# The Impact of China's Foreign Direct Investment on Economic Growth of Lao PDR

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For the researcher on the impact of Chinese foreign direct investment (FDI) on economic growth of Lao PDR in this paper, researcher used time series data from 2000 to 2019 and implied it with the Ordinary Least Squares (OLS) and Ordinary Least Squares Robust (OLS robust). The results indicated that Chinese FDI has positive significant effect on real GDP growth of Laos but it has lower impact than population growth rate. Which 1% of increasing in the population growth rate will affect the real GDP growth of Laos decrease by .55% because most of Lao labor force are low skills and could not participate in economic development as much as possible and 1% increasing of Chinese FDI inflows to Laos will generate the real GDP growth increase by .19% respectively. In addition, the constant has more effect than FDI and population growth, meaning that although there is no inflow of Chinese FDI and population growth but the economic growth of Laos remain growth an average of 4.89% per year. As the outcome of analysis, it is a basic important information for relative partners to find the ways to attract more FDI and try to improve labor skills because an increase in the skilled population will have a positive effect on economic growth (Kremer, M. 1990) and another macroeconomic factor excluded in this model should be taken into the decision. In the paper, the observations are small therefore further researchers should be considering penal data and other macroeconomic factors should be taken into the model because it will give more effective results.

**Keywords:** FDI, Growth, OLS robust.

**Abstract**

## 1. Introduction

Covid-19 has deeply shocked the world economy and global investment plummeted accordingly. However, a deeper look at the data published in the FDI report 2021 reveals the many different nuances of this main narrative, and provides valuable guidance for the years to come. In 2020, both the number of FDI projects and capital investment in FDI dropped by a third. This is hardly surprising given the tumultuous year seen across the globe. FDI Markets, a service from the Financial Times, recorded 11,223 FDI projects compared to the 16,816 recorded in 2019. Capital investment declined 34% to a total of $528.2bn with job creation falling by 41% to 1.4 million (Global Greenfield Investment Trend, 2021).

FDI has become an important source of private external finance for developing countries. It is different from other major types

of external private capital flows in that it is motivated largely by the investors' long-term prospects for making profits in production activities that they directly control. Foreign bank lending and portfolio investment, in contrast, are not invested in activities controlled by banks or portfolio investors, which are often motivated by short-term profit considerations that can be influenced by a variety of factors and are prone to herd behavior. FDI represents investment in production facilities, its significance for developing countries is much greater. Not only can FDI add to investible resources and capital formation, but, perhaps more important, it is also a means of transferring production technology, skills, innovative capacity, and organizational and managerial practices between locations, as well as of accessing international marketing networks. The first to benefit are enterprises that are part of transnational systems or that are directly linked to such systems through nonequity arrangements, but these assets can also be transferred to domestic firms and the wider economies of host countries if the environment is conducive. The greater the supply and distribution links between foreign affiliates and domestic firms, and the stronger the capabilities of domestic firms to capture spillovers from the presence of and competition from foreign firms, the more likely it is that the attributes of FDI that enhance productivity and competitiveness will spread. In these respects, as well as in inducing transnational corporations to locate their activities in a particular country in the first place, policies matter (Padma Mallampally and Karl P. Sauvant, 1999).

Lao PDR is one of the least developed countries, therefore foreign direct investment (FDI) will be a main source of technology transfer and push productivity efficiently. As the Bank of Lao PDR annual report in 2020, China remains the largest foreign investor in Laos, undertaking a total of 785 projects worth USD 12 billion. Special economic zones, industrial parks, and large-scale infrastructure projects make up the largest areas of Chinese investment in Laos.

For these reasons, researcher is interested in studying the impact of Chinese FDI on economic growth of Lao PDR. The main objective of this study is testing whether Chinese FDI can generate Lao PDR's growth or not. The researcher believed that the outcome of this paper will be a basic information for related partners to be use in policy making.

## 2. Materials and Methods

As Lao PDR is one of the least developed countries, prior the year 2000, most of data was stored in the traditional methods so the data was corrupted and could not be fully compiled. Therefore, this paper researcher used time series data from 2000-2019 (20 observation) which derived from Bank of Lao PDR annual reports and the website of global economic. For empirical analysis, the Multiple regression was used to estimate because Multiple regression analysis allows researchers to assess the strength of the relationship between an outcome (the dependent variable) and several predictor variables as well as the importance of each of the predictors to the relationship, often with the effect of other predictors statistically eliminated. Relationships may be nonlinear, independent variables may be quantitative or qualitative, and one can examine the effects of a single variable or multiple variables with or without the effects of other variables taken into account (Berger, D. E., 2004). According to literature reviews, the models of Mehdi, B (2012), Tamar. B & Luca, G (2020) were developed and implied with this study which has the equation as following:

$$Growth_t = \alpha + \beta_1 LnFDI_t + \beta_2 P_t + \beta_3 EF_t + \beta_4 M2_t + \beta_5 PS_t + \beta_6 Inf_t + \varepsilon_t \quad (1)$$

Where: $\alpha$: Constant

$\beta_i$: Coefficients

$Growth_t$: Real Gross Domestic Product (GDP) growth rate of Lao PDR in period t

$LnFDI_t$: Nature log of Chinese foreign direct investment in million dollars in Lao PDR in period t

$P_t$: the Population growth rate of Lao PDR in period t

$EF_t$: Economic Freedom of Lao PDR in period t (0 score minimum and 100 maximum)

$M2_t$: Percentage of money supply in period t

$PS_t$: Political Stability Index in period t (-2.5 weak; 2.5 strong)

$Inf_t$: Inflation rate of Lao PDR in period t

$\varepsilon_t$: Error terms

Hypothesis:

- $\beta_1 > 0$: Indicated that the Chinese foreign direct investment in Laos has positive effect on real GDP growth of local country due to the inflow of FDI might help to stimulate a country's economic performance via technology transfer and spill over efficiency (Borensztein et al., 1998).

- $\beta_2 > 0 \ or < 0$: Expressed that population can be in both positive and negative effect on real GDP growth which Malthus (1798) said that population growth leading to subsistence crises, there are serious negative impacts of high population growth for economic growth. If there are more people, Kremer, M. (1990) argues, then there are more scientists, inventors, and engineers to contribute to innovation and technological progress. As evidence for this hypothesis, Kremer begins by noting that over the broad span of human history, world growth rates have increased together with world population. This fact is consistent with the hypothesis that having more people induces more technological progress Mankiw (2010).

- $\beta_3 > 0$: Showing that economic freedom has positive effect on real GDP growth. Amartya Sen (1999) suggested that if the population has freedom to speech and has more opportunity to participate in economic development will cause economic growth.

- $\beta_4 < 0$: Meaning that money supply has positive effect on real GDP growth. Deficiency of money leads to an increase the price of not only for money, but also for all other goods, for which money is the equivalent. Thus, the compression of money supply also leads to inflation (Robert Nizhegorodtsev& Nina Goridko,2015).

- $\beta_5 > 0$: Expressed that political stability index has positive effect on real GDP growth. Economic growth and political stability are deeply interconnected. On the one hand, the uncertainty associated with an unstable political environment may reduce investment and the pace of economic development. On the other hand, poor economic performance may lead to government collapse and political unrest (Zahid Hussain,2014).

- $\beta_6 < 0$: Many authors have found a negative correlation between growth and inflation. High and volatile inflation undermines the confidence of foreign investors about the future course of monetary policy. Inflation also affects the accumulation of other determinants of growth such as human capital or investment in R&D. Kormendi & Meguire (1985) estimate a growth equation with cross-section data and find that the effect of inflation on the growth rate is negative, although it loses explanatory power when the rate of investment is also included in the regression.

As the conditional of statistical, before running the model, I have to check the multicollinearity between independent variables whether higher than 0.8 or not (Berry, W.D & Feldman, S. 1985). If diagnostic checking there are heteroscedasticity, serial correlation and residuals distributed problems the OLS robust model (Oscar Torres-Reyna, 2007) was used to solve those problems which heteroscedasticity was tested by Breusch–Pagan test (1979), Serial Correlation was tested by Durbin alternative test

(1950) and Residuals Distributed was tested by Shapiro-wilk test (1965) methods.

## 3. Results

Multicollinearity can affect any regression model with more than one predictor. It occurs when two or more predictor variables overlap so much in what they measure that their effects are indistinguishable. One popular detection method is based on the correlation matrix between predictor variables which result as the table 1 and seen that the correlation matrix above found that there is no evidence over 0.8 as the criteria of Berry, W.D & Feldman, S. (1985) so we can imply them with the multiple regression. Based on the empirical analysis by multiple regression from table 2 found that the Chinese FDI doesn't generate real GDP growth of Lao PDR which has only population growth rate has negative significant to real GDP growth at 1% statistical significance. Therefore, I continue to diagnostics checking. For Shapiro-Wilk W test for normality, the P-value based on the assumption that the distribution is normal. In the outcome, it is very large (0.9829), indicating that we cannot reject null hypothesis that residual is normally distributed. Durbin's alternative test for autocorrelation found that P-value is higher than the critical value, we cannot reject null hypothesis that no serial correlation. However, Breusch-Pagan test found that the prob=0.9942 is higher than the critical value, we cannot reject null hypothesis and conclude that where the error variances are all equal (homoscedasticity), this tells us the response variable that was not used in the regression model. Therefore, Oscar Torres-Reyna (2007) method was used, meaning that the OLS robust model was implied and the outcomes expressed that the Chinese FDI has positive significant to real GDP growth of Lao PDR (Borensztein et al., 1998) at the statistically 10% level and the population growth rate of Laos has negative significant Malthus (1798) at 1% statistically level.

In OLS robust model indicated that independent variables can explain growth by 72.34% which the Chinese FDI could generate real GDP growth of Laos but it has lower impact than population growth rate. If the population growth rate of Laos increases 1% will lead to the real GDP growth decrease by 0.55% because most of Lao labor force are low skills and could not participate in economic development as much as possible. In terms of the Chinese FDI, 1% increase of Chinese FDI inflows to Laos will generate the real GDP growth increase by 0.19% due to technology transfer and creating job for local people. However, the constant has more effect than FDI and population, meaning that another macroeconomic factors which excluded in this model, in this case, although there is no inflow of Chinese FDI and population growth or all independent variables equal zero but the economic growth of Laos remain growth an average of 4.89% per year.

## 4. Discussion

According to an empirical analysis by multiple regression or OLS robust model, the results aligned the study of Abdulhamid Suka, Syed Ahmed & Seid Hassan (2000) that studied the effects of foreign direct investment on economic growth: The case of Sub-Sahara Africa by using panel data for the period 1975-1999. They found that foreign direct investment has marginally significant positive effect on economic growth. Oyegoke, Ebunoluwa O. and Aras, Osman Nuri (2021) also studied the impact of foreign direct investment on economic growth in Nigeria and results in FDI inflow will improve the recipient economies thereby enhancing economic growth and development. Furthermore, Blomstrom et al. (1994) suggested that FDI had a positive impact on the growth of GDP in more advanced developing countries due to threshold stock of human capital and technology transfer. Moreover, Hansen and Rand (2006) using heterogeneous panel estimators in a sample of 31 developing countries for the period 1970 to

2000 they find clear evidence in favor of cointegration between FDI and GDP. Moreover, their results suggest that FDI has a positive long-run effect on GDP, whereas GDP has no long-run effect on FDI.

However, Olajide S. Oladipo (2009) pointed out FDI -led growth is not as strong as for export-led growth and Yemane Michael (2018) indicated that FDI had a negative and statistically significant effect on the growth rate of per capita GDP in sub-Saharan African for the period under consideration. In addition, Buckley et al. (2002) and De Mello (1999), the extent to which FDI contributes to growth depends on the economic and social conditions, and the environmental quality of the host country because the quality of the environment relates to savings and financial development in the host country, the degree of trade openness, human capital development and the level of technological development.

To exam the FDI-led growth debate, Aka (2007) has been Using an autoregressive-distributed lag (ARDL) Error Correction Model (ECM) on annual data from 1969 to 2001, he confirmed that an increase in private investment enhances economic growth, while public investment leads to increase in real GDP for Cote d'lvoire. The international experience, as surveyed in a multi-country study by Easterly, Rodriguez and Schmidt-Hebbel (1994), suggests that it is far more common for public investment to crowd out than to crowd in private investment. The conventional wisdom that public investment is good for private investment is contradicted by the evidence in half of the case studies, where public investment has a negative and statistically significant effect on private investment. The negative association in some cases is explained by the likelihood that public investment is replacing rather than complementing private investment.

As the results of this study and the debates above, the impact of FDI on economic growth still a controversial problem for further researchers. Therefore, model builders should use cross-section or panel data and imply them by ARDL and vector error correction model (VECM) to make the outcome more reliable.

## 5. Conclusion

According to the empirical results of the multiple regression model indicated that Chinese FDI has positive significant effect on real GDP growth of Laos but it has lower impact than population growth rate. Which 1% of increasing in the population growth rate will affect the real GDP growth of Laos decrease by 0.55% because most of Lao labor force are low skills and could not participate in economic development as much as possible and 1% increasing of Chinese FDI inflows to Laos will generate the real GDP growth increase by 0.19% respectively. In addition, the constant has more effect than FDI and population growth, meaning that although there is no inflow of Chinese FDI and population growth but the economic growth of Laos remain growth an average of 4.89% per year. As the outcome of analysis, it is a basic important information for relative partners to find the ways to attract more FDI and try to improve labor skills because an increase in the skilled population will have a positive effect on economic growth (Kremer, M. 1990) and another macroeconomic factor excluded in this model should be taken into the decision.

## 6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

## 7. References

Abdulhamid, Ahmed & Hassan (2000). The effects of foreign direct investment on economic growth: The case of Sub-Sahara Africa. Southwestern Economic Review, 1-14.

Aka (2007). Relative effects of public and private investment on Cote d'Ivoire economic performance. Applied Econometrics and International Development, Vol 7, No.1

Amartya Sen (1999). Development as freedom (1st ed.). New York: Oxford University. Press. ISBN 9780198297581.

Buckley et al. (2002). The impact of foreign direct investment on the performance of Chinese locally owned firms. Journal of International Business Studies, 33(4):637-655.

Berger, D. E. (2004). Using regression analysis. In Wholey, J. S., Hatry, H. P., & Newcomer, K. E. Handbook of practical program evaluation (2nd ed.). San Francisco: John Wiley & Sons.

Berry, W.D & Feldman, S. (1985). Multiple regression in practice. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series No. 07-050.

Breusch–Pagan test (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation: Econometrica, 47(5):1287-1294.

Borensztein et al. (1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45, 115–35.

Blomstrom et al. (1994). What explains developing country growth? Working Paper, no. 4132, Cambridge, NBER.

De Mello (1999). Foreign direct investment, international knowledge transfers and endogenous growth: Time-series evidence. Oxford Economic Papers, 133-151.

Kormendi & Meguire (1985). Macroeconomic determinants of growth. Cross-country evidence. Journal of Monetary Economics, No. 16(2):141-163.

Kremer, M. (1990). "Population growth and technological change: One Million B.C. to 1990," Quarterly Journal of Economics, 108, 681-716.

Mankiw N. Gregory (2010). Macroeconomics, Harvard University seventh edition Worth Publishers 41 Madison Avenue New York, NY 10010.

Mehdi, B (2012). Foreign direct investment and economic growth: Evidence from southern Asia. Atlantic Review of Economics, 2:1-14.

Malthus, T.R (1970). An essay on the principle of population (1798) and A summary view of the principle of population (1830). Flew A, ed. (Penguin Books, London).

Olajide S. Oladipo (2009). The controversy about foreign direct investment as a source of growth for the Mexican economy. Problemas del Desarrollo, 40(158). ISSN 0301-7036

Oscar Torres-Reyna. Panel Data Analysis Fixed and Random Effects. Princeton University, 2007.

Oyegoke, E. O. and A, Osman Nuri (2021). Impact of foreign direct investment on economic growth in Nigeria. Journal of Management, Economics, and Industrial Organization, 5(1 (1):31-38.

Nizhegorodtsev& Goridko (2015). The impact of money supply on economic growth: Theory, Experience, Modelling. Handbook on Economics, Finance and Management Outlooks. ISBN: 978-969-9952-03-6. Vol.3, 2015.

Tamar, B & Luca, G (2020). Impact of FDI on economic growth: The role of country income levels and institutional strength. EIB Working Paper, January 2020.

Yemane Michael (2018). The FDI and economic growth controversy in Sub-Saharan Africa. Determinants of Economic Growth in Africa, pp17-54. ISBN : 978-3-319-76492-4

Zahid Hussain (2014). Can political stability hurt economic growth? Retrieved on September 10, 2021. from https://blogs.worldbank.org/endpovertyins outhasia/can-political-stability-hurt-economic-growth

Table 1. Correlation Matrix

|  | Growth | LnFDI | P | EF | M2 | PS | Inf |
|---|---|---|---|---|---|---|---|
| Growth | 1.0000 | | | | | | |
| LnFDI | 0.5281 | 1.0000 | | | | | |
| P | -0.5750 | 0.0151 | 1.0000 | | | | |
| EF | 0.3582 | 0.7791 | 0.1396 | 1.0000 | | | |
| M2 | 0.2059 | -0.1082 | -0.0844 | -0.3635 | 1.0000 | | |
| PS | 0.1556 | 0.5971 | 0.1067 | 0.7090 | -0.3444 | 1.0000 | |
| Inf | -0.3724 | -0.6172 | 0.0524 | -0.7276 | 0.4463 | -0.7118 | 1.0000 |

Table 2. Empirical Results

| Independent Variables | Ordinary Least Squared | | Ordinary Least Squared Robust | |
|---|---|---|---|---|
| | Coefficients | t-test | Coefficients | Robust Std Err |
| $LnFDI_t$ | .1906 | 1.42 | .19064*** | .0967 |
| $P_t$ | -.5563* | -3.57 | -.5563* | .0751 |
| $EF_t$ | .0386 | 0.93 | .0386 | .0239 |
| $M2_t$ | .0282 | 1.83 | .0282 | .0187 |
| $PS_t$ | -.5337 | -1.16 | -.5337 | .5131 |
| $Inf_t$ | -.0411 | -1.00 | -.0411 | .0315 |
| Cons | 4.8906 | 2.74 | 4.8906* | .9127 |
| F-test | 5.67 | | 48.47 | |
| Prob | 0.0043 | | 0.0000 | |
| $R^2$ | 0.7234 | | 0.7234 | |
| Shapiro-Wilk W test | W= 0.9852 Prob>z = 0.9829 | | | |
| Durbin's alternative test | chi2(1) = 2.407 Prob > chi2 = 0.1208 | | | |
| Breusch-Pagan test | chi2(1) = 0.00 Prob > chi2 = 0.9942 | | | |

Note: *,** & *** statistical significant at 1%,5% and 10% respectively.