IMPACTS OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM MYANMAR (1989~2015)

By

PANN, Zun

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Committee in charge:

Professor Ji Sun BAEK, Supervisor

Professor In Soo JEONG

Professor Si Wook LEE

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ABSTRACT

This study analyzes the growth rate of Myanmar economic by inflow of foreign direct investment based on Vector Error Correction (VECM) Model. The objective of this paper is to determine whether getting foreign direct investment has positive or negative effects on the growth rate of GDP has positive or negative effects in the long-run. This study discovered that the growth rate of GDP is positively associated with getting foreign direct investment in the long-run but it is not statistically significant. Moreover, this study found that the negative correlation between the balance of trade and the gowth rate of GDP in the long-run, which owes to a trade deficit situation of Myanmar economy. Therefore, this study suggests that the government should focus on the economic stability and sound foreign direct investment policies to gain growth in Myanmar economy.

Key words:Foreign direct investment (FDI), The Growth rate of GDP, Myanmar,VECM.

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1.Introduction

Background of Study

Myanmar heavily relied on foreign investment in the economy until it began to practice inward policy from 1962 to 1988. At that time, the military government controlled all of the productive sectors and they did not accept FDI and foreign aid. As a consequence, economic growth declined slowly. After 1988, Myanmar adopted the outward economic policy by relaxing regulations and procedures on international trade, implementing economic reforms, and enacting an FDI law. Since 1990, economic growth has accelerated. The annual average GDP growth of 7.5 percent was achieved by implementing the four-year plan from 1992 to 1996. According to the government's stabilization program, the economy began to recover and investment had recovered during 1989 to 1991. The Government played an important role for the country's economic development through the introduction of the outward economic policy.

There are many interesting issues concerning with the effects of FDI on the economic growth rate of developing countries. FDI affects on economic growth in several ways. In the new growth theory, FDI contribute to enhance economic growth through transfer technology (Borensztein,Gregorio & Lee,1998). In the neoclassical growth model, inward foreign direct investment can increase capital income, but it has no long-run growth effect (Neusser,1991). Hsiao (2006) examined that inward FDI created an unidirectional effect on the growth rate of GDP, while relating a bidirectional effect between exports and the growth rate of GDP. According to the endogenous growth theory in the 1980s, technological progress and FDI have the growth effect in the host country through technology transfer and spillover (Fan, 2002). FDI can enhance the growth rate of GDP in the long run through sharing technological and capital accumulation under conditions of the trade openness regime. Moreover, FDI

inflows can support growing economies and markets by attracting multinational corporations (MNC) who would prefer to be located in more productive and fast growing countries Lim (2001).

There have been several studies on individual economies which sought to identify the cause and effect between FDI and GDP. GDP can be considered as an indicator of growth and standard of living for a country. BOT can also be considered as an indicator of economic growth.When imports are higher than exports, the negative balance of trade occurs, and it is a resource gap for developing countries (Rahman, 2015). Most of these studies have used the method of "correlation, regression, or Granger's bivariate causality tests" Granger (1988) to find the relationship of these variables under the context of different countries. For example, (Tiwari & Mutascu, 2011) analyzed that FDI had an unidirectional effect on the growth rate of GDP and bidirectional effect between exports and the growth rate of GDP in Thailand. In another paper, Rahman (2015) found the long-run equilibrium relationship and unidirectional effect between the economic growth rate and inflow of foreign direct investment in Bangladesh. Although most researchers found that FDI can enhance economic growth, but others have indicated that it is actually unclear.

Problem Statement

Recently, the government again enacted another FDI law which removed restrictions on private sector participation in domestic and foreign trade. Myanmar began to experience a faster flow of foreign trade and investment. The country can now enjoy some of the fruits of FDI as domestic companies are now required to have good human resources management, research, and development. The Government of Myanmar has also established a more predictable regulatory environment which does not discriminate between foreign and local

businesses. Moreover, both local and foreign investors are required to follow the rules, especially those regarding the environmental and natural resources.

Despite the government of Myanmar has made all-out efforts to attract FDI, there is still much work to be done in order to increase the inflow of FDI (Han, 2002). Myanmar need to change the policy of FDI to achieve sustainable growth (Khine, 2008). According to these two findings, the relation between FDI and Myanmar's economic growth rate is not fully known.Therefore, this research tries to examine that the inflow of FDI can effect positive or negative on the growth rate of GDP in Myanmar by using the Johansen test of co-integration and vector error correction model (VECM).This can help the government maintaining political stability since it has the power to make rules and regulations concerning investment policy, tax relaxation and implementing the basic infrastructure to attract foreign investors.

Research Objectives and Research Questions

The objective of study is to explore not only the impact of foreign direct investment (FDI) but also the balance of trade (BOT) on the growth rate of GDP.These findings embrace practical implications for policy makers, government and investors.

Based on these objectives, the research questions are: What is the significant effect of foreign direct investment inflows on the growth rate of GDP? What is the significant effect of balance of trade on the growth rate of GDP?

Regarding the fluctuated trend in Myanmar economic growth, the Government of Myanmar including policy-makers, economists and researchers have been mainly arguing about the cause and effect between foreign direct investment and the growth rate of GDP, increasing trade deficits, and weakness in the rules of law situation since the previous several decades. Therefore, this paper attempts to answer the ways for these two research questions to identify the relationship between foreign direct investment and economic growth in Myanmar based on the uncertainties and contradictions of the theoretical and previous empirical studies.

Method of Study

This study used quantitative methods time series data for 27 years from 1989 to 2015. These data variables were collected from UNCTADStat 2016.GDP is the measure of economic growth by real gross domestic product. FDI refers to the inward foreign direct investment of Myanmar. BOT refers to the balance of trade of Myanmar. "Augmented Dickey-Fuller test (ADF)" used to check whether the variables are stationary or not. Then, the Johansen co-integration test can avoid the spurious results and the Vector Error Correction Model (VECM) to determine the relationship between GDP, FDI and BOT in the case of Myanmar.The EViews software was used to estimate the result of VECM methodological framework. Data specifications are shown under the result and discussion section.

Hypothesis

According to the research objective and questions, the following hypothesizes are constructed for long-run relationship with the economic growth:

1) Foreign Direct Investment (FDI) will have positive effects on the growth rate of economic.

2) Balance of trade (BOT) will have negative effects on the growth rate of economic.

Organization of the Paper

The first section presents about the introduction and background of study. In the section two will review the literature on both theoretical views and empirical result. The third section will explain the methodology and the statistical interpretation. Section four describes results and discussion. Section five will conclude summary and conclusion.

2. Literature Review

2.1 Foreign Direct Investment (FDI)

"*Foreign Direct Investment (FDI) as an investment by a resident entity in one economy that reflects the objective of obtaining a lasting interest in an enterprise in another economy*",(UNCTAD,2016, pp-17). FDI is a powerful mechanism of economic development, especially for developing countries since the inflow of FDI can enhance export performance and have a positive effect on the trade when export volume is greater than import volume (Hailu, 2010).This section will review both theoretical views and empirical results.

2.2 Theoretical Review

In generally literature review, there is a positive relationship between FDI and the growth rate of GDP but a few explanations for it. According to the standard Solow type growth model, FDI can enable to achieve effective investment more than their own domestic saving and capital formation (Nyaga, 2013). Foreign direct investment can enhance the countries capital formation such as computers, steel plants and robots by using the standard solow type growth model (Mankiw &Wolfers, 2003).

The endogenous growth models highlights that FDI is the importance of improvement in technology, efficiency, productivity, and it can positively influence the growth rate because of production spillovers (Borensztein, De Gregorio & Lee,1998). According to this theory, Krugman (1994) argues why developing countries may not gain from FDI and found that it can happen due to the adverse selection problem.

On the other hand, the neoclassical growth model states that FDI enhance the GDP growth by the creation of capital stock (Neusser,1991). Further studies show that foreign direct investment could support more than the domestic investment for achieving sustainable

growth not only in a short run but also in a long run (Melnyk, Kubatko & Pysarenko, 2014). Moreover, modernization theory highlights that FDI can enhance the growth rate of economic by transferring the technologies and knowledge to developing countries (Afzalur, 2015).

2.3Empirical Review

There are several studies showed that FDI has positive effects on economic performances such as GDP and international trade. Most of them showed that FDI can enhance economic growth through the different channel. Bhagwati (1978) analyzed that export and import promotion theory can support to the efficiency of FDI in promoting growth . According to this finding, the growth effects of FDI's situation depends on host-country trade policies. Similarly, inward FDI flows can make faster the economic growth rate effectively and efficiently in developing countries (Balasubramanayam, Salisu & Sapsford,1996). Moreover, they argued that FDI rather than domestic investment can drive country economic development sustainably in exports promote countries. In addition, FDI can be enhanced the country economic growth by the situation of the open trade regime and macroeconomic stability.

Mohammad (2014) examined that the inflow of FDI has a positive effect on GDP and trade balance of four ASEAN countries. Moreover, Ahmad(2013) empirically investigated the positive relation between inflow of the FDI, balance of trade and the growth rate of GDP in Pakistan. Moreover, Mohanasundaram & Karthikeyan (2015) examined the positive relation between high inflow of the FDI and growth rate of GDP.

Some research can't find a clear result concerning with FDI can enhance further growth. Rahman (2015) empirically analyzed an insignificant effect of FDI on the growth rate of GDP by using annual data of Bangladesh. Some studies indicated negative or no relationship between FDI and the growth rate of GDP. (Enisan,2004) found that negative

influence of FDI on growth in Nigeria but did not show significance by using ECM (Error correction Model). Although FDI may confer benefits or costs, the governments of the LDCs try to attract FDI because of a win-win situation.

Additionally, the literatures continue to indicate that FDI has a positive or negative effects on the economic performances depending on their FDI's policy. Therefore, this study came to build on previous studies to examine the effect of the FDI policy of Myanmar. In Myanmar, the restrictions of the previous economic policies and foreign direct investment policies distort foreign trade and discourage FDI and increase transactions costs. This study will explore empirical evidence on the FDI effect on country economic growth.

2.4 Types of FDI

There are three ways of FDI impacts on country economic growth: direction, target, and motive (Dunning,1993, as cited in Khaing, 2009). Inward and outward FDI are way of direction effect. Investment, mergers and acquisitions, horizontal and vertical FDI are ways of target effect. The ways of motive effect are resources seeking, market seeking, efficiency seeking and strategic asset seeking.There are four investment types in Myanmar according to the Myanmar Investment Law (2016). They are as follows,

1. 100% investment by Foreign investors
2. Joint Venture (Foreign, local and government)
3. Contract (mutually agreed)
4. Others
    1- Build operate transfer (BOT)
    2- Build operate own (BOO)

2.5 FDI inflows into Myanmar

According to "the State Law and Order Restoration Council or SLORC (now called State Peace and Development Council or SPDC)", Myanmar initiated the open-door programme of economic reforms in late 1988 (Zaw & Win, 2007). Foreign investment from various countries flowed into to Myanmar since 1989. However, most of the investor from the US and Europe such as Apple Computers, Kodak, Motorola, Disney, PepsiCo and Levi Strauss & Co. stopped to invest after 1992 because of human rights abuse. In November 2012, Former President U Thein Sein approved "the new Foreign Investment Law (FIL) No. 21/2012, which repealed the 1988 Foreign Investment Law." Even though the US and Europe extended the restriction of sanction, Myanmar entered into the bilateral investment agreement with China and other ASEAN countries because Myanmar has abundant natural resources, cultivable land, strategic location, long coastlines, navigable river systems, and a literate young population. These attractive incentives were expected to persuade foreign investors. According to "the Directorate of Investment and Company Administration (DICA)", Myanmar has twelve bilateral investment treaties . They are as shown in table 1,

Table 1. ***Bilateral Investment Agreement Treaties***

No	Year	Partner Country	Agreement
1	1998	Philippines	"Promotion and Reciprocal Protection of Investment"
2	2000	Vietnam	"Promotion and Reciprocal Protection of Investment"
3	2001	China	"Promotion and Protection of Investment"
4	2003	Laos	"Promotion and Reciprocal Protection of Investment"
5	2008	Kuwait	"Encouragement and Reciprocal Protection of Investment"

No	Year	Partner Country	Agreement
6	2008	Thailand	"Promotion and Protection of Investment"
7	2008	India	"Promotion and Protection of Investment"
8	2013	Japan	"Promotion and Protection of Investment"
9	2013	Indonesia	"Framework Agreement on Trade and Investment"
10	2013	United State of America	"Investent Incentive Agreement"
11	2014	Republic of Korea.	"Promotion and Protection of Investment"
12	2014	Israel	"Reciprocal Promotion and Protection of Investment"

Data Source: http://www.dica.gov.mm

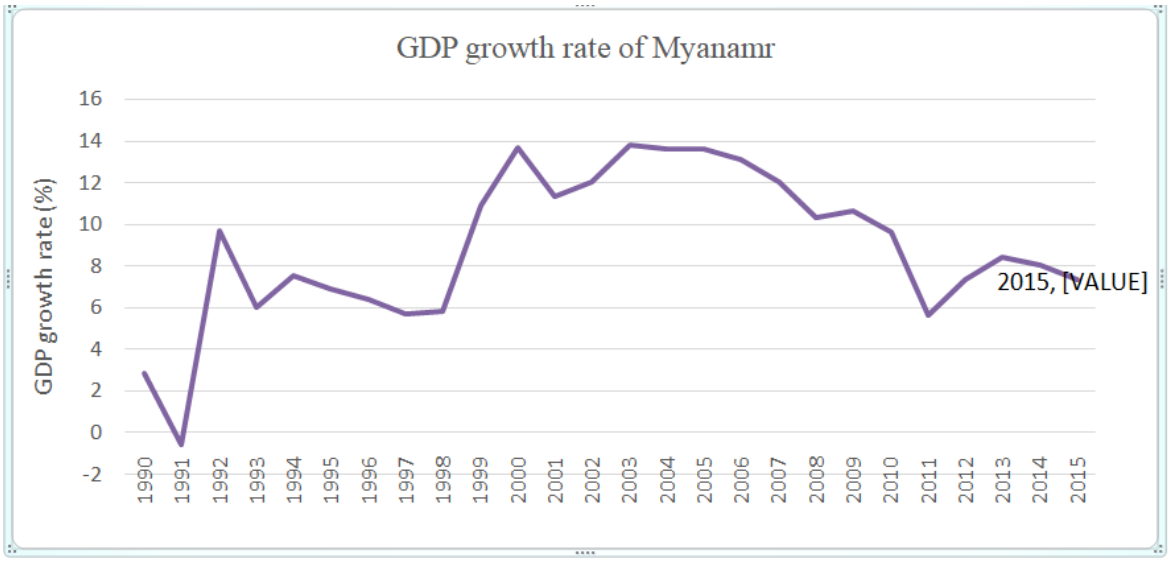
Moreover, Myanmar signed the regional free trade agreement (FTAs) with China, Korea, Auatraila and India in 1st January 2010. However, Myanmar suffers from the high transaction cost, unconvincing intellectual property rights and unpredictable political situation. Therefore, Myanmar is difficult country to do business until now (Freire,2014). The new law attracts more foreign investment as well as promoting domestic investment. Yet, most of the foreign investors still do not want to invest not only because of the shortage of power but also unskilled labor (Jones, 2014).

3. Empirical Analysis

3.1. Yearly trend of GDP, FDI and BOT

Myanmar economic growth rate has had positive trend except in 1991 (Figure 1). There was a sharp decline in 1991 and 2011 due to the political transition period. However, economic growth rate was 7.29% in 2015 because of Myanmar's positive political developments and economic reforms.

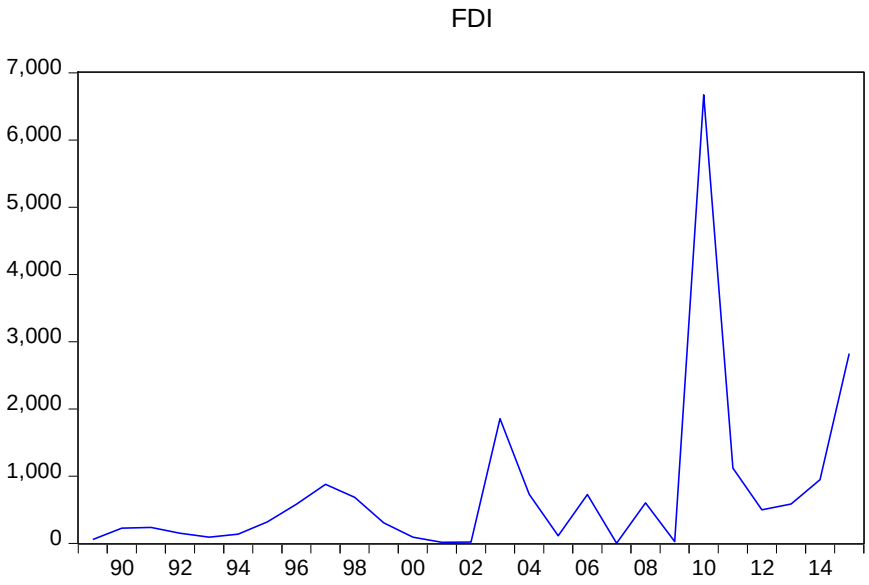
Figure 1.*GDP growth rate of Myanmar (in USD million)*



Source:UNCTADSTAT, 2016

According to the trend of GDP growth rate data as shown in Figure 2, where in the inflow of FDI dramatically increased after 2012 because of political changes and the enactment of the Foreign Investment Law. Even though the Government of Myanmar enacted the new strategic investment law for improve export quality, however, FDI inflows has been decreasing from 2015. Therefore, we cannot say Myanmar Foreign Direct Investment Law is successful.

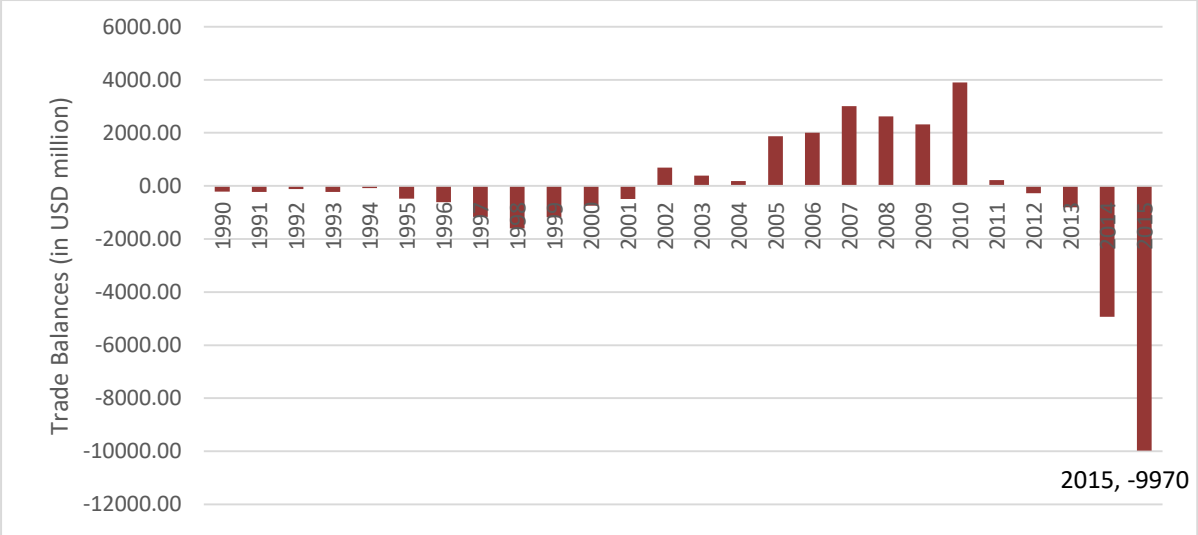
Figure 2.*FDI inflow into Myanmar (1989 to 2015, Kyat Million)*



Source: UNCTADSTAT, 2016

According to the trend of balance of trade data as shown in Figure 3, the period of 2002-2011 was the trade surplus period of Myanmar because of the contributions of FDI flows to Oil and Gas sector mainly from China. During the period from 2011 to 2015, trade deficits became larger because country situation required more imports from the other countries for the development process in this transition period.

Figure 3.*Trade Balances of Myanmar (in USD million)*



Source: UNCTADSTAT, 2016

3.2Data Collection and Methodology

This study use annual data for 12 sectors of Myanmar from 1989 to 2015. The data are collected from UNCTADSTAT 2016[1] because most of the studies used from UNCTAD data and reliable to use. We used "Augmented Dickey Fuller (ADF)" test to check the variables are stationary or not. And then we explored the Johansen co-integration test to avoid the spurious results, "Vector Error Correction Model (VECM)" (Engle & Ganger, 1987) to examine the relationship (existent or not) between RGDP, FDI and BOT in the case of Myanmar.The econometric model of this research as follows,

$$\mathbf{Y = \alpha + \beta_1 (FDI) + \beta_2 (BoT) + \mu}$$

Where:

Dependent Variable = GDP Growth Rate (real)

Independent variables are:

FDI= Foreign Direct Investment (constant price)

BOT= Balance of Trade

β = Coefficients of the independent variables

3.3 Variable Description

Table 2.*Variable description and expected signs*

Variables	Description	Expected sign
RGDP	GDP Growth Rate	
FDI	Foreign Direct Investment	Either Positive or Negative
BOT	Balance of trade	Negative

[1] UNCTAD. (2016). Methodological Note. World Investment Report, 201–207.

GDP and FDI

The study expects that FDI inflows will have a positive effect on GDP. FDI inflow will increase, it can help the economic growth of Myanmar. In other words, FDI inflow will decrease that it will not help. FDI is a powerful instrument of economic development, especially for developing the country. It is also important for the export subsector. Moreover, the inward FDI can stimulate exports from domestic sectors through an industrial linkage as well as FDI can enhance export-oriented productivity that increases export performance. Expanding FDI in the recipient country can have a positive effect for export promotion. On the other hand, the effect of FDI on imports is limited due to FDI's initial investment and operation phases increasing imports for the recipient country. If FDI uses local raw materials and inputs for production, it cannot have significant adverse effect on imports. Moreover, FDI will have a positive effect on the trade if the export volume is greater than import volume. Thus, FDI was expected to have positive effects.

GDP and BOT

GDP is direct relationship trade balance because GDP equal to consumption plus government expenditure plus export minus import. If the export is greater than import, the GDP will increase. If import is greater than export, the GDP will decrease. GDP growth rate also increases or decreases depend on GDP increase or decrease. Generally, BOT should have a positive effect on GDP but this study expects BOT to have a negative effect on GDP. When a country's export is greater than import, positive trade balance occurs. If domestic producers sell to foreigners exceeds, it is trade surplus and GDP increase. If domestic consumers spend more on foreign products, it can be happened a trade deficit and then GDP decreases.

Unit Root Test

This study used the "Augmented Dickey-Fuller test (ADF)" to check whether the variables have unit root or not. If the variables have unit root, there is no changing variance in over time.[2] If a model contains non-stationary variables in the data, it may produce varying regression results. Therefore, trended data has differenced a minimum of time to generate a stationay timeseries.[3]

$$\Delta X_t = \alpha + pt + \beta X_{t-1} + \sum_{i=1}^{k-1} \gamma_i \Delta X_{t-1} + \varepsilon_t \quad (1)$$

In this equation,

α = "constant" ,

p = "The coefficient of time trend."

X = dependent variable

Δ = "The first difference operator"

t = a time period

ε = "a stationary random error."

"X_{t-1}" = The coefficient for unit root test

This study includes log(GDP), log(FDI) and log(BOT). If β is significant and different from zero ($\beta \neq 0$,) the variable are stationary.

Optimal Lags and Johansen Cointegration Test

Lag is a very important issue that can actually change the whole result.When the lag number is changes, the outcome changes as well, thus affecting the decision. Lag value is the past value of all variables used to predict future value of dependent variables. The optimal lag was chosen by exploring the information criterion such as "*Akaike Information Criterion*

[2] M. Wooldridge J.M (2013) Introductory Economics 5th edition

[3] Gujarati Basic Econometrics, 2009

(AIC), Schwarz-Bayesian (SBIC), Hannah-Quinn (HQIC), Likelihood Ratio test (LR) and Final Prediction Error (FPE)." (Eview 9.5 calculation)

In economic theory, two series are cointegrated if they have comparable long-run properties. Individual series may be unstable and diverge from each other over a shorter period, but converge towards equilibrium over the long run.[4] Cointegration, therefore, highlights the existence of a long-run equilibrium to which the system converges overtime.[5] Johansen cointegration test can check whether the variables can move together in the long-run or not. If two or more variables are co-integrated each other, they have long-run association in generally and the VECM can be run for this study.

Vector Error-CorrectionModel (VECM)

If the variables are cointegrated, can use VECM model by calculating the error correction term. The error term sign must be negative and less than critical value significantly that means, any short-term relationship between variables will enhance the stable long-term relationship running from independent variables to dependent variables. If the variables are not co-integrated each other,we cannot use the (VECM) model and can check with Granger-Causality test.

[4] Green R.Econometrics,2003
[5] Gujarati Basic Econometrics, 2009

4. Results and Discussion

4.1 Unit Root Test Result

Table 3.*Unit Root Test*

Series	Level			First Difference		
	Test Stat	5% Critical	p-value	Test Stat	5% Critical	p-value
LGDP	-3.354	-2.981	0.0225	-8.1515	-2.986	0.0000
LFDI	-4.682	-2.981	0.0010	-9.5129	-2.986	0.0000
LBOT	-1.254	-2.981	0.6349	-4.669	-2.986	0.0011

Source:Author's calculation in E-view 9.5

In the level of LGDP, absolute value (Test Statistics) is higher than 0.05. Therefore LGDP does not have unit root and stationary. The coefficient of L1 is negative therefore we can accept this model.

Both of the level and first diference of absolute value (Test Statistics) of LFDI is higher than 0.05 level value.Therefore, LFDI does not have unit root and stationary.The coefficient of L1 is negative therefore we can accept this model.

In the level of LBOT, the variable is nonstationary therefore we use the first difference level. Absolute value (Test Statistics) of D(LBOT) is higher than 0.05 level value. Therefore D(LBOT) does not have unit root and stationary. The coefficient of L1 is negative therefore, we can accept this model.

4.2 Johansen Test of Cointegration

Table 4. "*Johansen Cointegration Test"* Author's calculation in E-view 9.5

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE (s)	Eigen value	Trace Statistics	0.05 Critical Value	Probability**
None *	0.811427	58.82132	29.79707	0.0000
At most 1*	0.500616	18.78289	15.49471	0.0154
At most 2	0.084460	2.117785	3.841466	0.1456

Trace test indicates 2 cointegration eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** Mackinnon-Haung-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigen value)				
Hypothesized No. of CE (s)	Eigen value	Max-Eigen Statistics	0.05 Critical Value	Probability**
None *	0.811427	40.03843	21.13162	0.0000
At most 1*	0.500616	16.66511	14.26460	0.0205
At most 2	0.084460	2.117785	3.841466	0.1456

Max Eigen test indicates 2 cointegration eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** Mackinnon-Haung-Michelis (1999) p-values
Source:Author's calculation in E-view 9.5

Co-integration rank is estimated by using the Johansen test of co-integration methodology. There are two likelihood estimators for the rank of co-integration. The results are presented in Table 4.

H0: rank=0

H1: rank≥1

In the trace statistics of rank 0 **greater than** 0.05 level. So we **can reject** null hypothesis. There is co-integration among variables.

H0: rank≤1

H1: rank≥2

In **rank 1** also trace statistics **is greater than** 0.05 level. So we **can reject** null hypothesis. Therefore, there is two or more co-integrated model in this system.

H0: rank≤2

H1: rank≥3

But in rank 2, trace statistics **is less than** 0.05 level. Therefore, we **cannot reject** null hypothesis. There are two co-integrated model in this system. Rank 3 also too. When the variables are co-integrated, we can run the VECM. They have long-run association ship.

In the max- eigen statistics rank 0 **greater than** 0.05 level. There is co-integration among variables. In **rank 1** also max- eigen statistics **greater than** 0.05 level. Therefore, there is two or more cointegrated model in this system. But in rank 2, trace statistics is less than 0.05 level value. Therefore, there are two cointegrated among variables. Rank 3 also too. When the variables are cointegrated, we can run the VECM. They have long run association ship running from FDI and BOT to GDP growth rate of Myanmar.Therefore, we will estimate by using the VECM Model.

"*According to the test of Johansen's cointegration, there are at most two cointegrations among the variables, however, only one cointegration was used to avoid complexity*." (Brook, 2008, pp -373). Therefore, we used this VECM Model. The long-run relationship between GDP, FDI and BOT for one co-integration vector for Myanmar in the period of 1989 to 2015 is shown in the succeeding section.

4.2.1 VECM Long-run Coefficients Estimation

Table 5. *VECM Long-run Coefficients Estimation*

Dependent variable is lgdp

Variables	Coefficient	Std.Error	t-Statistics
LFDI	**0.075879**	**0.06966**	**-1.08924**
LBOT	**-0.020232**	**0.00820**	**2.46793**
Error Correction	**-0.924106**	**0.13374**	**-6.90958**

***Source:*Author's calculation in E-view 9.5**

LGDP = C(1)*(LGDP(-1) + 0.0758791700784*LFDI(-1) - 0.0202316081568*LBOT(-1) + 1.80516887716

According to vector error correction model, when two cointegrating vectors are estimated, the coefficients can be shown as long-run association. The results show that foreign direct investment has a positive effect on the growth rate of gross domestic product of Myanmar in the long-run but it is not significant because test statistics is less than 2. The balance of trade has a negative effect on the growth rate of gross domestic product in the long run, such that for 1% increase in BOT, GDP decreases by 0.02% because of a negative sign. The ECM term of VECM must be negative and significant to confirm the long-run and short-run relationships of the variables. ECM term in the model is the speed of adjustment term converging towards the long-run equilibrium and having a negative sign means that converge to the equilibrium. The results showed that ECM term is negative -0.924106 and significant at 1% significant level. Therefore, this study can conclude that there is both long- run and short-run relationship in the estimated model for this study.

4.2.2 VECM Short Run Coefficients Estimations

Table 6.*Vector Error Correction Model Result (Short Run)*

Dependent Variable: D(LGDP)
Method: Least Squares (Gauss-Newton/ Marquardt steps)
Date:09/10/17 Time:19:46
Sample (Adjusted): 1992 2015
Included observations: 24 after adjustments
D(LGDP)= C(1)*(LGDP(-1) – 0.075879170084*LFDI(-1)- 0.0202316081568*LBOT(-1)-1.80516887716)+C(2)*D(LGDP(-1))+C(3)*D(LGDP(-2))+C(4)*D(LFDI(-1))+ C(5)* D(LFDI(-2))+C(6)*D(LBOT(-1))+C(7)*D(LBOT(-2))+C(8)

	Cofficient	**Std.Error**	**t-Statistics**	**Probability**
C(1)	-0.924106	0.133743	-6.909580	0.0000
C(2)	-0.109337	0.121498	-0.899913	0.3815
C(3)	-0.016073	0.097511	-0.164831	0.8711
C(4)	-0.114194	0.033346	-3.424484	0.0533
C(5)	-0.064711	0.031017	-2.086285	0.0533
C(6)	0.017753	0.014582	1.217492	0.2411
C(7)	0.028660	0.016009	1.790284	0.0923
C(8)	0.130428	0.055847	2.335460	0.0329
*R-squared	0.871833			

*Adjusted R-sq	0.815759
*Prob(F-statistics)	0.000005

Source:Author's calculation in E-view 9.5

R-squared is 0.871833 which means that 87% change in LGDP because of LFDI and LBOT's changing. Last 23% are because of error term. Moreover, probability of F-statistics is 1% level of significance.Therefore, model is good fit.

Table 7. *Wald Test Result (Short Run) for LFDI to LGDP"*

Test Statistics	**Value**	**df**	**Probability**
F-statistic	5.921401	(2. 16)	0.0119
Chi-square	11.84280	2	0.0027
Null Hypothesis: C(4)=C(5)=0			
Null Hypothesis Summary			
Normalized Restriction(=0)		**Value**	**Std Err.**
C(4)		-0.114194	0.033346
C(5)		-0.064711	0.031017

Restrictions are linear in coefficients.
Source:Author's calculation in E-view 9.5

H0: There is no short run causality LFDI (all lags) to LRGDP

H1: There is short run causality LFDI (all lags) to LRGDP.

According to the result, the probability value is less than 0.05 level value. There is short-run cause and effect LFDI (all lags) to LGDP negatively significant.

Table 8. *Wald Test Result (Short Run) for LBOT to LGDP*

Test Statistics	**Value**	**df**	**Probability**
F-statistic	2.416149	(2. 16)	0.1211
Chi-square	4.832297	2	0.0893
Null Hypothesis: C(6)=C(7)=0			
Null Hypothesis Summary			
Normalized Restriction(=0)		**Value**	**Std Err.**
C(6)		0.017753	0.014582
C(7)		0.028660	0.016009

Restrictions are linear in coefficients.
Source:Author's calculation in E-view 9.5

H0: There is no short run causality LBOT (all lags) to LRGDP

H1: There is short run causality LBOT (all lags) to LRGDP.

According to the result, p value is greater than 5% value. There is no short run causality LBOT (all lags) to LRGDP.

4.3 Diagnostics Tests

In this research, we used diagnostics tests to check the model's stability, normality, heteroskedasticity,and serial correlation. LM test is to check serial correlation of the residuals in the model and heteroskedasticity test is for checking heteroskedastic problem of the model and CUSUM tests was used to test model's stability. These tests are shown in table-10.

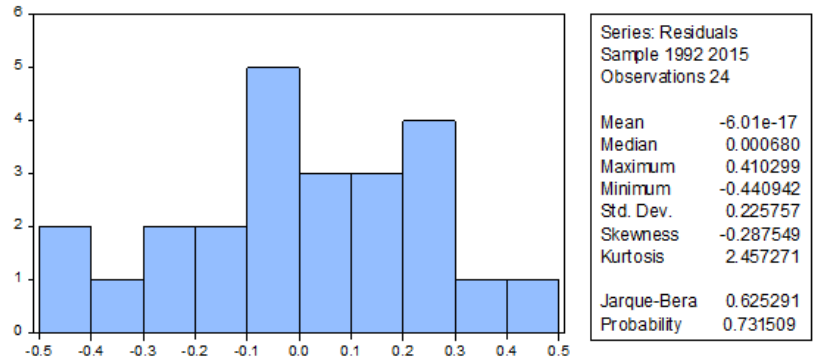
Table 9.*Diagnostic tests*

Breusch-Godfrey Serial Correlation LM Test	
Obs* R-Squared	0.2702 (pvalue)
Normality Test	
Jarque-Bera	0.731509 (pvalue)
Heteroskedasticitytest:ARCH	
Obs* R-Squared	0.9587 (pvalue)

***Source:*Author's calculation in E-view 9.5**

We need to check that our model is serially correlated or not by using Breusch-Godfrey LM test. The probability value is more than 5%, we can't reject null hypothesis. Therefore, residuals are not serially correlated.(autocorrealted) That's a good model. The probability value is 0.2702, greater than 0.05. Therefore, model is not serially correlated. And then we check that our variables are constant variance or not by using Heteroskedasticity test. The probability value is more than 5%.Therefore, residuals are homoscedastic (constant variance).

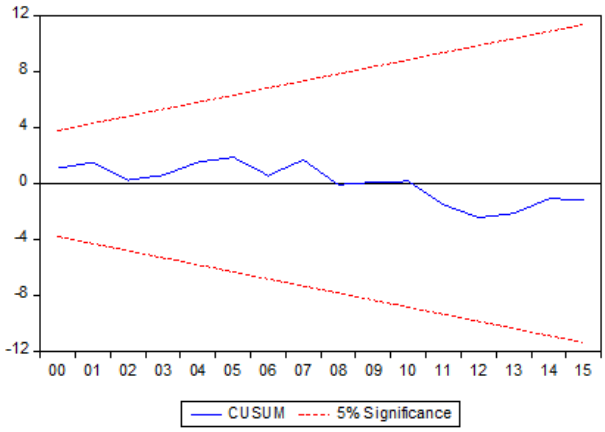
Figure 4.*Normal Distribution Test*



Source: Author's calculation in E-view 9.5

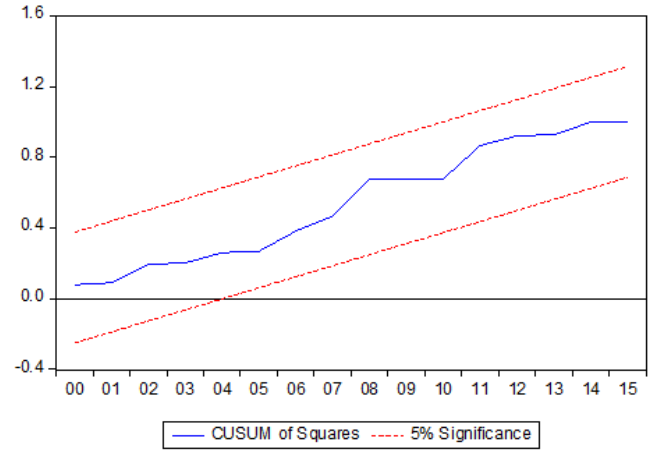
According to the figure-4, we check that our data are normally distributed or not. The probability value is more than 0.05 level value so residual is normally distributed.

Figure 5. *Plot of cumulative sum of recursive residuals*



Source: Author's calculation in E-view 9.5

Figure 6. *Plot of cumulative sum of Squares recursive residuals*



Source: Author's calculation in E-view 9.5

According to Brown (1975), when checking based on cumulative sum of recursive residuals (CUSUM) and cumulative sum of square of recursive residuals (CUSUM of squares), the model is stable because both of the CUSUM and CUSUM of squares statistics are within the critical bounds.Therefore, the model is good for this study.

5. Conclusion

This study aims to study whether foreign direct investment has positive or negative impact on economic growth of Myanmar for the period of 1989 to 2015 by using VECM model. LGDP is dependent variable; LFDI and LBOT are independent variables. All of the variables are stationary and do not have unit root at 5% level of significance. There is a positive relation between foreign direct investment and growth of gross domestic product of Myanmar in the long run but it is not significant. Therefore, we failed to reject main hypothesis of this research.On the short run analysis, FDI variable shows short run negative significant in one year lag. This was because most of the Westernfirms stopped investment. Moreover, inflows of FDI can cause higher local consumption and usage for products such that it decreases export values to other countries. However, this cannot enhance substainable economic growth. It is important for government and policymakers to make policies for attracting FDI efficiently and effectively.

In addition, balance of trade also negative relation with growth of gross domestic product in the long-run. But, there is no short-run causality LBOT (all lags) to LGDP. This is due to the trade deficit situations in Myanmar.This result proved that balance of trade is negative trade balance due to export is less than import and can reject the null hypothesis of this research. If this problem can still in the long-run, it can have negative impact on the whole economy of Myanmar. Therefore, this study result also turned out to show that negative relationship in the long-run between balance of trade and economic growth rate. We should also change our export policy. Moreover, the new government should change appropriate strategic policies to FDI flows and significant reforms are necessary to achieve sustainable economic growth of Myanmar. This study results can support for future research to make sound foreign direct investment policies to gain growth in Myanmar economy.

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Appendix

Table 1.

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.802748	0.0000
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 09/14/17 Time: 20:10
Sample (adjusted): 1991 2015
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.335204	0.196274	-6.802748	0.0000
C	0.236685	0.581262	0.407191	0.6876

R-squared	0.668001	Mean dependent var	0.007246
Adjusted R-squared	0.653567	S.D. dependent var	4.929467
S.E. of regression	2.901415	Akaike info criterion	5.044892
Sum squared resid	193.6188	Schwarz criterion	5.142402
Log likelihood	-61.06116	Hannan-Quinn criter.	5.071938
F-statistic	46.27738	Durbin-Watson stat	2.082577
Prob(F-statistic)	0.000001		

Source:Author's calculation in E-view 9.5

Table 2.

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.977578	0.0000
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 09/14/17 Time: 20:11
Sample (adjusted): 1991 2015
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.369093	0.196213	-6.977578	0.0000
C	1.615332	1.268889	1.273029	0.2163
@TREND("1989")	-0.098059	0.080446	-1.218943	0.2358

R-squared	0.689005	Mean dependent var	0.007246
Adjusted R-squared	0.660733	S.D. dependent var	4.929467
S.E. of regression	2.871249	Akaike info criterion	5.059538
Sum squared resid	181.3696	Schwarz criterion	5.205803
Log likelihood	-60.24422	Hannan-Quinn criter.	5.100106
F-statistic	24.37035	Durbin-Watson stat	2.171308
Prob(F-statistic)	0.000003		

Source:Author's calculation in E-view 9.5

Table 3.

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.562413	0.0013
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 09/14/17 Time: 20:12
Sample (adjusted): 1990 2015
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.973423	0.213357	-4.562413	0.0001
C	767.1853	307.5561	2.494457	0.0199

R-squared	0.464472	Mean dependent var	106.4615
Adjusted R-squared	0.442159	S.D. dependent var	1852.354
S.E. of regression	1383.500	Akaike info criterion	17.37642
Sum squared resid	45937763	Schwarz criterion	17.47320
Log likelihood	-223.8935	Hannan-Quinn criter.	17.40429
F-statistic	20.81562	Durbin-Watson stat	1.919876
Prob(F-statistic)	0.000126		

Source:Author's calculation in E-view 9.5

Table 4.

Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.297734	0.0012
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 09/14/17 Time: 20:13
Sample (adjusted): 1990 2015
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-1.120471	0.211500	-5.297734	0.0000
C	-150.9957	522.9425	-0.288742	0.7754
@TREND("1989")	75.40680	35.86203	2.102692	0.0466

R-squared	0.550819	Mean dependent var	106.4615
Adjusted R-squared	0.511760	S.D. dependent var	1852.354
S.E. of regression	1294.317	Akaike info criterion	17.27752
Sum squared resid	38530925	Schwarz criterion	17.42269
Log likelihood	-221.6078	Hannan-Quinn criter.	17.31932
F-statistic	14.10215	Durbin-Watson stat	2.011494
Prob(F-statistic)	0.000101		

Source:Author's calculation in E-view 9.5

Table 5.

Null Hypothesis: D(BOT,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.486244	0.0000
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BOT,3)
Method: Least Squares
Date: 09/14/17 Time: 20:14
Sample (adjusted): 1993 2015
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOT(-1),2)	-2.832433	0.333768	-8.486244	0.0000
D(BOT(-1),3)	0.637044	0.179695	3.545139	0.0020
C	212.6325	200.2168	1.062011	0.3009

R-squared	0.916487	Mean dependent var	-6.643478
Adjusted R-squared	0.908135	S.D. dependent var	3133.477
S.E. of regression	949.7308	Akaike info criterion	16.67134
Sum squared resid	18039772	Schwarz criterion	16.81945
Log likelihood	-188.7204	Hannan-Quinn criter.	16.70859
F-statistic	109.7415	Durbin-Watson stat	1.865637
Prob(F-statistic)	0.000000		

Table 6.

Null Hypothesis: D(BOT,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.921322	0.0000
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BOT,3)
Method: Least Squares
Date: 09/14/17 Time: 20:14
Sample (adjusted): 1993 2015
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOT(-1),2)	-2.953779	0.331092	-8.921322	0.0000
D(BOT(-1),3)	0.700771	0.178021	3.936454	0.0009
C	-477.2049	478.2946	-0.997722	0.3310
@TREND("1989")	46.70859	29.62638	1.576588	0.1314

R-squared	0.926148	Mean dependent var	-6.643478
Adjusted R-squared	0.914487	S.D. dependent var	3133.477
S.E. of regression	916.3080	Akaike info criterion	16.63535
Sum squared resid	15952787	Schwarz criterion	16.83283
Log likelihood	-187.3066	Hannan-Quinn criter.	16.68502
F-statistic	79.42406	Durbin-Watson stat	1.989986
Prob(F-statistic)	0.000000		

Table 7.

Date: 09/11/17 Time: 23:07
Sample (adjusted): 1992 2015
Included observations: 24 after adjustments
Trend assumption: Linear deterministic trend
Series: LGDP LFDI LBOT
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.811427	58.82132	29.79707	0.0000
At most 1 *	0.500616	18.78289	15.49471	0.0154
At most 2	0.084460	2.117785	3.841466	0.1456

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.811427	40.03843	21.13162	0.0000
At most 1 *	0.500616	16.66511	14.26460	0.0205
At most 2	0.084460	2.117785	3.841466	0.1456

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LGDP	LFDI	LBOT
2.420639	-0.183676	0.048973
0.620404	-1.239046	0.130380
1.020985	0.655280	0.160804

Unrestricted Adjustment Coefficients (alpha):

D(LGDP)	-0.381761	0.042656	0.030945
D(LFDI)	0.174773	0.617123	-0.456085
D(LBOT)	-0.635996	-1.900592	-0.590722

Unrestricted Adjustment Coefficients (alpha):

D(LGDP)	-0.381761	0.042656	0.030945
D(LFDI)	0.174773	0.617123	-0.456085
D(LBOT)	-0.635996	-1.900592	-0.590722

1 Cointegrating Equation(s): Log likelihood -105.4303

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LFDI	LBOT
1.000000	-0.075879	0.020232
	(0.06966)	(0.00820)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.924106
	(0.13374)
D(LFDI)	0.423063
	(1.08773)
D(LBOT)	-1.539516
	(2.04694)

2 Cointegrating Equation(s): Log likelihood -97.09773

Normalized cointegrating coefficients (standard error in parentheses)

LGDP	LFDI	LBOT
1.000000	0.000000	0.012731
		(0.00879)
0.000000	1.000000	-0.098852
		(0.03428)

Adjustment coefficients (standard error in parentheses)

D(LGDP)	-0.897641	0.017267
	(0.13547)	(0.06791)
D(LFDI)	0.805928	-0.796746
	(1.05463)	(0.52864)
D(LBOT)	-2.718650	2.471738
	(1.74798)	(0.87619)

Table 8.

Vector Error Correction Estimates
Date: 09/11/17 Time: 23:16
Sample (adjusted): 1992 2015
Included observations: 24 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LGDP(-1)	1.000000
LFDI(-1)	-0.075879 (0.06966) [-1.08924]
LBOT(-1)	0.020232 (0.00820) [2.46793]
C	-1.805169

Error Correction:	D(LGDP)	D(LFDI)	D(LBOT)
CointEq1	-0.924106 (0.13374) [-6.90958]	0.423063 (1.08773) [0.38894]	-1.539516 (2.04694) [-0.75210]
D(LGDP(-1))	-0.109337 (0.12150) [-0.89991]	-0.507323 (0.98814) [-0.51341]	1.353635 (1.85953) [0.72794]
D(LGDP(-2))	-0.016073 (0.09751) [-0.16483]	-0.353635 (0.79305) [-0.44592]	0.326393 (1.49241) [0.21870]
D(LFDI(-1))	-0.114194 (0.03335) [-3.42448]	-0.586658 (0.27120) [-2.16316]	0.672752 (0.51037) [1.31817]
D(LFDI(-2))	-0.064711 (0.03102) [-2.08629]	0.026488 (0.25226) [0.10500]	0.752114 (0.47472) [1.58433]
D(LBOT(-1))	-0.017753 (0.01458) [-1.21749]	-0.196768 (0.11859) [-1.65920]	-0.055891 (0.22317) [-0.25044]
D(LBOT(-2))	-0.028660 (0.01601) [-1.79028]	-0.035669 (0.13020) [-0.27396]	0.257376 (0.24501) [1.05046]
C	0.130428 (0.05585) [2.33546]	0.186014 (0.45420) [0.40954]	-0.075286 (0.85474) [-0.08808]
R-squared	0.871833	0.472514	0.236032
Adj. R-squared	0.815759	0.241739	-0.098204
Sum sq. resids	1.172225	77.53717	274.5887
S.E. equation	0.270673	2.201380	4.142679
F-statistic	15.54810	2.047511	0.706185
Log likelihood	2.175279	-48.12697	-63.30117
Akaike AIC	0.485393	4.677247	5.941764
Schwarz SC	0.878078	5.069932	6.334449
Mean dependent	0.109029	0.103579	0.110439
S.D. dependent	0.630598	2.528050	3.953119

Determinant resid covariance (dof adj.)	4.430982
Determinant resid covariance	1.312884
Log likelihood	-105.4303
Akaike information criterion	11.03586
Schwarz criterion	12.36117

Table.9 Yearly trend of real GDP growth rate, FDI and BOT

Years	GDP	FDI	BOT
1989	3.70	56.0	-412.70
1990	2.82	225.1	-412.10
1991	-0.65	235.1	-383.30
1992	9.66	149.0	-286.30
1993	6.04	91.7	-605.00
1994	7.48	135.2	-496.90
1995	6.95	317.6	-935.00
1996	6.44	580.7	-1,064.40
1997	5.65	878.8	-1,272.70
1998	4.95	683.6	-1,619.70
1999	10.95	304.0	-1,467.50
2000	13.75	91.1	-358.20
2001	11.34	15.3	-191.33
2002	12.03	17.7	763.22
2003	13.84	1855.2	116.84
2004	13.56	729.9	2,908.83
2005	13.57	110.4	1,573.60
2006	13.08	724.2	2,296.00
2007	11.99	2.2	3,048.30
2008	10.26	603.4	2,235.80
2009	10.55	27.2	3,405.50
2010	10.16	6669.4	2,448.30
2011	5.59	1117.7	100.50
2012	7.33	496.9	-91.90
2013	8.43	584.3	-2,555.50
2014	7.99	946.2	-4,108.90
2015	7.29	2824.0	-5,441.30

Source:Unctadstat