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Impact of FDI on Economic Growth of Lao PDR

Anitta PHOMMAHAXAY

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Impact of FDI on Economic Growth of Lao PDR

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Abstract

Foreign Direct investment (FDI) is considered to be significant capital sources to support social economic development in Laos, and it becomes a crucial factor to stimulate an economic growth. The aim of this research is to access the impact of FDI for both aggregate and disaggregate levels and some macroeconomic variables on real economic growth. The multiple linear regression is applied to estimate the significant factors influence on economic growth, during the period from 1990-2011.

Last two decades Lao government has highly attempted to improve Investment law in order to attract large amount FDI inflows to Laos. As evidenced by allowing 100% foreign ownership of investment in 1988, it followed by extending of investment concession from 20 years in 1999 to 99 years in 2009, establishing the special economic zones, granting import duties free and income taxes exemption, which depends on promoting zones and investment areas. As a consequence cause FDI inflows to Laos has rapidly increased from US$ 58.54 million in 1991 to US$ 1.16 billion in 2011, the FDI inflows to Laos is dominated by hydropower and mining sectors, which accounted for 70% of total FDI during the period 2006-2011. While major sources of foreign investors are from China, Vietnam and Thailand, the three countries covered for 78.26% of the total FDI in during period 2001-2011.

The findings suggest that FDI inflows in manufacturing sector have played a crucial role to support economic growth. Then, the higher real trade openness and labor force are important components to stimulate economic growth. In addition, we also find that a booming of FDI inflows in mining sector can lead to the issues of Dutch disease. Real exchange rate might be makes domestic production costs increase and lead to a slowly economic growth.

1. Introduction

In the construction and development of the country, FDI is a vital capital source for the development of the social economy for both developed and developing countries. FDI is considered to be a significant factor in order to support economic growth, the inflows of foreign capital is not only creating more employment to the host countries, but it also provide a dynamic benefit to those countries in term of technological transfer. A large amount of capital comes in through these investments more and more industries are set up, and it helps in promoting international trade. However, the benefit of FDI does not automatically occur and regularly in countries, sectors and local communities. So, the law on promotion and management of FDI or national policies of developing and less develop countries is an important factor to attract FDI and obtain the full benefits for economic development.

Lao People's Democratic Republic (Lao PDR) has implemented the incentive investment policies in order to attract the foreign direct investment inflows into the country after Lao PDR has transformed from the central planning economy to market mechanism in 1986, by opening more cooperation with many countries, and building necessary conditions to attract FDI from around the world. However, less incentive investment policies and lack foreign investors protection law, as a consequence causing FDI inflows to Laos was relatively small.

The Government has initially proposed the investment promotion law in 1989, after that the FDI inflows to Laos has dramatically increased from US$30 million in 2001 to US$1.16 billion in 2011, major investment sources are from China, Vietnam and Thailand, the 3 countries have accounted for 83.15%[1] of total FDI inflows to Laos, then the major FDI inflows to agriculture, service, industry and mining sectors.

Although, the FDI inflows to Laos had increased rapidly since last decade, the total FDI inflows accounted for only 26.5% of GDP in 2011[2]. In addition, lack of FDI diversification source and a high investment concentration, especially for hydropower and mining sectors, are important obstacles faced by Lao government. Therefore, whether FDI inflows will stimulate economic growth? This is a vital question will be elaborated in this research.

[1] The author's based on the MPI database
[2] The author's calculation based on the BOL database, 2012

1.1 Rationale

FDI generate employment, promoting international trade, and it is a significant factor to support economic growth. In addition, it provides a dynamic benefit to the host countries in term of technological transfer. Whether inflows of FDI will stimulate economic growth? And how can the host countries benefit from the foreign capital inflows? This is the main issue we try to examine.

1.2 Research Question

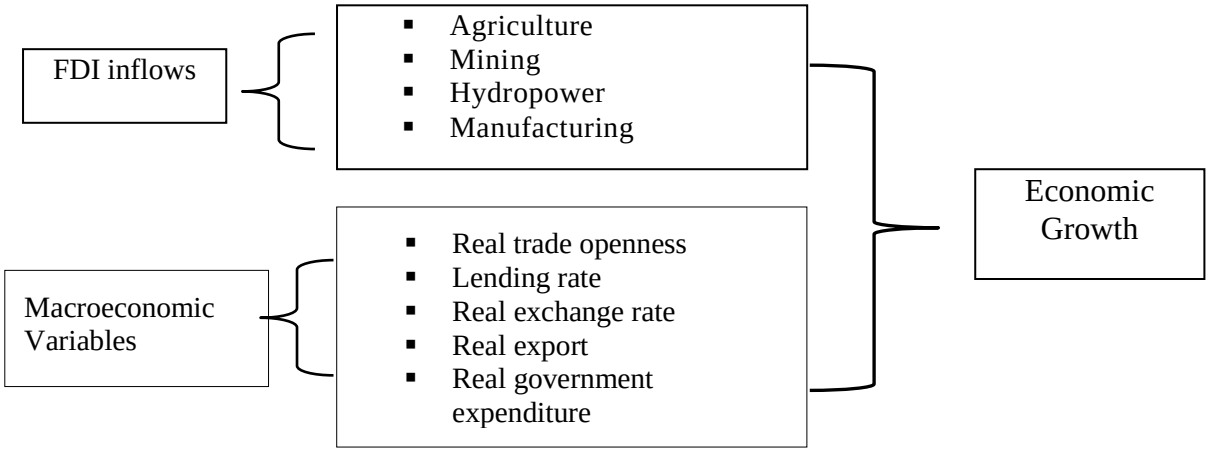
- Whether the inflows of FDI have influence on economic growth of Laos.
- Who will benefit from FDI inflows?

1.3 Objective

- To identify the characteristic of FDI inflows to Laos by focusing on investment categories, types of FDI and source of investors
- To access the impact of FDI on economic growth for both aggregate and sectoral levels.
- To identify major issues, prospects, and major constraints of FDI in Laos.

1.4 Conceptual Framework

To identify the determinants of economic growth, several FDI sectors will be taken into account. In addition, some macroeconomic variables are considered to be significant factors can influence on economic growth such as real trade openness, real lending, real exchange rate, real export, government expenditure. The framework detail has showed bellow:



1.5 Scope and Limitation

This paper presents a critical analysis of the effects of foreign direct investment in Laos's economies. The study aims to provide a better understanding of the relationship between foreign direct investment and its effect on economic growth. It examines the role of FDI in Laos's economic development with special emphasis on the extent of foreign capital inflows and their impacts on economic growth in Laos by means of both aggregate and some dominated FDI are included Agriculture, Mining, and Hydropower sector, by using data from 1990-2011.

2. Review of Literature

2.1 Theoretical Framework

The literature identifies several channels through which FDI contributes to economic growth. Economic theories suggest that economic growth provided citizens with a high level of social welfare, improved methods and technology raise the returns to the productive factors by increasing the outputs of each worker. From the viewpoint of neoclassical growth theory, FDI inflows increase the stock of capital in host countries thereby allowing higher rates of economic growth than would be possible from reliance on domestic savings. Endogenous growth theory postulates that technological advancement stimulates economic growth by creating externalities that compensate for diminishing returns to capital (Romer, 1990; Mankiw, Romer and Weil, 1992). FDI can therefore enhance growth by allowing host

countries access to advanced technologies not available domestically. It has also been argued that FDI leads to increased competition in the domestic market which can cause greater efficiency of domestic firms (UNCTAD, 1999). In addition, improved managerial practices may be transmitted to domestic firms that attempt to imitate foreign firms. In case where FDI involves training of domestic labor, the strengthening of human capital will generate positive externalities that could raise economic growth. Moreover, FDI has the potential to expand access to export markets. For those developing countries with limited industrial bases, increased export earnings facilitate imports of capital goods that can lead to higher levels of economic growth, S.Wright, et al. (2010)

Furthermore Dunning (1980) suggested that there were 3 advantages for firms transferring their production abroad: ownership advantage, internalization advantage and locational advantage. Ownership advantage is foreign firms mostly have strong ownership advantage over domestic firms, due to three dominated assets, namely production technology, managerial skill and marketing technique. These assets are significant factors in assuring that foreign firms have international competitive advantage and high efficiency in production. Internalization advantage is the second component of the Eclectic paradigm derived from situation when the firms find that it is better to internalize their ownership advantage of the specific asset by setting up new production plants in the host countries, instead of licensing or franchising to foreign firms. Locational advantage is the third frame work of the Eclectic theory derived from the fact that when firms discover that a greater benefit can be achieved when some parts of their countries, depending on the attractive factor endowment in the host countries such as having a large domestic market, abundant natural, low production cost, attractive investment policies, good governance and stability of macroeconomic policy.This has become the Eclectic paradigm (Dunning, 1980 and Bende-Nabende, 2002)

2.2 Review of Related Literature

Agrawal, et al. (2011) investigated the effect of FDI on economic growth of China and India for the time period of 1993-2009. They built the modified growth model from the basic growth model. The factors included in growth model were GDP, Human Capital, Labor Force, FDI and Gross Capital Formation. After running OLS method of regression, they found that 1% increase in FDI would result in 0.07% increase in GDP of china and 0.02% increase in GDP of India. They also found that China's growth is more affected by FDI than

India's growth. The majority of the foreign investors prefer china over India for investment because China has a bigger market size than India, offers easy accessibility to export market, government incentives, developed infrastructure, cost – effectiveness, and macro-economic climate.

Li, et al. (2005) investigated FDI effect economic growth by suing a panel of data for 84 countries over the period 1970-99. The relationship between FDI and growth examined by both single equation and simultaneous equation system techniques. A significant endogenous relationship between FDI and economic growth is identified from the mid-1980s on- wards. FDI not only directly promotes economic growth by itself but also indirectly does so via its interaction terms. The interaction of FDI with human capital exerts a strong positive effect on economic growth in developing countries, while that of FDI with the technology gap has a significant negative impact.

Ang (2009) investigated the roles and impact of FDI and financial development in the process of economic development by used case study of Thailand using annual time series data from 1970 to 2004. The results show that financial development stimulates economic development whereas FDI impacts negatively on output expansion in the long run. However, an increased level of financial development enables Thailand to gain more from FDI, suggesting that the impact of FDI on output growth can be enhanced through financial development and develop financial system allow Thai's economy to exploit more benefit from FDI.

Flexner (2000) used ordinary least squares (OLS) estimation to examine the determinants of FDI and the effect of FDI on economic growth in Bolivia over the period 1990-1998. The findings suggest that, the real exchange rate, the ratio of external debt to GDP, and a dummy representing capitalization inflows had significant impact FDI, while the terms-of-trade, the ratio of private sector credit to GDP, and the ratio of government spending have a statistically significant impact on economic growth. Excepted of total FDI inflows in the FDI determinants model has very little impact on the overall results.

Alfaro (2003) examined the effect of foreign direct investment on growth in the primary, manufacturing, and services sectors. An empirical analysis effect of FDI on growth by using cross-section regressions with 47 countries and data in the period 1981-1999. Finding that, foreign direct investments in the primary sector tend to have a negative effect on growth,

while investment in manufacturing has a positive one. Evidence from the service sector is ambiguous.

Anwar, et al. (2010) used of a recently released panel dataset that covers 61 provinces of Vietnam from 1996–2005. Their main objective is to examine the link between foreign direct investment and economic growth. By applying the simultaneous equations model, in order to estimate two-way linkage between FDI and economic growth exists in Vietnam. The finding presented in this study suggest that the impact of foreign direct investment on economic growth in Vietnam will be larger if more resources are invested in education and training, financial market development and in reducing the technology gap between the foreign and local firms.

Abdul, et al. (2007) investigated the impact of foreign direct investment (FDI) on economic growth using detailed sectoral data for FDI inflows to Indonesia over the period 1997-2006[3]. In the aggregate level, FDI is observed to have a positive effect on economic growth. However, when accounting for the different average growth performance across sectors, the beneficial impact of FDI is no longer apparent. When examining different impacts across sectors, estimation results show that the composition of FDI matters for its effect on economic growth with very few sectors shows positive impact of FDI and one sector even showing a robust negative impact of FDI inflows (mining and quarrying).

Mutascu, et al. (2011), this study examines the impact of foreign direct investment on economic growth in Asian countries. Their analysis was the panel framework for the period 1986 to 2008. They also examined the nonlinearities associated with foreign direct investment and exports in the economic growth process of Asian countries under consideration. They find that both foreign direct investment and exports enhance the growth process. In addition, labor and capital also play an important role in the growth of Asian countries. They suggest export is important factor to support FDI inflows, and an amount of capital inflows depends on the incentive of FDI policies of the host countries.

Agbo (2012), this paper investigates the impact of foreign direct investment (FDI) on

[3] Sector of FDI included are: farm food crops, livestock product, forestry, fishery, mining and quarrying, non-oil and gas industry, electricity, gas and water, construction, retail and wholesale trade, hotels and restaurant, transport and communications, and other private and services sectors.

Economic Growth in Nigeria within the period 1986-2007. The paper employed multiple regression models to determine the impact of some external or macro variables on the gross domestic product (GDP) proxy for economic growth in Nigeria. The paper used time series data to ascertain the inflow of FDI to the Nigerian economy and its implications on economic growth. The study found that FDI has the potential to positively impact upon the economy though its contribution to GDP was very low within the period under review. The multiple regression results revealed that FDI, government tax revenue and savings exerted positive but not significant impact, except savings, on GDP during the study period. However, foreign exchange and public expenditure on education had inverse relationship with GDP. The study concluded that FDI induces the inflow of capital, technical know-how and managerial capacity which can stimulate domestic investment and accelerate the pace of economic growth.

Imoudu (2012) investigated the relationship between foreign direct investment (FDI) and economic growth in Nigeria between 1980-2009 through the application of Johansen Co-integration technique and Vector Error Correction Methodology in which FDI is disaggregated into various components. The Johansen Co-integration result establishes that the impact of the disaggregated FDI on real growth in Nigeria namely: agriculture, mining, manufacturing and petroleum sectors is very little with the exception of the telecom sector which has a good and promising future, especially in the long run.

Koojaroenprasit (2012) explored the impact of Foreign Direct Investment (FDI) on economic growth in South Korea, by applying data the previous data from 1980-2009. The author attempts to determine empirical impact of FDI on South Korean economy using macroeconomic variables are FDI, domestic investment, employment, export and human capital. The multiple regressions are employed. As a result found that there is a strong and positive impact of FDI on South Korean economic growth. Furthermore, the study indicates that human capital; employment and export also have positive and significant impact, while domestic investment has no significant impact on South Korean economic growth. The interaction effects of FDI- human capital and FDI-export indicated that the transfer of high technology and knowledge has an adverse impact on South Korean economic growth.

SISOMBAT (2008) analyzed the trend and pattern of FDI inflows to Laos by focusing on

Australia's FDI inflows to Laos, provides an overview of the trend and patterns of Australia investments in Laos from 1988-2004. Findings suggest that, FDI has benefited the country in terms of its contribution to the socio-economic development, foreign exchange rate earning, technological advantages, increased gross domestic product, and employment creation.

3. Research Methodology

3.1 Research Design

Following the previous in economic theories and literatures, there is several factors influence on economic growth, which depending particular countries over difference time periods. The main factors that influence economic growth are various such as FDI, trade openness, FDI in mining, FDI in manufacturing, FDI in hydropower, FDI in agriculture, real exchange rate, real lending rate, real export, labor force and government expenditure. By gathering all factors influencing on economic growth from the previous discussion, the Lao economic growth function can be written as:

$$GR_i = f(FDI_{ji}, FDI\_Agro_{ji}, FDI\_mining_{ji}, FDI\_hydro_{ji}, FDI\_manu_{ji}, TO_i, RLD_i, RER_i, RE_i, L_i, G_i)$$

When GR_i is the annual real economic growth of country i, FDI_{ji} is real total foreign direct investment from country j to country i, FDI_Agro_{ji} is real foreign direct investment in agriculture products from country j to country i, FDI_mining_{ji} is real foreign direct investment in mining from country j to country i, FDI_hydro_{ji} is real foreign direct investment in hydropower from country j to country i, FDI_manu_{ji} is real foreign direct investment in manufacturing from country j to country i, TO_{ji} is real trade openness of country j and country i, RLD_{ji} is real lending rate, RER_{ji} is real exchange rate from country j to country i, RE_{ji} is real export of country i, L_i is the proportion of labor force to total population, G_i is government expenditure of country i)

This study is based on the previous study of Agrawal et al. (2011),Koojaroenprasit (2012) and Nguyen et al (2010).From the economic growth function, by including the Asian financial crisis variable, this model can be written as the multiple linear regression form as:

$$GR_{it}=\beta_0+ \beta_1 LogFDI_{jit} + \beta_2 LogFDI\_Agro_{jit} + \beta_3 FDI\_mining_{jit} +$$

$$\beta_4 FDI\_hydro_{jit} + \beta_5 LogFDI\_manu_{jit} + \beta_6 RTO_{jit} + \beta_7 RLR_{jit} + \beta_8 LogRER_{jit} + \beta_9 LogRE_{jit} + \beta_{10} L_{it} + \beta_{11} G_{it} + \beta_{12} Dcrisis + \varepsilon_{ijt}$$

Subscript i and j refer to host and source countries, t refers to the time, β_0 is intercept, D crisis is a dummy variable, which is used to measure the effect of Asian finanical crisis on economic growth of Laos and ε_{ijt} is error term.

3.2 Data Collection

This research uses various data sources in order to estimate the effect of FDI inflows to Laos including Ministry of Planning and Investment, Ministry of Industry and Commerce, Bank of Lao PDR (BOL), World Bank, Asia Development Bank, ASEAN database and the United Nations Conference on Trade and Development (UNCTAD)**.**

4. Results and Discussion

4. 1 Overview of Foreign Direct Investment in Laos

4.1.1 The Progress of FDI Liberalization in Laos

Lao PDR has transformed from the central planning economy to market mechanism in 1986, by opening more cooperation with many countries. However, government tries to build a good investment environment to attract FDI from nearby countries and around the world.

The Lao government has proclaimed the law on foreign investment promotion and management in 1988, which allowed100% foreign ownership of investments since the beginning. The investment term of a foreign investment enterprises depended on the nature, size, and conditions of the business project, but normally it could not exceed 15 years for 100% foreign ownership and 20 years for joint venture. Since the first law on foreign investment in Lao PDR was promulgated in 1988, it was revised in 1994, 2004 and 2009.

The first revision was in 1994, foreign investors may invest in the Lao PDR in two forms such as a joint venture with domestic investors and a wholly foreign owned enterprise. Major incentive of investment promotion laws have been highlighted as foreign investors shall pay the annual profit tax at a 20%, whereas the expiration of investment term was retained

relatively short at 15-20 years for all sectors, which calculated in accordance with the provision of the applicable laws of Lao PDR. They shall pay import duty on equipment means of production, spare parts and other materials used at 1% of their import value. The government exempted import duty for raw materials and intermediate components imported for the purpose of processing and then re-export and all products for export will also be exempted.

In the second revision in 2004, foreign investors may invest in the Lao PDR in three forms: business cooperation by contract, joint ventures between foreign and domestic investors; and 100% foreign-owned enterprises. The investment term of a foreign investment enterprise depends on the nature, size and conditions of the business activities or project but shall not exceed 50 years and may be extended with the approval of the government. However, the investment term of a foreign investment enterprise shall be for a maximum of 75 years. The profit tax was maintained at 20% for all sectors and the reduction and exception criteria were offered by various zones based on social-economic conditions and geographical locations, ONPHANHDALA and SURUGA (2010).

The investment promotion law has been revised in 2009. The investor may invest in three types of investment as general business, concession business, activities for development of special economic zones and specific economic zones. As concession business refers to investment activities authorized by the Government to utilize ownership and other rights of the government in conformity with regulations, for the purpose of developing and conducting business operations, it includes right on land concession, minerals, electric power, airlines, telecommunication, insurance and financial institutions. Term of concession business depends on type, size, value, and condition it shall not exceed 90 years and may be extended by the approval of the government or provincial authorities, especially in the case where the project has generated maximum benefits for the country, and contributed to local development.

Table 1. The incentive of investment promotion of Laos

	Profit tax exemption		
	Level 1	**Level2**	**Level3**
Zone1	10 years	6 years	4 years
Zone2	6 years	4 years	2 years
Zone3	4 years	2 years	1 year
Import duty fee	Raw material, equipment, spare parts and vehicle are directly used for production		
Improving investment application (Working days)	10-45		

Source: Law on the investment promotion in The Lao PDR, 2009

Note:

There are three levels of promotion:

- Level 1: Activities with highest level of promotion
- Level 2: Activities with moderate level of promotion
- Level 3: Activities with low level of promotion

There are three zones of promotion:

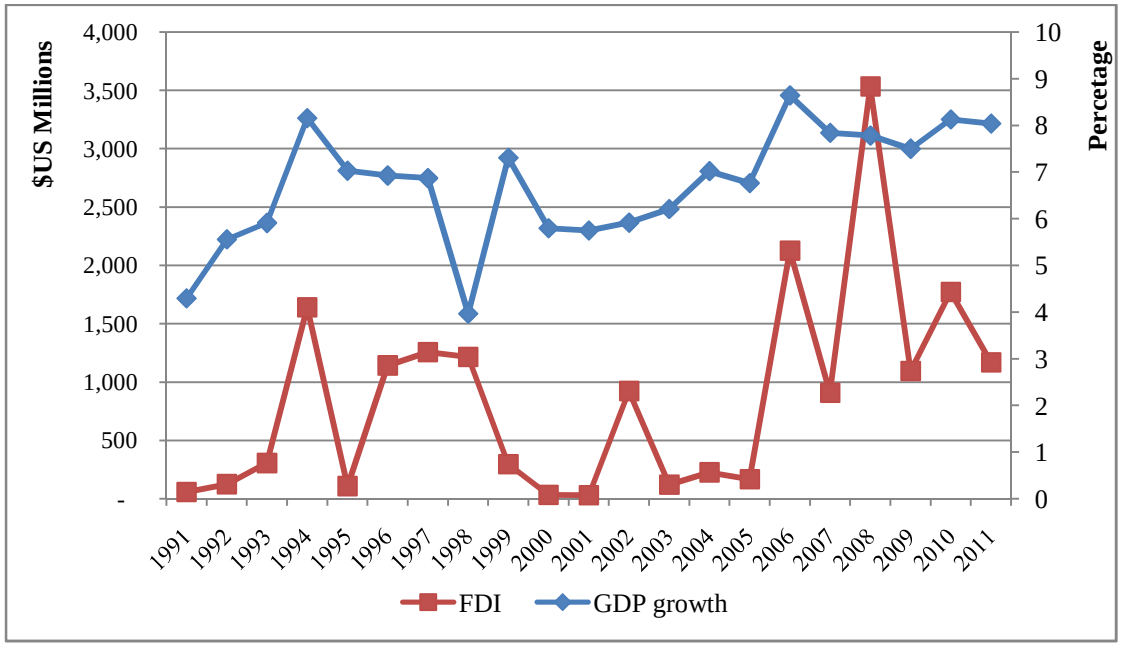
- Zone 1: Having least socio-economic infrastructure development in facilitating investment.
- Zone 2: Having moderate socio-economic infrastructure development in facilitating investment compare with zone 1.
- Zone 3: Having good socio-economic infrastructure development supporting investment.

According to table 1 indicates that profit tax exemption is classified in three levels, which depended on different zones promotion. The first zone is the area of least socio-economic

infrastructure development, so the profit tax exemption is ranged from 4-10 years, while the second zone which having moderate socio-economic infrastructure development, the profit tax exemption is ranged from 2-6 years. Finally, the third zone which having good socio-economic infrastructure development the profit tax exemption is ranged from 1-4 years.

In addition, foreign investors will receive import duty fee when they import raw material, equipment, spare parts and vehicle are directly used for supporting production, and the period of improving investment application is between 10-45 working days.

4.1.2 FDI Inflows to Laos by Economic Sectors and Source Countries



Source: Ministry of planning and investment, and UNCTAD database

Figure 1. Approved investment values and GDP growth, 1991-2011

Since 1986, Lao PDR implemented the first process of the economic reform from a centrally planned economy to the New Economic Mechanism (NEM). This reform was a significant dimension of introducing the Lao's economy to market orientation. The core of this reform focused on adapting to one price principle, and dismantling of the state-owned enterprises (SOEs) monopoly in foreign trade. This will be an initial step of moving forward to the privatization, trade liberalization and FDI inflows. Lao government promulgated of the first foreign direction investment law in 1988, by allowing 100% foreign ownership, after that the FDI inflows to Laos has started increasing from US$ 58.54 million in 1991 to US$ 1.64

billion in 1994. As a consequence, causing GDP growth to increase from 4.29% in 1991 to 8.15% in 1994. However, the first investment law was still lack of implementation detail, and relatively high of profit tax, which ranged between 20%-50%. As a result, FDI inflows declined to US$ 108.85 million in 1995.

FDI inflows to Laos revealed shrank sharply from US$ 1.25 billion in 1997 to US$ 30.70 million in 2001, which led to economic falling to the bottom of 3.97% in 1998 before it rebounded to 5.75% in 2001. An Asian financial crisis during the period of 1997-1999, and uncertainty of macroeconomic condition were significant factor causing major FDI flows out, especially FDI from ASEAN countries.

However, an amount of capital inflows to Laos showed a tremendous increase more than threefold, from US$ 923.20 million in 2001 to US$ 3.53 billion in 2008, due to FDI policy has been revised in 2004, by allowing foreign investors can be extended a longer investment period between 50-75 years, which compared to before 15-20 years and the profit tax fell to 20% for all sectors. In addition, the single investment window has been implemented in order to shorten documents progress and reduce transaction costs. Then, the flows of FDI show a small fluctuation above US$ 1 billion during the period of 2009-2011.

Table 2. FDI inflows to Laos by economic sectors

		1990-1995	1996-2000	2001-2005	2006-2011
Mining	Million US$	42.32	61.78	85.83	2,598.43
	Share in total FDI (%)	1.38	1.56	5.84	24.50
Agriculture	Million US$	53.96	85.20	157.49	1,847.71
	Share in total FDI (%)	1.76	2.16	10.73	17.42
Manufacturing	Million US$	237.06	203.90	138.36	1,071.31
	Share in total FDI (%)	7.73	5.17	9.42	10.10
Hydropower	Million US$	2,175.00	2,769.00	828.00	5,082.86
	Share in total FDI (%)	70.99	70.21	56.41	47.92

		1990-1995	1996-2000	2001-2005	2006-2011
Telecommunic	Million US$	69.24	568.41	36.49	44.77
ation	Share in total FDI	2.26	14.41	2.48	0.42
	(%)				
Consulting	Million US$	2.54	2.54	1.91	32.33
	Share in total FDI	0.08	0.06	0.13	0.30
	(%)				
Construction	Million US$	55.84	10.21	50.88	415.81
	Share in total FDI	1.82	0.25	3.46	3.92
	(%)				
Trading	Million US$	40.92	15.67	35.77	104.59
	Share in total FDI	1.33	0.39	2.43	0.98
	(%)				
Service	Million US$	58.45	37.83	64.04	1,526.32
	Share in total FDI	1.90	0.95	4.36	14.39
	(%)				
Hotel and	Million US$	298.12	216.18	52.95	244.21
restaurant	Share in total FDI	9.73	5.48	3.60	2.30
	(%)				
Banking	Million US$	30.00	16.00	12.50	174.16
	Share in total FDI	0.97	0.40	0.85	1.64
	(%)				
Total (Million US $)		3,063.47	3,986.76	1,464.28	13,142.56

Source: Ministry of planning and investment

Table 2shows the composition of FDI flows in Laos by sectors during the period 1990 to 2011. The FDI inflows to Laos is dominated by hydropower and mining sectors, the investment value of two sectors has speedily increased from US$ 2.217 billion during a period 1990-1995 to US$ 7.681 billion during a period 2006-2011, the share of two sectors account for 70% of total FDI inflows to Laos. Since the country is rich of natural resources, especially water resources of the Mekong River and its tributaries are estimated to hold a hydropower potential in excess of 20 times the current power production (Fraser, 2010). In addition, investment laws have been revised in 2010, by providing a longer land accession up to 99 years for both mining and hydropower projects.

Furthermore, FDI inflows for service and agriculture sectors reveal dramatically increase from $U 58.45 million and US$ 53.96 million during a period 1990-1995 to US$ 1.526 billion and US$ 1.847 billion during a period 2006-2011, and the two sectors share 14.39% and 17.42% of total FDI in 2011, respectively. Due to the fact that, more than half of Lao population have involved in agricultural production, and the share of agriculture and service sector to GDP account for 28.11% and 38.08% in 2011[4]. Meanwhile FDI in manufacturing shows a small reduction during a period 1996-2000, after that it increases sharply to US$ 1.071 billion in 2011. For Consulting, telecommunication and trading sectors remain the least attractive for foreign investors, which illustrated by the share of three sectors is less than 1% of the total FDI during a period 2006-2011.

Table 3. Top 10 FDI sources inflows to Laos from 1990 to 2011

	1990-2000		2001-2011		
Ranking	**Countries**	**Value (Million $)**	**Countries**	**Projects**	**Value (Million $)**
1	Thailand	2,592.80	Vietnam	393	3,209.58
2	USA	1,054.66	China	641	2,970.51
3	Malaysia	722.46	Thailand	389	2,840.39
4	France	410.91	S.Korea	176	523.13
5	Australia	201.86	France	115	473.48
6	Korea	195.8	Norway	4	357.36
7	China	151.19	India	10	355.23
8	Taiwan	69.99	Japan	53	347.23
9	Russia	29.75	Australia	48	321.74
10	Japan	23.82	Malaysia	61	127.63

Source: Ministry of Planning and investment

Table 3 presents the top 10 countries ranging of aggregate FDI inflows to Laos from 1990 to 2011 based on approved value of investment. During this period, there were 38 countries invested to Laos with totally 2,899 projects and total accumulated FDI was US$ 15 billion.

[4] BOL annual report, 2011.

From 1990 to 2000, top range of foreign investors in Laos was Thailand, which had the total accumulated investment value of US$ 2,590.8 million, followed by the United States and Malaysia, the total investment value was US$ 1,054.66 million and $ US 3,952 million, respectively.

Beginning from 2001 to 2011, China and Vietnam have become the dominant foreign investors in Laos, which the total accumulated investment value were US$ 3.209 billion and US$ 2.920 billion, it was followed by Thailand with the total investment value of US$ 2.840 billion. Since both China and Vietnam are considered to have a good relationship to Laos, then we also have a similar economic policy and political system, this might be a reason causing a rapidly increase of FDI from the two countries.

In addition, FDI from South Korea and Japan have shown a great improvement, the accumulated FDI value of two countries have increased from US$195.80 million and US$ 23.82 million during a period 1990-2000 to US$ 523.13 million and US$ 347.23 million during a period 2001-2011. In contrast, FDI from Malaysia has dropped sharply from US$ 722.46 million during a period 1990-2000 to US$ 127.63 million during a period 2001-2011.

4.2 Empirical Result of the Multiple Linear Regression

This section will highlight the statistical description of the determinants of economic growth, which will be used to estimate the multiple linear regression. Then the OLS results will be present and it is followed interpretation the empirical results.

Table 4. Summarized statistic descriptive

Definition	Variable	Obs	Mean	Std. Dev.	Min	Max
Real Economic growth	rgdp_g	22	6.734	1.220	3.968	8.645
Real Foreign Direct Investment (RFDI) in US$ million	rfdi	22	42.800	66.500	0.460	246.000
RFDI in Mining (US$ million)	rmining	22	1.374	2.632	0.000	12.300
RFDI in Agriculture (US$ million)	ragro	22	1.303	1.259	0.040	4.800

Definition	Variable	Obs	Mean	Std. Dev.	Min	Max
RFDI in Manufacturing (US$ million)	rmanuf	22	2.857	3.267	0.120	11.800
RFDI in Hydropower (US$ million)	rhydro	22	29.200	53.800	0.000	181.000
Real trade openness (%)	to	22	49.686	10.875	25.920	74.680
Real exchange rate (KIP/US$)	rer	22	4,791.96	1.146	1.650	7.290
Real Export (US$ million)	ex	0				
Lending rate (%)	lending	22	21.449	12.112	0.000	32.000
Labor (Thousand)	labor	22	46.617	1.731	44.964	49.835
Dummy for Asian Financial crisis	Dummy crisis	22	0.136	0.351	0	1

According to Table 4 shows that the statistic descriptive, which is explained by the mean, standard deviation, minimum and maximum of values of independent and dependent variables. An average of real economic growth is 6.73%, the standard deviation is 1.22, the maximum value of real economic growth rate is 8.64%, and the minimum value is 3.96%. Then, the mean of real FDI inflows to Laos is US$ 42.80 million, the maximum value of real FDI is US$ 246.00 million, and the minimum value is US$ 0.46 million. Among 4 sectors of real FDI, the mean of real FDI in mining sector has the lowest value of US$ 1.37 million, while the mean of real FDI in hydropower has the highest value of US$ 29.20 million. Furthermore, the rate of real trade openness ranges from 25.92% to 74.68%, the mean of real export value is US$ 16.60 million, and while the mean of lending is 21.45% and the maximum lending rate is 32%.

Before running the multiple linear regression, it is important to check the multiple correlation matrix between independent and dependent variables, ignore this issue might lead to inconsistency of the results. The results of correlation matrix show that there a high correlation between lending rate and real government expenditure, which it has a value of 0.93, to remediate the correlation issue, we have remove the government expenditure out of the regression. For other variables the estimation value are below 0.90 (See Appendix 1), so it

is safe to use this data for applying the multiple linear regression. In addition, to avoid the issue of heteroskedasticity, the robust standard error will be applied; this is to ensure the variance of error term is constant over time. The detail of multiple linear regression results can be summarized as follows:

Table 5. OLS regression results the determinant of real economic growth

			Robust		
Definition	**Variable**	**Coef.**	**Std. Err.**	**t**	**P>t**
Real Foreign Direct Investment (RFDI)	rfdi	-0.619	0.425	-1.460	0.176
RFDI in Mining	rmining	-0.189	0.070	-2.71**	0.022
RFDI in Agriculture	ragro	0.035	0.251	0.140	0.892
RFDI in Manufacturing	rmanuf	1.290	0.530	2.43**	0.035
RFDI in Hydropower	rhydro	0.044	0.049	0.900	0.391
Real trade openness	to	0.055	0.017	3.21***	0.009
Real exchange rate	rer	0.274	0.698	0.390	0.702
Real Export	ex	-0.510	0.614	-0.830	0.426
Lending rate	lending	0.007	0.020	0.360	0.727
Labor	L	0.611	0.318	1.92*	0.084
Dummy variable (Asian Financial Crisis)	dummycrisis	-0.177	1.262	-0.140	0.891
Constant	_cons	-25.471	21.94	-1.160	0.273
Observation		22			
R		81.66			

Note: *, ** and *** indicate significance at 1%, 5% and 10% levels, respectively. Data using for analysis is from 1990 to 2011.

The OLS results reveal that most of independent variables have expected signs and statistically significant. Although the aggregate of real FDI does not show any significant effect on real economic growth, at sectoral level, we find that an 1% increase in real FDI for manufacturing sectors (rmanuf) will stimulate a real economic growth on average is 1.290%.

The main reason because of FDI in manufacturing sector has shown a remarkable increase from US$ 15.19 million in 2000 to US$ 103.73 million in 2011. Our finding is consistent with Alfaro (2003) and Imoudu (2012) who found that FDI in manufacturing had a positive effect on economic growth across 47 countries. The FDI in manufacturing sectors ranges as the fourth of total FDI inflows to Laos in 2011. In addition, the share of industry sector to total GDP has shown a rapid increase from 16.80% in 2000 to 27.46% in 2011[5]. Therefore, arising in FDI from this sector has played a crucial role to support economic growth in Laos.

In contrast, FDI inflows in mining sector show a negative effect on real economic growth, and statistically significant (rmining). The findings can be explained by a booming of FDI in mining sector might lead to a large foreign capital inflows causes exchange to be appreciated, as a consequence country's exports decline and lead to economic growth has a depression, which is known as Dutch disease phenomenon. World Bank's report (2010) highlighted that Dutch disease can have a negative impact on all resource-rich economies by reducing the size of their manufacturing or other tradable sectors. On average, resource-rich countries have a tradable sector (manufacturing) that is 15% points lower than other countries. Short- and medium-term effects include real exchange rate appreciation that can harm exporters and reduce economic growth as well.

Furthermore, higher trade liberalization, which measure by the level of a country's openness (to) turn out to have positive effects on FDI. The finding suggests that a 1% increase in level of openness will stimulate real economic growth on average 0.055%. In addition, the finding indicates that trade liberalization is important factor to support economic growth, Chantasasawat (2004) argued that trade openness covered various types of trade costs, including tariff and non-tariff barriers, such as restriction in capital control, local content requirement and technology transfers requirement. The more a country is open to trade, the larger economic growth is expected to be obtained. Our result is similar to Li and Liu (2004), Flexner (2000) and Ayanwale (2007), who found a positive relationship between trade openness and economic growth of China and Bolivia.

Our finding has support the classical economic theory that labor force has played a crucial role to support economic growth. Assume other factors are constant; a 1% increase in number

[5] Author's calculation based on the Bank of Lao PDR annual report database

of labor will stimulate economic growth on average of 0.61%. Since major economic activities in Laos, including manufacture and agriculture production are highly depended on labor intensive. This is because of the progress of technology development in Laos is relative low and the country still has a shortage of capital. In addition, a relative low of wage rate, which minimum wage is 348,000 Kip (about $44.12)[6] per month. Therefore, labor force will be important component to stimulate economic growth.

On the other hand, a depreciation of real exchange rate (rer) turns out to have positive effect on economic growth, but it does not show any significance. An appreciation of domestic currency over US$ from 10,056 Kip/US$ in 2002 to 8,029 Kip/US$ in 2011, it might be important factor to make domestic production costs to increase, as a consequence lead to a slowly economic growth. We also find that the real export reveals to have adverse effect on economic growth, but it is insignificant due to the fact that although nominal exports show increase rapidly, but in real term the export value has a slight decrease because of arising in consumer price indices. In addition, a high concentration of country exports product, as evidenced by the share of mining export has accounted for 55% of the total export in 2010. Therefore, unsustainable of exports can be important factor causes the relationship between export and economic growth is insignificant.

Meanwhile, the relationship between lending and economic growth does not show any significant. Since major manufacturing in Laos is dominated by SMEs, which accounts for 90% of total enterprises[7], and important capital sources are derived from their families and borrowed from relatives. So a change of domestic lending might have a small effect on economic growth. Finally, we find that an Asian Financial Crisis have negative effect on economic growth, but statistically insignificant. Since Lao's economy has recovered fast from financial crisis, as indicated by an economic growth rate increases from 6.87% in 1997 to 7.31% in 1999, and FDI inflows was growth on averaged of 6.06% during the same periods.

[6] Labor law, No 06/NA, Date 27 Dec 2006
[7] Policy and progress in SMEs in Laos, Laos-Japan Human Resource Development Institute, NUOL, 2010

5. Conclusions and Recommendation

This research estimates the impact of FDI inflows for both aggregate and disaggregates levels on economic growth. Then, some economic variables such as trade liberalization, real exchange rate, real export and lending rate and Asian financial crisis will be taken into account in order to find out major determinant of economic growth in Laos. The multiple linear regression model has been applied, during the period from 1990 to 2011.

FDI inflows to Laos has showed tremendous increase from US$ 58.54 million in 1991 to US$ 1.168 billion in 2011, this is because of incentive investment policies, which have been offered by government in order to attract foreign investors such as a low profit tax, import tariff exemption for machinery and equipment, and a longer land concession. However, FDI inflows have a high concentration on hydropower and mining sectors, the two sectors account for 70% of total FDI during a period 1990-2011. Furthermore, FDI from Service and agriculture sectors show a rapidly increase from US$ 58.45 million and US$ 53.96 million during a period 1990-1995 to US$ 1.526 billion and US$ 1.847 billion during a period 2006-2011, respectively. Major important sources of FDI inflows to Laos are from neighboring countries, namely Vietnam, China and Thailand, the three countries accounts for 80% of total FDI inflows to Laos.

The OLS results indicate that FDI inflows in manufacturing sector are significant factor to support economic growth. A 1% increases in the FDI in manufacturing will stimulate real economic growth on average 1.29%. We also find that a higher level of trade openness and labor force are considered to be necessary to maintain a sustainable economic growth. On the other hand, a booming of FDI in mining sector leads to capital inflows, causing export to decline, and depressing economic growth. While real exchange rate, real export and lending rate do not show any significant effects on economic growth.

To ensure the country will be benefit from FDI inflows, this will be important component to support economic growth, some recommendations are given:

1. Government should provide incentive investment policies to diversify investment sectors, especially for manufacturing sector in order to support a sustainable economic growth.

2. More trade liberalization (remove all investment barriers) and relatively low of wage is critical factor to reduce the production costs and stimulate economic growth.

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Appendix. Correlation among independent variables

Definition		rgdp_g	rfdi	rmining	ragro	rmanuf	rhydro	to	rer	ex	lending	g	dummy c~s
Real Economic growth	rgdp_g	1											
Real Foreign Direct Investment (RFDI)	rfdi	0.1399	1										
RFDI in mining	rmining	0.0079	-0.3093	1									
RFDI in agriculture	ragro	0.4442	0.1599	0.5122	1								
RFDI in manufacturing	rmanuf	0.1656	0.7988	-0.0323	0.4299	1							
RFDI in hydropower	rhydro	0.3983	0.7099	-0.2054	0.1122	0.3273	1						
Real trade openness	to	0.1664	0.1694	0.1537	0.0346	-0.0238	0.3924	1					
Real exchange rate	rer	0.086	-0.0904	-0.0726	-0.0688	-0.2856	0.1042	-0.1706	1				
Real export	ex	-0.0013	0.783	-0.1349	0.2896	0.8607	0.2886	0.2025	-0.2535	1			
Lending rate	lending	-0.3303	-0.3306	0.0662	-0.1921	-0.2639	-0.3356	0.0451	0.0811	-0.2787	1		
Government expenditure	g	-0.0164	0.7531	-0.1771	0.2889	0.8645	0.2139	-0.1049	-0.1763	0.9361	-0.4204	1	
Dummy	dummycrisis	-0.2285	0.219	0.1283	-0.0743	0.0509	0.3154	0.6095	-0.2731	0.1109	-0.0342	-0.0665	1

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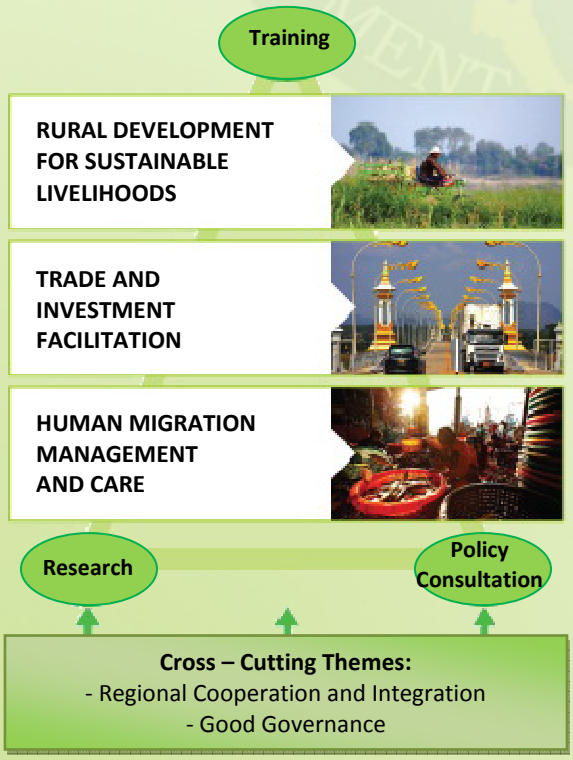

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