambodia; Nevertheless the country also importing parts and some of electric equipments from its neighboring countries such as China Thailand and Vietnam for facilitate to rural area consumption, although Lao PDR is increasing energy generation in each year.

^③Reported by the Ministry of Industry and Commerce, Lao PDR, 2016.

Table 5: Energy Generation in Lao PDR (2006-2014)

Year	Total (Unit: KWH)
2006	3,609
2007	3,420
2008	3,678
2009	3,381
2010	8,449
2011	12,979
2012	12,860
2013	15,505
2014	15,853

Source: Carbinet, Ministry of Energy and Minies, 2015

4.2.2. Wood manufacturing case

With the results of this study, manufacture of wood products is steadily increasing in Lao PDR, which is wood industry includes: fuel wood and charcoal (SITC 245), wood in chips or particles (SITC 246), wood rough, rough squared (SITC 247), and wood simply worked (SITC 248).

Table 6: Comparison Lao PDR's competitiveness of wood processing industry with two ASEAN counties (Thailand and Vietnam)

RCA	fuel wood and charcoal									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Laos	9.59	13.03	30.98	30.12	33.64	48.13	49.48	84.06	97.68	94.61
Thailand	0.12	0.29	0.51	0.61	0.36	0.46	0.77	0.62	0.85	0.77
Vietnam	2.56	4.51	1.89	2.17	1.66	0.62	0.76	0.63	1.27	2.36
RCA	wood in chips or particles									
Laos	0.52	0.91	0.58	0.74	0.74	0.33	0.34	0.09	0.34	0.13
Thailand	0.56	0.68	1.7	1.93	2.97	3.88	4.52	3.7	3.22	3.03
Vietnam	11.65	12.26	13.75	12.52	18.34	21.21	21.25	22.52	18.4	18.16
RCA	Wood rough, rough squared									
Laos	40.95	64.94	70.29	52.28	71.17	116.9	132.7	150.5	253.48	164.4
Thailand	0	0	0.01	0.01	0	0.01	0.01	0.01	0	0
Vietnam	0.76	1.12	0.39	0.31	0.32	0.68	0.69	0.93	0.39	0.46
RCA	wood, simply worked									
Laos	44.77	36.04	51.88	43.01	44.44	53.87	54.88	58.31	65.68	44.68
Thailand	0.83	0.78	0.83	1.12	1.32	1.61	1.56	1.84	1.78	1.73
Vietnam	0.39	0.49	0.44	0.52	0.8	1	0.82	0.94	0.78	1.06

Source: Author compiled and Calculated with Balassa Index (data are from UN Comtrade online database) and using 2 digits.

During the period, wood and wood products have high comparative advantage more than Thailand and Vietnam, particularly fuel wood and charcoal, wood rough, rough squared and wood, simply worked. However, Vietnam has high RCA with wood in chips or particles gather than Lao PDR and Thailand (table 6).

Since 2005, Fuel wood and charcoal in Lao PDR is produced for domestic consumption as well as export in Asia. The main export markets for fuel wood and charcoal products are Vietnam and Thailand. Regarding to the Ministry of Industry and Commerce reported that Lao PDR has exported fuel wood and charcoal to Vietnam about 75,000 tons while exported to Thailand approximately 40,000 tons in 2009.

According to Lao-Viet Timber Trade (Phuc, 2009), Lao PDR has become a major exporter of wood furniture manufacturing industry for Vietnam's exploding wood processing industry. In 2011, accounting for 23% that Lao PDR exported timber to Vietnam and the total of value reached US\$313.65 million. As the same Thailand that has imported wood and wood articles, wood charcoal from Lao PDR by the US\$42.29 Million in 2015^④ and the country is not only export of wood and wood products to intra-ASEAN but still exported to extra-ASEAN such as Austria, France, Italy, Korea and Japan (Lao statistic Bureau, 2015).

^④ According to the United Nations COMTRADE database on international trade.

Although, this industry has high exportation in the country but Lao PDR are now suffering from labor forces which is lack of skills and knowledge, Lao's labor skills of carpenters need to be improved. Furthermore, some wood product items have both with low value-added and low tools in advanced technology compared with neighboring country.

4.3 Lao PDR's policy implication for industrialization

In fact, Lao PDR currently still lacks clear and detailed policy on industrial sector such as hydropower plant as well as wood processing industry. However, the country could manage to apply some kind of policy and approaches in developing its industry sector. The approaches and policies can be seen through its 5-year plan which was approved in the Lao high-level politic congress. The 7th national party congress of Laos in 2001 had set its strategic target on graduating Lao PDR from Least Development Countries (LDCs) by 2020. To achieve this goal, Laos has to do its best in economic development which its growth must stay above 7%. In doing so, agriculture and forestry sectors must be developed in line with industry and service sector, strongly, clearly and with certain focus. The important issue is building precondition for industrialization and modernization.

The new-change approaches are aiming at liberating entrepreneurs in their self-management, and at the same time Lao government manage on strategic industry fields like electricity and wood processing industry.

4.3.1 A brief of industrial policy in Lao PDR

The system of Lao PDR's industrialization can be divided into two periods such as first periods called Centrally-planned system (1976-1985) and Second periods namely New Economic Mechanism System (1986-Now).

1) Centrally-planned System (1976-1985)

In this period, the important thing is an agriculture based on country, thus the government applied industrialization policy that makes from agriculture. The government provided the capital, production tools and techniques, included setting the prices from whole agricultural goods that produced by famers in country and then distributed products and services to famers under equitable principles (The agricultural cooperative program). At that time, Lao's government greatly believed that agricultural cooperative program would reinforce agricultural productivity, decreasing some traditional farming activities for example slash, burn and seasonal based on farming. In addition, the government created one year plan (1976-1977), three year plan (1978-1980) and five year plan then. So, 1st five year National Socio-Economic Plan in Lao PDR was built during 1981-1985 by the Party Congress II. With three main objectives were:

- Promote agricultural productivity and forestry production for food stability.
- Improve existing industrial plants and factories and to construct a number of new industrial plants and factories.
- Infrastructure construction primarily for the national highway No. 9 and the national highway No.13.

2) New Economic Mechanism System (NEMs,1986-Now)

In this period, the government has a new concept that called transition to a market-oriented economic system and started open the economy which is an important mean for economic development in country and in order to attracting about foreign direct investment (FDI) increasingly.

Therefore, 2nd five year national socio-economic development plan (1986-1990) was created by Party Congress IV in year 1986, and the goals were:

- Create the structures for growth in agriculture forestry, industry and services.
- Improve and prepare the laws and regulation for the private sector.
- Open door policy for foreign cooperation.
- Develop education, public health, and upgrade people's livelihoods.
- Privatize of former state enterprises.

Moreover, the government has continued 3rd five year national socio-economic development plan (1991-1995), 4th five year national socio-economic development plan (1996-2000), 5th five year national socio-economic development plan (2001-2005) and respectively. By the way, to promote Lao PDR's industrialization, the government set up significant

strategy on sectors such as agricultural manufacturing, hydropower, tourism, mining industry, and infrastructure construction.

4.3.2 The Overall Policy development of Industrial Sector Currently

Since 2009, the new Investment Promotion Law was disseminated to furnish obvious policy in operating private domestic and foreign direct investment in Lao PDR (GOL, 2009). The content of this Law is focus on to promote both domestic investors and foreign investors by set up of duty and a tax incentive includes a whole benefits from investment in country. According to the Prime Minister regulation on Special Economic Zone (SEZ) was presented in 2010, which is a subordinate legislation and the aims of this decree is to impose the significant principles consists of regulations, policies, organization and activities that related with SEZ.

To promote the dominant industrial sector to be a large growth sector quantitatively and qualitatively and to supply domestic consumption sufficient as well as for export needs in order to making more income and rapidly economic growth based on the country has export competitiveness. These are overall policy for pushing hydropower and wood processing industry sector as follows:

- Promote Lao handicraft products which are traditional and significant products in country. Particularly, it is inheritance value for each local people and its sign for each local area such as garments, silk cloth, skirt weaving, bamboo weaving and woodcarving goods.

- Strive to increase hydropower development, solar energy, thermal electric and industrial plants energy for domestic supplied and selling to external market.
- Provide the facilities laws and investment processing for both private sector and foreign investor to join in wood processing industry.

4.3.3 Policy Recommendation

With the respect to the results, Lao PDR has potential industry is outstanding on hydropower (electricity generation), and wood processing industry. However, RCA in the country has remained lower than others ASEAN country among essential products, so in order to achieve and to promote industrialization and become to modernized in the future, there are few recommendations for consideration as follows:

- Promote more facilities of trade, stimulate production, law of investment promotion clearly and focusing on the significant projects such as hydropower plant for higher quality.
- Strive to continue attracting on quality FDI which help to labor skills and increase value-added from other products for competitiveness export.
- Enhancing more bilateral (cooperation with some European countries) and multilateral cooperation (the Greater Mekong Sub-region, GMS), that related with services, construction and infrastructure development.

In contract, wood product is a primary energy sources, at the same time, Lao PDR's forest are significant for supplying clean water, sustaining preservation, also protecting important biodiversity as well as acting bumper

for natural disaster but Lao PDR has a large exported in wood products during the period study time (2006-2005) until now, that makes the country's forest has declined rapidly, it has a negative impact to the environment for a long term (Tong, 2009). With this issue from the results above, the government should be considering more such as:

- Strengthening to create policies and regulations related to timber logging and also export aim to prevent existing the natural forests. Furthermore, shifting Lao PDR towards sustainable management of forest, creating participatory (both government and local people), and are seen as welcome development country.

- Enhancing more environmental protection legislation consists of implementing the National Environmental Action Plan (NEAP) that it relates to the power sector along with the strengthening of environmental monitoring and also efficient evaluation.

CHAPTER 5 CONCLUSION

This research has presented an analysis on the competitiveness of Lao PDR by using revealed comparative advantage (RCA) index for 2006-2015, and then compare RCA's trend in Lao manufactured goods with 2 ASEAN countries which are Thailand and Vietnam as those two countries are major trading partner in country as regards to export-import goods and services for long term. Although, Lao PDR always has trade deficit compared to both Thailand and Vietnam. Furthermore, this paper also proposed implication for industrialization. That is very important element for develop industrialization and modernization in Lao PDR with integrate into global production networks and Free trade agreements (FTAs).

With respect to the results, Lao PDR has strong RCA in some manufactured goods such as electricity, wood processing industry, textiles and clothing over 10 years (2006-2015). Other results, Lao PDR have no changed much about RCA trend in each year. Meanwhile country has comparative advantage on electric power (hydropower), wood products and mining industry (copper, lead) compared to both Thailand and Vietnam over the studying periods. Thus, the country strives to promote international trade, enhance industrialization and adapt policy implication respectively. However, Lao PDR lost much about balance of trade due to import value is bigger than export value and country has still lost ability to competition widely. In fact, Lao PDR will continue to benefit from international aid and foreign direct investment in hydropower and wood processing industry term.

Besides, the long term purpose is to upgrade and to develop the industry sector such as electricity generation, wood processing industry as a major role of the both industrialization and modernization process. The industrialization in Lao PDR would base upon the natural resource endowment, labor skills and the comparative advantage that the country possesses. At the same time, promoting with strong policies and regulations related to timber logging and also export aim to prevent existing the natural forests and in Lao PDR.

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국문초록

본논문은 라오스의 비교우위를 분석하여 산업화 시대의 수출 경쟁력에어떠한 영향을 미치는지 살펴본다. 본 연구의 목적은 다음과 같다: 1) 현시 비교우위지수(RCA)를 바탕으로 2006-2015년의 라오스의 수출 경쟁력을 살펴보고, 2) 가공품의 경쟁력을 측정하여 아세안 국가인 태국과 베트남과 비교하고, 3) 라오스가 산업화를 성공적으로 이루기 위한 정책을제시하고자 한다. 라오스는 개발도상국으로 분류되고 있고, 여타 아세안국가들과 비교했을 때 수입이 수출을 능가한다.

본 연구의 결과로 라오스가 전기발생 및 목재가공 산업 등의 특정 산업에 있어 높은 현시 비교우위지수를 가지고 있는 것으로 나타났다. 동시에, 2006-2015년까지 라오스는 전기 발생과 목재가공 산업에 있어 태국과 베트남에 비해 비교우위를 가지고 있는 것으로 나타났다. 하지만 라오스는아직까지 뚜렷한 산업정책이 수립되어 있지 않기 때문에 향후 무역원활화를 위한 정책을 세우고 투자촉진법을 수립해야 할 것이다. 또한 정부는목재가공산업에 영향 받는 삼림지역을 보호하는데 힘써야 할 것이다.

주요어: 비교우위, 가공품, 수출 경쟁력, 라오스 산업정책

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Agreement
ASEAN	Association of South East Asian Nations
ATIGA	ASEAN Trade in Goods Agreement
CEPT	Common Effective Preferential Tariff
ECI	Economy Complexity Index
FDI	Foreign Direct Investment
FTAs	Free trade agreements
GDP	Gross Domestic Product
GMS	The Greater Mekong Sub-region
GOL	Government of Lao PDR
GWh	Gigawatt hours
LDCs	Least Development Countries
LTP	Lao Trade Portal
LVTT	Lao-Viet Timber Trade
MPI	Ministry of Promotion and Investment
MW	Megawatt
NEMs	New Economic Mechanism
RCA	Revealed Comparative Advantage Index
SEZs	Special Economic Zones
Th .\$USD	Thousand US dollar
UN Comtrade	The United National Comtrade
WTO	World Trade Organization