



Macroeconomic Determinants of FDI Inflows in Cambodia, Laos, Myanmar and Vietnam: Panel Data Analysis

Xin-Lin Soo

Faculty of Economics and Business, Universiti Malaysia Sarawak, Malaysia

*Jerome Kueh**

Faculty of Economics and Business, Universiti Malaysia Sarawak, Malaysia

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Abstract

The main objective of this study is to examine the macroeconomics determinants of FDI inflows in Cambodia, Laos, Myanmar, and Vietnam. There are many factors obstruct the ability in attracting investments into developing countries. The selected macroeconomics determinants are market size, inflation rate, openness, real effective exchange rate and labor force. This study covered from 2000 to 2016 using annually data. The methods adopted are panel unit root tests, panel cointegration tests, Fully-Modified Ordinary Least Square (FMOLS) and panel Granger causality. The study findings indicate that all the exogenous variables are cointegrated and significant in influencing FDI inflow. However, in the short run, there is only unidirectional causal relationship.

Keywords: Foreign Direct Investment, Fully-Modified Ordinary Least Square, Panel Granger Causality, Openness, Exchange Rate

JEL Classifications: C23, F21, F23, O50

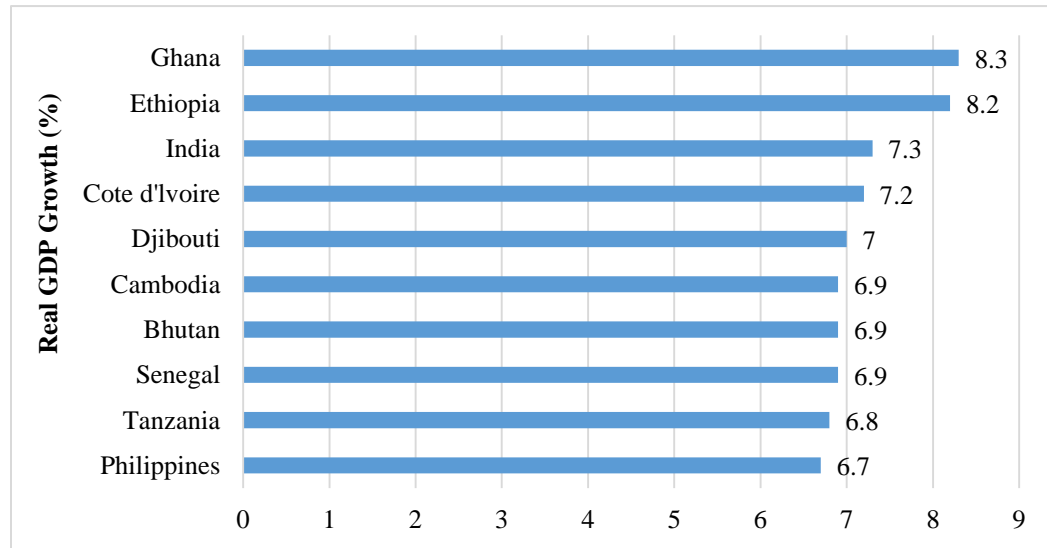
* **Correspondence author:** Address: Jalan Datuk Mohammad Musa, 94300 Kota Samarahan, Sarawak, Malaysia. Email: kshjerome@unimas.my

1. Introduction

Foreign direct investment (FDI) refers to an investment made by investors from one country into another that involves the long term interest. The investment is directly due that the investment is done on purchasing income-generating assets in a foreign market. FDI can be differentiated into three main types, which is horizontal, vertical, and conglomerate. Horizontal FDI occurs when same businesses or activities are done aboard the same way as at home. A vertical FDI occurs when added different stages of activities abroad. Vertical FDI can be divided into forward and backward. Forward vertical FDI is where FDI takes the firm nearer to the market. FDI is often seen to be a healthy way for less-developed and developing countries to overcome their saving-investment gap, which limits the level of domestic investments. In this research study, the countries being investigated are Cambodia, Lao PDR (Laos), Myanmar, and Vietnam. These four countries are the members of ASEAN. In the past few years, these countries are having similar experiences with FDI inflows. Since foreign private capital was generally not permitted into the four countries in the years preceding their 'opening up', the governments of these countries have experienced a steep learning curve; learning how to attract, retain, sustain, manage, harness, and monitor FDI inflows (Hsieh & Hong, 2005). Based on the statistics from World Bank (2019), it showed that Cambodia is one of the world's fastest growing economies in 2018, which ranked at 6th among the 10 countries with 6.9% of real GDP growth.

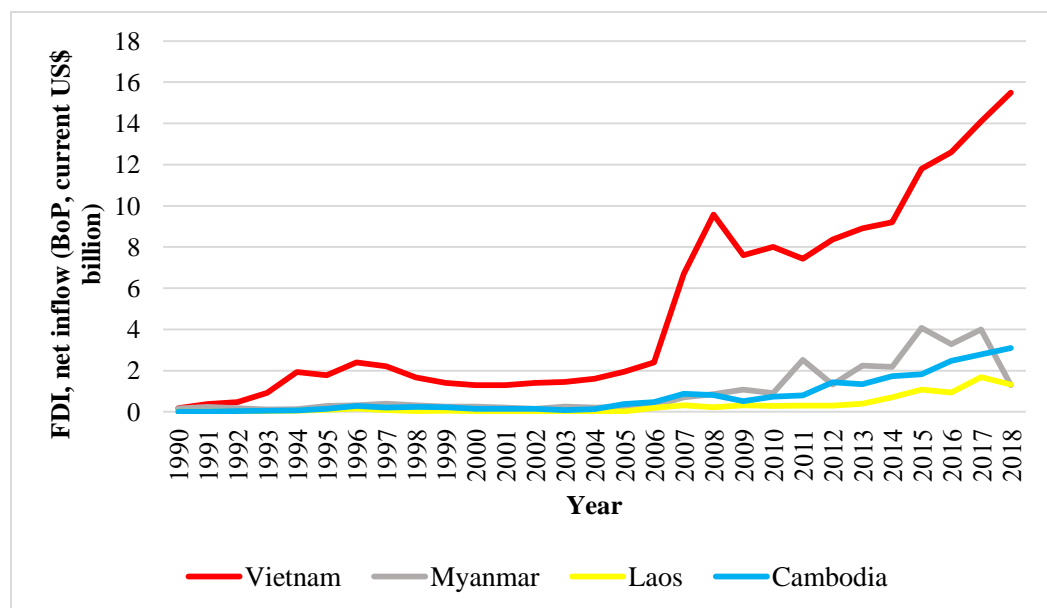
FDI can contribute to the economic growth in most of the developing countries. FDI can help improve the capital supply, with the appropriate host-country policies. Besides, FDI also can facilitate technology transfer. Besides, during the 6th Cambodia-Laos-Myanmar-Vietnam (CLMV) Summit held in Vientiane in March 2013, leaders of Cambodia, Laos, Myanmar, and Vietnam agreed to set up single-stop inspections at the feasible border crossings between these four countries in order to enhance connectivity and facilitate trade, investment, tourism and transportation. This agreement can help minimize the number of offices that transporters must visit, as well as the amount of paperwork required at borders. With this, the economics of a country can be improved due to the frequent foreign investment from the neighboring countries. Besides, Laos, Myanmar, Thailand and Vietnam reached this agreement to boost the economic connectivity and cooperation along the East-West Economic Corridor. The bombastic increase in the FDI net flows in Vietnam from 2007 to 2008 is due that Vietnam had joined WTO in the earliest of 2007. Moreover, Vietnam became the 150th member of the WTO on January 11, 2007. However, the late 2008, is a world financial crisis that causes FDI net inflows to drop slightly in three countries, except Myanmar which has a small and smooth increase. From year 2011, the FDI net flows has started to grow again after some slightly drop in the previous years. All in all, the FDI trend of these four countries have a research needed to investigate their macroeconomics determinants of FDI inflows.

Figure 1: World's Fastest Growing Economies, 2018



Source: World Bank (2019).

Figure 2: FDI, net inflows of Cambodia, Laos, Myanmar, and Vietnam



Sources: World Development Indicator, World Bank (2019).

Nevertheless, a small fluctuation in a country's economy, whether it is good or bad, is enough to put every investor into turmoil, especially top investors. Fluctuation is normally caused by economic instability of the country being invested, which draws near a lot of unwanted or unexpected problems, throwing the country into a great danger. Government of these four research countries are working hard to maintain the openness of the economy and planning to strategize to lead the entire market in future economic development. By doing so, the government adopted free enterprise, open door policy and

so on to attract foreign investors. As such, these countries' exports and foreign direct investment (FDI) increased years by years. This is clearly made an argument that they play an important role in the economy market. Each investor is putting their trust into this small country believed to be of great potential in economic growth. At the same time, higher inflation brings a few more economic challenges. Moreover, there is also a possibility of housing bubble and emerging-market weakness. These factors have shaken economic base as well as the investors'. Investors will start to think over and over again to make sure they do not invest in a wrong country, which in turns affecting the FDI inflow of Cambodia, Laos, Myanmar, and Vietnam. Moreover, these four countries broadly opened up to foreign investment at roughly the same time, issuing and subsequently improving quite liberal foreign investment laws and implementing regulations, where the FDI reacts quickly to the promulgation of foreign investment laws in these countries, and thus the aggregate FDI inflows have been quiet admirable (Hsieh & Hong, 2005).

In recent years, there are many international enterprises build up their factories in Cambodia, Laos, Myanmar, and Vietnam. Some firms newly launch their factories in these countries, while some are expanding in number of factories. MASCOT is one of the company that builds its factory in Laos. MASCOT opens up the new factory in Laos in 2013 (Mascot workwear, 2014). MASCOT is Denmark's largest manufacturer of work wear, where this company is 100 percent foreign owned enterprise. On the other hand, according to Bhatnagar, Rathore, Moreno, and Kanungo (2003) Nike Inc. is another example that shows number of factories built in Vietnam. Nike Inc. is a US company that focuses on industry of apparel, accessories, and footwear. Nike is ranked second highest number of factories in Vietnam among all factories of Nike over the world. Besides, the factories in Vietnam own the highest number of workers among other factories. The first factory of Nike Inc. in Vietnam is established in 1995, then the number of factories are being increase until today. Moreover, Stangler (2015) mentioned that H&M is one of the western clothing companies that built many factories, about 65 large factories in Cambodia that involved in manufacturing and processing. All these global enterprises open up their factories in these four countries because the countries are rich in labor force. In addition, these countries have great advantages in easy access to ASEAN markets.

Furthermore, Hsieh and Hong (2005) mentioned that market size which is measured by GDP per capita is the most important determinant of FDI when compares with other macroeconomics variables. Normally, when the market size increases, FDI inflows will increase likewise. However, this situation does not happen all the time. As an example, Cambodia, Laos, Myanmar, and Vietnam faced the same problem where the FDI inflows and GDP per capita do not show a positive relationship in certain period of years. Therefore, this research is to investigate the macroeconomics determinants of FDI in 4 ASEAN countries, and also inspect the relationship between variables in the short run and the long run.

Furthermore, many researchers investigate the determinants of FDI are mostly on in those European developed countries, for example Biswas (2002); Bevan and Estrin (2004); Sharma and Bandara (2010). However, the developing countries are less frequent been attracted to the foreign investors. This may due to the instability condition, for example political instability, and the fluctuation of currency value in many countries. On the other hand, the data obtained must be complete without occurring of missing data. In other words, the data must be balanced data. This can ensure higher accuracy in research work.

On the other hand, this research can also provide useful insight to the policy makers to develop appropriate policies and strategies to attract sustainable inflow of FDI. The macroeconomics determinants of FDI is such important as reference to these countries in order to better up their FDI. It can be said that it is beneficial for these countries to introduce new policy to encourage the growth of FDI. Meanwhile, the encouragement of FDI inflows can be achieved at the end of the agreement, which depends on the interests of both the investors and the host country. Additionally, the risk of each investment in a particular country can be measured by every investor before the decision is made by referring to this research study. This research study is also advantageous for the investors to evaluate and find out the possible factors that will drive their investments to have profit if they wish to expand the business to particular countries. Furthermore, this research study is also able to provide a more recent insight for policy makers in determining the potential of a country to be invested.

In addition, the research on this topic will enhance the effectiveness and efficiency in the process of attracting or absorbing FDI into host countries. In orderly, this can highly stimulate the economic growth of those countries and also directly contribute to the developing process of a country. Besides, this can also allow the host countries access to new and modern technology along with the one brought in by multinational co-operations who invest in host countries. Meanwhile, indirectly, FDI's inflows creates employment chances for the nationals of the host countries too.

2. Literature Review

Foreign direct investment (FDI) is important for a country to be in a good balance situation and hence improves the growth. The previous studies on the macroeconomics determinants of FDI are reviewed. Market size is the most important macroeconomics factor (Hussain & Kimuli, 2012) and has most influential effect on the FDI which is according to most of the researchers that had done the researches on the same topic. Market size can be categorized through national income, and hence following the previous researchers Wahid, Sawkut, and Seetanah (2006) to use GDP per capita to proxy for market size. It has high potential in FDI development. According to Cuyvers, Soeng, Plasmans, and Buleke (2011), the larger market size tends to induce more FDI to the host country. This is because investors will have more interest to invest in large market size rather than in a small and no invest gain market. Based on Hsieh and Hong (2005), their research is done in Cambodia, Laos, Myanmar, and Vietnam from year 1990 to 2001, which apply on a dynamic panel data model. They found that market size which used GDP per capita as proxy is the most important determinants that has significantly contributed to attract FDI. Moreover, Hoang (2006) conducted a research on factors affecting FDI inflows too. However, Vietnam is the selected country in the research. Hoang (2006) found that GDP presents a positive impact on FDI inflows between 1988 and 2005 when the data is recorded quarterly. Next, Ang (2008) mentioned that real GDP has a positive impact on FDI inflows. This research result is based on Malaysia, a developing country, from the year 1960 to 2005 by using time series data, unrestricted error-correction model, and 2SLS approach. In addition, panel data analysis is used to estimate the determinants of FDI inflows in 61 provinces of Vietnam from the year 1996 to 2005 (Anwar & Nguyen, 2010). Anwar and Nguyen (2010) found that market size plays an important role which has positive and significant effect on attracting large number of FDI inflows. Cuyvers et al.

(2011) also mentioned that market size has positively significant impact to FDI inflows in Cambodia from the year 1995 to 2005. They concluded that larger market size of the home country tends to induce FDI from the home country to Cambodia.

Inflation rate is one of the macroeconomics determinants of FDI inflows of countries. Inflation rate plays a role that will affect the country's overall financial performance and it relates to macroeconomic mismanagement, which deter FDI inflows to countries (Farazmand & Moradi, 2014). The research on 38 developing countries is done with average value of data from 2000 to 2004 (Demirhan & Masca, 2008). In this research study, OLS regression is adopted to estimate the results. The results shown that inflation rate is statistically significant, but is in negative relationship with FDI inflows. Next, according to Farazmand and Moradi (2014), they adopted panel data analysis, which covered the dataset from 1990 to 2012 annually. They investigated the factors affecting FDI inflows in Malaysia, Philippines, Singapore, Thailand, and also Turkey with panel unit root test, Pedroni cointegration test, Hausman test, heteroscedasticity, and GLS technique. They concluded that inflation rate has negative effect on FDI inflows.

Trade openness plays an important role in motivate the investment of foreign investors to the country. The trade barrier of a country will directly affect the FDI inflows. Therefore, a low import barrier will reduce the tariff-jumping of the FDI. However, it may stimulate vertical FDI by facilitating the imports of inputs or machinery (Jaumotte, 2004). Besides, the FDI inflows will be affected by the degree of openness too. According to Onyeiwu and Shrestha (2004), they used panel analysis approach to determine the factors of FDI inflows in 29 African countries. The time period for their research is from 1975 to 1999, which is in annual data. In panel analysis, they adopted fixed and random effects models. Openness shows statistically significant results in both models. In other words, openness will deter the foreign investment to a host country. Moreover, Hsieh and Hong (2005) found that the research on Cambodia, Laos, Myanmar, and Vietnam from the year 1990 to 2001 by using dynamic panel data model, degree of openness has significantly contributed to attracting FDI inflows. They also mentioned that the degree of openness is one of the most important determinants to attract FDI. Next, Vietnam's openness shows a statistically significant and positive effects to FDI inflows (Hoang, 2006). Hoang (2006) chose to estimate the time series model by using OLS regression. The time period for the model is from 1988 and 2005, which is recorded quarterly. In addition, a research is done on Malaysia, Philippine, Singapore, Thailand, and Turkey, which are developing countries from the year 1990 to 2012 by Farazmand and Moradi (2014). They used panel data analysis and found that openness is positively and significantly correlated to FDI in their five researched countries.

Exchange rate is another important variable in determine FDI inflows of a country. Normally, exchange rate is related to appreciation and depreciation that is very concerned by foreign investors. The appreciation and depreciation of an exchange rate will definitely influence the decisions of investors to invest in foreign countries. Hence, the FDI inflows will be affected too. As a reference to the research done by Kaur and Sharma (2013), it is based on India from the year 1990 to 2011, which is in quarterly data frequency. They found that exchange rate is a significant variable which has negative impact on FDI. Narayan (2014) research is done on India too, which is the same as Kaur and Sharma (2013). However, the different is the time period, where Narayan (2014) chose the time period from 1991 to 2013, in two-year data frequency. However, the result in Narayan (2014) research showed that the real effective exchange rate is positively correlated to FDI inflows in India. In addition, Gharaibeh (2015) conducted a research on examine the

factors that influence FDI inflows in Bahrain. The time period of the research covered from 1980 to 2013 by adopting OLS regression analysis. The results indicated that exchange rate is having positive insignificant relationship with FDI inflows.

On the other hand, labor force is the main asset of a country in order to expand the country's economy. Labor force is classified as the total number of workers, both skilled and unskilled. Foreign investors like to invest in a country that is rich in number of labor force. This is because a large number of workers can indicate higher productivity and efficiency. According to Gharaibeh (2015), he chose labor force as one of the indicators to examine the factors affecting FDI inflows in Bahrain. The time period of the research covered from 1980 to 2013, which is recorded yearly. In order to test the model, OLS regression is adopted. The results show that labor force is statistically significant and positive relationship to FDI inflows at 1% of significant level. This suggests that an increase in labor force increases the amount of FDI inflows into the country, too (Gharaibeh, 2015). Hence, in the research, it concluded that labor force is a determinant factor of the FDI inflows.

3. Data and Methodology

The purpose of this research is to examine the macroeconomics determinants of FDI in 4 ASEAN countries, which are Cambodia, Laos, Myanmar, and Vietnam that will influence the economy of each country from the year 2000 to the year 2016, a panel data analysis will be carried out with balanced panel data, which covered 68 observations. The dependent variable is FDI inflows of the 4 CLMV countries and the explanatory variables are market size, inflation rate, trade openness, real effective exchange rate, and total labor force. In order to make the research clear, following is the explanation on dependent and independent variables.

Foreign Direct Investment (FDI)

FDI inflows is the dependent variable in this research, where it is important for the growth of a country. The FDI inflows of countries are measured by FDI inward flow of stock in US dollars at current prices and current exchange rate. The data is obtained from UNCTAD statistics database.

Market size (SIZE)

The market size variable is measured by real GDP per capita as proxy. This is to show the strength of economic condition of a country. Real GDP per capita is calculated by total population of a country divided by GDP. The measurement for GDP per capita is US dollars at constant prices (2005) and constant exchange rate (2005) per capita. The data of market size variable is obtained from World Development Indicators, World Bank (2017).

Inflation Rate (INF)

Inflation is defined as a sustained increase in the general level of prices of goods and services. It is measured as an annual percentage increase; therefore, it is called inflation rate. As inflation rises, every dollar owns to buy a smaller percentage of goods or services. The measurement of inflation rate is CPI in based 2005. The data of inflation rate is obtained from UNCTAD stat (2017).

Trade Openness (OPEN)

Trade openness is important for foreign direct investors who are motivated by the export market (Wahid et al., 2006). Trade openness is calculated by the summation of imports and exports divides by GDP of a country. Imports, exports, and GDP are measured in USD at current prices and current exchange rates. Trade openness is expected to have positive sign, too. The variables data are obtained from UNCTAD stat (2017).

Real Effective Exchange Rate (REER)

Real effective exchange rate is concerned by mostly of the foreign investors regarding its appreciation and depreciation. REER is the weighted average of a country's currency relative to an index or a basket of other major currencies which is adjusted for the effects of inflation, for example USD, Yen, Euro. In this study, REER is measured by CPI with index base of the year 2005. The data is obtained from UNCTAD stat (2017).

Total Labor Force (TLF)

According to Gharaibeh (2015), labor force is a variable that seldom considered by past researchers. Nowadays, labor force is the important assets for companies to run their factories. A greater number of labor force can enhance productivity. The measurement for total labor force is in the absolute value. The data for total labor force also is obtained from UNCTAD stat (2017).

The main reason for this study to proceed with the methodology of panel unit root, panel cointegration, fully modified OLS, and panel Granger causality, is because N is smaller than T . N denotes the number of individuals, and T denotes the number of time periods. In this study on examining the macroeconomics determinants of FDI inflows, N is equal to 4 (Cambodia, Laos, Myanmar, and Vietnam) and T is equal to 17 (the year 2000 to 2016). Instead, macro panel is characterized by having a relatively large T and a relatively small N . In this study, as $N < T$, thus the study is said to be macro panel. As a consequence, this is the main reason why this study has to be proceeded with selected methodologies.

$$FDI_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 INF_{it} + \beta_3 OPEN_{it} + \beta_4 REER_{it} + \beta_5 TLF_{it} + \varepsilon_{it} \quad (1)$$

However, this balanced panel model is a linear function with the degree of coefficients and variables exactly equal to one. In order for the model to get the best fit model, the variables in the model is applied to log form. Hence, the equation applied with logarithm, and the equation is expressed as follow.

$$FDI_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 INF_{it} + \beta_3 OPEN_{it} + \beta_4 REER_{it} + \beta_5 TLF_{it} + \varepsilon_{it} \quad (1)$$

Panel Unit Root Tests

A unit root test is used to test the stationary of a process that changes with time. Stationary is essential in testing for variables to find out the validity of standard assumptions for asymptomatic analysis. In this study, Levin, Lin, and Chu (2002) and Im, Pesaran, and Shin (2003) panel unit root and stationary tests are adopted. This is to obtain conclusive evidence with regard to the order of integration of the series under investigation (Jayaraman & Lau, 2008). For Levin and Lim (1993); Levin et al. (2002); Im et al. (1997, 2003), the hypothesis test is shown.

H_0 : Unit root exists (non-stationary)

H_a : No unit root (stationary)

Stationary of variables normally will happen at first difference, $I(1)$, seldom in level form. The rejection rule for those tests are if the t -statistics value is greater than the significance value, H_0 is rejected, which means that the variable is stationary vice versa.

Panel Cointegration Tests

Panel cointegration test is normally used to investigate the long run equilibrium relationship between variables. In cointegration test, the Pedroni (1999, 2001, 2004) and Kao (1999) tests are utilised. Both tests have different requirements in continue the tests, however both tests have the same H_0 .

H_0 : No cointegration (no long run)

H_a : Cointegration exists (has long run)

Firstly, Pedroni (1999, 2001, 2004) test is determined by taking the majority number on which the variables is reject or do not reject. After that, Kao (1999) test is carried out to support the results in Pedroni (1999, 2001, 2004) test. Pedroni (1999) shows that under appropriate standardization based on the moments of vector of Brownian motion function, each of these statistics converges weakly to a standard normal distribution when both the T and N of the panel grow large. Jayaraman and Lau (2008) mentioned that for Kao (1999) test, cross-section specific intercepts and homogeneous coefficients on first-stage regressors are specified. Therefore, the panel regression model for Kao (1999) is stated as:

$$y_{it} = x_{it}\beta + z_{it}\gamma + \varepsilon_{it} \quad (3)$$

where y_{it} and x_{it} are $I(1)$ and non-cointegrated. Kao (1999) also suggests that ADF-type unit root tests for ε_{it} is null hypothesis no cointegration.

Panel Fully Modified OLS (FMOLS) Estimates

In this study, the econometric approach, fully modified OLS (FMOLS), is employed for the estimation, which is to provide optimal estimates of linear cointegrating regressions. Phillips and Hansen (1990) proposed an estimator that employs a semi-parametric correction to remove the issues caused by the long run correlation between the cointegrating equation and stochastic regressor innovations. Moreover, FMOLS estimator is asymptotically unbiased and has fully efficient mixture normal asymptotic allowing for standard Wald tests using asymptotic Chi-square statistical inference. The FMOLS comes out to be more reliable at extracting strong signal-to-noise ratios throughout the samples and is preferred. Additionally, the FMOLS procedure accommodates the heterogeneity that is typically presented both in the transitional serial correlation dynamics and in the long run cointegrating relationships (Jayaraman & Lau, 2008).

Granger Causality Test

According to Holtz-Eakin, Newey, and Rosen (1988, 1989), estimation on a panel based vector error correction model (VECM) with a dynamic error correction term is adopted to test for panel causality. Whereby, the causal relationship can be classified into unidirectional causal, bi-directional causality relationship, and indirect causal relationship.

4. Empirical Findings and Results Analysis

The empirical tests that are covered under this model are panel unit root test, panel cointegration test, fully-modified OLS estimation (FMOLS), VECM, and panel Granger causality test. The empirical analyses of panel data in this study comprise the following steps. First, the stationary of data is examined by panel unit root tests. Under panel unit root tests, Levin et al. (2002) and Im et al. (2003) are adopted. Second, tests for cointegration among panel data were the panel cointegration test developed by Pedroni (1999, 2004), and Kao (1999). Next, is the estimation of long run on FMOLS. Fourth, proceed to VECM. Lastly, once the results of VECM is obtained, the panel Granger causality is employed to find out the short run causality among variables. While on the empirical results, the variables that emphasized are market size that used GDP per capita as proxy, inflation rate, trade openness, real effective exchange rate (REER), and total labor force.

Panel Unit Root Tests

According to Farazmand and Moradi (2014), Breitung (2000) and Levin et al. (2002) began to study on panel unit root with heterogeneous dynamics, fixed effects, and an individual specific determinant trend. However, they assumed the present of a homogeneous autoregressive root under the alternative. Whereas Im et al. (2003) allowed the between-group panel unit root tests that permit heterogeneity of the autoregressive root under the alternative. The null hypotheses of all unit root tests are to have a unit root in a series. Nevertheless, there is a great deal of research been committed to the use of unit root tests. In other words, Levin et al. (2002) and Im et al. (2003) are the most popular approaches used by researchers in unit root tests. Therefore, in my research study, I adopted both approaches to examine the stationary of data.

Table 1: Levin, Lin & Chu (LLC) Panel Unit Root Test Results

	Individual Intercept	Individual Intercept and Trend
	<u>Level</u>	
LFDI	-0.5349 (0.2963)	0.8978 (0.8154)
LGDP	-2.2253 (0.0130)**	2.4923 (0.9937)
LINF	-3.8395 (0.0001)**	-1.7225 (0.0425)**
LOPEN	-1.8449 (0.0325)**	-0.9153 (0.1800)
LREER	1.7789 (0.9624)	-2.1121 (0.0173)**
LTLF	-1.4884 (0.0683)**	-0.3433 (0.3657)
	<u>First Difference</u>	
ΔLFDI	-4.5352 (0.0000)**	-3.7574 (0.0001)**
ΔLGDP	-2.5374 (0.0056)**	-3.5209 (0.0002)**
ΔLINF	-3.8249 (0.0001)**	-4.6463 (0.0000)**
ΔLOPEN	-2.6703 (0.0038)**	-1.7367 (0.0412)**
ΔLREER	-4.0266 (0.0000)**	-3.6788 (0.0001)**
ΔLTLF	0.9590 (0.8312)	-0.1460 (0.4420)

Notes: LLC indicated the Levin et al. (2002) panel unit root and stationary tests. The LLC examines the null hypothesis of non-stationary of variables. The parenthesized values are the probability of rejection. Asterisks (**) indicates statistically significant at 10 percent level. All the variables are in logarithm form.

Table 2: Im, Pesaran and Shin (IPS) Panel Unit Root Test Results

	Individual Intercept	Individual Intercept and Trend
	<u>Level</u>	
LFDI	-1.2051 (0.7233)	-2.2842 (0.4077)
LGDP	-1.1997 (0.7268)	-1.4042 (0.9393)
LINF	-2.0422 (0.1417)	-1.9788 (0.6500)
LOPEN	-2.0719 (0.1289)	-2.0179 (0.6202)
LREER	-0.2097 (0.9950)	-2.5187 (0.2394)
LTLF	-0.3527 (0.9889)	-1.0614 (0.9876)
	<u>First Difference</u>	
ΔLFDI	-3.3424 (0.0002)**	-2.2842 (0.4077)
ΔLGDP	-2.3370 (0.0520)**	-1.4042 (0.9393)
ΔLINF	-2.3521 (0.0489)**	-1.9788 (0.6500)
ΔLOPEN	-2.7245 (0.0087)**	-2.0179 (0.6202)
ΔLREER	-2.6229 (0.0146)**	-2.8352 (0.0992)**
ΔLTLF	-1.1463 (0.7540)	-1.9846 (0.6398)

Notes: IPS indicated the Im *et al.* (2003) panel unit root and stationary tests. The IPS examines the null hypothesis of non-stationary of variables. The parenthesized values are the probability of rejection. Asterisks (**) indicates statistically significant at 10 percent level. All the variables are in logarithm form.

Table 1 and Table 2 tabulated the results of the LLC and IPS tests. Based on the results, it summarized that the series of these variables in LLC test are of an $I(1)$ process. While for the IPS test, only minority series of these variables are of an $I(1)$ process. However, overall, this balanced data is stationary in their first difference. The panel unit root tests provide strong evidence in support that there are five series (except total labor force) which do not have a unit root and those variables are integrated of order one. According to Levin et al. (2002) and Im et al. (2003), the null hypothesis for both approaches are the same, which is a unit root exists. Based on the theory, all variables should be stationary, where there is no unit root existence. When the variables are stationary, the test can proceed to cointegration test. In LLC and IPS tests, majority of the variables are greater than the significant level of 10 percent in level form, $I(0)$ of both individual intercept and trend, which means that variables are non-stationary and a unit root exists. Therefore, we proceed to first difference, $I(1)$. In first difference, for LLC test, almost all variables are smaller than significant level, hence the null hypothesis of a unit root exists is rejected. Therefore, we can conclude that all variables are stationary in $I(1)$, which a unit root does not exist in LLC test. On the other hand, for IPS test, in first difference, $I(1)$ only minority variables are smaller than significant level, where the null hypothesis of a unit root exists is rejected. In conclude, almost all variables have no unit roots and are integrated of order one.

Panel Cointegration Tests

The availability and interest in a wide range of panel data has led to the expansion of various statistical tests to panel data seriously. There are plenty of literatures that central on the issues related to examine the cointegration in a panel setting. The most used tests are Pedroni (1999, 2004), Kao (1999), and a Fisher-type test using an underlying Johansen

methodology (Maddala & Wu, 1999). As overall, Pedroni (1999, 2001, 2004) and Kao (1999) panel cointegration test. There are two sets of tests recommended in Pedroni (1999, 2001, 2004), which are within dimension approach and between dimension approach. In within dimension approach, there are four types of test statistics, *v*-statistics, *rho*-statistics, *PP*-statistics, and *ADF*-statistics. These statistics are basically for different country from pooled regression on coefficients unit root test estimation residuals. Besides, common time factors and heterogeneity across country are considered too. Whereas, for between dimension approach, it included group *rho*-statistics, *PP*-statistics, and *ADF*-statistics. These statistics are based on the average of individual autoregressive coefficients associated with the unit root tests of the residuals for each country in the panel.

The panel cointegration results, it is employed to determine the strong evidence to reject the null hypothesis of no cointegration for six out of the seven statistics provided by Pedroni (1999, 2001, 2004). Similarly, the null hypothesis of no cointegration using the *ADF*-type statistics from Kao (1999) panel cointegration test will be rejected if the probability is smaller than the significant level. As refer to the results in Table 3, Pedroni (1999, 2001, 2004) cointegration test, there are only four out of seven statistics that have evidence to reject the null hypothesis of no cointegration. However, it is a majority of statistics significantly rejecting the null hypothesis of no cointegration. Meanwhile, in Kao (1999) test, the probability is also smaller than the level of significant. Thus, found that LGDP, LINF, LOPEN, LREER, and LTLF are cointegrated in the multi-country panel setting for the sample period.

Table 3: Panel Cointegration Test Results

A: Pedroni Residual Cointegration Test		
	Without Trend	With Trend
Panel cointegration statistics (within-dimension)		
Panel <i>v</i> -statistics	-0.2529 (0.5998)	-1.1437 (0.8736)
Panel <i>rho</i> -statistics	-0.0571 (0.4772)	0.5144 (0.6965)
Panel <i>PP</i> -statistics	-10.1016 (0.0000)**	-10.9528 (0.0000)**
Panel <i>ADF</i> -statistics	-7.6203 (0.0000)**	-8.0387 (0.0000)**
Group mean panel cointegration statistics (between dimension)		
Group <i>rho</i> -statistics	2.1640 (0.9848)	2.7623 (0.9971)
Group <i>PP</i> -statistics	-3.0404 (0.0012)**	-3.7404 (0.0001)**
Group <i>ADF</i> -statistics	-2.6910 (0.0036)**	-2.1805 (0.0146)**
B: Kao Residual Cointegration Test		
<i>ADF</i>	-3.4147 (0.0003)**	-

Notes: The number of lag truncations used in the calculation of the seven Pedroni statistics is 2 while Kao ADF statistic is 3. The parenthesized values are the probability of rejection. Asterisks (**) indicates statistically significant at 10 percent level.

Fully Modified OLS (FMOLS)

Fully modified OLS (FMOLS) is adopted followed the work by Pedroni (2000) to obtain long run estimates of the cointegrating relationship (Jayaraman & Lau, 2008). The following Table 4 shows the results of FMOLS.

Table 4: Fully Modified OLS (FMOLS) Results

	Panel Group
LGDP	0.9787 (0.0000)**
LINF	-0.4391 (0.0000)**
LOPEN	-0.3521 (0.0002)**
LREER	0.4425 (0.0000)**

Notes: The values in parentheses are t-statistics. Asterisk (**) shows significance at 10 percent level.

The long run estimates for the panel of FDI are presented in Table 4. In the equation with FDI as dependent variable, it is seen that the estimated coefficients for LGDP, LREER, and LTLF are positive and significant; while coefficient for LINF and LOPEN are negative but significant. Since the variables are in log forms, values of the estimated coefficients denote the elasticity magnitudes: one percent rise in GDP gives rise to 0.98 percent increase in FDI. This supports the conventional view that there exists correlation between FDI and GDP as evidences past research (Hsieh & Hong, 2005). In addition, the results for GDP is positive and significant to FDI inflows which is tally and match the findings of the past studies, for examples, Bevan and Estrin (2004); Azam and Lukman (2006); Hoang (2006); Wahid et al. (2006); Demirhan and Masca (2008); Anwar and Nguyen (2010); Wafure and Nurudeen (2010); Vijayakumar, Perumal, and Kao (2010); Mughal and Akram (2011); Cuyvers et al. (2011); Ranjan and Agrawal (2011); Khan and Akbar (2013); Narayan (2014). They stated that GDP has positive and significant relationship with FDI inflows of respective country.

Furthermore, for REER, it also shows positive and significant relationship with FDI inflows. The estimate of FDI with respect to REER is 0.4425, indicating one percent increase in REER leads to 0.44 percent rise in FDI. The result is the same to the past studies of Onyeiwu and Shrestha (2004); Kaur and Sharma (2013); Gharaibeh (2015); Anwar and Nguyen (2010). Real effective exchange rate is statistically significant and has positive relationship with FDI. This can be explained that the purchasing power parity of the foreign investors is relatively higher, hence foreign investors are the ability to invest in these countries, nevertheless the increase in real effective exchange rate.

Next is about TLF. The elasticity estimate of FDI with respect to TLF is 3.7377, this means one percent increase in TLF gives rise to 3.74 percent increase in FDI. This supports the conventional view that there is an existing of strong correlation between FDI and GDP. Besides, the results indicate that TLF is positive significant with FDI inflows. As refer to the study done by Gharaibeh (2015), the study mentioned that labor force is significant and has positive relationship to FDI inflows. The findings on my research is the same with the past study of Gharaibeh (2015). In other words, the increase in labor force leads to the increase in FDI inflows, too. A giant number of labor force is favored by foreign investors, as this can improve productivity. On the other hand, according to the findings in Table 4, INF and OPEN is statistically significant but negative to the FDI inflows. The elasticity estimate of FDI with respect to INF is -0.4391 and OPEN is -0.3521. This means that as INF is raised by one percent, it will lead to the decrease in FDI by 0.44 percent. This finding is supported by Demirhan and Masca (2008) and Ranjan and Agrawal (2011). On the other hand, increasing in one percent of OPEN will incur a decline in FDI by 0.35 percent, where this finding is supported by Gharaibeh (2015). In conclude, they found that INF and OPEN is negatively significant to FDI inflows.

Panel Granger Causality

The empirical results for panel Granger causality is presented in Table 5 and Table 6, meanwhile being discussed too. First, the coefficient of the error correction term (ECT) is statistically significant, indicating there is a long run causality relationship running from GDP, INF, OPEN, REER, and TLF to FDI. Second, there appears to be a significant short

run causal relationship running from GDP, INF, OPEN, REER, and TLF to FDI based on the Chi-square statistics of the coefficients of the variables.

Table 5: VECM Result

Dependent Variables	ECT	t-ratio
Δ LFDI	-0.0588**	-1.9064
Δ LGDP	0.0046	2.4418
Δ LINF	-0.0009	-0.5993
Δ LOPEN	-0.0033	-0.9449
Δ REER	0.0072	5.6040
Δ TLF	0.0000	0.3962

Notes: Parenthesized value shows the statistically significant value of ECT. Δ is the first different operator. Estimations are based on the balanced data for 2000-2016 and 4 ASEAN countries. Countries (N=4, T=17) with two lags. Asterisk (**) shows significance at 10 percent level.

Moreover, there is short run causality running from INF to FDI, OPEN to INF, INF to REER, and REER to OPEN, which shown in Table 6. These four causality only are in unidirectional causality between each one. In addition, there are bidirectional causality from FDI to REER and REER to GDP. However, TLF does not show any causality among variables. Fourth, LFDI appears to be the initial receiver of any exogenous shocks that disturb the equilibrium of the panel system under 10 percent of the significant level. This is evidenced in the statistically significant ECT in the LFDI equation in the panel system. The coefficient of ECT in LFDI equation is 0.0588 indicating that about 5.88 percent of the adjustment is completed in a year. This means that FDI needs approximately 17 years to reach long run equilibrium from the estimated results. The directions of causal relationship obtained from Table 6 are graphically illustrated in Figure 3.

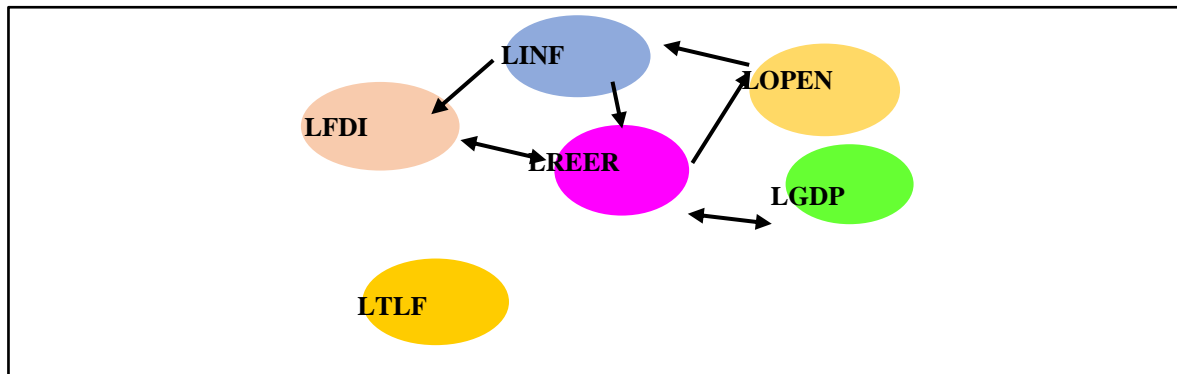
Table 6: Panel Granger Causality Results

Dependent Variables	Δ LFDI	Δ LGDP	Δ LINF	Δ LOPEN	Δ REER	Δ TLF
	χ^2 -statistics (p-value)					
Δ LFDI	-	2.1072 (0.3487)	4.9824 (0.0828)**	0.2134 (0.8988)	5.1491 (0.0762)**	1.1970 (0.5496)
Δ LGDP	4.0764 (0.1303)	-	2.5398 (0.2809)	0.1836 (0.9123)	14.1335 (0.0009)**	1.9948 (0.3688)
Δ LINF	2.0850 (0.3526)	0.8931 (0.6398)	-	5.3330 (0.0695)**	1.5322 (0.4648)	0.3933 (0.8215)
Δ LOPEN	1.1245 (0.5699)	0.9440 (0.6237)	0.2147 (0.8982)	-	8.5000 (0.0143)**	0.6887 (0.7087)
Δ REER	10.9262 (0.0042)**	10.8424 (0.0044)**	7.8086 (0.0202)**	2.0626 (0.3565)	-	1.5225 (0.4671)
Δ TLF	2.2287 (0.3281)	0.9546 (0.6205)	0.5817 (0.7476)	0.2814 (0.8688)	1.6697 (0.4339)	-

Notes: Parenthesized values are the probability of rejection of Granger non-causality. Δ is the first different operator. Estimations are based on the balanced data for 2000-2016 and 4 ASEAN countries. Countries (N=4, T=17) with two lags. Asterisk (*) shows significance at 10 percent level.

Source: Author's estimations.

Figure 3: Direction of Causal Relationship



Notes: LINF→LFDI, LOPEN→LINF, LINF→LREER, and LREER→LOPEN imply unidirectional causality, while LFDI↔LREER and LREER↔LGDP imply bidirectional causality.

Source: Author's explanations.

5. Conclusion

This study is to find out the macroeconomics determinants of FDI inflows in the four ASEAN countries, which are Cambodia, Laos, Myanmar, and Vietnam by applying a panel data analysis approach. The time series of the data is 17 years (2000-2016), where there are totally 68 observations. Besides, the data is recorded annually. The macroeconomics determinants are market size, inflation rate, trade openness, REER, and total labor force. The methodology adopted are panel unit root tests, panel cointegration tests, FMOLS, and Granger causality tests. This paper has found and presented evidence that market size, real effective exchange rate, and total labor force increase the FDI inflows to developing countries. These findings are largely consistent with the findings of previous literature on the same topic. The findings showed that all series of variables are stationary with order of integration of first. On the other hand, panel cointegration tests reveal that there is a significant and positive association between FDI inflows, market size, inflation rate, REER, trade openness, and total labor force.

Moreover, for FMOLS estimation results for the panel group, only GDP, REER, and TLF are positive and significantly influence FDI inflows, while INF and OPEN are negatively significant to FDI inflows. Next, the panel Granger causality results indicate that unidirectional causality linkage runs from INF to FDI, OPEN to INF, INF to REER, and REER to OPEN only in the short run. In addition, FDI to REER and REER to GDP have bidirectional causality. However, TLF does not granger cause any variables in the short run. In other words, there are only four unidirectional causality and two bidirectional causality in the short run as well.

According to Farazmand and Moradi (2014), in the efforts on attracting the interest of foreign investors, the strong economic growth and positive trade liberalization is needed. In order to capture the attention of foreign investors, government should implement fiscal policy. In fiscal policy, taxes play a huge responsibility. Government should increase the

spending, and hence reduce the taxes. Foreign investors favor countries with low tariffs, as this can help them earn more money. The government can sign contracts with the neighboring countries to have zero taxes if their investors invest in the host country.

Furthermore, one country should join more global organizations, for example TPP, to gain benefits from that. As an example, investors can freely move in the countries to invest without any extra charges or taxes. This is one of the benefits. Along with these efforts, the FDI inflows will experience huge increase and hence the economy will grow faster too. As an example, Vietnam joins WTO in 2007, where in that year, Vietnam gains a bombastic expand in the FDI inflows. Moreover, this can help improve the openness of a country. For Cambodia, Laos, and Myanmar, they are less open on trade as compare to Vietnam. Hence, the FDI inflows of those three countries are still in a starting pace. Government should open up their markets globally. Joining global organization is one of the best choice.

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