Investigating the effects of Foreign Direct Investment Inflows on Economic Growth in Cambodia

By

VAT, Namon

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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ABSTRACT

Foreign Direct Investment (FDI) is crucial for economic growth and development since it promotes technology and innovation transfers and capital accumulation. The main objectives of this study are to analyze and evaluate Cambodia's FDI inflows and the impact on the economy, especially the contribution from 1993 to 2019. Using a time-series data regression method, the Vector Autor Regressive (VAR) model, Vector Error Correction (VEC), and co-integration technique analyze the quantitative data. The study confirms the long-run association between foreign direct investment inflows and economic growth. Furthermore, the study carries out the granger causality test among economic growth rate (GDP), Foreign Direct Investment (FDI), Total Labor Force (LF), and Gross Fixed Capital Formation (K). The findings suggest a bidirectional relationship between GDP and FDI in the long run. To be specific, one percent increase in foreign direct investment leads to an 0.09 percent increase in GDP growth.

Keywords: Foreign Direct Investment, Economic Growth, Labor Force, Gross Fixed Capital Formation, Vector Error Correction, Granger Causality Test, Co-integration Technique, Unit Root Test.

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ABBREVIATION

GDP	:	Gross Domestic Products
GNP	:	Gross National Products
ADF	:	Augment Dickey-Fuller
AIC	:	Akaike Information Criteria
SBIC	:	Schwarz Information Criteria
LR	:	Likelihood Ratio
ECT	:	Error Correction Terms
VAR	:	Vector Auto-Regressive
VECM	:	Vector Error Correction Model
FDI	:	Foreign Direct Investment

CHAPTER 1

INTRODUCTION

1. Background

Foreign Direct Investment (hereafter FDI) plays a critical role in a country's development. FDI has been regarded to promote economic growth and social improvement for both developed and developing countries. Over decades, ASEAN countries have attracted high levels of FDI inflows, becoming one of the most invested-friendly locations. According to the United Nations Conference on Trade and Development UNCTAD (2019) investment report, ASEAN countries increased their FDI inflows for the third consecutive year, accounting for USD 155 billion in 2018, and the region's share in the global FDI inflows also went up 11.5 percent. The service sector has the largest share of the FDI inflows in ASEAN countries, rising from 50 percent in 1999-2003 to 66 percent in 2014-2018. In 2019, 41 percent of outward regional FDI was from Japan and the largest source of investment. Meanwhile, China and Hong Kong attracted 38 percent of the total FDI inflows to the region as recipient countries (UNESCAP, 2020).

Cambodia is one of the fast-growing economies in the ASEAN region, attracting FDI inflows since the late 1980s when the country was transformed and known as a free market-oriented economy. According to UNCTAD (2020), Cambodia's economy received important advantage from FDI. Due to political stability, sensible macroeconomic policies, and the broad regional economy's growth, Cambodia became a friendly, appealing place for investors. In the country, FDI inflows are concentrated in labor-intensive and manufacturing industries, especially garment and footwear as well in the tourism sector.

As the result, the country's economy has maintained a steady growth rate of 7.0 percent in 2019, yet is expected to merely reach 6.8 percent in 2020 due to the pandemic hit (World

Bank, 2020). According to the Council for the Development of Cambodia (hereafter CDC), in 2019, the value of investment approval has increased to USD 85.88 billion. Similarly, the investment approval was recorded at USD 4.90 billion, compared to an increase to USD 10.89 billion in 2018, motivated by China (USD 2.75 billion), Hong Kong (USD 912.55 million), and Japan (USD 298.84 million)[1]. As a result, in 2019, 13.5 percent of FDI was presented in Cambodia's GDP (Gross Domestic Product), a considerably higher rate than other peer countries in the region, including Thailand and Vietnam, with 1.1 percent and 6.1 percent, respectively.

Cuyvers, Soeng, Plasmans, and Van den Bulcke (2008) stated that FDI inflows have been taking inconsiderable inflows of financial sectors. Likewise, the National Bank of Cambodia (2020) published the report "Macroeconomic and Banking Sector Development in 2019 and Outlook for 2020," stating that USD 2.3 billion was plugged into the financial sector. The report tracked that the largest share was from China (43%), followed by South Korea (11%), Vietnam (7%), while Japan and Singapore shared the same percentage, 6%. CDC stated the focus of committed investments was on the industrial and infrastructure sectors. From 2015 to 2019, these two was reported 53 percent of the total assets were reported, 41 percent on the tourism sector and 6 percent on agriculture[2]. Moreover, as improving physical infrastructure, namely garment and travel goods factories, is one of the prioritized sectors, China is the only country sharing the largest investment (21.81%).

2. Problem Statement

Foreign direct investment is considered an engine in boosting economic growth and development in Cambodia. There are several studies on the relationship and impacts of the FDI and economic growth. To name a few, Hong (2014) studied the empirical relevance of FDI and

[1] http://www.cambodiainvestment.gov.kh/why-invest-in-cambodia/investment-enviroment/fdi-trend.html
[2] http://www.cambodiainvestment.gov.kh/why-invest-in-cambodia/investment-enviroment/fdi-trend.html

economic growth in China by utilizing the GMM (Generalized Method of Moments) method by using panel data from 1994 to 2010 from 284 Chinese prefecture cities. The results showed that FDI has a substantial impact on economic growth in China. Moreover, other relevant factors including economic of scale, human capital, infrastructure level, wage levels, and regional difference, exert a positive relationship with FDI.

Chee and Nair (2010) employed panel data methods (fixed affects-estimator and random affects-estimator) by exploiting 44 Asia and Oceania countries from 1996 to 2005 to examine the important role of FDI and financial sector development economic growth. The finding reveals the significant complementary part of FDI and financial sector development on economic growth occurred in the least developed countries. Silajdzic and Mehic (2015) estimated the impacts of FDI and other relevant externalities in transition economies by using panel data estimation from 2000 to 2013. Their study found that knowledge spillover is an indirect effect of FDI on economic growth; meanwhile, the higher levels of technological and innovative effects are key determinants underpinning growth performance.

According to UNCTAD (2020), the surge of FDI in 2019 was the highest, which accounted USD 3.7 billion and a 16 percent rise compared to 2018, USD 3.2 percent. This huge investment was due to the manufacturing and service industries. Although Cambodia has been experiencing the peak of FDI inflows, this increase does not reflect whether FDI inflows positively impact growth in Cambodia. However, there are studies of the relationship between FDI and economic growth from distinguished authors, whether the long-run impacts in Cambodia remain to be confirmed. The entire economy should have been evaluated and concentrated on its contribution and effects on future development. Therefore, this empirical study will take this opportunity to fill in the gaps with reference along with implications to foreign direct investment inflows into Cambodia's economy.

3. Purpose of the study

FDI inflows seem to have effects on Cambodia's GDP

This study aims to analyze the trend and evaluate the contribution and effects of FDI inflows on the economic growth in Cambodia.

4. Research Question

In order to achieve the objectives, this study strives to answer the following questions;

1) Does FDI contribute to the Cambodian economy?

2) Is there any short-run and long-run relationship between FDI and GDP in Cambodia?

3) What is the magnitude of FDI contribution to the economic growth in Cambodia?

4) What are the impacts of contribution from FDI inflows to Cambodia's future economic growth?

5. Significance of the Study

This study will contribute both to the academic literature and policymaking. For academics, the study provides empirical evidence on the impacts of foreign indirect investment on economic growth for developing countries such as Cambodia. In addition, the result of the study may be used as an input into policies to promote and attract more investors into Cambodia.

6. Scope and Limitation

This study will investigate the impacts and contribution of FDI inflows on economic growth in Cambodia from 1994 to 2018. However, given the limited sample size and a few input variables, the findings and statistical tests in the study are also constrained and should be verified in future work when more time-series data and other relevant indicators are available.

7. Outline of the study

This study will be divided into five chapters as follows: Chapter 1 covers the introduction and background, problem statements, research objectives, research questions, and finally, the scope and limitation of the study. Chapter 2 focuses on theory and empirical literature reviews of foreign direct investment. Chapter 3 presents the model specification, data collection as well as further data analysis. Chapter 4 and 5 wrap up with result discussion, conclusion, and recommendation.

CHAPTER 2

LITERATURE REVIEW

1. Overview of Foreign Direct Investment

There have been a lot of studies on the impacts of foreign direct investments (FDI) and economic growth due to their importance in every economy's development. The inflows of the FDIs enlarge a host country's markets, which mainly contribute to economies of scale, especially industrial development. What is more, it is typical of a host country that benefits from a spillover of knowledge and technology from foreign-owned to domestic-owned firms. Likewise, (Mathews, 2004), (Ning & Reed, 1995), and (Tsai, 1994) have classified the factors of FDI driver into two groups, which are push and pull factors. Push factor includes skilled labor, research and development, and infrastructure. Pull factor includes the host country's economic climate, interest rate, tax incentives, market size, wage rates, income distribution, human capital, cost differentials, exchange rates, fiscal policies, trade policies, physical and cultural distance. As a result, foreign direct investment has been regarded as a method to promote economic growth and development for developing countries.

The neoclassical model of growth and endogenous model of growth brought up the theoretical foundation of FDI and growth. Solow (1956) considered that FDI merely increases the level of income while regarded technology progress and labor force as exogenous. However, in the long-run growth, foreign direct investment directly contributes to economic growth through capital accumulation and technological spill-over to recipient countries. In contrast to the neoclassical growth model, the endogenous growth model further explains the role of FDI in an economy. There are a few important channels in which FDI plays a crucial ability such as human capital accumulation, skilled spillover effects, research, and development (R&D), and positive externalities in economic development that primarily boost long-term economic

growth. Moreover, besides the growth theory related, institution factors including the degree of trade policies and openness, law enforcement and legislation environment of recipient countries are all vital internal factors that determine the relationship between FDI and growth.

2. Empirical Study

Various studies from distinguished authors have found a positive relationship between economic growth and foreign direct investment from different countries. A few studies have found similar findings from their research. For example, Silajdzic and Mehic (2015) studied the knowledge spillover, absorptive capacities, and the impact of foreign direct investment (FDI) on economic growth by employing econometric analysis to investigate the impact of foreign direct investment and other externalities on economic growth in transition economies from the years of 2000 to 2013. From the empirical analysis of the study, they found the positive contribution of FDI on economic growth predominantly through knowledge spillovers as well as the level of high technology development.

Also, the more knowledge-capacity and efficiency-seeking FDI the study found the positive impacts of FDI on economic growth are associated with the positive impacts of FDI on economic growth. Moreover, Nistor (2014) studied the dynamics of foreign direct investment and economic growth in the case of Romania during the period of 1990 to 2012 by using the Durbin-Watson test, which could determine the autocorrection using the regression. The study found a significant relationship between FDI and host economies that can be traced to the micro and macroeconomic levels. However, the manifest of the investment is different from each area to others and the quality and quantity of the inflows.

Similarly, a study from Fadhil and Almsafir (2015) researched the role of FDI inflows on economic growth in Malaysia by using annual time-series data cover from 1975 to 2010. Unit root test and Johansen co-integration test were adopted in the study and thus, Hierarchical Multiple Regression (HMR) analysis was conducted to look at the momentum of FDI inflows

and economic growth. The study's result showed that FDI and human capital development made a strong contribution to the host country's economic growth. however, technological spillover of FDI inflows was not sufficiently counted in the growth.

Last but not least, NGUYEN (2020) has also studied the impacts of foreign direct investment and international trade (export and import) on Vietnam's economic growth from the 2000-2018 period, along with the Ordinary Least Square (OLS) method. An empirical test showed the relation of FDI and international trade with economic growth in Vietnam. Nevertheless, while FDI and export have a positive coefficient and statistically significant effect on the country's economy, import is found to have a negative sign and statistically insignificant effect.

On the other hand, some scholars seem to have found something different from the above studies. For example, Dinh, Vo, and Nguyen (2019) have studied the foreign direct investment and economic growth in the short run and long run with empirical evidence from lower-middle-income countries by employing panel-based unit root test, Johansen co-integration test, Vector Error Correction Model (VECM) and Fully Modified OLS (FMOLS) from 2000 to 2014. The analysis results found that FDI seems to help stimulate economic growth in the long-run, yet not in the short-run for the selected countries in the study.

Besides, other macroeconomic factors namely, money supply, human capital, total domestic investment, and domestic credit for the private sector are the main drivers for the long-run economic growth. In addition, a study has found that foreign direct investment did not precisely reflect a positive effect on economic growth. Alfaro (2003) studied the foreign direct investment and growth, from 1981 to 1999 with cross-country data across sectors, primary, manufacturing and service sector. The study found a negative relationship of FDI on economic growth in the primary sector; meanwhile, a positive effect was seen from investment in manufacturing inflows. From the literature reviews, the relations of foreign direct investment

impact economic growth in different ways. It might be a case that FDI causes growth or does not.

This study, however, will look at the causal relationship between foreign direct investment and economic growth in the Cambodia context, which is to be confirmed with the abovementioned empirical studies. By contributing to the literature reviews, the study will try to figure out the positive and statistically significant effects of FDI on GDP in Cambodia from 1993 to 2019. Economic growth is an increase in the productive capacity of one economy, which means that an economy can produce more quantities of goods and services efficiently and effectively. Thus, economic growth is desirable and is a means to bring economic development. Various economic growth theories have been formulated and are discussed in the following sections.

3. Theoretical Growth Review

The Keynesian Theory of Economic Growth

The Harrod Domar Model

Keynesian theory of economic growth assumes that households consume and save a constant proportion of their income; meanwhile, producers convert savings into investment. However, Kaldor (1955) noted that the causes of growth are not just saving, investment, technical progress, and population, but the attitude of investing by the society and particular entrepreneurs. By following the Keynesian approach, Kaldor understood that the economy's expansion was driven by psychological and social factors like human attitude toward risk-taking and money-making.

The Classical Theory of Economic Growth

Generally, classical economists noted that many factors promote economic growth. The conventional factors of production that promote economic growth are labor, capital, land and

technology and non-economic factors such as political stability, private property security, laws and institutions' role, the expansion of towns and population growth, and non-market variables such as education and customs.

Neoclassical Theories of Growth

Solow (1956) was the first economist who developed the theory and a model that represents the neoclassical theory growth incorporating this idea. Later on, there was another economist named Trever Swan who further developed the model, which was called Solow-Swan model, which focused on the aggregate constant return to scale production function that mixes the labor and capital in the production of a composition good Solow (1957).

CHAPTER 3

RESEARCH METHODOLOGY

1. Model Specification

In order to achieve the stated objectives and questions, a quantitative approach is conducted by simple regression analysis, also known as Ordinary Least Square (OLS) to capture the long-term relationship between GDP and FDI inflows in Cambodia. Cambodia is known as a labor-intensive country. Hence, the Cobb-Douglas production function is well suited to explain the country's economic growth by considering capital accumulation, labor, and technological progress. However, the study does not cover the non-economic variables. Following Faridi (2012), the following neoclassical production functions are specified;

$$GDP = f(LF, K) \quad (1)$$

In the production function to be regressed, foreign direct investment is separated, so the following is the modified production function;

$$GDP = f(LF, K, FDI) \quad (2)$$

Where GDP is denoted as the total output of the economy at time, t

FDI is denoted as Foreign Direct Investment

LF and K are the conventional factors of the production functions known as the labor force and the stock of capital, respectively.

Since there are other variables beside targeted variables that are correlated with FDI inflows, error term is used to measure them and thus the study will express this parameter as a function of various models which can be written as below;

$$GDP = f(LF, K, FDI, \mu) \quad (3)$$

Where μ is an error term,

Last but not least, from the equation (1), (2) and (3), we can derive another equation, (4), which is the logarithm form of equation (3). Both sides of equation (3) were transformed in order to avoid the problems of heteroscedasticity and also to reduce the distribution between independent and dependent variables.

$\ln GDPt = \ln A_t + \alpha \ln FDI_t + \beta \ln LF_t + \gamma \ln K_t + \mu_t$ (4)

Where lnGDP is a natural logarithm of gross domestic product (economic growth),

lnFDI is a natural logarithm of foreign direct investment,

lnLF is a natural logarithm of labor force,

lnK is a natural logarithm of gross domestic fixed capital formation,

A is the constant value,

α, β, γ are the parameters of independent variables to be forecasted in the regression

μ is an error term.

2. Data Analysis Method

The study will employ the Vector Autoregressive Model (VAR) or the Vector Error Correction Model (VECM) and Co-integration Technique to estimate the coefficient of the short and long-run relationship between foreign direct investment and economic growth as a methodology in this study. The reasons that VAR and VECM are used in this study are because: (1) the method is simple; all the variables in VAR are endogenous, thus no need to worry about determining which variables are endogenous or exogenous. (2) Estimation is simple; the usual OLS method can be applied to each equation separately. (3) The forecasts obtained by this method are in many cases better than others obtained from the more complex simultaneous-equation models.

Moreover, VECM restricts the long-run behavior of the endogenous variables to converge to their co-integration relationships and allow us to study the short run dynamics relationship between the dependent and independent variables. The following specification is

the estimated unstructured VAR equation system for studying the relationship between foreign direct investment and economic growth.

$$\ln GDP_t = \beta_{10} + \beta_{11}\ln GDP_{t-1} + \beta_{12}\ln FDI_{t-1} + \beta_{13}\ln LF_{t-1} + \beta_{14}\ln K_{t-1} + \varepsilon_1$$

$$\ln FDI_t = \beta_{20} + \beta_{21}\ln GDP_{t-1} + \beta_{22}\ln FDI_{t-1} + \beta_{23}\ln LF_{t-1} + \beta_{24}\ln K_{t-1} + \varepsilon_2$$

$$\ln LF_t = \beta_{30} + \beta_{31}\ln GDP_{t-1} + \beta_{32}\ln FDI_{t-1} + \beta_{33}\ln LF_{t-1} + \beta_{34}\ln K_{t-1} + \varepsilon_3$$

$$\ln K_t = \beta_{40} + \beta_{41}\ln GDP_{t-1} + \beta_{42}\ln FDI_{t-1} + \beta_{43}\ln LF_{t-1} + \beta_{44}\ln K_{t-1} + \varepsilon_4$$

Where in the following bold face refers to vector and light face font refer to scalar.

β_{ij} is the row vector of coefficient of variable j in equation i

$\ln GDP_{t-1}$ is the column vector of lag of lnGDP from period t-1 to t-k

$\ln FDI_{t-1}$ is the column vector of lag of lnFDI from period t-1 to t-k

$\ln LF_{t-1}$ is the column vector of lag of lnLF from period t-1 to t-k

$\ln K_{t-1}$ is the column vector of lag of lnK from period t-1 to t-k

$\varepsilon_1, \varepsilon_2, \varepsilon_3, \varepsilon_4$ are the scalar of error terms.

In case that the variables are co-integrated, the VEC version of (I) will be used by including the co-integrated vectors terms. The different time series data analysis techniques were used to analyze the short- and long-run impacts of foreign direct investment on economic growth. So, to determine the impacts of foreign direct investment inflows on economic growth, co-integration and error correction model are used, but before the analysis is conducted, the stationary of time series data is tested. Augment Dickey-Fuller (ADF) is used to test the stationary of the variables. After that, co-integration analysis is carried out to see if there is a long-run relationship between the main two variables.

In short, the following steps will be performed:

Step 1: Identify the stationary, non-stationary integrated order of all variables by using unit roots test.

Step 2: If all variables are I(0), VAR model will be used in the level.

Step 3: If all variables are I(1) and Co-integration test will be performed.

Step 4: If all variables are not co-integrated, VAR will be done at first difference.

Step 5: If all variables are co-integrated, VEC will be used.

Step 6: Granger causality test will be performed.

Step 7: If all variables are I(2) or higher than its I(1), form is used, and step 3 to 6 will be done.

2.1 Stationary, Non-stationary, and Integrated Order of Series

A non-stationary time series has a different mean at different points in time, and its variance increases with the sample size and cannot be easily predicted and modeled. Therefore, the results obtained by using non-stationary time series such as in regression may be spurious. They may indicate a relationship between two variables that, in essence, do not exist. Therefore, in order to achieve consistent and reliable results, the non-stationary data have to be transformed into stationary data. On the other hand, a series is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance gap or lag between the two time periods and not the actual time at which the covariance is computed (Gujarati, Porter, & Gunasekar, 2012).

Consequently, the first thing in an econometric work is to check whether a series is stationary or not since non-stationary series behaviors can be studied only for the period under consideration. A non-stationary time series can become stationary after differencing d times, which are integrated of order *d* (Gujarati et al., 2012) that could also be written as I (*d*) and in addition series be difference or trend stationery. When a difference stationary series becomes stationary after differencing while a trend stationary series becomes stationary after deducting an estimated constant and a trend from it.

To establish the order of integration of a series, a unit root test is performed. In fact, Dickey and Fuller (1979) constructed a method for formal testing of non-stationary. The Dickey-Fuller is suitable if the error term (μ_t) is not correlated and it becomes inapplicable if error terms (μ_t) are correlated. To all the various possibilities, the DF test is estimated in three different forms:

Without drift and trend

$$\Delta Y_t = \delta Y_{t-1} + \mu_t \qquad (5)$$

With drift

$$\Delta Y_t = \beta_0 + \delta Y_{t-1} + \mu_t \qquad (6)$$

With drift and trend

$$\Delta Y_t = \beta_0 + \beta_{1t} + \delta Y_{t-1} + \mu_t \qquad (7)$$

Where t is the time or trend variable

In each case, the null hypothesis is:

$H_0 = \delta = 0$; the time series is non-stationary (the series has a unit root), and

$H_1 = \delta < 0$; the time series is stationary (the series has no a unit root)

But in case μ_t is correlated, Dickey and Fuller have developed a test knis knowns the Augmented DiDickey-FullerADF) test. The test is conducted by augmenting the preceding three equations by adding the lagged values of the dependent variable Y_t. The ADF test here consists of estimating the following regressions:

Without drift and trend

$$\Delta Y_1 = \delta Y_{t-1} + \sum \Delta Y_{t-1} + \mu \qquad (8)$$

With drift and no trend

$$\Delta Y_t = \beta_0 + \delta Y_{t-1} + \alpha_t \sum \Delta Y_{t-1} + \mu_1 \qquad (9)$$

With drift and trend

$$\Delta Y_t = \beta_0 + \beta_{1t} + \delta Y_{t-1} + \alpha_t \sum \Delta Y_{t-1} + \mu_1 \qquad (10)$$

Where, β_0 is the constant and t is the time,

The ADF test assumes that the errors are statistically independent and have a constant variance. Thus, an error term should be uncorrelated with others and has a nstant variance. First, the test is carried out with a constant and trend on the variable in level form. Secondly, it is carried out with a constant only and lastly without constant or trend on the difference variable depending on which was significant in the level form. If the ADF statistic is greater than the critical value, then the series is stationary, and if the ADF statistic is less than the critical value, the time series is non-stationary. Here are the following hypotheses that will be used to test for checking stationary data.

$H_0 = Y_t$ is not stationary or has unit root

$H_1 \neq Y_t$ is stationary or does not have unit root

Moreover, the ADF test is performed by including both the intercept and time trend as well as appropriate lags. The selection criteria of the test, whether it includes intercept, time trend, and the selection of lags length for the test, is based on Akaike Information Criteria (AIC).

2.2 Co-integration Test

Granger (1969) introduced the concept of co-integration. Co-integration is the statistical implication of the existence of long run relationship between the variables which are individually non-stationary at their level form but stationary after first difference (Gujarati et al., 2012). The theory of co-integration can be used to study series that are non-stationary but a linear combination of which is stationary. The two main procedures that are used to test for co-integration are the Engle and Granger (1987) and Søren Johansen (1988) co-integration test.

The Engle and Granger test is a two-step test that first requires that the variables can be integrated of the same order. The first step consists of estimating the equation at level form, while the second step consists of testing the stationary of the residual of the estimated equation.

The existence of co-integration is confirmed if the residuals are stationary at level form (Engle & Granger, 1987).

The Engle and Granger co-integration test is based on residuals:

$\varepsilon_t = Y_t - \beta_0 - \beta_1 X_t$ (11)

For testing co-integration, we; use the following equation:

$\Delta\varepsilon_t = \mu + \varphi\varepsilon_{t-1} + \varepsilon_t$ (12)

To test for co-integration, we set:

H_0 = no co-integration, ($\varphi = 0$)

$H_1 \neq$ co-integration, ($\varphi \neq 0$)

The co-integration in multiple equations can be examined by Soren Johansen and Juselius (1990) approach. Johansen procedure of co-integration gives two statistics. These are the value of the likelihood ratio (LR) test based on the maximum Eigen-value and the trace value of the stochastic matrix. The Johansen test uses the likelihood ratio to test for co-integration. Up to (r-1) co-integrating relationship p may exist between a set of r variables. The hypothesis of co-integration is accepted if the number of co-integration relationships is greater than or equal to one. The decision rule compares the likelihood ratio to the critical value for a hypothesized number of co-integration relationships. If the likelihood ratio is greater than the critical value, the hypothesis of co-integration is accepted, if not, it is rejected.

The generalization of Johansen's procedure is as follows: $\Delta Y_t = \alpha\beta' Y_{t-1} + \Sigma\Pi_i \Delta Y_{t-1} + \varepsilon_t$

Where y is a (K X 1) vector of I(1) variables, α and β' are (K X r) parameter matrices with rank r<K, Π1,……., Πp−1 are (K x K) matrices of parameters and $\boldsymbol{\varepsilon_t}$ is a (K x 1) vector of normally distributed errors that is serially uncorrelated, but it has a contemporaneous covariance matrix π. Johansen's procedure relies on the rank of II and its characteristic roots. If rank (II)=0, the matrix is null (no co-integration), and equations in vector Y_t area common VAR

in first difference. If II has a full rank (II=k), the vector process is stationary, and the equations Y_t are modeled in levels I(0). If rank (k<II), there is evidence of a single co-integration vector. There is two likelihood ratio (LR) test statistics for co-integration under the Johansen approach; the trace (λ_{trace}) and the maximum Eigen value (λ_{max}) statistics which are specified as followings:

$$\lambda trace\ (r) = -T\Sigma \ln\ (1-\lambda_i g_{i=r+1}) \qquad (14)$$

$$\lambda max\ (r,r+1) = -T\ln(1-\lambda_{r+1}) \qquad (15)$$

Where T is the number of observations, and the λ_i are the estimated eigenvalues. For any given value of *r*, large values of the trace statistic are evidence against the null hypothesis that there is *r* or fewer co-integrating relations in the VECM. The trace test attempts to determine the number of co-integrating vectors between the variables by testing the null hypothesis (H_0) that r = 0 against the alternative (H_1) that r > 0 or r ≤ 1 (*r* equals the number of co-integrating vectors). The maximum eigenvalue tests the null hypothesis (H_0) that the number of co-integrating vectors equals *r* against the alternative (H_1) of the r+1 co-integrating vector. If the likelihood ratio value is greater than the critical values, the null hypothesis of zero co-integrating vectors is rejected in favor of the alternatives. Therefore, this study is employed both the Søren Johansen (1988) co-integration by emphasizing the value of maximum Eigen value (λ_{trace}) and trace statistics (λ_{trace}). Engle and Granger co-integration test for comparison of the results with Johansen is also conducted.

2.3 Error Correction Model

In order to examine the short run relationships of the variables, the error correction model has been used. Error correction terms included in the model, explains the speed of adjustment towards the long run equilibrium term. Initially, if the variables confirm the existence of co-integration, after that the Error Correction Model (ECM) will be estimated. Granger and Weiss (1983) and Granger (1969) stated that if two variables are co-integrated in first difference, their relationship can be expressed as the ECM by taking part disequilibrium as explanatory variables

for the dynamic behavior of current variables. The ECM method corrects the equilibrium error in one period by the next period (Maddala & Lahiri, 1992). As a result, the deviation from the long run relationship should be included as an explanatory variable in an Error Correction Model, which can be presented as the followings:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t + \beta_2 \mu_{t-1} + \varepsilon_t \qquad (16)$$

Where $\Delta Y_t = Y_t - Y_{t-1}$, $\Delta X = X_t - X_{t-1}$, β_1 and β_2 are the dynamic adjustment coefficients, μ_{t-1} is the lag of residual representing short run disequilibrium adjustments of the estimates of the long run equilibrium error. At the same time, $\boldsymbol{\varepsilon_t}$ is the random error term (Gujarati et al., 2012). The error correction coefficient must be negative which indicates the existence of a short run relationship. The size of the error correction coefficient determines the speed of adjustment towards equilibrium. In this study, the Error Correction Model (ECM) is estimated as follows:

$$\Delta LGDP_t = \beta_0 + \beta_1 \Delta LFDI_t + \beta_2 \Delta LF_t + \beta_3 \Delta K_t + \alpha ECM_{(t-1)} + \varepsilon_t \qquad (17)$$

Where; $\Delta LGDP_t$ is the change in natural logarithm of real gross domestic products,

$\Delta LFDI_t$ is the change in natural logarithm of foreign direct investment,

ΔLF_t is the change in natural logarithm of total labor force,

ΔK_t is the change in natural logarithm of gross domestic fixed capital formation,

β_0 is the constant term,

β_1, β_2, β_3 are the parameters of the independent variables,

εt is the stochastic error term and,

$ECM_{(t-1)}$ represents the short run disequilibrium adjustments of the estimates of the long run equilibrium error, and α is the coefficient of the Error Correction Term.

2.3 Granger Causality Test

In addition to this study, the Granger Causality test will be applied to examine the two variables' causality. Granger starts from the premise that the future cannot cause the present or

the past. A causality test is done to check which variable causes or precedes another variable in the multivariate time series analysis. By given two variables X and Y, X is said to Granger cause Y if the lagged value of X gives a prediction to Y well. Meanwhile, suppose the lagged values of Y give a prediction to X. In that case, there is bi-directional causality between variable X and Y. Granger (1969) devised some tests for causality such as the followings: consider two-time series, Y_t and X_t : the series Y_t fails to Granger cause X_t if in a regression of Y_t on lagged Y's and lagged X's, the coefficients of the latter are zero. Considering as;

$$Y_t = b_0 + b_j Y_{t-j} + cjX_{t-j} + \varepsilon_t \quad (18)$$

Then, if $c_j=0$ and j = 1, 2 . . . k, X_t fails to cause Y_t. We test the hypothesis that H_0: $c_j=0$ against H_1:$c_j\neq0$ by using an F test. In this study, foreign direct investment inflows granger causes economic growth (a proxy by GDP) or vice versa, then the model is given below by;

$$\ln GDP_t = b_0 + b_j \ln GDP_{t-j} + c_j lFDI_{t-j} + \varepsilon_t \quad (19)$$

$$\ln FDI_t = b_0 + b_j \ln FDI_{t-j} + cj \ln RGDP_{t-j} + \varepsilon_t \quad (20)$$

Where $LnGDP_t$ is a natural logarithm of gross domestic products,

$\ln GDP_{t-j}$ is a lagged value of natural logarithm of gross domestic product, $\ln FDI_t$ is natural logarithm of foreign direct investment and

ε_t is an error term.

From the above equation if $c_j=0$ and j=1, 2, 3…. k then $\ln FDI_{t-j}$ fails to cause $LnGDP_t$ under the null hypothesis of H_0, $c_j=0$ against the alternative hypothesis H_1, $c_j \neq 0$ by using F test. Thus, in the view of the Granger causality test, the presence of a co-integration vector shows that at least granger causality much exists in one direction.

3. Selected Variable Definition

The main variables used in this study are Economic Growth (Gross Domestic Products, GDP), Foreign Direct Investment (FDI), Labor Force (LF), and Gross Fixed Capital Formation

(K), which are already y mentioned in the above section. However, the above-mentioned variables that cannot be measured are concentrated by a disturbance variable (μ).

The definition of the exogenous and endogenous variables is stated as followings;

- Gross Domestic Product: is known as an exogenous variable in the study. In this case, the study intends to look at the relationship between GDP and FDI inflows in Cambodia. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates. Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates. An alternative conversion factor is used for a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions. The data is extracted from World Bank national accounts data and OECD National Accounts data files.
- Foreign Direct Investment: is the main share of Cambodia's economic growth. FDI refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. As foreign direct investment inflows remarkably increase, Cambodia's economy has improved in its productivity growth in firms, residents' income as well as purchasing power. Consequently, the variable is expected to have a positive sign and relationship with economic growth in Cambodia.

- Labor force is an independent variable that captures the effect of labor on the economy because the development of the manufactured sector will improve labor productivity, and even more, it plays a vital role in export growth. The neoclassical theory stated that as if input labor or capital increases leads to an increase in total outputs. The labor force comprises people ages 15 and older who supply labor to produce goods and services during a specified period. It includes people who are currently employed and people who are unemployed but seeking work as well as first-time job-seekers. Not everyone who works is included, however. Unpaid workers, family workers, and students are often omitted, and some countries do not count armed forces members. Moreover, labor force size tends to vary during the year as seasonal workers enter and leave. It is therefore expected that the labor force will have a positive relationship with economic growth. Derived using data from International Labor Organization, ILOSTAT database, and World Bank population estimates. Labor data were retrieved in November 2017.
- Gross Fixed Capital Formation: or known as (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation, and data are in constant 2010 U.S. dollars. The data are extracted from World Bank national accounts data, and OECD National Accounts data files.

4. Data Collection

To answer the research questions, secondary data is collected, and time series data is utilized. Some econometric analysis will be regressed with the data from World Development Indicators (WDI) as the main data source. Moreover, for a comprehensive understanding of Cambodia's context in terms of its relationship with foreign direct

investment inflows, relevant policy reports and academic journals are used to further detail the analysis's statistical results.

CHAPTER 4

RESULT AND DISCUSSION

1. Descriptive analysis

This study provides a short presentation of statistical analysis at the level before econometric analysis. The descriptive analysis with an interpretation is presented in Table 1

below. At constant price 2010 US$, the average of gross domestic products is 9,8 billion US$ and the average of foreign direct investment inflows is approximately 1,03 billion US$. On average, the gross fixed capital formation and total labor force are 1,8 billion US$ and about 7 million workers, respectively. At the same time, the value of Jarque-Bera test is 2.25, 3.01, 1.98 and 3.97 of the main four variables, GDP, K, LF and FDI, respectively. Those values indicate the insignificant departures from normality for the model based on their probability value.

Skewness is a measure of departure from symmetry. The variables GDP, K, and FDI included in the regression are positively shewed or rightward skewed while the variable LF is negatively skewed or leftward skewed. The values of GDP, K and FDI are almost equivalent to zero. This means that the variables are all normally distributed or Skewness.

Noted: the unit of Mean, Median, Maximum, Minimum and Standard Deviation of GDP, K, LF and FDI are in million forms.

Table 1. Descriptive Statistics at Level Form

	GDP	K	LF	FDI
Mean	9,780	1,850	6,94	1,030
Median	9,010	1,670,	6,99	483
Maximum	20,900	5,180	9,32	3,660
Minimum	3,310	326	4,28	54,12
Std. Dev.	5,340	1,400	1,61	1,090
Skewness	0.56	0.80	-0.17	0.93
Kurtosis	2.14	2.64	1.72	2.67
Jarque-Bera	2.25	3.01	1.98	3.97
Probability	0.33	0.22	0.37	0.14
Observations	27	27	27	27

The data transformation to logarithm form is very important in econometric analysis and Table 2 below provides a summary table for the logarithm form. The purpose of

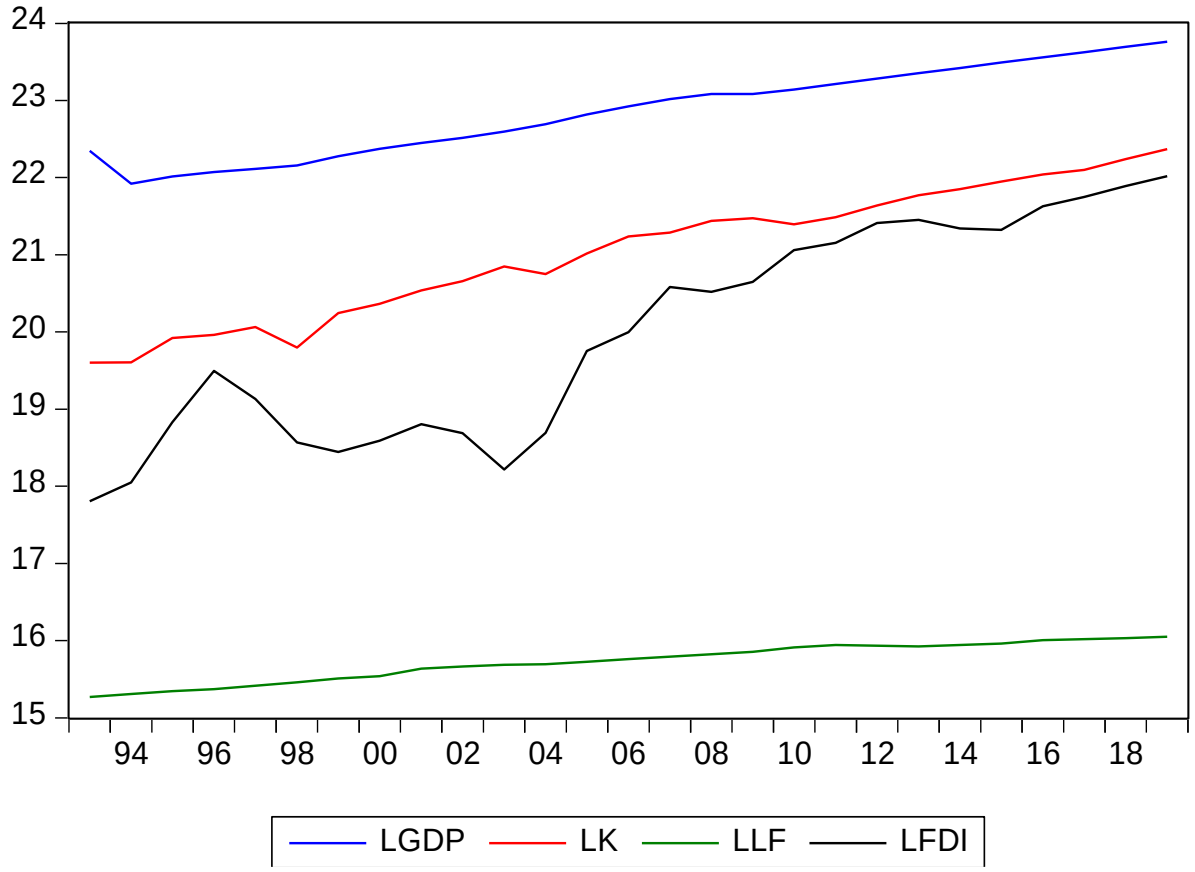
transforming the data into logarithm form is to reduce the outliers and convert the data series into normal distribution. As a result, skewed distribution of the time series data is eventually less skewed. Hence, further analysis is done in the logarithm form. Table 2 shows a table of the statistical analysis in logarithm form.

Table 2. Descriptive Statistics at Logarithm Form

	LGDP	LK	LLF	LFDI
Mean	22.85	21.02	15.72	19.99
Median	22.92	21.24	15.76	20.00
Maximum	23.76	22.37	16.05	22.02
Minimum	21.92	19.60	15.27	17.81
Std. Dev.	0.57	0.86	0.25	1.39
Skewness	-0.05	-0.19	-0.42	-0.03
Kurtosis	1.71	1.80	1.88	1.47
Jarque-Bera	1.89	1.79	2.22	2.65
Probability	0.39	0.41	0.33	0.27
Observations	27	27	27	27

In order to see clearly about the importance of using the logarithm form in the analysis, Figure 1 below presents the stationary of the variables, LGDP, LK, LLF, and LFDI. The graph shows the logarithm form of GDP, K, LF, and FDI movement during 1994 to 2019. The LGDP, LK an LLF have an increasing smooth direction altogether. Meanwhile, there is only LFDI which fluctuates during the mentioned period.

Figure 1: Log-Transformed Data of the Variables



2. Econometric Analysis

2.1 Unit Root Test and Integration Order

Time series data typically contains unit root, which is known non-stationary properties that cannot predict and forecast easily. Thus, to get a better regression with time-series data in this study, it is mandatory to test the existence of unit roots of each variable in equations. Doing such, all the variables are needed to be stationary or integrated. Therefore, in this study, the Augmented Dickey Fuller (ADF) test is applied to all targeted variables in the model.

First, in order to identify the integrated order of the time series data, the series must be tested at level, first, and second difference. In this study, the rejection of the null hypothesis test is based on critical values obtained by Mackinnon (1993) rather than conventional t-critical value or standard normal critical value.

Moreover, the ADF test is performed by setting maximum lag length to 3 lags due to a small sample size. ADF model with a lower AIC value was chosen for the interpretation. ADF-test with intercept only without trend tends to have the lowest AIC than the ADF-test with intercept and trend and the ADF-test without intercept and trend. Therefore, this study chooses to interpret result based on the ADF test that includes only intercept and without trend as shown in Table 3 below.

Table 3. Results of ADF test for Unit Root

Result of Unit Root Test with Intercept				
Variable	Level	1st Difference	Conclusion	Leg Length
LGDP	-0.64	-19.69**	I(1)	0
LFDI	-0.97	-3.58**	I(1)	0
LLF	-2.57	-3.69**	I(1)	0
LK	-0.89	-7.38**	I(1)	0

Notes. *Significant at 10 percent, **significant at 5 percent, and ***significant at 1 percent

The results of the stationary test of the variables at the level form and first difference are presented by I(0) and I(1), respectively. In order to reject the null hypothesis, the ADF test statistics should be greater than the critical value or we can say P-value should be smaller than the standard level 1 percent, 5 percent, and 10 percent. The second column result of Table 3 is the null hypothesis test at level form that is not rejected for all the variables. From the third column, the ADF test statistics for the first difference of variables, gross domestic products, foreign direct investment, total labor force, and gross fixed capital formation, are significantly at 5 percent level. In short, the series, GDP, FDI, K and LF are all stationary at first difference which is concluded as integrated of order one or I(1) process.

2.2 Co-integration Test

The integrated test order already demonstrated the specifications of the integration order. All the variables, GDP, FDI, K, and LF are integrated of order one, I (1). Using Johansen maximum likelihood method, the study tries to verify and estimate the long run relationship between the main two variables, economic growth, and foreign direct investment inflows. Prior to proceed with Johansen co-integration technique, the decision on the lag order using VAR specification is to be set first.

There are many types of lag length selection criteria for the selection of the lag order such as Sequential Modified Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criteria (AIC), Schwarz Information Criteria (SBIC), Hannan-Quinn Information Criteria (HQIC). In this study, value of Akaike Information Criteria (AKC) and Schwarz Information Criteria (SIC) are selected. The maximum is set to 4 lags for the VAR models and among one of lag, 0, 1, 2, 3, and 4, is selected based on the estimated VAR that has the lowest value of AIC.

Table 4. Lag Order Selection Criteria Result

Lag	LogL	LR	FPE	AIC	SC	HQ
0	44.41	NA	0.00	-3.51	-3.32	-3.46
1	150.16	165.52	0.00	-11.32	-10.33	-11.07
2	164.99	18.05	0.00	-11.22	-9.44	-10.77
3	180.08	13.12	0.00	-11.14	-8.57	-10.49
4	242.61	32.62*	1.60e-11*	-15.18*	-11.83*	-14.34*

Notes. *Indicate the lag length selection by the criteria

The fact that the time series data is small and less variables included in the equations, there are only 4 lags set to ensure a sufficient degree of freedom and statistical hypothesis testing in an appropriate way. Table 4 represents the value of each lag for all criteria with an important notice between the value of AIC and SBIC with a similarity in terms of its value.

Nevertheless, from the theoretical point of view, the time series data, states that one lag order is technically acceptable in lag order selection. As the result, Johansen integration test is done with intercept (no trend) in CE while VAR test is also tested with the assumption that the time series and variables have no trend. The Trace and Maximum Eigenvalue give different value Soren Johansen and Juselius (1990) recommended on basis to identify the co-integration vectors, based on the Trace statistics. This study uses the interpretation based on the result of the Trace statistic and concludes one co-integration vector among the fourth variables, LGDP, LFDI, LK and LLF.

Table 5. Co-integration Vectors by Trace Statistics

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.99	162.38	47.86	0
At most 1 *	0.81	62.61	29.80	0
At most 2 *	0.64	24.43	15.49	0.0017
At most 3	0.04	0.91	3.84	0.3407

Notes. **denotes rejection of the hypothesis at the 5 percent level

The summary table of the Trace Statistics is depicted in the Table 5 which indicates three co-integrated vectors equations at 5 percent level. Since the null hypothesis of rank (r=0) and the alternative hypothesis is rank (r=1), the Trace statistic value is 162.38, greater than 5 percent critical values at none of 47.86. As a result, the null hypothesis of no cointegration is rejected and the study eventually concludes that there is at least one co-integration vector in the equation.

To conclude, gross domestic products, foreign direct investment inflows, total labor force, and gross fixed capital formation in Cambodia are associated with a long-run relationship.

The magnitude of each variable contribution varies to its nature of impact. The value of its contribution will be explained by coefficients.

2.3 Vector Error Correction Model

2.3.1 Long Run Relationship

After determining the integration order to prove the existence of co-integrations among the variables, the estimation of the long-term relationship between economic growth and foreign direct investment, total labor force and gross fixed capital formation can be done. Table 6 below reports the long-run parameters.

Table 6. Normalized Co-integration Coefficient: 1 Co-integration Eq (s)

Variable	Coefficient	Std. Error	t-statistics
LFDI	0.09**	0.00	57.17
LLF	-0.21**	0.02	-9.64
LK	0.63**	0.01	94.62
C	11.12		

Notes. *Significant at 10 percent, **significant at 5 percent and ***significant at 1 percent

The results in Table 6 shows that the LFDI and LK have a positive sign and statistically significant variables at 5 percent; meanwhile, the LLF has a negative sign. In conclusion, there is a positive relationship in the long-run between the dependent variable LGDP and independent variables LFDI and LK. At the same time, a negative relationship between LGDP and LLF is also found. Simply saying, if independent variable changes, the dependent variable definitely changes as well and vice versa.

The findings from Table 6 interpret that foreign direct investment inflows have a positive and statistically significant effect on economic growth in Cambodia. The table depicts one percent increase in foreign direct investment leads to an increase in gross domestic product growth by 0.09 percent. Despite a small magnitude of the coefficient, the number provide an

importance of FDI inflows on Cambodia's economy. This can be supported by Zhang (2001) research on whether foreign direct investment promotes economic growth in East Asia and Latin America. The author found that FDI boosts economic growth depending on the host country's characteristics whom adopt liberalized trade regime, education improvement, exported-oriented FDI and macroeconomic stability.

Similarly, FDI enhances a host country's economic growth in developing countries rather than developed countries through technology spillovers and physical capital inflows (Johnson, 2006). As such, inflows of foreign investments allow a recipient country to benefit from technology transfer, particularly in the form of capital inputs that cannot be attained as financial investments or trading in goods or services.

Although FDI is expected to boost host economic growth, it is shown that the extent to which FDI is growth-enhancing appears to depend on country-specific characteristics. Particularly, FDI tends to be more likely to promote economic growth when host countries adopt liberalized trade regime, improve education and thereby human capital conditions, encourage export-oriented FDI, and maintain macroeconomic stability.

With the increase in gross fixed capital formation in the economy, the result shows the coefficient and significant contribution to the growth rate in the economy in Cambodia. From the table, a one percent increase in gross fixed capital formation will lead to an increase in gross domestic products by 0.63 percent. The number represents a huge contribution of the capital to boost economic growth in the country in the long-run. Theoretically, gross fixed capital formation is one of the determinants of economic growth and its effects either in the form of physical stock or technological spillovers. Hence, the finding from the analysis likely agrees with the nature of gross fixed capital formation impacts on economic growth. Gross fixed capital formation is also defined as a part of the current output of goods and services that adds value to the stock of capital and increases the economy's future potential income flows.

However, there is also a long-run relationship between total labor force and economic growth, despite the negative sign of the total labor force. Historically, labor participation is also the main factor in driving the growth rate in the country. The result from the analysis contrasts with theoretical labor force participation stimulating a growth rate in the country. This case can be explained through the unskilled labor participation rate and low educated workers in the current market. Moreover, total labor force and gross fixed capital formation are theoretically factors in the total production function in the Cobb-Douglas production function.

Given the fact that total labor force and gross fixed capital formation are of high correlation independent variables, so-called collinearity, that create redundant information, skewed and misleading results in the regression. In other word, collinearity makes LF and K variable statistically insignificant when it should be significant. Hence, dropping the total labor force in the equation will definitely change the coefficient of gross fixed capital formation. As the result, Table 7 represents the long-term relationship of LGDP, LFDI and LK without including the variable LLF in the analysis. Notedly, while the significant coefficient of the variable LFDI is not much different from the previous analysis, the coefficient of the variable LK drops to 0.58. This means that one percent increase in gross fixed capital formation will lead to an increase in gross domestic products by 0.58 percent.

Table 7. Normalized Co-integration Coefficient: 1 Co-integration Eq (s) without LLF

Variable	Coefficient	Std. Error	t-statistics
LFDI	0.08**	0.01	15.91
LK	0.58**	0.01	67.97
C	9.04		

Notes. *Significant at 10 percent, **significant at 5 percent and ***significant at 1 percent

2.3.2 Error Correction Model

The error correction model shows the speed of adjustment of the variable to the equilibrium after an exogenous shock. The sign of the α in the equation 17 must be negative and significant to indicate the validity of long-run equilibrium relationship of the model. Furthermore, the coefficient must be in between 0 and -1, 0 suggests there is no one-time adjustment period later while -1 means a full adjustment. Table 7 represent the results of error correction model.

Table 8. Error of Correction Model for Short-Run Dynamics

	Coefficient	Std. Error	t-statistics
Speed of Adjustment ECT (-1)	0.95**	-0.36	2.62**
Constant	0.12	-0.04	3.29

Notes. *Significant at 10 percent, **significant at 5 percent and ***significant at 1 percent

Based on Table 7, the error correction term (ECT) coefficient is negative, less than one (-0.95) which has an appreciate negative sign and is apparently significant at 5 percent level. Thus, ECT performs well to correct any shock from the long-run equilibrium. The result can be interpreted that the adjustment speed is about 95 percent each year, which takes less than 1 year to return to the long-run equilibrium. The existence in the long-run relationship between economic growth and foreign direct investment is explained by the significant value of ECM. The existing long-run relationship between the two main variables in Table 7 gives a strong implication that the study can be used for future forecasting.

3. Granger Causality Test

The results of unit root tests and co-integration test of the variables between gross domestic products and foreign direct investment inflows offer an implication that there is a long-run causality in at least one direction case (Engle & Granger, 1987) whether from GDP to

FDI or vice versa. By selecting the 4 lags, the Granger causality test determined the long-run causality of GDP and FDI. The result is presented in Table 8.

Table 9. Granger Causality Test Result

Null Hypothesis	Obs	F-Statistic	Prob.
LFDI does not Granger Cause LGDP	21	6.04224	0.01**
LGDP does not Granger Cause LFDI		3.73812	0.04**
LLF does not Granger Cause LGDP	21	0.28213	0.93
LGDP does not Granger Cause LLF		1.23403	0.38
LK does not Granger Cause LGDP	21	1.51368	0.29
LGDP does not Granger Cause LK		6.83006	0.01**
LLF does not Granger Cause LFDI	21	3.04662	0.07
LFDI does not Granger Cause LLF		0.43896	0.83
LK does not Granger Cause LFDI	21	5.15838	0.02**
LFDI does not Granger Cause LK		1.7306	0.23
LK does not Granger Cause LLF	21	2.54668	0.11
LLF does not Granger Cause LK		0.62167	0.71

Table 8 indicates that the null hypothesis that foreign direct investment does not granger cause economic growth is rejected and vice versa. The result implies that there is bidirectional causality between economic growth and foreign direct investment inflows. Thus, there is a directional causality between the two variables running from foreign direct investment inflows to economic growth and vice versa. This hypothesis offers an implication the increases of each variable will lead to an increase of another one. Other than the two dominant variables, from the table, the hypothesis of economic growth does not granger cause gross fixed capital formation is rejected, which means an increase in economic growth also leads to an increase in capital formation.

This finding is supported by economic theory that the more consumer spending leads to higher economic growth rate in the entire economy. At the same time, the hypothesis of gross fixed capital formation does not granger cause foreign direct investment, thus is rejected. This implies that more capital formation in an economy will attract more foreign direct investment inflows which seems to be reverse in the historical reviews and literature reviews that foreign direct investments bring impacts through technology spillover. However, it might be a case of lacking government investment in infrastructure, research, and development, and so on.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

1. Conclusion

The study's main objective is to empirically estimate the effects of foreign direct investment inflows on economic growth in Cambodia by employing time series data during the period 1993 to 2019. This study utilizes the unit root test, to be specific ADF and co-integration test by Johansen's procedure to explore the existence of the short and long-term relationship between FDI inflows and GDP. The findings show a long-term relationship between the two variables. Most importantly, the research considers an error correction model and granger causality test running from foreign direct investment to economic growth and vice versa.

Despite the current pandemic, the foreign direct investment has dramatically decreased in its value. However, it still has a positive impact and significant contribution to Cambodia's GDP. The analysis shows a positive sign and statistical share from FDI's coefficient. In this regard, a one percent increase in FDI inflows leads to a 0.09 percent increase in the GDP growth rate. Moreover, the study finds a positive and significant relationship in the long-run between the gross fixed capital formation and economic growth in Cambodia as it is also a prime determinant of economic growth.

Furthermore, the error correction model shows the speed of adjustment for the short-run disequilibrium, 95 percent indicating the return to long-run equilibrium with no longer than one year. One year, for the short-run, disequilibrium is quite impressive from the analysis as the speed of coming back from any shock to normality is at high as 95 percent.

2. Policy Recommendation

The results from the above analysis must motivate the government of Cambodia to develop an industrial-innovation policy to attract potential foreign direct investment. Given its

significance on economic growth, the government of Cambodia has set its priority to encourage investors to diversify production chains in various sectors in the entire economy to increase its impacts. The government might consider providing incentives to any firms that facilitate the transfer of innovation and high technology. Moreover, the government should be concentrated on higher value-added manufacturing investments and products that can increase export effects and sustain the country's economic growth.

On the other hand, human capital is also prominent. Providing sufficient education, knowledge, and skills will help to significantly increase productivity and wages. Even if the country receives a large amount of FDI, it will not result in the creation of high-skill jobs if the labor force lacks the knowledge and skills to develop such duties. As a study from Elboiashi (2015) figured out that the magnitude of FDI on economic growth depends on the host country conditions in which human capital, infrastructure development, financial market development, trade openness and institution quality generally give a positive impact on economic growth.

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