
How does FDI promote Economic Growth: Evidence from Mekong River Countries?

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FDI가 어떻게 경제 성장을 촉진하는가?: 메콩강 주변국 연구

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Abstract

This research focuses on the influences of FDI on the economic growth of four countries by Mekong river: Vietnam, Laos, Cambodia and Thailand. At the same time, the study also analyzes the contributing of economic growth to attract FDI inflow to these countries. The panel data during the period 1998-2017 were collected from World Bank.

Empirical analysis figures out that GDP, mobile phone, labor force are the determinants affecting positive to FDI and vice versa exchange rate, wage are the negative factors. Secondly, FDI, export, exchange rate, government expenditure impact positively on economic growth but inflation and population have negative effect on the economic development. Thirdly, The FDI and economic growth have impact mutually in Vietnam, Laos, Cambodia and Thailand economy. FDI plays a very crucial role in contributing greatly to the economic development of the Mekong sub-region. The economic growth is higher, the FDI inflow is more attractive.

From the results, some practical suggestions are offered to enhance the competitiveness in attracting FDI.

Keywords: economic growth, FDI, Vietnam, Lao PDR, Cambodia, Thailand

JEL Classifications: F15, F16

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I. INTRODUCTION

The experience of Asia over the past few decades has shown that opening up the economy, especially attracting foreign direct investment (FDI) helps these regional countries quickly achieve economic achievements. Asia become one of the promising dynamic economic regions in the world. FDI inflows also play an important role in emerging market economies, which may help developing countries bridge the gap with other countries. For investors, the benefit is to expand the market, extend the life cycle of the product through technology transfer, utilize resources and advantages from the investment recipient country. From the perspective of receiving investment countries, they have more resources from outside to invest in, promote economic development, have more jobs, increase technology level, etc. The emerging economies of Asia have certain advantages when viewed as new potential markets, abundant labor force, cheap labor costs and investment incentive policies.

For developing countries in general and the development of Vietnam, Laos, Cambodia and Thailand in particular, FDI is an important source to supply the shortage of capital. Investment capital is the basis for creating jobs, innovating technology, increasing labor productivity, thereby increasing wage, increasing accumulation for socio-economic development. FDI is different from foreign loans, it can help CLVT (Cambodia, Laos, Vietnam and Thailand) overcomes the shortage of capital without having to borrow. Besides, borrowing from abroad is often controlled in terms of duration, sometimes the repayment period is too short, causing difficulties in investment. Capital from FDI is more flexible; hence, it is more advantageous

in investment.

The 1st Mekong-KOREA Summit would take place on November 27 at Busan. It was the first Summit meeting between the Mekong region and Korea. Korea expect further cooperation between the Mekong region and Korea because of Korean government's strong New Southern Policy. This meeting has served as an opportunity to evaluate the past 10 years of Mekong-Korea relations and discuss how to make the Han River Miracle applied to the Mekong River.

With a summit, it would also pave the way for mutual economic growth by enhancing concrete collaboration that meets local needs and building capacity of the Mekong countries.

The purpose of this paper is to analyze how FDI promote economic development by comparing Mekong River countries in terms of export, import, GDP and other economic indicators by using panel data.

The article is organized as follows. The second section presents a literature reviews. The third section describes the research methodology, followed by a discussion of the results. The fourth section presents the conclusions of this research.

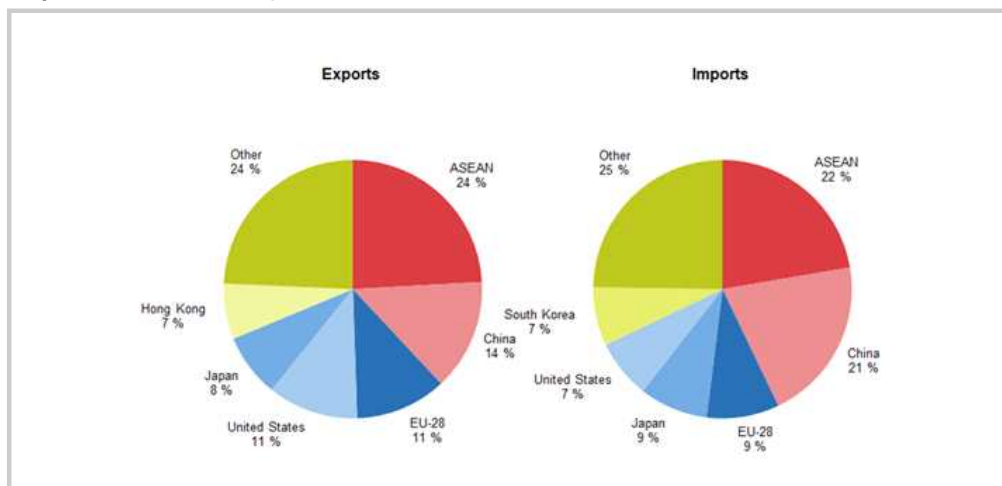
II. THEORETICAL BACKGROUND AND LITERATURE REVIEW

1. Mekong sub region trade and investment

In ASEAN region as a whole, the six largest trade in goods partners of ASEAN countries are shown in Graph below. Between a quarter and a fifth of exports and imports of ASEAN countries is with other ASEAN countries. In both cases China and EU are the second and third largest partner respectively.

Graph. 1. ASEAN trade partners, 2018

(Unit :%)



Source: UN Comtrade Database

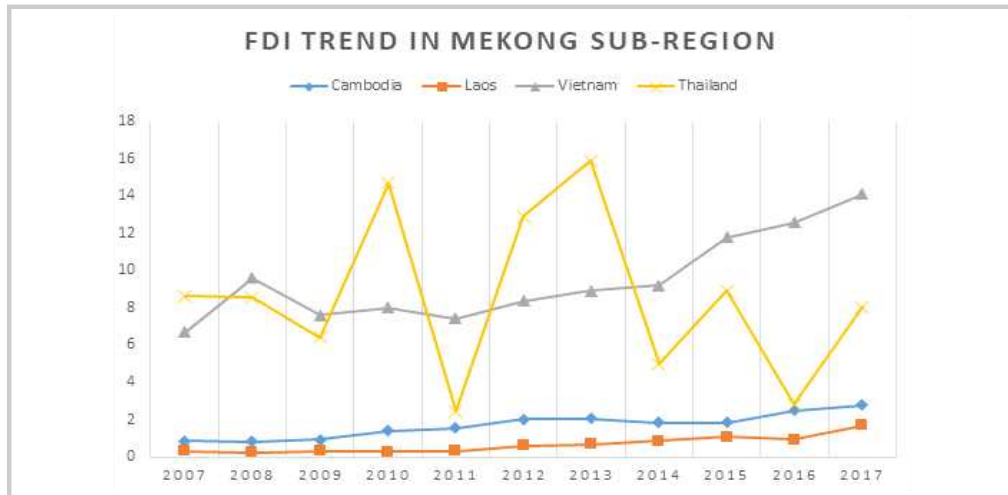
For exports, the next three largest partners are the United States, Japan and Hong Kong, and for imports the next three are Japan, the United States and South Korea.

Thanks to growing trade, FDI inflows to ASEAN have reached a record high, from USD 123 billion in 2016 to USD 137 billion in 2017, underpinned by a significant increase in investment in 8 member countries. As a result, the rate of ASEAN FDI flowing into developing economies increased from 18% in 2016 to 20% in 2017. In the total amount of FDI into East Asia and Southeast Asia, ASEAN's market share also increased from 31% in 2016 to 34% in 2017. Intra-ASEAN investment, making the biggest contribution to the FDI inflows in the region, reached a new high of 27 billion USD, equivalent to about 19% of the total capital flowing into the zone. A key development in ASEAN is increased investment in the digital economy, including e-commerce, FINTECH, venture capital and other digital activities such as data center development and Information and Communication Technology (ICT) infrastructure

All four countries have increased their trade flows with the Mekong-4. Cambodia has increased its trade with Mekong-4 countries from 12.9% in 2000 to 15.4% in 2008, as shown in table below. Laos amplified it from 66% up to 71% in the same period. On the other hand, Thailand and Vietnam are much less dependent on trade with Mekong countries. Thailand's trade with Mekong countries amounts to only 3.1% of its total trade in 2008 from 1.5% in 2000, while Vietnam increased its trade with the Mekong by only 0.6%, to 5.7% over the eight year period. In the period 2000 to 2008, every Mekong country increased their trade within the region and with China, whereas each country decreased their trade with the EU. Trading with the United States showed a mixed pattern. The table illustrates that Laos heavily relies on intra-Mekong trade, particularly with Thailand, Laos' trade with Thailand accounted for 60% of its total trade in 2008, and 71.3% of its total trade in Mekong-4. Cambodia traded more with the US than with Mekong-4 and the rest of ASEAN

Graph. 2. FDI trend in Mekong sub region

(Unit: Billion USD)



Source: World Bank

members combined. Thailand traded more with other ASEAN nations than with Cambodia, Laos and Vietnam. In the same vein, Vietnam traded less within Mekong-4 than with the other ASEAN members, China, the EU, or the United States.

2. Foreign direct investment (FDI)

Foreign direct investment (FDI) in the Mekong sub-region has increased rapidly from 4 billion USD and in the early 2000s to more than 10 billion in the 2010s. With economic development, population distribution and advanced industrial infrastructure, sub-regions have become a global FDI attraction.

However, careful consideration should be given to whether the increase in FDI will lead to long-term industrial development in the region. FDI into the current Mekong sub-region focuses on natural resources (for example, oil and gas, minerals, water and land), industries that require a lot of low-cost labor (for example, export processing

footwear and clothes), large-scale assembly lines of manufacturing industries. FDI from Japan includes investment of both large and small enterprises, from upstream to downstream of the production value chain throughout the Mekong sub-region. This represents the fact that Japanese enterprises view the Mekong sub-region as a single production area and wish to build industrial clusters in the entire Mekong sub-region, expanding the existing value chain of these businesses in Thailand and China, based on the development of neighboring countries. In addition, to keep up with the development of manufacturing industries and the growth of local wage, investment activities are expanded to many industries from wholesale and retail to services related to production.

3. Literature review

The numerous researches of FDI influencing the economic growth were taken by economists and researchers with varied

conclusions on the role of FDI on economic growth.

Freeman (2002) studied overview of FDI in Vietnam until 2002. The author has reviewed the recent experiences in attracting FDI and weaknesses outlined in the policy framework on FDI in Vietnam, as draws out the factors affecting FDI in Vietnam. The authors concluded that the policies of economic reform and liberalization business has made a positive impact to the business environment for investors. However, in order to promote FDI inflows, Vietnam needs to strengthen coordination and perfection than those policies.

Thi Huong Nguyen and Huy Nhuong Bui (2003) compared the situation of attracting FDI in China and Vietnam in the period of 1979-2002 as a basis for drawing lessons for Vietnam. The authors assess FDI plays an important role in the development of the country in general such as economic growth, economic structural transformation, budget collection, job creation to attract capital. Foreign investment, all authors agreed to synchronize from the promulgation of policies, laws, sector development planning, etc.

Sajid Anwar & Lan Phi Nguyen (2010) did the research about Foreign direct investment and economic growth in Vietnam during the period 1996-2005. The paper showed the linkage between FDI and economic growth through empirical model. The study also indicated that areas which have higher education and training, financial market development and technology would be attractive more than others.

Xuecong Zhu (2014) has studied the comparativeness of FDI and economic growth between China and Korea. This study discussed the effects of foreign direct investment on host country's economic growth, and the empirical study shows

various results on the impact on foreign direct investment in economic growth. The research used the panel data in the period 1980-2012 of China and Korea. The relationship between foreign direct investment and economic growth has been studied in many respects, and the real system is established depending on the transformational factors of the system growth factors between the foreign direct investment and the host country's economy. Foreign investment is largely gained from well-developed loan markets and national growth. There are other factors that influence the effect of FDI on host country's economic growth. The gap between the technology host and the country of origin and the shared ownership of the foreign-invested companies are also factors. As globalization and liberalization have increased in recent years, it has become a new axis of the world's economic order, and countries around the world are making extreme efforts to attract foreign capital to their own countries.

In Ji Kim (2015) has carried out the research on the effects of FDI inflow on China's Economic Growth. This paper analyzed the effects of foreign direct investment inflows on regional economic growth in each country. Foreign directors increased employment in each country, contributed to GDP growth in each region, contributed to the expansion of exports according to policies that encourage exports, it also contributed to the growth. The efficiency problem of foreign direct investment is significant in terms of the foreign direct investment policy of the government in the future. This is because it is possible to implement policies that attract more efficient investments on industrial and regional basis rather than unconditionally attracting foreign direct investment.

Mai Mohamed Ahmed Elbahrawy (2016)

Table 1. Summaries of studies

	Title	Data sample/ Model	Description
Freeman (2002)	Foreign Direct Investment in Vietnam: An Overview	Case study	The policies of economic reform and liberalization business has made a positive impact to the business environment for investors
Thi Huong Nguyen and Huy Nhung Bui (2003)	The lessons from the comparing FDI policies in Vietnam and China	1. Panel data 1979–2002 2. A gravity model	FDI plays an important role in the development of the country in general such as economic growth, economic structural transformation, budget collection, job creation.
Sajid Anwar & Lan Phi Nguyen (2010)	Foreign direct investment and economic growth in Vietnam	1. Panel data of 61 provinces in Vietnam from 1996–2005. 2. A regression model	The determinants which impacts on FDI are provincial economic growth rate (+), GDP per capita (+), gross domestic investment per capita (+), export of goods and services (+), skilled labour (+), monthly average wage (-), telephone (+), real exchange rate (+). The determinants which impacts on provincial economic growth are FDI (+), government expenditure (+/-), ratio of exports (+), number of university and college students (+), gross domestic investment (+), labor (+), learning by doing (+), real exchange rate (-).
Xuecong Zhu (2014)	Comparative analysis of the impact of inflow Foreign Direct Investment on the Economic Development in China and South Korea.	1. The statistical data of China and Korea during the period (1980–2012) 2. A regression model	The determinants which impact on the economic growth of China and Korea are import, export volume (+), FDI (+), private investment (+), average years of education (+), Government Spending (+), inflation rate (-), population (+).
In Ji Kim (2015)	The Effect of Inward FDI on the Regional Economic Growth in China	1. Panel data of regional economy in China 1987–2014 2. A regression model. Random effect, fixed effect, Hausman test	FDI, domestic investment, export, urban employment are the determinants impact on regional economic growth in China.

	Title	Data sample/ Model	Description
Mai Mohamed Ahmed Elbahrawy (2016)	Determinants of Egyptian economic growth does FDI matter for Egypt' s economic growth?	1. The data of Egyptian economy in the period 1985–2015 2. Ordinary Least Square equation (OLS). 3. Augmented Dickey–Fuller unit root test	The results showed that FDI had an insignificant influence on GDP per capita in Egypt. Contributing family workers (+), government consumption spending (+), and secondary school enrollment rate (+), household consumption expenditure (-), terms of trade (-).
Dong Ho Joo (2016)	Comparative Analysis of Determinants for between Korea and Developed, Developing countries	1. Panel data from 1990–2014 2. A gravity model 3. Pooled OLS, random effect, fixed effect	GDP, FDI and exchange rate had positive effect while population had negative effect on trade volume.
Habtamu Alamayo (2019)	FDI Inflows and Economic Growth: empirical evidence from selected East African Countries	1. Panel data from 1997–2016 of 11 East African 2. Ordinary least square (OLS) regression	The determinants which impact on the economic growth of East African are FDI (-/+), exchange rate (-), inflation (+), infrastructure (+), labor force (+), domestic investment (+), openness (-/+), population (-/+), common markets for Eastern and Southern Africa (-).

studied to measure the importance of different aspects of the economy to determine which determinants affect economic growth performance in Egypt. In order to analyze that, this study used annual time series analysis to determine the impact of various economic factors on economic growth in Egypt during the period 1985-2015. The regression model was then tested and the results showed that FDI had an insignificant influence on GDP per capita in Egypt while contributing family workers, government consumption spending, and secondary school enrollment rate have positive effect on GDP. On the other hand, household consumption expenditure, terms of trade are the factors showed a significant negative impact on GDP that required quick measures to increase the exports value and decrease imports value.

Dong Ho Joo (2016) studied how trade volume affected by GDP, population, FDI exchange rate between Korea and developed, developing counties through 700 data in the period 1990 to 2014. The result showed that GDP, FDI and exchange rate had positive effect while population had negative effect.

Habtamu Alamayo (2019) researched the influence of FDI on economic growth during the period 1997-2016 in 11 countries of East Africa. The result indicated that in short term FDI had positive effect on economic growth but in long term the effect was reverse.

III. RESEARCH METHODOLOGY

1. Model

Determinants of economic growth

Foreign direct investment (FDI) is a factor impacting significantly on the economic growth (Sajid Anwar & Lan Phi Nguyen 2010). Foreign direct investment (FDI) is an important factor affecting the economic growth of developing countries. FDI supplements investment capital, provides new technology, creates jobs for human resource development, economic restructuring and export market expansion.

Inflation is another determinants that might have negative effect on the growth of economy. In the world, there have been many studies proving the existence of inflation threshold for samples of different countries such as Sarel (1996), Khan and Senhadji (2001), Alfaro (2003), Drukker and partners (2005), etc. Minh Sang Nguyen & Nu Dieu Khue Ngo (2015) tested nonlinear relationships calculation between inflation and economic growth by the self-regression method. As a result, a sample of 17 developing countries, including Vietnam from 2000 to 2012. The model estimation results show that there exists an inflation threshold that when inflation exceeds this threshold, it will have a negative impact on economic growth.

Government expenditure is a determinant which Keynes (1936) argues that the state can achieve its goal of creating effective aggregate demand through stimulus from public spending. Public spending policies on education, health care, infrastructure, research and development will have a long-term impact on economic growth. However, the role of public spending on economic growth is still a controversial topic and requires more

research (Grier & Tullock, 1989). Some researchers argue that the impact of public spending on economic growth is negative or unrelated (Akpan, 2005; Laudau, 1983), while others believe that spending. Government has a positive impact on economic growth (Korman & Barahmasrene, 2007). Public spending plays an important role in the government's fiscal policy to stimulate economic growth and development. With the data set of Southeast Asian countries collected from 1995 to 2012 with the fixed impact regression (FE), Quang Trung Nguyen & Pham Khanh Toan Tran (2014) found the positive impact of public spending on economic growth in Southeast Asian countries.

Studies show that exports impact economic growth in many ways. According to Helpman and Krugman (1985), growth in exports increases productivity gained from economies of scale. Krueger (1985) argues that growth in exports results in higher quality products due to international consumer pressure on exporters. According to Rodrik (1988), Ghirmay, Grabowski and Shama (2001), exports motivate enterprises to increase investment in new technologies as a strategy for higher production scale and increasing capital formation rate. Konya (2004), About-Stait (2005) and Arthar (2012) show that growth in exports helps to improve resource allocation, encourages foreign direct investment and technology transfer, and enhances the skills of workers and management qualifications, job creation and production capacity improvement of the economy.

Population is one of the factor impacting on the economic growth. The research conducted by Kelley and Schmidt (2005) in 86 countries around the world through the estimation of growth regression equation and representative variables are the working age

population and dependent population group. The results show that population growth in working age has a positive effect on economic growth. The population variable contributed 8% to global economic growth, 25% to European economic growth during 1965-1990. Bloom and Williamson (1998) use growth regression methods with representative variables of labor growth and population growth to study population-economic relations in East Asian countries. The study results confirmed that the "golden population structure" contributed 37% to the miraculous growth in East Asia during 1960-1990. An and Jeon (2006) used the method of least squares of total correction (FMOLS) and annual demographic data of Korea from 1972-2003 to study the impact of population change on economic growth in this country. The results show that population change with a "golden population structure" contributed 30% to Korea's economic growth during the study period.

According to Minh Sang Nguyen & Nu Dieu Khue Ngo (2015), increasing the exchange rate due to inflation increases the cost of foreign debt in foreign currencies of businesses and the Government that has foreign loans thereby increasing the risk of default of enterprises and the Government. For some open economies, but the exchange rate is not fully flexible, the trade balance deficit will have a negative impact on economic growth. Kamin and Rogers (2000), Husain et al. (2005), Sajid Anwar & Lan Phi Nguyen (2010) indicated exchange rate fluctuations considered as a characteristic for poor macroeconomic policies, resulting in devaluation of real exchange rates thus hindering economic growth.

Determinants of Foreign Direct Investment

GDP plays an important role in attracting FDI for one country. Some researchers proved that GDP impact positively on FDI inflows of a number of countries. Sajid Anwar & Lan Phi Nguyen (2010), Xuecong Zhu (2014) indicated that GDP per capita had positive effect on FDI.

Wage is one of the influent factor of FDI. In the research of Sajid Anwar & Lan Phi Nguyen (2010), labor cost impact negatively on the FDI inflows, the lower labor cost might attract the foreign companies investing to host countries. On the other hand, Ngoc Anh Nguyen and Thang Nguyen (2007), Juan Du (2011) found that wage had significantly positive effect on FDI due to higher labor quality.

Infrastructure quality is also an additional relevant factor Habtamu Alamayo (2019). There is considerable evidence that infrastructure is a core factor for economic activity. Infrastructure is defined as transportation, telecommunications, water and sanitation, energy and gas, and other facilities, and can be measured using a variety of indicators. In the studies of Sajid Anwar & Lan Phi Nguyen (2010), telephone had positive influence on attracting FDI inflow.

Labor force is an important factor to consider when investors decide whether to invest in the host country. Abundant and cheap human resource is an attractive factor to attract enterprises with low technological level and labor-intensive. Skilled and disciplined labor suitable for industrial production lines; and especially managerial and technical workers with foreign language skills working for foreign-invested enterprises. According to Sajid Anwar & Lan Phi Nguyen (2010), Habtamu Alamayo (2019) labor force

Table 2. Description of variables

Variable	Meaning of variable	Source
GDP _{it}	Gross Domestic Product (US dollar)	World Bank
FDI _{it}	Foreign direct investment net inflows (current US dollar)	World Bank
GE _{it}	Government expenditure to GDP (%)	CountryEconomy.com
EX _{it}	Exports of goods and services (% of GDP)	World Bank
LF _{it}	Labour force (person)	World Bank
ER _{it}	Official exchange rate (LCU per US dollar, period average)	World Bank
IF _{it}	Inflation (%)	World Bank
POP _{it}	Population (person)	World Bank
WA _{it}	Wage (US dollar)	World Bank
MB _{it}	Mobile phone per 100 people	World Bank

is also a positive factor in attracting investment. The paper applies and combines many methods such as: analysis and synthesis, in which the main method is the regression method to analyze table data in order to assess the impact of public spending on economic growth with the support of Eview 10.0 software, with two regression models proposed for the study as follows:

$$\text{Model (I): } \text{GDP}_{it} = \alpha_0 + \alpha_1 \text{FDI}_{it} + \alpha_2 \text{GE}_{it} + \alpha_3 \text{EX}_{it} + \alpha_4 \text{POP}_{it} + \alpha_5 \text{IF}_{it} + \alpha_6 \text{ER}_{it} + \epsilon_{it} \quad (1)$$

$$\text{Model (II): } \text{FDI}_{it} = \beta_0 + \beta_1 \text{GDP}_{it} + \beta_2 \text{WA}_{it} + \beta_3 \text{MB}_{it} + \beta_4 \text{ER}_{it} + \beta_5 \text{LF}_{it} + \gamma_{it} \quad (2)$$

Where α , β = intercept (constant), i = cross section (countries), t = time series (years)

The hypotheses of the study are as below

- H1. The FDI and economic growth have impact mutually in Vietnam, Laos, Cambodia and Thailand economy.*
- H2. Nations which have better economy power, wage, or living standard are more attractive to foreign investors.*
- H3. FDI also impact on the growth of Vietnam, Laos, Cambodia and Thailand economy.*

2. Data

In order to study the above-mentioned research objectives and to have high practical results, and to be applicable to developing countries, the author conducts research on countries in the Mekong sub-region as a research sample. Data collected for this study included 4 countries: Vietnam, Laos, Cambodia and Thailand from 1998 to 2017. The study used the panel data extracted from World Bank, countryEconomy.com.

IV. EMPIRICAL RESULT

1. The correlation matrix

The table below shows that the correlation between the variables in model (I) on the factors affecting economic growth. Accordingly, it can be seen that the correlation coefficient between variables is less than 0.8. The correlation coefficient between FDI and economic growth is

Table 3. The correlation matrix of dependent variable GDP and other independent variables

	LOG(GDP)	LOG(FDI)	IF	LOG(EX)	LOG(ER)	GE	POP
LOG(GDP)	1						
LOG(FDI)	0.756	1					
IF	-0.325	-0.329	1				
LOG(EX)	0.504	0.812	0.234	1			
LOG(ER)	-0.666	-0.409	0.158	-0.297	1		
GE	0.761	0.413	-0.180	0.128	-0.877	1	
POP	0.438	0.761	-0.190	0.728	-0.218	0.241	1

Table 4. The correlation matrix of dependent variable FDI and other independent variables

	LOG(FDI)	LOG(GDP)	MB	IC	ER	LF
LOG(FDI)	1					
LOG(GDP)	0.756	1				
MB	0.628	0.728	1			
WA	0.494	0.764	0.357	1		
ER	0.036	-0.282	0.059	-0.621	1	
LF	0.776	0.471	0.376	0.395	0.370	1

relatively high 0.756.

The correlation between export variables with GDP, government spending with GDP, and population variables with GDP is also quite strong, respectively 0.504, 0.761 and 0.438. On the other hand, inflation, exchange rate variables show negative correlation with economic growth relatively high -0.325, -0.666.

Regarding to model (II), the result of the table below indicates that the correlation of GDP and FDI in model (II) is significant with 0.756, the same as the result in model (I).

Mobile phone per 100 people, labor force, wage variables have high correlation with FDI 0.628, 0.776, 0.494. Besides, Mobile phone per 100 people and GDP have high

correlation with 0.728, wage and GDP are also a significant correlation 0.764.

Conducting the regression analysis, the stability of the data used in the estimation model should be verified. Although there are various methods to test the stability of time series data, this study mainly focused on ADF and PP fisher chi-squares techniques. Therefore, the results of the panel unit root test to test this are shown in Table 5. The results of the panel unit root test show that almost the variables except for GDP, labour force and wage are stationary for the level data. However, the log data verification results for variables are significant, excepting inflation due to negative value.

Table 5. Panel unit root test

Categories		Level		Log data	
		statistic	prob	statistic	prob
ER	ADF- Chi-square	12.94	0.114	12.15	0.14
	PP- Chi-square	18.31	0.019**	26.57	0.0008***
FDI	ADF- Chi-square	12.26	0.075*	39.9	0.0000***
	PP- Chi-square	14.13	0.078*	123.4	0.0000***
EX	ADF- Chi-square	9.69	0.28	9.46	0.3
	PP- Chi-square	14.97	0.059*	20.18	0.0097***
GDP	ADF- Chi-square	1.01	0.998	22.92	0.0035***
	PP- Chi-square	1.03	0.998	22.76	0.0037***
IF	ADF- Chi-square	34.36	0.0000***	X	X
	PP- Chi-square	42.71	0.0000***		
GE	ADF- Chi-square	21.47	0.0000***	61.61	0.0000***
	PP- Chi-square	20.88	0.0000***	72.36	0.0000***
LF	ADF- Chi-square	9.87	0.274	21.24	0.0021***
	PP- Chi-square	12.16	0.143	31.27	0.0001***
MB	ADF- Chi-square	29.69	0.0002***	23.3	0.003***
	PP- Chi-square	30.16	0.0002***	30.59	0.0002***
POP	ADF- Chi-square	2.9	0.954	21.53	0.0059***
	PP- Chi-square	50.35	0.0000***	27.03	0.0007***
WA	ADF- Chi-square	1.28	0.99	59.8	0.0000***
	PP- Chi-square	1.25	0.99	62.5	0.0000***

Note: Shows the results of statistical significance. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2. Regression result

In order to test the hypothesis, the study used the panel data with 2 dimensions: one is a cross-sectional dimension (4 countries: Vietnam, Laos, Cambodia and Thailand), the other is time-series dimension (20 years 1998-2017).

1) GDP dependent variable regression

The regression for each countries showed that FDI, population have positive effects on GDP, but the other variables affect negative or positive in Cambodia, Laos, Vietnam, Thailand as the table below.

Model of GDP dependent variable

$$GDP = \alpha_0 + \alpha_1 FDI_{it} + \alpha_2 GE_{it} + \alpha_3 EX_{it} + \alpha_4 POP_{it} + \epsilon_{it} \quad (I, 1)$$

$$GDP = \alpha_0 + \alpha_1 FDI_{it} + \alpha_2 GE_{it} + \alpha_3 EX_{it} + \alpha_4 POP_{it} + \alpha_5 IF_{it} + \epsilon_{it} \quad (I, 2)$$

$$GDP = \alpha_0 + \alpha_1 FDI_{it} + \alpha_2 GE_{it} + \alpha_3 EX_{it} + \alpha_4 POP_{it} + \alpha_5 IF_{it} + \alpha_6 ER_{it} + \epsilon_{it} \quad (I, 3)$$

The result displays the differences of the effect on economic growth when adding a variable in each model. The OLS and fixed effect are used in the regression models as the table below.

Table 6. The regression of GDP dependent variable for individual country analysis

Independent Variables	Dependent variable: GDP			
	Cambodia	Laos	Vietnam	Thailand
FDI (log (FDI))	0.11*** (0.0000)	0.06* (0.0573)	0.238*** (0.0018)	0.7379*** (0.006)
Export (log(EX))	0.05 (0.50)	0.35* (0.057)	-0.37 (0.3573)	-0.35 (0.3080)
Government expenditure (GE)	0.027** (0.0337)	0.016 (0.1594)	-0.084** (0.0478)	0.933*** (0.0055)
Population (POP)	3.00E-07*** (0.0000)	1.08E-06*** (0.0000)	7.09E-08** (0.0359)	1.6E-07*** (0.0000)
Inflation (IF)	0.005*** (0.0048)	-0.0009 (0.2964)	0.003 (0.3370)	0.015** (0.0104)
Exchange rate (log(ER))	0.582 (0.2172)	0.018 (0.8718)	1.09** (0.0437)	-1.225*** (0.0000)
Cons	-5.199 (0.1556)	-2.552** (0.0411)	-13.16*** (0.0026)	3.25* (0.06)
Observations	20	20	20	20

Notes: Shows the results of statistical significance. * p<0.1, ** p<0.05, *** p<0.01

Table 7. The comparison of GDP dependent variable regression models

Explanatory variables	OLS			Fixed effect		
	(I.1)	(I.2)	(I.3)	(I.1)	(I.2)	(I.3)
FDI(log (FDI))	0.32*** (0.0000)	0.31*** (0.0000)	0.264*** (0.0000)	0.275*** (0.0000)	0.263*** (0.0000)	0.259*** (0.0000)
Export(log(EX))	0.249 (0.3203)	0.254 (0.3123)	0.762** (0.0134)	0.034 (0.8755)	0.24 (0.2273)	0.234 (0.217)
Government expenditure (GE)	0.075*** (0.0000)	0.075*** (0.0000)	0.119*** (0.0000)	0.058*** (0.0000)	0.044*** (0.0007)	0.035*** (0.0052)
Population(POP)	-7.00E-09*** (0.0010)	-6.84E-09** (0.013)	-8.62E-09*** (0.0001)	1.11E-07*** (0.0000)	1.03E-07*** (0.0000)	1.13E-07*** (0.0000)
Inflation(IF)		-0.025 (0.3578)	-0.0022 (0.3905)		-0.006*** (0.0000)	-0.008*** (0.0000)
Exchange rate (log(ER))			0.126*** (0.0068)			-0.438*** (0.0058)
Cons	-1.18 (1.295)	-0.976 (0.2266)	-3.397*** (0.0045)	-4.283*** (0.0000)	-4.304*** (0.0000)	-1.141 (0.3500)
R2	0.958	0.967	0.857	0.958	0.967	0.97

According to the regression results of the three models I.1, I.2 and I.3 show the relationship between economic growth and FDI, government expenditure is positively

and significantly correlated in all regressions. At the same time, the population always has a negative correlation. Particularly, export variable has a positive effect but it is not

Table 8. The regression of FDI dependent variable for individual country analysis

Independent Variables	Dependent variable: FDI			
	Cambodia	Laos	Vietnam	Thailand
GDP (log(GDP))	8.13*** (0.0019)	6.92** (0.0135)	1.5* (0.0516)	8.05 (0.1277)
Mobile phone per 100 people (MB)	0.003 (0.5509)	-0.03 (0.1024)	0.0088*** (0.0072)	-0.05** (0.0206)
Wage (WA)	-0.0096** (0.0438)	-0.001 (0.8175)	0.0024*** (0.0015)	2.63E-13 (0.6892)
Exchange rate (ER)	-0.0005 (0.8415)	-0.0002** (0.0374)	-0.0004*** (0.0004)	0.15 (0.3835)
Labor force (LF)	-1.02E-06* (0.0824)	-6.67E-06 (0.3243)	-3.6E-08 (0.6746)	-3.39E-07 (0.2074)
Cons	-15.55 (0.1433)	-3.96 (0.5878)	17.97*** (0.0000)	-34.05 (0.3421)
Observations	20	20	20	20

significant in the regression.

In model I,2, the inflation variable is added, having a negative impact on economic growth and the remaining variables have similar results to model I,1.

After using Ordinary Least Square method in model I,3 with exchange rate variable is added, the variable FDI impacted positively on Gross Domestic Product variable (0,264). While Export (0,762), Exchange rate (0,126) and Government expenditure (0,119) had a positive effect on GDP, inflation (-0,0022), population (-8,62E-09) increasing caused the decreasing of GDP. Excepting Inflation variable, the other variables are significant on dependent variable.

After using fixed effect method, if the inflation variable was not significant in using OLS, it is significant at 1% when using fixed effect. The reliability R-squared in model (I,3) is higher (0,97). The result also indicates that FDI, Inflation, Exchange rate, Government expenditure, Population are significant at 1%, the only one variable export is not significant.

While exchange rate (-0,438) and inflation (-0,008) are negative values, the other variables FDI (0,259), Export (0,233), Government expenditure (0,035) and Population (1,13E-07) have positive effects on GDP.

2) FDI dependent variable regression

As the table below, GDP impact positively on FDI, and the other variables have negative and positive effects on each countries according to each regression of them.

Model of FDI dependent variable

$$FDI = \beta_0 + \beta_1 GDP_{it} + \beta_2 WA_{it} + \beta_3 MB_{it} + \gamma_{it} \quad (II, 1)$$

$$FDI = \beta_0 + \beta_1 GDP_{it} + \beta_2 WA_{it} + \beta_3 MB_{it} + \beta_4 ER_{it} + \gamma_{it} \quad (II, 2)$$

$$FDI = \beta_0 + \beta_1 GDP_{it} + \beta_2 WA_{it} + \beta_3 MB_{it} + \beta_4 ER_{it} + \beta_5 LF_{it} + \gamma_{it} \quad (II, 3)$$

The table below reports the summary results OLS regression with 3 models for FDI

Table 9. The comparison of FDI dependent variable regression models

Explanatory variables	OLS			Fixed effect		
	(II.1)	(II.2)	(II.3)	(II.1)	(II.2)	(II.3)
GDP(log(GDP))	1.634*** (0.0000)	1.469*** (0.0000)	1.487*** (0.0000)	1.858*** (0.0000)	1.889*** (0.0000)	1.891*** (0.0000)
Mobile phone per 100 people (MB)	0.0035 (0.4030)	0.0015 (0.7148)	0.038** (0.0278)	-0.002 (0.5091)	0.002 (0.4300)	0.002 (0.4486)
Wage(WA)	-8.56E-14 (0.2335)	6.99E-14 (0.3990)	-6.11E-13*** (0.0000)	-3.37E-13*** (0.0001)	-4.61E-13*** (0.0000)	-4.60E-13*** (0.0000)
Exchange rate (ER)		8.87E-05*** (0.0017)	-0.00025*** (0.0000)		-0.0002*** (0.0000)	-0.0002*** (0.0012)
Labor force (LF)			1.11E-07*** (0.0000)			-2.86E-09 (0.9496)
Cons	9.413*** (0.0001)	9.73*** (0.0000)	10.594*** (0.0000)	8.623*** (0.0000)	9.85*** (0.0000)	9.88*** (0.0000)
R2	0.592	0.643	0.937	0.923	0.949	0.949

Note: Shows the results of statistical significance. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

dependent variable in order to test the influence of independent variables on attracting FDI.

As the result above, in model II.1, there is only significant GDP variable and positive impact on FDI, mobile phone per 100 people and average wage are not significant in regression model.

When the exchange rate variable is added, GDP and exchange rate impact positively on FDI and they are significant to regression model. Mobile phone per 100 people and wage variables are positive effect but they are not significant to regression model.

The addition labor force variable appear in the model II.3, wage and exchange rate variables are from positive effect changed to negative effect. On the other hand, the GDP is significant on FDI with positive effect. If GDP increase 1%, FDI will rise 1.487%. The test showed that mobile phone per 100 people (0.038) and labor force (1.11E-07) had

positive influence on the dependent variable FDI. All independent variables are significant.

In fixed effect results, GDP, wage, exchange rate is significant at 1% on FDI. Through the fixed effect test, GDP (1.891), mobile phone (0.0019) is positive influence. In contrast, if wage (-4.6E-13), exchange rate (-0.00018), labor force (-2.86E-09) is up, the dependent variable FDI will be down. The differences between OLS and fixed effect are labor force in OLS had positive value, while in fixed effect results it is negative; besides, OLS test inflation variable is not significant, in fixed effect mobile phone and labor force are not significant. However, the R-squared in all 3 model (II.1), (II.2),(II.3) in using fixed effect are higher than in using OLS method.

From the previous sections, FDI and GDP was tested the correlation between them in order to examine the hypothesis.

According to the result above, FDI and GDP have positive effects on each other. The

Table 10. Correlation between FDI and GDP

Independent Variables	Dependent variables	
	FDI	GDP
GDP	1.487***	
FDI		0.264***

Note: * Shows the results of statistical significance. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

results are also significant at 1%. Basing on the test, if the GDP increase, the FDI will rise and in the opposite, foreign direct investment goes up, the economic growth also goes up.

V. CONCLUSION

The study examines the impact of foreign direct investment on the growth of the Mekong sub region countries from 1998 - 2017. First, data was analyzed in each country on World Bank and country economy. Secondly, using the Eviews 10.0 analysis software, data was collected and analyzed as a group. The results show that foreign direct investment actually promotes economic growth. At the same time, the economic growth of Vietnam, Laos, Cambodia and Thailand also has the effect on attracting foreign investment.

The results of the empirical analysis show that countries with a weak financial market, the financial system is still fragile if faced with strong fluctuations or crises that will negatively impact on attracting FDI. The foreign investment simultaneously has the influence on nation's economic growth. The more FDI is attracted, the higher economic growth is tested.

FDI plays a very important role, contributing greatly to the economic development of the Mekong sub-region. In addition to the obtained results, the fact that FDI attraction

is still not commensurate with the potential, advantages and development requirements of other countries. In the coming years, in order to be able to increase the attraction of FDI to supplement the development investment capital, contributing to accelerating the economic growth rate, exploiting and improving the efficiency of using resources in the sub-region, it is necessary to must implement synchronously many solutions as below

First, completing the infrastructure system to attract investment. Important transport and service must be constructed such as utilities, communications, transportation, healthcare, education, especially focusing on infrastructure investment in industrial area.

Second, training of human resources should be carried out. Strengthening training of high-quality human resources to meet both quantity and quality requirements. The high quality of human resources will encourage investors to invest in because they will save training costs when recruiting workers. The improvement of the quality of human resources is firstly the professional and technical qualifications for employees depending on the education and training system (general education, vocational training, professional secondary school, university and post-graduate).

Third, improving the quality of FDI projects invested in the Mekong sub-region. Focusing on calling for foreign direct investment on a selective basis of industries and areas

reasonably, industrial development associated with urban development, security services and environment. The investment environment should be improved. Creating favorable conditions to strongly attract international capital sources, attract large investors with high technology, source technology and expanding export markets.

Fourth, the government should carry out administrative reform, renovate the organization and administrative procedures to enhance the attraction of foreign direct investment.

Fifth, countries must ensure a stable stability of security, political and social environment. Stabilizing the security, political and social environment is the top concern of investors, which is the leading decision to effectively mobilize and use investment capital, especially foreign direct investment.

Last but not least, countries in the Mekong sub-region should enhance economic cooperation, trade and experience sharing to develop together, making the Mekong sub-region as an important economic region of Asia and the world.

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