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The Relationship between Korea's Direct Investment and Export on the Economic Growth of Laos

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Abstract

The goal of this study is to demonstrate the connection between three factors: the GDP growth of Laos, Korean direct investment in Laos, and Lao exports to Korea. The research approach is based on secondary data from many sources. The variables were recorded as annual data from 2002 to 2024, and every association was analyzed using the vector autoregression model (VAR). As a result, 23 observations were included in this estimation.

The results of the stationary property test showed that only two variables were determined to be stationary at 1st difference level by the ADF test, whereas the PP test found all variables to be stationary at level. However, it was permissible to identify this distinction. The VAR model results, which show the long-term relationship between GDP growth, exports, and FDI, identified a significant return to equilibrium, as represented by the equation coefficient. After completing an experiment with the lag (lagged value) in the VAR Model program, it was determined that a lag level of 2 is the right one. Each variable in this study is equal to t-2 since the GDP calculation produces that value. The vector autoregressive results showed a long-term relationship between GDP growth, exports and FDI. GDP will rise 0.071 and 0.032 units if exports increase by one unit, while GDP will increase 0.1725 and 0.1560 if investment in Laos decline by one unit. Form an impulse reaction it is discovered that FDI fluctuates slowly; it will increase by 1 unit, causing the GDP to decline sharply in the second year, then gradually increase to a positive number in the fifth year, and eventually reach the equilibrium point in the ninth year. In the first 2, 3, and 4 years of an increase in exports of 1 unit, the GDP growth rate will increase significantly.

Keywords: FDI, Economic Growth, VAR Model, Lao PDR, ROK

1. Introduction

The sectoral distribution of FDI in Laos has changed considerably since the adoption of the law on FDI in 1988. In the early 1990s, foreign investment in Laos concentrated on the hydropower sector (Gunawardana, 2008) and the mining sector and the Lao People's Democratic Republic (Lao PDR) hydroelectric dam collapse in 2018 has caused severe concerns over its government's plans for economic growth to become Southeast Asia's powerhouse.

Despite being one of the least developed nations (LDCs) in the world, Lao PDR's economy has had rapid growth from the start of its modern economic development, with an average growth rate of over 7% between 1986 and 2014. (United Nations, 2015). The nation made tremendous strides in 2015, when its gross national income (GNI) per capita reached an all-time high of 1,740 US dollars, earning it a ranking as a low-middle income economy. A significant portion of this success was credited to an economic boom predominantly fueled by foreign direct investment (FDI) in hydropower and the mining of natural resources (UNDP & MPI, 2016).

According to its current economic situation and potential, Laos is one of many developing nations (Developing Countries) and one of the newly emerging nations (Emerging Market Economies), so it needs to increase its capacity in attracting more foreign investments to spur its economic growth, create more circulating funds in its financial system, and maintain its ability. The Republic of Korea and other foreign countries have made significant investments in Laos (Extra ASEAN). Thus, Foreign trade and investments are now essential to the countries that receive more investment capital since they can raise the stature of the nations who provide the capital abroad. Along with these benefits, doing so also enables the governments of those receiving the cash to greatly advance the progress of their nation and meet new demands. Laos has collaborated with numerous nations recently, notably those that invest foreign capital, and its nation has received a number of concessions.

Investments in Laos totaled USD 78,757,000, predominantly sourced from South Korean investors. Since the establishment of diplomatic relations in 1995, the Republic of Korea has contributed significantly to Laos' socioeconomic growth and has encouraged South Korean investments in the country. As of 2016, Korea ranked fifth among nations investing in Laos, with a total global investment of $1.03 billion. By 2017, South Korea's assets in Laos reached USD 120 million. Trade expanded from 1988 to 2014, elevating Korea's investment ranking from 11th to 3rd in the Lao PDR (Somsamone, 2019). In 2020, South Korea exported $49.8 million worth of goods to Laos, mainly including motor vehicles, delivery trucks, and beauty products, with a steady annual growth of 7.85%. Conversely, Laos exported $41 million to South Korea, featuring wood charcoal and fertilizers, achieving an annual growth rate of 14.4% over the same period.

According to theory, foreign direct investment (FDI) is a significant source of inward capital accumulation for transitional and developing economies, which directly boosts domestic growth by boosting employment. In addition, FDI indirectly strengthens the economy of the host nation by facilitating access to the global market, transferring assets like cutting-edge technologies, and boosting competitive advantages. In studies of a host country's absorptive capacity in the cases of Vietnam and Mozambique by Anwar and Nguyen (2010) and Gonzalez, Miura, Moraes, Feijo, and Carvalho, among others, these direct and indirect benefits of FDI have been clearly highlighted (2014). Numerous studies have examined the impact of FDI inflows on the expansion of the Lao PDR's economy during the past three decades. Nevertheless, none have been devoted particularly to exploring.

The purposes of this research were investigating the relationship between the increase of Laos' GDP and Korean exports and FDI in Laos as a result, this study uses the VAR model and granger causality approaches to evaluate the relationship between the GDP of Laos, Korean direct investment in Laos, and Lao exports to Korea. The approach is discussed in the part that follows, and then the empirical findings are given. The final portion contains the conclusion and discussion

Some studies, including those by Balasubramyam, Salisu, and Sapsford, attest to the impact of FDI on the GDP (1996). They discovered that FDI had a positive influence on GDP in 46 countries and that FDI had a greater impact on GDP in countries that promote exports than in nations that substitute imports. According to Borensztein, Gregorio, and Lee (1998), the amount of human capital in the host economy affected how FDI affected growth.

Granger causation from FDI to GDP was discovered in Benin and Togo as well as GDP FDI in Burkina Faso, Gambia, Madagascar, and Malawi by Tekin (2012) who evaluated the causality links among real GDP, real exports, and actual net FDI inflows among least developed nations. Additionally, there was proof that exports from Angola, the Chad, and Zambia caused GDP in Angola, Haiti, Rwanda, and Sierra Leone. While researching the relationships between exports and foreign direct investment, it became clear that there was a causal relationship between exports and FDI in Benin, Chad, Haiti, Mauritania, Niger, Togo, and Yemen as well as Haiti, Madagascar, Mauritania, Malawi, Rwanda, Senegal, and Zambia. It was argued by Carkovic and Levine (2002) that this impact was stable.

The overall amount of foreign direct investment rose by 13.2% from the same period last year to USD 8.16 billion in the first nine months of 2021. The Laos-China Railway, the Vientiane Logistics Park, goods and services in special economic zones, mining and agriculture, building roads, and energy-related projects were the main drivers of capital inflows into Laos.

As the international and local economies recover in 2021, exports will keep expanding. To replace the dwindling tourism profits, they will serve as the main source of foreign exchange earnings. The total value of exports in 2021 increased by 21.7% to USD 7.495 billion. Exports to China were for USD 2.220 billion, those to Vietnam were worth USD 1.220 billion, and those to Thailand were worth USD 2.509 billion. In 2021, electricity, raw coffee, minerals, and bananas were among the major exports. Electricity, minerals, and the processing industry dominated production in 2021. Due to fewer natural disasters, pest outbreaks, and animal diseases, the agriculture industry also did well. Additionally, there was a rise in both domestic and global food demand.

2. Materials and Methods

The research approach is based on secondary data from a variety of sources, including exports from Laos to Korea, Korean direct investment in Laos, and Lao GDP. Three sources were used to compile the data. The World Bank provided GDP figures, the Korean Statistical Information Service provided FDI numbers, Trademap.org provided export statistics, and the World Bank provided GDP statistics for Laos. The variables were tracked as annual data from 2002 to 2024, and all relationships were examined using the Vector autoregressive (VAR). Consequently, this estimation included 23 observations. All variable measures are expressed in logarithmic form and are all expressed in millions of US dollars at current exchange rates. The four stages used were outlined in this section.

1) Stationary Test

Nearly all macroeconomic time series variables were non-stationary, exhibited a time-dependent variation, and lacked a tendency to return to long-run deterministic paths (Nelson and Plosser, 1982). There were fictitious regressions and unbelievable findings when utilizing the non-stationary variable in the regression using ordinary least square (OLS). Augment Dickey Fuller (ADF-test) and Phillips Pearson were the standard methods for examining non-stationary property (PP-test). The same model was used in both ways, but different estimating methods were used by employing the t-test statistic. The following equations were used in this approach to test the stationary property.

$$\Delta X_t = \alpha X_{t-i} + \sum_{i=1}^{P} \omega_i \Delta X_{t-i} + \varepsilon_t \qquad Eq(1)$$

$$\Delta X_t = \delta + \alpha X_{t-i} + \sum_{i=1}^{P} \omega_i \Delta X_{t-i} + \varepsilon_t \qquad Eq(2)$$

$$\Delta X_t = \delta + \gamma^{\theta} + \alpha X_{t-i} + \sum_{i=1}^{P} \omega_i \Delta X_{t-i} + \varepsilon_t \qquad Eq(3)$$

Where X was examined variable, t was any time, ε_t was error term, was X Coefficient, δ was intercept term γ^{θ} was trending term and $\sum_{i=1}^{P} \omega_i \Delta X_{t-i}$ autoregressive process term. Eq (1) was model which estimated without intercept and trending in process, while Eq (2) was estimated with intercept in process and Eq (3) was estimated with intercept and trending in process. However, all equations above which approach by PP-test were none term of autoregressive process.

The stationary property considered by. If was equal 0, X was non-stationary while X was stationary if less than 0. For tested the condition, Coefficient (α) would transform into ADF-t statistic by following.

$$ADF = \frac{\hat{\alpha}}{SE\hat{\alpha}} \qquad Eq(4)$$

The McKinnon critical value and the ADF-t statistic would be compared for a conclusive stationary potential. ADF-t statistics that are higher than the McKinnon critical value indicate that the variable is non-stationary. In contrast, if the ADF-t statistic is less than the McKinnon critical value, the variable will become stationary.

Variables that are explained may not be stationary at level or I (0). They could, however, remain stable at greater integrated I(1) or I (2). Therefore, the variable should be tested again at a higher order of integration if the empirical results at the level were unit root. When the stationary level of all variables was discovered at the second differential, this process was complete.

2). Co-integration

The regression by OLS was not appropriate in cases of estimated variables which were non-stationary. However, they might have a long-run relationship if there are co-integration (Johansen, 1988) & (Engle and Granger, 1987). Later, Johansen presented the new approach which could estimate many equations base on Vector autoregressive (VAR) process for test co-integration property as the system-based reduced rank regression approach (Johansen Co-integration test). Co-integration test in this study would be using the co-integration testing which present by Johansen (1988) for investigate the long run relationships between FDI, GDP and Export by following:

$$\begin{bmatrix} LnEX_t \\ LnFDI_t \\ LnGDP\_G_t \end{bmatrix} = \begin{bmatrix} \beta & \beta_1 & \beta_2 \\ \partial & \partial_1 & \partial_2 \\ k & k_1 & k_2 \end{bmatrix} \begin{bmatrix} LnEx_{t-i} \\ LnFDI_{t-i} \\ LnGDP\_G_{t-i} \end{bmatrix} + \begin{bmatrix} u_t \\ v_t \\ z_t \end{bmatrix} \quad Eq(5)$$

When $\begin{bmatrix} \beta & \beta_1 & \beta_2 \\ \partial & \partial_1 & \partial_2 \\ k & k_1 & k_2 \end{bmatrix}$ vector was the parameter $\begin{bmatrix} u_t \\ v_t \\ z_t \end{bmatrix}$ was the vector of error term. The approach was based on the concept that if variables were co-integrated, then the rank of vector of parameter wasn't zero. The statistical which used for proving the hypothesis was λ_{Trace} and λ_{max} eigenvalue. Null hypothesis of λ_{Trace} eigenvalue was the number of co-integration vector was rank < k while the alternative that rank = k and Null hypothesis of λ_{max} eigenvalue was rank < k while the alternative hypothesis was rank = k+1.

3). Granger Causality test

This experiment was based on the hypothesis that the explanatory variable was a Granger cause when the explanatory variable's lag could explain the dependent variable rather than only their own lag (Freeman, 1983). For the purpose of demonstrating causality, this study used a short run effect from the independent variable to the dependent variable. The entire lag coefficient wasn't significantly zero if the independent factors could adequately explain the dependent variable. The Wald test would support this claim.

4). Vector Autoregression (VAR)

The short- and long-term relationship as well as the rate of adjustment from the explained variable return to equilibrium after independent variables were changed could be shown through error correction mechanisms. A large number of statisticians have enhanced the traditional Error correction mechanism. utilizing vector autoregression in a study (VAR). The assumption that the VAR model is organized is not its foundation, and VAR models occasionally yield outcomes that can be evaluated or more accurately anticipated.

A formalized model VAR has the benefit of eliminating the need to try to identify which variable is due to the model's endogenous or exogenous variable. The model is unable to detect any significant correlation between any of the variables; instead, it can only confirm that each variable in the VAR affects the others. Consequently, the investigation of the interaction between and impact of one variable on another in a quantitative model Methods like impulse response function analysis and variance fractionation can be used to model the data. VAR can be employed because of (Variance Decomposition). following shape:

$$\begin{bmatrix} \Delta LnEX_t \\ \Delta LnFDI_t \\ \Delta LnGDP\_G_t \end{bmatrix} = \begin{bmatrix} \alpha \\ \gamma \\ \theta \end{bmatrix} \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix} \begin{bmatrix} \Delta LnEx_{t-1} \\ \Delta LnFDI_{t-1} \\ \Delta LnGDP\_G_{t-1} \end{bmatrix} + \begin{bmatrix} d_1 & d_2 & d_3 \\ e_1 & e_2 & e_3 \\ f_1 & f_2 & f_3 \end{bmatrix} \begin{bmatrix} \Delta LnEx_{t-2} \\ \Delta LnFDI_{t-2} \\ \Delta LnGDP\_G_{t-2} \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix} \quad Eq(6)$$

a. Vector Autoregression (VAR)

In order to examine multivariate time-series data, Christopher Sims (Sims, 1980) developed the vector autoregression (VAR) model. Consider yourself as internal (endogenous) variables, many variables occurring at once in an equation. The VAR model, however, presupposes that every internal variable has a unique lagged value, and the lag value of every other internal variable in the VAR model can be expressed as an equation as follows:

The appropriate lag both the Schwarz's Bayesian Information Criterion (SC, BIC, or SBC) and the Akaike Information Criterion (AIC) were utilized as suitable criteria in this investigation. as a consideration Using the following formula, the number of lags or delays.

AIC = 2k - 2ln(L)

SC = -2ln(L) + kln(n)

The model with the fewest AIC or SC values will be chosen for the model selection criteria. The following factors will cause lower AIC and SC values: 1. There is variance and less covariance; 2. There are few variables and little lag; and 3. There are many data points available for estimation.

Use SC since SC is qualified to select a number model if these two criteria differ. In over-parametric models, the almost perfect model for AIC is often asymptomatic.

b. Impulse Response Function

From coefficients, VAR analysis cannot be performed. To evaluate the movement of variables that are time series in the form of a Vector Moving Average, the Impulse Response Function (IRF), a method that employs the Moving Average principle, must be utilized (VMA) as below:

$$\begin{bmatrix} X_{1t} \\ X_{2t} \end{bmatrix} = \begin{bmatrix} \overline{X_{1t}} \\ \overline{X_{2t}} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} \emptyset_{11(i)} & \emptyset_{12(i)} \\ \emptyset_{21(i)} & \emptyset_{22(i)} \end{bmatrix}^{i} \begin{bmatrix} \epsilon_{X1t(i)} \\ \epsilon_{X2t(i)} \end{bmatrix}$$

Afterward, get the multiplier ($\emptyset_{ij(i)}$) of the error value (ε_t) in the VMA model for each period, then take that multiplier and graph it against the time period to obtain IRF. The one-to-one correspondence between each variable across time can be described by the IRF. including each period's impact's size, direction, trend, and change.

c. Variance Decomposition

An investigation of the variables under study using pairs is the IRF test. The variance decomposition approach is employed because the coefficient of error value (ε_t) can be computed from the error value of a single variable. Let's go over any more forecast-related variance components.

Variance decomposition (VD) is possible to assess the overall change and determine the percentage of movement in a sequence of one variable as a result of the shock of another. based on the percentage of the variable's impact

3. Results

The empirical findings and discussion were presented in this part. The findings of the stationary check were displayed in Table 1 and Tables 2 show the results of the Co-integration test and the results of the Error Correction Mechanism. The Granger Causality results are displayed in table 3.

All variables were found to be stationary at level by the PP test according to the stationary property test, however only two variables were found to be stationary at 1st difference level by the ADF test. This distinction was, nevertheless, acceptable. According to these findings, co-integration testing might estimate the long-term association for all variables.

There were long-term relationships along the variables, as shown by the co-integration test findings in table 2. The trace test indicates 1 cointegrating equation at the 0.05 level, showing that the system has one long-term equilibrium relationship among the variables.

The results of the Granger Causality Results are shown in table 3. This Granger causality test elucidates that foreign direct investment (FDI) influences fluctuations in GDP, although GDP does not serve as a causative factor for changes in FDI. Both variables exhibit reciprocal interactions, with FDI affecting GDP in the short term.

Long-term relationships between GDP and exports and FDI fit to Dunning's eclectic model of global production (2001). Long-term location advantages, as demonstrated by Laos's GDP and the rise in prospective exports from Laos to Korea, draw Korean investors. If the Laos's government wants to attract more long-term direct investment, they should promote domestic economic growth and trade sector openness.

$$\begin{bmatrix} \Delta LnEX_t \\ \Delta LnFDI_t \\ \Delta LnGDP\_G_t \end{bmatrix} = \begin{bmatrix} 0.5875 \\ 0.5543 \\ 0.0462 \end{bmatrix} \begin{bmatrix} 0.8489 & 0.3515 & 0.0718 \\ -0.5113 & -0.6979 & -0.1725 \\ -1.3349 & 2.8815 & 0.1151 \end{bmatrix} \begin{bmatrix} \Delta LnEx_{t-1} \\ \Delta LnFDI_{t-1} \\ \Delta LnGDP\_G_{t-1} \end{bmatrix} + \begin{bmatrix} 0.4033 & 0.3401 & 0.0327 \\ -1.9084 & -1.0104 & -0.1560 \\ 6.2676 & 3.0133 & 0.8247 \end{bmatrix} \begin{bmatrix} \Delta LnEx_{t-2} \\ \Delta LnFDI_{t-2} \\ \Delta LnGDP\_G_{t-2} \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix}$$

The AR root test was conducted to examine the stability of the variables employed in the analysis at a lag length of t-2. The results show that all roots have modulus values less than 1, indicating that the VAR model is stable and all variables are suitable for further testing analysis.

The impulse response functions demonstrate asymmetric adjustment patterns across variables. A one-standard-deviation shock to FDI initially induces a contractionary effect on GDP in period 2, before gradually reversing to positive territory by period 5 and achieving equilibrium by period 9. Conversely, export shocks exhibit strong contemporaneous and lagged positive effects on GDP growth, with significant contributions persisting through the first four periods. These findings suggest that while FDI impacts materialize with considerable lag, export-led growth effects are more immediate and sustained in the short run.

And the Variance Decomposition test findings revealed that the change in GDP in the initial period or first year was modified by 100% from the second year forward. The change in GDP is around 80% and is influenced by Korea's direct investment and exports, respectively, although with a low percentage, implying that the change in GDP is influenced by other factors that have not been included in this research.

4. Discussion

The main issue in the long-term relationship between FDI and GDP into export was reportedly the inability to boost production while still being rich in natural resources. The capital inflow from Korea alleviated the problem by increasing investment in Laos and enabling the use of natural resources to raise Lao GDP. Both industries boosted output and productivity, most of which came from sources like wood charcoal, hydrometers, and potassium fertilizers. In other words, the supply of inputs for other industries in the ROK increased. Therefore, increasing Korean direct investment and Lao GDP will have a positive impact on Lao exports to the Republic of Korea same as the observed long-term relationships between GDP, exports, and FDI align well with Dunning's Eclectic Paradigm of International Production (OLI framework, 2008) & Dunning (2000). This paradigm posits that firms undertake foreign direct investment when they possess ownership-specific advantages, find location-specific advantages in the host country, and perceive internalization advantages in exploiting these advantages themselves rather than through licensing or exporting (Dunning, 2000).

In the context of Laos, the finding that the long-term relationships between GDP and exports and FDI fit Dunning's eclectic model (2001) is crucial. Laos's GDP and the rise in prospective exports to Korea represent significant location advantages that attract Korean investors. This is consistent with the OLI framework, where attractive host country characteristics, such as a growing economy and export potential, are key determinants of FDI inflows (Stoian & Filippaios, 2008). On the other hand, FDI and exports had little long-term impact on GDP. It's likely that Laos's human capital development wasn't sufficient to have an impact on the relationship between FDI and GDP, contrary to what Borensztein, Gregorio, and Lee found (1998) whereas Laos' exports to ROK are exogenous and dependent on ROK demand, and an increase in Laos' GDP will affect investors from ROK in Laos, the study showed the value of human capital in the long-term relationship.

There was only one unidirectional causality in top equation. In the short and long term, GDP growth has a significant impact on exports. Some studies by Wattanakul and Watchalaanun (2017) and Tekin (2012) indicate a directionality from GDP to exports. Input supply for Korea industry most certainly grew as a result of the growth in Laos output, and long-term demand for input from Laos to Korea also likely increased same as the research by Tekin, R. B. (2012), which investigated Granger causality among real GDP, real exports, and inward FDI in Least Developed Countries (LDCs), offers a broader perspective on the diverse causal relationships that can exist Tekin, R. B. (2012). Tekin's findings of varied causal directions across different LDCs (e.g., unidirectional causality from exports to GDP in some, and from GDP to exports in others; FDI Granger-causing GDP in some, and GDP Granger-causing FDI in others) underscore the context-specific nature of these relationships. While the specific causal links may differ, the overall conclusion that FDI and exports are intricately linked with economic growth in developing economies is consistently supported Tekin, R. B. (2012). The findings for Laos, particularly the causality from GDP growth to both exports and FDI, can be seen as a specific manifestation of these broader patterns, indicating that a strong domestic economy is a foundational element for attracting and benefiting from international economic engagement.

5. Conclusion

The results show a long-term association between Laos' GDP growth and exports to the Republic of Korea as well as between Laos' GDP growth and Korean direct investment, which is consistent with other studies. Phouthakannha Nantharth and Eungoo Kang released The Effects of Foreign Direct Investment and Economic Absorptive Capabilities on the Economic Growth of the Lao People's Democratic Republic in 2019. The study looks into how FDI affected the Lao People's Democratic Republic's (Lao PDR) economic growth between 1993 and 2015. In the short term, there is only one way to get from Laos' economic growth to its exports to Korea. The results of the stationary property test showed that only two variables were determined to be stationary at level by the ADF test, whereas the PP test found all variables to be stationary at level. However, it was permissible to identify this distinction. The vector error correction results, which show the long-term relationship between GDP growth, exports, and FDI, identified a significant return to equilibrium, as represented by the equation coefficient. After completing an experiment with the lag (lagged value) in the VAR Model program, it was determined that a lag level of 2 is the right one. Each variable in this study is equal to t-2 since the GDP calculation produces that value. GDP growth will shift from 0.071 to 0.032 units if exports increase by one unit. However, the investment in Laos will rise from 2.881 to 3.103 if the GDP growth rate improves by one unit. Korea will increase its investment by 0.350 to 0.35 units. Form an impulse reaction It is discovered that FDI fluctuates slowly; it will increase by 1 unit, causing the GDP to decline sharply in the second year, then gradually increase to a positive number in the fifth year, and eventually reach the equilibrium point in the ninth year. In the first 2, 3, and 4 years of an increase in exports of 1 unit, the GDP growth rate will increase significantly. There will subsequently be a minor movement in the opposite direction, but it can reach equilibrium in the sixth year. In the early era, the change itself, at a high level of more than 80%, is what causes the change in the GDP growth rate. Once the second, third, and fourth years have passed, FDI and exports from the Lao People's Democratic Republic to the Republic of Korea start to have an impact on GDP change. Korea at levels of more than 30% and more than 20%, respectively. This demonstrates that the change in the GDP growth rate is due to foreign investment from the Republic of Korea. Korea (which can enter an equilibrium state in the long run) is more important than exports in terms of long-term consequences.

According to this study, the relationship between exports and FDI from abroad is only pointing in one direction for the Republic of Korea in the near future, as shown by the country's GDP growth rate. Additionally, the prognosis indicates that his exporters will profit in the near future, along with Korean investors. Since increased exports result in increased production and employment, they also stimulate the economy of the Lao People's Democratic Republic. The suggested procedure is this: Laos' numerous advantages, including its highly skilled workforce, affordable salaries, and wealth of natural resources, are explained by this policy change. In addition, the China-Laos railway is now assisting in the development of a new communication path between China and the larger Mekong Subregion and the Association of Southeast Asian Nations and the empirical results for Laos are not isolated but are part of a larger body of literature that emphasizes the critical role of FDI and exports in economic development, often mediated by a country's inherent advantages and policy environment, as conceptualized by Dunning's Eclectic Paradigm. The policy recommendation for Laos to promote domestic economic growth and trade sector openness is thus strongly supported by both the internal empirical evidence and external academic consensus. The China-Laos railway is anticipated to play a significant role in the continued, progressive growth of product traffic between Southeast Asia and Europe, especially for the region's comprehensive economic cooperation (RCEP). According to the theory and conclusions of this study, the Lao government should take prompt action to boost the attractiveness of and stimulate foreign direct investment in order to expand wealth beyond exports and foster long-term economic growth. A statistical significance level of 0.01 was used to determine that foreign investment can, over time, boost exports and the Lao People's Democratic Republic's economic growth in the future.

6. Conflict of Interest

I, as a scientific researcher, hereby certify that the material provided in this academic publication is free of conflicts of interest and does not benefit any particular party. In the case of any infraction, I am ready to accept sole responsibility.

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Table 1. Stationary Test Results

Variable	ADF-test			PP-test		
	None	Intercept	Intercept and trending	None	Intercept	Intercept and trending
LnFDI	-4.0271***	-4.4599***	-3.5420**	-4.0363***	-4.7082***	-9.1871***
LnGDP_G	-3.2423***	-3.1242***	-4.2605***	-3.2955***	-3.1733**	-13.0213***
LnEX	-3.3187***	-6.5275***	-5.4758***	-3.3429***	-3.6068**	-3.9983**

Note: Selected by the Schwarz Information Criterion (SC)

*** Significant at 0.01

** Significant at 0.05

Table 2 Co-integration Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.840470	40.80834	29.79707	0.0018
At most 1	0.438413	13.27548	15.49471	0.1051
At most 2 *	0.265117	4.620665	3.841465	0.0316

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3 Granger Causality Results

Null Hypothesis	**Lag 1**	**Lag 2**	**Lag 3**
LnFDI does not Granger Cause LnEX	0.4047	0.1279	0.0031
LnEX does not Granger Cause LnFDI	0.8255	0.7859	0.0694
LnGDP_G does not Granger Cause LnEX	0.7979	0.8972	0.7430
LnEX does not Granger Cause LnGDP_G	0.0674	0.1833	0.2678
LnGDP_G does not Granger Cause LnFDI	0.2187	0.2633	0.9708
LnFDI does not Granger Cause LnGDP_G	0.0113	0.0037	0.0042

Appendix 1

VAR Lag Order Selection Criteria
Endogenous variables: D(LNEX) D(LNFDI) D(LNGDP_G)
Exogenous variables: C
Date: 02/06/23 Time: 11:03
Sample: 2002 2021
Included observations: 14

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-13.19562	NA	0.002031	2.313661	2.450601	2.300984
1	-0.573672	18.03136*	0.001271	1.796239	2.344002	1.745533
2	11.31090	11.88457	0.001077*	1.384157*	2.342743*	1.295422*
3	18.67801	4.209775	0.003008	1.617428	2.986836	1.490664

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion