

Determinants of Economic Growth in Laos

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ABSTRACT

This paper identifies the key determinants influencing economic growth of Laos, using annual time-series data from the period of 1980-2010. We use the augmented Dickey–Fuller of unit roots test to examine whether the variables are stationary in order to avoid the problem of spurious in our regression (OLS). One of the contributions of this paper is its input to the existing empirical literature and theory on the effects of trade openness and the impacts of foreign aid on economic growth. Firstly, we examine the impacts of trade openness, following which we analyse the impacts of foreign aid on economic growth. The findings show that both variables have strong positive impacts and distribute economic growth in Laos. Furthermore, the other factors, such as foreign direct investment, domestic investment, and government expenditure, show a positive correlation with growth, while the population growth has a negative impact on economic growth. This is in line with the assumption that a large population is related to the capacity of government expenditure to provide the people with social services efficiently, thereby negatively impacting on development. To sustain a high rate of growth, this paper suggests improving the trade policy orientation, based on value-added products for exporting, together with investment policy adoption and tourism promotion based on the potential resources of the country. The foreign aid allocation should be focused on specific areas and ensure positive effectiveness with accountability and transparency methods, such as (1) promoting economic growth and (2) direct intervention for the poor.

Keywords: Economic Growth, Trade Openness, Foreign Aid, Investment, and Government Expenditure

1. INTRODUCTION

Laos pursued significant economic reform under the new economic mechanism (NEM) in 1986, aiming to improve the economic development system based on a market-oriented economy, with the intention of transforming the nation from a closed and centrally planned economy to a market-oriented one. Laos made great efforts to reform state-owned enterprise and promote private enterprise and foreign investment, in parallel with strengthening the banking system and implementing trade liberalization. From the early 1990s, this country has paid attention to improving its business environment to make the country more investor-friendly, together with trade promotion and international cooperation.

Following the open-door policies, Laos accepted several offers of support from governments and international organizations from around the world. These factors are assumed to have had a positive impact on its economic development. Sustained growth is considered to be a key factor for current

and future development, particularly to achieve the development goal for 2020, which is to emerge from the list of least developed countries (LDCs); in addition, the country expects to achieve at least the middle-income country status. Economists have long been interested in the factors that cause different countries to grow at different rates. One of such factors is economic reform. Laos sustained a high rate of growth from 1990 to 2010, particularly after the introduction of the NEM in 1986, which is basically an open economy to international transaction and integration, which is assumed to have a positive impact on growth. The economic development of Laos under the NEM depends on the perspective of trade with other nations. Moreover, foreign aid is considered to be one factor that dominates the growth, since this country depends heavily on foreign aid for the promotion of higher economic growth and poverty reduction.

Foreign aid plays a crucial role in overcoming problems in poor countries including Laos, this country received a great deal of support from international organizations and agencies in terms of foreign aid, amounting to 16 per cent of the GDP, on average, between 1989 and 2010. This aid was allocated to social economic development, particularly rural development and poverty alleviation. Regarding other factors, such as investment, both foreign and domestic investments have increased significantly, particularly after gaining full membership of the ASEAN in 1997. The Government of Laos is committed to achieving robust economic growth through various policies and strategies, which totaled around 6-8 per cent on average per annum from the late 1990s to 2010, and emerging from LDC status by 2020.

This paper attempts to examine the impacts of the key factors, such as aid, trade openness, and investment, on economic growth in Laos for the period 1980–2010, based on the context of a simple modified growth model and experience from previous studies. The expected outcomes will provide good suggestions for the future development of Laos. This paper consists of five sections, including the introduction. The next section reviews the theoretical issues and the literature. Section III specifies the methodology and provides the model specification, while the empirical result is detailed in Section IV. Finally, Section V concludes the paper.

2. THEORY AND LITERATURE REVIEW

Economic growth means an increase in the average rate of output produced per person, usually measured on a per annum basis. This chapter reviews the theoretical and empirical studies related to economic growth, particularly the relationship between economic growth and its explanatory variables, such as trade openness, foreign aid, investment (foreign and domestic investment), government expenditure, population, labour force, and dummy variables.

2.1. Theories of Economic Growth

Growth theory has mainly developed from the neoclassical model, by authors such as Solow [1], Cass [2], and Koopmans [3]. One characteristic of the model, explored in the empirical hypothesis of recent studies, is the convergence property. The studies state that a country that begins with a lower level of GDP per capita is expected to achieve a higher growth rate in the long term. This could imply the assumption that if all economies were basically the same, except for their initial capital intensities, poor economies would probably grow faster than rich ones. However, this theory has not been completely proved by the empirical analysis, since the economic systems of different countries differ in various features, including the government policy, access to work, international cooperation, willingness to work, and access to technology; thus, the convergence force employs only a conditional logic.

The widespread use of the neoclassical model focuses on the roles played in coordinating and integrating various factors in macroeconomics, public finance, and international economics. This model usually finds wide usage in aggregate economic analysis. Solow's model of economic growth allows the determinants of economic growth to be separated out into increases in inputs (labour and capital) and technical progress. The theory of Solow essentially argues that when production takes place under usually neoclassical conditions and constant returns to scale, there will be no opposition between natural and unwarranted rates of growth. The system is self-adjusting to any given rate of growth in the labour force and eventually approaches a state of steady proportional expansion. The main innovation introduced by Solow is the ability to allow for factor sustainability so that stable equilibrium growth could be attained.

Given the empirical and policy problems associated with the Solow growth model, several studies of new models have attempted to identify the growth process. Due to the dependence of growth on exogenous technical progress in the neoclassical growth model and the evident inconsistency of the “unconditional convergence”, the hypothesis led to a renewed search for alternative models that can generate economic growth endogenously. According to the endogenous growth theory, economic growth is primarily the result of endogenous and not external forces. This theory maintains that investment in human capital, innovation, and knowledge is a significant contributor to economic growth; therefore, the endogenous theory emphasizes education, on-the-job training, and the development of new technologies for the world market, accounting for their increasing relevance. These proponents are confirmed by the studies of Lucas [4], and Uzama [5].

Several studies have followed the endogenous theory, such as the study by Romer [6], who identifies four basic preconditions for growth: (1) capital-measured in units of consumption goods; (2) labour skills available from a healthy human body; (3) human capital-activities such as formal education and on-the-job training, which is person-specific; and (4) an index of the level of technology. However, this model specification is less clear about the technical progress and the factors influencing growth are hard to measure. A number of studies have attempted to prove the growth of the neoclassical framework. Many of them begin with the basic function form of the neoclassical production function:

$$Y_t = A_t F(K_t, L_t) \quad (1)$$

Where: Y_t denotes the output,
 A_t is the technical change,
 K_t is the capital stock; and
 L_t is the labour force.

Economic theory usually suggests different factors, such as trade and foreign aid, which are assumed to dominate growth. One prevailing thought in the economic literature is globalization through trade openness and investment. Those factors may have a positive impact on economic growth.

2.2. Literature Review of Empirical Evidence

Economists generally agree that openness to international trade facilitates development. Several studies confirm that the openness achieved through trade cooperation and reduced trade obstruction is related to greater growth. This is confirmed by the study of Harrison [7], who examined the relationship between openness and the rate of GDP growth, using the results from cross-sectional and panel data estimates while controlling for country effects. This study shows that the openness measures seem to have a positive correlation with GDP growth, meaning that the more open the economy, the higher the growth rate, while the more protected the local economy, the slower the growth in income.

Hassan Mobeen [8] states that trade openness is believed to lead to the improved allocation of all types of resources, economies of time scale, improvements in production techniques by widening knowledge and the technical base, multilateral international arrangements for the transfer of technology, accumulation and formation of capital, and raising the level of employment by job creation and thus economic growth and development. He points out that the concept of trade openness is derived from the classical school of economics and from the theory of Adam Smith and David Ricardo, which specifies that the theory of international trade relates trade and international development. It is believed that economic gains of specialization, discernible in enhanced exports, entail higher levels of GDP, thus exports contribute directly to growth in the national income.

The impact of trade on growth is confirmed by a number of empirical studies. For example, the study by Dolla and Kraay [9], using cross-country data on 100 countries, confirms that changes in the growth rate are associated with changes in trade volumes. Particularly, the change in trade policy is one of the key factors that causes an increase in trade volume and leads to rapid growth. Fosu [10] and Sachs and Warner [11] conducted studies on several African countries, and agreed that more trade restrictions have a negative impact on growth. However, those studies based on cross-country data may suffer from biased estimation, since the different characteristics of each individual country lead to differences in data measurement and collection.

Many of the recent studies using time analysis to examine the impacts of trade on economic growth confirm that there is a strong correlation between export performance and economic growth, such as the study by Medina-Smith [12]. The relationship between trade and growth is envisaged through an export-led growth strategy, which follows the theory that sustained trade is the main engine of economic growth. This idea is confirmed by Obadan et al. [13], who examined the impacts of trade on economic growth and development in Nigeria using time-series data. The study was developed from the studies of Edwards [14] and Obandan [15], though with some modifications to the model. The GDP growth is the function of the degree of openness, exchange rate, foreign direct investment, domestic investment, and political stability. The study confirms that trade openness produced a positive impact on Nigeria's economic growth. Moreover, it states that political instability has a strong negative impact on growth and development.

A positive correlation between trade openness and economic growth has been carried out and proved by many recent studies [16, 17]; however, the growth may be influenced by the other factors of economic development, which depend on the characteristics of the individual countries, particularly developing countries. Therefore, other studies have explored the impact of foreign aid on economic development, since foreign aid is assumed to play a crucial role in overcoming economic problems in many developing countries. For example, Indonesia in the 1970s, and Bolivia in the late 1980s, moved from a slow path of economic growth to rapid development; in fact, foreign aid plays a significant role in stimulating growth by transferring money, ideas, and technology from donor countries to developing countries [18]. Moreover, the positive impacts of aid on promoting economic growth are confirmed by the studies by Mosley et al. [19], Arvin and Barillas [20], Hudson [21], and McGillivray et al. [22].

Recently, the relationship between foreign aid and economic growth has attracted great attention and there is now a large amount of literature on the correlation between foreign aid and growth. The study by McGillivray [23] identifies the impact of foreign aid on growth in African countries, using time series from 1968 to 1999; the result of this study demonstrates that aid not only has a positive impact on growth, but also reduces poverty in Africa. The study by Gomanee et al.[24] addresses the mechanisms through which aid impacts on growth. Using data on 25 sub-Saharan African countries over the period 1970 to 1997, this study indicates that there is a positive correlation between aid and growth; it proves that foreign aid has a significant positive effect on economic growth. Moreover, this study identifies investment as the most significant transmission mechanism for growth.

Karras [25] investigates the relationship between foreign aid and growth per capita using annual data on 71 aid-receiving developing countries, from the period of 1960 to 1997, the result of this study shows that the impact of foreign aid on economic growth is positive, permanent, and statistically significant. A permanent increase in foreign aid by US\$20 per person results in a permanent increase in the growth rate of real GDP per capita by 0.16 per cent; however, this result is obtained without considering the effects of policies.

Chansomphou and Ichihashi [26] examine the impact of foreign aid and foreign direct investment on the long-run income per capita and short-run income growth of Laos. Using time-series data from the period 1970–2008 and deriving a modification of Solow's growth model in regression analysis, this study indicates that foreign aid has a strong positive impact and it is considered to be a main contributor to income growth in Laos, while FDI has a negative impact on income per capita. They conclude that the negative impact of FDI might be due to its surge in and contribution to a few economic sectors and its extreme rises and falls in some periods.

From the above review of the empirical literature, based on the study by Obadan and Elizabeth [27], this study hypothesizes that trade openness has a positive impact on economic growth; an increase in the openness level is associated with an increase in the level of income per capita through economic performance, meaning that the trade openness is a driving force of economic growth. Next, we consider the impact of foreign aid on growth, based on the hypothesis that foreign aid has a positive impact on economic growth, since the impact of foreign aid on growth, particularly in developing countries, is confirmed by numerous studies [28, 29,30]. The main role of foreign aid in stimulating economic growth is to supplement domestic sources of finance, such as savings, thus increasing the amount of investment and capital stock.

3. METHODOLOGY

This chapter discusses the data sources and variables, and then it presents the model specification to examine the relationships between trade openness and economic growth, as well as the relationship between foreign aid and GDP per capital growth.

3.1. Variable Description and Data Sources

In order to examine the relationship between trade openness and growth, as well as the impact of foreign aid on growth, the annual time-series data of Laos were collected, for the period 1980–2010. The data applied for this study are taken from different sources, both international and national. Mostly, the data are from the World Development Indicators, Penn World Table 07, Asian Development Bank, UNDP, Laos Economic and Consumption Survey (LECS), and relevant ministries in Laos. Additionally, data were collected from surveys and case studies carried out by local and international organizations including economic annual reports of Laos, economic monitoring reports by the World Bank, economic development strategy, etc.

The growth of real GDP per capita, in constant prices of US\$ in 2000, is used to represent economic growth from the World Development Indicators. The trade openness level is based on the proportion of exports and imports per GDP or (export + import)/GDP from Penn World Table 07 (PWT07). The data on foreign aid and FDI are from the World Development Indicators, while the data on domestic investment are from PWT07, which is converted to constant 2000 prices.

The descriptive statistics is divided in two periods for our analysis, one is before becoming a full membership, and second one is after being a full membership of ASEAN in 1997, this organization was preceded by an organisation called the Association of Southeast Asia comprising ten member countries in Southeast Asia, including: Singapore, Thailand, Malaysia, Indonesia, Philippine, Brunei, Laos, Vietnam, Cambodia, and Myanmar. Using dummy variable aims to highlight the difference of economic development progress between these two periods.

Table 1: Descriptive Statistics of variables

Variable	Obs	Before being a member of ASEAN (Dummy<=1997)				After Being a member of ASEAN (Dummy >1997)			
		Mean	Std.Dev	Min	Max	Mean	Std.Dev	Min	Max
lnGDPP	31	5.66	0.35	5.05	6.27	6.13	0.48	5.53	6.84
lnOPEN	31	0.31	0.19	0.07	0.60	0.73	0.06	0.64	0.83
lnAID	31	18.34	0.88	17.20	19.62	19.58	0.21	19.32	20.02
lnFDI	23	16.76	1.55	14.51	18.89	18.03	1.19	16.64	19.67
lnpop	31	1.26	0.13	0.88	1.47	1.09	0.15	0.86	1.34
lnLBF	31	14.43	0.14	0.88	14.65	14.82	0.10	14.67	14.97

Source: Author calculation

Considering at mean value in table 1, it indicates that all economic development indicators after becoming a full membership of ASEAN are higher those before, this would assumes that becoming a membership of ASEAN produces positive impact on economic development of Laos.

For time-series data it is necessary to check the stationarity; thus, we used the unit root test (ADF) to check the stationarity of the variables and for all of those variables that were stationary at first difference we were able to use the co-integration technique.¹ The possibility of the nonstationarity of time series data becomes an important issue. A stationary series is defined as a series that trend to return to its mean value and fluctuate around it. To avoid this problem, non-stationarity variables should be differentiated. The variables are differentiated “d” times and then stationary and OLS results are valid in interpretation. The aim of unit roots test is to test stationarity, using the Augmented Dickey-Fuller (ADF) test and the results are detailed in table 2.

Table 2: The results of Augmented Dickey-Fuller (ADF) units test

¹ Co-integration is a statistical property of time-series variables. Two or more time series are co-integrated if they share a common stochastic drift.

At level	Lag	ADF Test computed t-statistics	Critical Value
Ln GDPP	1	-2.179**	-1.706
LnAID	1	1.890*	-1.601
LnFDI	0	1.654*	-1.600
LnDI	0	3.364***	-2.654
LnGoEx	0	2.744***	-2.654
LnOPEN	0	-2.004 **	-1.950
LnPOP	5	-1.661*	-1.600
LnLBF	0	-2.999***	-2.654
At first difference	Lag	ADF Test computed t-statistics	Critical Value
dLnGDPP	1	-2.462*	-2.426
dLnAID	5	-2.690**	-2.630
dLnFDI	4	-2.921**	-2.630
dLnDI	3	-2.797*	-2.338
dLnGoEx	0	2.744***	-2.654
dLnOPEN	4	-3.953***	-3.750
dLnPOP	5	-1.662*	-1.600
dLnLBF	0	-2.249***	-2.654

Note: Asterisks (***), (**), and (*) indicates the significant level at 1%, 5%, and 10 %, respectively, where “d” refers to the first order difference.

Notice: In time series analysis, the first difference operator “d” is a special case of lag polynomial. This factor is used to examine the impact of the change of each variable in each period of time (t). For example, the change of income per capita (Y) between 2000 and 2001, we can generate this function: $Y_{2001} = Y_{2001} - Y_{2000}$ (2), if the “t” presents the year and “L” is the polynomials of the lag operator, this is a common notation for ARMA (autoregressive moving average) models, we can simplify in this function:

$$dY_t = Y_t - Y_{t-1} \quad (3)$$

$$dY_t = (1 - L)Y_t \quad (4)$$

The null hypothesis of unit roots test is non-stationarity if the absolute value of the ADF-test statistic is smaller than a certain value of significant level, at 1%, 5% or 10%, otherwise, reject the null hypothesis. The results in table 2 indicate that all variables are stationarity and are able to use and interpret in regression; we use the first order difference in our study.

3.2. Specification of the Model

The growth theory has mainly been developed from the neoclassical model, by authors such as Solow [1], Cass [2], and Koopmans [3]. Firstly, this study attempts to examine the impact of trade openness on economic growth and development in Laos. So, the first model derives from the study by Obadan and Okojie [31], though with some modifications. The first growth model can be specified as below:

$$\text{LnGDPP}_t = \alpha_0 + \alpha_1 \text{LnOPEN}_t + \alpha_2 \text{LnFDI}_t + \alpha_3 \text{LnGoEx}_t + \alpha_4 D_{1997} + E_t \quad (5)$$

where: GDPP_t denotes the GDP per capita at time (t=1980, 1981, 1982...)

OPEN_t is the degree of trade openness

FDI_t is foreign direct investment

GoEx_t is government expenditure

D_{1997} is the dummy variable

E_t represents the error term

The real growth of GDP per capita (GDPP_t) is the dependent variable, while other variables, such as openness, foreign direct investment, and government expenditure, are the independent variables,

and becoming a full member of the ASEAN in 1997 serves as a dummy variable: $D_{1997} = 0$ before becoming a member of the ASEAN, while $D_{1997} = 1$ after joining the ASEAN in 1997. The dummy variable is used to examine the impact of membership of the ASEAN on the economic growth of Laos. The discussion above has exhaustively shown that trade plays an important role in growth. The critical variables in the model are justified below.

The openness variable is measured as exports plus imports divided by GDP or (export + import)/GDP=OPEN; this variable is used to proxy for the level of trade between the country's economy and the rest of the world. It is expected to have a positive impact on economic growth as drawn from various studies reviewed earlier [10, 11, 19, 20, 21, & 22].

Foreign direct investment and domestic investment are expected to have a direct or positive impact on economic growth in Laos. Foreign investment (FDI) has been known as foreign direct investment, which represents any contribution of foreign capital liable to monetary evaluation. It constitutes foreign investors' own capital under their own risk, which originates from abroad and is aimed to be an investment in the host country. Domestic direct investment (DI) refers to any contribution of national capital liable to monetary evaluation that constitutes national investors' own capital under their risk aimed to be an investment in their own country. Government expenditure (GoEx) is used as government spending on public sectors, such as education, health, sanitation and water supply, and infrastructure.

The next equation explores the impact of foreign aid on economic growth, under the hypothesis that foreign aid plays a critical role in boosting economic growth and development. This model derives from the earlier study by Chansomphou and Ichihashi [26], with some modifications. This model is derived from a production function in which foreign aid is introduced as an input in addition to labour and domestic capital. In general notation the production function can be written as below:

$$Y=f(L, K, A) \quad (6)$$

Where Y is the gross domestic product (GDP) in real terms, L is the labour input, K is the domestic capital, and A is the stock of foreign aid.

Following Karras [25] and others, several other variables that are assumed to have a favorable impact on growth are also integrated into the analysis. In addition, the rate change in labour input is replaced by the growth rate of the population. The next model can be notated as the following equation:

$$\ln GDP_t = \alpha_0 + \alpha_1 \ln AID_t + \alpha_2 \ln FDI_t + \alpha_3 \ln DI_t + \alpha_4 GoEx_t + \alpha_5 POPG_t + E_t \quad (7)$$

Some variables are the same as in equation (5), such as GoEx FDI and dummy, while AID_t is the foreign aid of Laos in year t and $POPG_t$ is the growth rate of population in year t; the growth rate of population is a proxy for the growth rate of the labour force. In addition, we may consider the growth rate of the labour force instead of the growth rate of population. E_t is the error term.

4. Results and discussion

This chapter presents the results of the empirical analysis. The first result concerns the relationship between trade openness and economic growth, followed by an analysis of the impact of foreign aid on economic growth and development, based on the hypothesis and model specification of this study. In addition, the analysis considers some other factors, such as FDI, DI, GoEx and the dummy variable, since these variables are expected to have impacts on the economic growth and development of Laos. The results of this study are detailed in table 3.

Table 3: Empirical results

Explanatory variable	$dLnGDPP_t$ (1)		$dLnGDPP_t$ (2)	
Intercept(c)	5.47*** (0.286)	-10.72*** (1.750)	3.54* (1.122)	-11.81 (9.14)
dlnOPEN	0.736** (0.154)	0.265 (0.3419)		
dLnAID			0.205** (0.101)	0.371* (0.13)
dLnFDI		0.066** (0.0305)		0.01515 (0.0589)
dLnDI				0.087* (0.0255)
dLnGoEx		0.874*** (0.089)		0.864*** (0.4257)
dlnPOP			-1.326*** (0.476)	
dlnLBF				0.308 (4.45)
Dummy (1997)		0.00046 (0.0978)	0.072 (0.222)	
R-square	0.19	0.9492	0.41	0.96
Adj R-square	0.16	0.9372	0.369	0.94
Heteroskedasticity*: Prob > chi2	0.852	0.10	0.0729	0.10

Note: All the equations are estimated using the OLS method. Inside the parentheses are t-statistics with *, **, and *** denoting statistical significance at the 10%, 5%, and 1% level, respectively. The values in the parentheses are the standard errors of the parameter estimates.

In regression result, *Heteroskedasticity is frequently encountered in regression analysis, we hypothesize that error term (ϵ) is constant, if the heteroskedasticity exists; it means the variance of the error term (the residual) is not constant.

The positive impact of trade openness on economic growth has been confirmed by several empirical studies, as already mentioned in the literature review section. Regression 1 is used to examine the impact of trade on growth in Laos. The result shows a statistically significant and positive correlation between trade openness and economic growth. This indicates that an increase in the trade volume of Laos is associated with an increase in the national income, based on the gross domestic product per capita. This confirms the first hypothesis that there is a positive correlation between trade and growth.

Trade openness is considered to be one of the factors encouraging the economic growth of Laos; in particular, since the introduction of the open-door policy in 1986, the Government of Laos has been committed through various policies and strategies to achieving a robust growth rate of around 7-8 per cent per annum on average and aims to emerge from the LCD status by 2020. The trade policy promotion has been improved, especially the extension of exports, which is considered to have played a critical role in economic growth during these two decades (1990-2010). Numerous export products have become more diversified and embodied more value added since 1990; the majority of those products are wood products, garments, coffee, electricity, timber, and mining products (gold and copper).

In regression 1, the result shows the strong positive relation between trade and economic growth, considering that the value of R-square, which is only 19 per cent of the systematic variations in GDPP (the proxy for economic growth), is explained by the explanatory variable and that heteroskedasticity exists.² To avoid this problem we considered adding other variables, such as FDI, government expenditure (GoEx), and a dummy variable. These variables are expected to have impacts on economic growth. The result shows that there is a positive correlation between trade and growth but it is not statistically significant, while the coefficient values of FDI, and GoEx, are positive and statistically significant, while dummy is also positive but statistically insignificant.

² We used the Breush–Pagan/Cook–Weisberg test for heteroskedasticity.

Since the economic reform, particularly from the early 1990s, the Government of Laos has paid more attention to improving its business environment to make the country more investor-friendly. An investment law policy and regulations have been adopted and developed. The first investment law policy was introduced in 1988. The first revision of this law was made in 1994, followed by the second revision in 2004 and another in 2009. The increase in the FDI inflow has been widely considered to be a potential contributor to growth and economic development. The result of the equation confirms that FDI has a positive impact on economic growth; an increase of 1 per cent in the FDI is associated with an increase of 0.06 percent in the GDP per capita. The FDI inflow in Laos is mainly related to the availability of natural resources, such as minerals, hydropower, and agricultural endowments. This confirms the study of Shahbaz et al. [32], who find that foreign direct investment is a good promoter of economic growth.

The strong positive impact of government expenditure confirms that this factor is very influential in economic growth. This expenditure includes spending on the national infrastructure (roads, bridges, electricity, information networks, etc.) and social services (education, health, water supply, etc.). These factors are considered to be important factors that dominate economic growth. For example, the improvement of education and health services is related to a high quality of human resources or labour, which is assumed to increase productivity and growth, while infrastructure improvement is considered a necessary condition for economic performance and productivity distribution, and better infrastructure is related to better economic performance.

The positive side of the dummy variable (year 1997) and economic growth proves that becoming a member of the ASEAN (in 1997) was good for the economic growth and development of Laos. This is one of the most important events to play a critical role in economic growth. It is a good opportunity to promote the position of this country in the international community; in this case, Laos would have a long-term effect on the direction of its economic development and it was necessary for Laos in respect of its economic progress, both regional and global [33].

With the next equation, we examine the impacts of foreign aid on economic growth. Recently, the positive impact of foreign aid in the growth process of developing countries has been a topic of intense debate; therefore, it is questionable whether this factor influences the economic development of Laos, particularly the economic growth. This analysis is used to examine the hypothesis that foreign aid can promote growth in Laos through infrastructure improvement and rural development. The result of regression 2 shows a positive and statistically significant correlation between aid and economic growth, while the coefficient for population growth is negative and statistically significant. This result confirms that foreign aid has been influential in economic growth, and it is a major form of foreign capital expected to play important roles in boosting the economic growth and development of Laos. It would be assumed that the negative correlation between the growth and the high rate of population growth may be related to the capacity of the Government to provide social services to the people efficiently, thereby negatively affecting economic growth and development. The coefficient value of dummy is also positive but statistically insignificant.

To sustain a high rate of growth in Laos, both foreign and domestic investments are also considered to support economic growth. The coefficients of those two variables in regression (2) are expected to be positive and the results are consistent. However, the coefficient of FDI is also positive, but statistically non-significant, while the coefficient of DI is positive and statistically significant. This confirms that there is a positive correlation between domestic investment and economic growth. The domestic investment involves both public (excluding aid) and private investment, which progressed greatly after economic reform, particularly following the introduction of the new investment policy and joining the ASEAN.

The government expenditure is one of the most important variables related to the national income. It is important to examine the impact of GoEx on economic development, thus the coefficient of this variable is expected to be positive and the result is consistent as in regression (1). This implies that the government expenditure influences economic growth indirectly through social services and public infrastructure improvement. The last variable is the labour force; in regression (2), we found that there is a positive correlation between the economic growth and the labour force level. The increase in the labour force is assumed to increase the amount of employment in the market and the productivity of a country. However, the coefficient of this variable is statistically insignificant, so we cannot conclude that an increase in the labour force can increase the level of economic growth of Laos; it may depend on the job opportunities that those labourers can find in Laos, which are directly related to the

government policy to push economic activities, that can generate more employment opportunity, especially tourism promotion, manufacturing investment, and organic agricultural promotion, based on the absolute advantage of potential resources of the country.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study analyses the key factors that have dominated the sustained growth of Laos. Firstly, we analysed the effects of trade openness on economic growth and development, followed by the impacts of foreign aid and other factors (FDI, DI, GoEx, and POP); these factors are assumed to have impacts on economic growth and development of this country. One of the contributions of this paper is its input to the existing empirical literature on the effects of trade openness and foreign aid on economic growth.

The first result confirms the hypothesis that there is a positive relation between trade openness and economic growth. It implies that the open-door policy is good for the economic development of Laos. An increase in the trade openness level is associated with an increase in economic growth. This may boost the international cooperation and national economic productivity, which lead to the trade growth of the country. Moreover, this study shows that becoming a full member of the ASEAN (in 1997) played a critical role in economic growth. This study also shows a negative impact between population growth and economic growth. The high rate of population growth may affect the capacity of the Government to achieve efficient expenditure on social and public services.

Secondly, this paper also proves that foreign aid has a positive impact on the economic growth of Laos. Following the economic reform, Laos faced difficulties with the trade deficit; therefore, foreign aid is considered to have been an essential factor for the implementation of the Government's investment programme. Furthermore, this study confirms that other factors, such as foreign direct investment and domestic investment, have a positive correlation with economic growth. These two factors are expected to play an important role in the economic development of Laos; particularly, they are assumed to generate job opportunities for Laos's population and increase the national productivity, leading to economic growth.

The government expenditure is one of the other factors that dominate the economic growth. This refers to the government spending on infrastructure (roads, bridges, electricity) and public services (health services and education), which are the basic needs for the economic development of a country. The last result shows the positive correlation between the change in the labour force level and the economic growth, but it is statistically insignificant, so we can conclude that there is no evidence that increasing the labour force increases the national income. It may depend on the government policy to extend the employment opportunities thorough domestic investment as well as foreign direct investment in three major sectors: agriculture, industry, and services.

5.2. Recommendations

This study highlights the positive impact of trade openness and foreign aid on economic growth in Laos. However, to ensure the effectiveness of sustained growth to distribute to the total population for the current and future generations, the following recommendations are made.

Although the trade openness shows a very strong correlation with economic growth, the Government of Laos should exaggerate the efforts to diversify the country's export base, which relies less on the exporting of natural resources and raw products, such as wood logging, timber, minerals, etc. The Government should consider its potential resources that can be allocated to national productivity and exports. Even foreign aid has a very strong positive impact on economic growth; this depends on how it is distributed to economic activities, and it also depends on the monitoring and evaluation system used to evaluate the impact of aid spending with accountability and transparency concepts. Thereby, the Government and donor should develop a clear methodology and policy for aid allocation, which involves a good monitoring and evaluation system; this is important to avoid issues of uselessness and corruption.

Foreign direct investment is one of the key factors for current and future development. This factor has a positive impact on aggregate economic growth that will not be distributed throughout the total population. In this respect, it suggests that the Government of Laos should encourage the diversity of

FDI, particular in agriculture, manufacturing, and services, instead of prioritizing only some key factors, such as the electricity and mineral sectors. Moreover, domestic investment is important for economic growth; it is necessary to have a good policy to promote private domestic investment, which is a harmless natural resource.

Government expenditure is considered to be one key factor for economic development, which is the basic need for economic growth. The Government has to balance its expenditure on infrastructure and public services, by increasing the budgets for education system improvement as well as health service promotion, which is the development concept of long-term development. Education is related to good human resources, while good health is related to good employers or labourers who can contribute to the social economic development of Laos.

Another suggestion for policy makers and relevant institutions is that they should consider how to take the lead in constituting well-defined schemes and well-timed policies, for which it is important to monitor indicators such as technology, employment market, business practice, education opportunity, and other factors. This creation would ensure a balance between economic efficiency and economic growth, which is a concept of sustainable development.

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