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Abstract

This study examines the impact of institutional quality in attracting FDI in Algeria over the period 1995-2011 using the Heritage Foundation's economic freedom index which reflects economic institutional quality (EIQ) and two governance indicators, namely: government effectiveness (GE) and voice and accountability (VA) that represent political institutional quality.

The Johansen cointegration test has been employed in order to investigate the existence of long-run relationships among the tested variables. Additionally, the vector error correction model (VECM) has been applied to analyze the long-run and short-run dynamic relationships among the various time series, besides using both impulse response functions and variance decomposition.

The main results indicate that there is a long run relationship among the tested variables and the VECM confirms the existence of this relationship. It is also revealed that both EIQ and VA have long-term positive effects on FDI inflows in Algeria. In the light of the results obtained from this study, it could be concluded that the improvement of economic freedom and voice and accountability in Algeria can be considered a fruitful plan for providing good investment climate and attracting more FDI inflows in the long term.

Keywords: Institutional Quality, FDI, Algeria, Johansen Cointegration Test, VECM.

JEL Classification Numbers: F21, O16, O17, P26, O55, C22.

1. Introduction

There is a broad consensus among researchers that inward FDI plays a vital role in the development process of the host countries in several ways, such as through knowledge spillover and capital accumulation (*De Mello, 1999*). Also, it is the main driver of technological diffusion, which is beneficial for developing economies (*Borensztein, De Gregorio, Lee, 1998*).

FDI induces the promotion of host countries' transport and communication infrastructures. Moreover, multinational corporations (MNCs) that conduct FDI are considered an engine of competition, innovation, know-how and managerial skills, thus they are able to improve the productivity and performance of local firms in host economies (*Bengoa and Sanchez-Robles, 2003; Romer, 1993*).

Considering the importance of macroeconomic factors in attracting FDI inflows, recent studies have highlighted the essential role played by institutional factors in creating a more attractive investment climate (*Nasir and Hassan, 2011).* These factors are characterized by property rights protection, rule of law, the effective use of resources, the absence of violence, barriers and restrictive policies. These factors are what foreign investors are looking for when entering a host country. Moreover, all these elements have been taken into consideration in most investment decisions, and for this reason many developing countries have focused on promoting their institutional quality in order to benefit from FDI's advantages. Algeria is one of these countries that has a great desire to attract more FDI, which remains modest and is associated with weak political and economic institutional quality. Thus, this directed study aims to test the impact of institutional quality in attracting FDI inflows in Algeria over the period 1995-2011. For this purpose, the remainder of this paper is organized as follows:

Section 2 presents theoretical and empirical evidence on the impact of institutional quality in attracting FDI inflows, section 3 discusses foreign direct investment inflows, political and economic institutional quality in Algeria, section 4 introduces the data and econometric model, section 5 analyses the empirical results and finally section 6 concludes the paper.

2. Theoretical and Empirical Evidence on the Impact of Institutional Quality in Attracting FDI Inflows

2.1. The Impact of Political Institutional Quality in Attracting FDI Inflows

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010) define governance as "*The traditions and institutions by which the authority in a country is exercised*", also they introduced six worldwide governance indicators scaled between -2.5 and +2.5, where a higher score means better quality of institutions, and the simple average of these indicators can be considered as the best available proxy for political institutional quality (*Williams and Siddique, 2008; Singh, Jain-Chandra, and Mohommad, 2012; Alonso and Garcimartín, 2013*).

The six elements comprising the governance indicator positively influence the countries' ability to receive more FDI inflows as follows:

*<u>***Voice and Accountability:***</u> are responsible for providing a free investment climate from future violations of the foreign investors' rights (*Inter American Development Bank, 2001; Siddharthan, 2009*).

*<u>***Political Stability and Absence of Violence:***</u> these two factors ensure the continuity of MNCs' activities and FDI projects in the host countries (*Inter American Development Bank, 2001*), FDI is a long-term investment, and any kind of threat will impede the future return flow and this is not desired by foreign investors (*Fazio and Talamo, 2008*). Moreover, most multinational companies avoid FDI in cases of high political risk and move towards other forms of international business (*Meier, 2006*).

*<u>***Government Effectiveness:***</u> facilitates foreign investors' activity through the reduction of heavy bureaucracy, procedures and the overall time it takes for any agent to complete them (*Inter American Development Bank, 2001; OECD, 2002*).

<u>Regulatory Quality</u>: encourages the entry of foreign investors by eleminating market unfriendly policies such as price controls, government intervention, and restrictions on capital movement (*Fazio and Talamo, 2008*).

*<u>***Rule of Law:***</u> stimulates current decision making that maximizes the long-term value of assets, because future returns will be protected in the presence of the rule of law (*Hoff and Stiglitz, 2005*).

*<u>***Control of Corruption:***</u> corruption can be considered a form of taxation; it does not only reduce FDI inflows, but also contributes to changing the types of inward FDI (*Dunning, 1993*). Moreover, some bureaucratic regulations come as a result of widespread corruption and are not intended to correct market distortions or even protect investors (*Alam, Mian and Smith, 2006*). Also pervasive corruption leads to inefficient long term plans due to uncertainty, and causes an ambiguity about return predictability (*Sabri, 2008*). On the other hand, corruption can attract more foreign investors by reducing heavy bureaucracy and providing fast and efficient government services (*Méon and Sekkat, 2005; Swaleheen and Stansel, 2007*).

2.2. The Impact of Economic Institutional Quality in Attracting FDI Inflows

Many researchers argue that economic freedom reflects economic institutional quality (*Bengoa and Sanchez-Robles, 2003; Heriot, Theis andCampbell, 2008; Caetano and Caleiro, 2009; Pourshahabi, Mahmoudinia, and Soderjani, 2011; Nasir and Hassan, 2011; Subasat and Bellos, 2011*).

In 1995, Heritage Foundation and Wall Street Journal introduced the Index of Economic Freedom (which contains ten economic freedoms scaled from 0 to 100, where 100 represents maximum freedom) with a comprehensive definition of Economic Freedom as follows: "*All liberties and rights of production, distribution, or consumption of goods and services. The highest forms of economic freedom should provide an absolute right of property ownership; full freedom of movement for labor, capital, and goods; and an absolute absence of coercion or constraint of economic liberty beyond that which is necessary for the protection and* *maintenance of liberty itself* " (*Heritage Foundation, 2013*). Moreover, economic freedom is the main factor of the attractiveness of FDI, and a good illustration of economic freedom's importance requires scutinizing the impact of its 10 subcomponents as follows:

• ***Business Freedom*** eases the success of foreign investors by eleminating the excessive regulations and rigid bankruptcy procedures, and it's important to note that almost all multinational firms decide to invest in countries where it is easy to enter and exit from the market (*Heritage Foundation, 2013*).

• ***Trade Freedom*** has two opposite effects on inward FDI depending on the type of this investment. In other words, Horizontal FDI (*which is directed to the final consumption market*) is expected to decline with the rise of trade freedom that allows the entry of goods similar to those produced by foreign investors in this host country. In contrast, Vertical FDI (*which specializes in manufacturing the intermediate goods and semi-final products*) is supposed to rise with high trade freedom for its permanent need to import and export, also trade openness attracts both export-oriented and efficiency-seeking FDI (*Salism, 2004*). However, protectionist policies of host countries, such as trade restrictions, keep advanced-technology goods and services away from host countries (*Heritage Foundation, 2013*).

• ***Fiscal Freedom*** means more profits for foreign investors because a higher fiscal burden leads to lower revenues (*Serin and Caliskan, 2012; Meier, 2006*). Furthermore, fiscal policies reflect the government's budget,. For example, large deficits could lead to high taxes.

• ***Government Spending (Freedom from Government)*** affects inward FDI in two different ways. On one hand, excessive government spending generates crowding out effects that lead to a misallocation of resources and reduce the MNC's productivity. On the other hand, it contributes to the improvement of infrastructure and human capital, thus it constructs the necessary basis for FDI entry (*Heritage Foundation, 2013*).

• ***Monetary Freedom*** that curbs inflation and price instability makes foreign investors able to rely on market prices in the future besides doing other long-term planning such as savings and investments (*Heritage Foundation, 2013*).

• ***Investment Freedom*** induces the expansion of foreign investors'activitiy and drives it towards the appropriate directions characterized by high returns and low risks. Also, it encourages innovation and competition, and supports all types of foreign companies, including, of course, small firms (*Heritage Foundation, 2013*).

• ***Financial Freedom*** allows foreign investors to benefit from fair funding opportunities, the most efficient financial intermediation and real-time information on prices (*Heritage Foundation, 2013*). Additionally, these investors search for any financial incentive to minimize the cost of doing business (*Cohen, 2007*).

• ***Property Rights*** should be well protected by the host country's constitution, including securing full compensation in cases of expropriation, because these two elements make foreign investors feel safe (*Economic and Social Commission for Asia and the Pacific, 2003*). In addition, weak protection of property rights leads inward FDI towards distribution rather than production (*Dunning, 1993*).

• ***Freedom from Corruption*** helps foreign investors to avoid the undesirable costs resulting from widespread corruption, because they could be unaware of some unwritten rules (*Serin and Caliskan, 2012*).

• ***Labour Freedom*** eliminates restrictive labour policies that obstruct MNCs' activities, such as wage controls, hiring and firing restrictions. Moreover, freedom in the labor market is required just like freedom in the goods and services market (*Heritage Foundation, 2013*).

The quantitative impact of institutional quality on inward FDI has occupied the attention of researchers in last decades, and the table below summarizes the empirical studies that have investigated the effect of institutional quality on FDI inflows.

Table 1: *Empirical Evidence on the Impact of Institutional Quality in Attracting FDI Inflows*

Authors	***Sample***	***Empirical approach***	***Results***
Amal, M., Tomio, B.T., and R. Raboch, H. (2010)	Latin American countries 1996- 2008	Panel Data Analysis	Government effectiveness has a negative and significant impact on FDI inflows. In contrast, political stability has a positive and significant effect on inward FDI, while the other governance indicators appear with insignificant values.
Koen Berden, Jeffrey H. Bergstrand and Eva van Etten (2012)	28 OECD countries as source countries, 124 target countries 1997-2004	State-of-the-Art Gravity Specifications Motivated by the General Equilibrium Knowledge-and-Physical-Capital model, Traditional Gravity Equation, OLS Method	The inward FDI is significantly negatively affected by government effectiveness; also a higher level of 'voice and accountability' reduces the inward FDI.
Turan Subasat and Sotirios Bellos (2013)	18 Latin American countries 1985-2004	Panel Data Gravity Model	There is a negative and statistically significant relationship between all governance indicators and FDI inflows in selected Latin American countries.
Steven Globerman and Daniel Shapiro (2002)	144 countries 1995–1997	OLS Method, Heteroskedastic-Consistent Standard Errors	Both 'Voice and accountability' and 'Government effectiveness' contribute positively in rising FDI inflows.

Marta Bengoa, Blanca Sanchez-Robles (2003)	18 Latin-American countries 1970-1999	Cross Country and Panel Data Analysis	The host country's economic freedom is found to be a positive and statistically significant determinant of FDI inflows.
Steven Globerman, Daniel Shapiro and Yao Tang (2006)	138 countries 1995-2001	GLS Random Effects Estimation	Good governance increases FDI inflows.
Méon, P.G. and K. Sekkat (2007)	96 countries 1990-2000	Two-Stage Least Squares Regressions	'Voice and accountability' has a positive and statistically significant impact on the FDI to GDP ratio.
Kirk C.Heriot, John Theis and Noel D.Campbell (2008)	121 countries 1970- 2005	Pooled OLS	Higher levels of economic freedom attract more FDI inflows.
Murat M. Kenisarin and Philip Andrews-Speed (2008)	153 countries 1998-2004	Regression Correlations	Both governance indicator and economic freedom index positively influence the inward FDI.
José Martins Caetano and António Bento Caleiro (2009)	MENA countries+ EU countries 1999/2001- 2005/07	Fuzzy Logic Clustering	The inward FDI is positively associated with greater levels of economic freedom.
W.N.W. Azman-Saini, Ahmad Zubaidi Baharumshah and Siong Hook Law (2010)	85 countries 1976–2004	The Generalized Method-of-Moments (GMMs) Panel Estimator	Countries that promote economic freedom absorb more FDI's benefits.
Saeed Rasekhi and Zeinab Seyedi (2010)	10 developing countries 1995-2004	Panel Data Analysis, Fixed Effect Method	Economic liberalization positively affects the inward FDI.
Turan Subasat and Sotiris Bellos (2011)	24 target countries from Latin America 1985-2008	Panel Gravity Model	Economic freedom is considered as an essential determinant of FDI in the selected countries, but its effect cannot be generalised.
Nassima Debab, Ali Al Mansoor (2011)	Bahrain 1990-2009	OLS Estimation	The efficient environment characterized by higher levels of economic Freedom is likely to attract foreign investors.

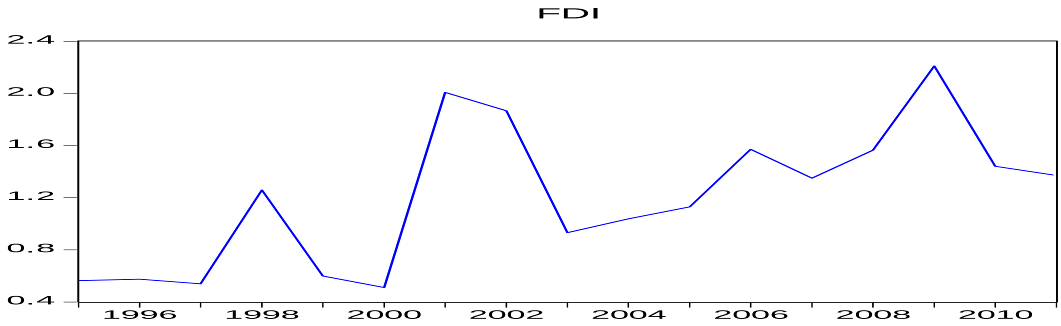
Zafar Mueen Nasir and Arshad Hassan (2011)	South Asian countries 1995-2008	Panel Data Analysis, Fixed Effects Model	There is a significant positive relationship between economic freedom score and FDI inflows.
Farshid Pourshahabi, Davoud Mahmoudinia and Ehsan Salimi Soderjani (2011)	OECD countries 1997-2007	Panel Data Method, Random Effect Estimation	Economic Freedom in OECD countries has an insignificant positive impact on inward FDI.
Kahai, Simran K. (2011)	55 developing countries 1998- 2000	Pooled OLS	The inward FDI is significantly positively related to the level of economic freedom.
Aviral Kumar Tiwari (2011)	28 Asian countries 1998-2007	Dynamic Panel Data Techniques	Positive correlation between FDI inflows and 4freedoms, namely (Business freedom, Fiscal freedom, Investment freedom, Trade freedom).
Dennis Pearson, Dong Nyonna and Kil-Joong Kim (2012)	50 US states 1984-2007	Random Effects Regression Model	FDI inflows move towards states that enjoy higher levels of economic freedom.
Ourvashi Bissoon (2012)	45 developing countries in the African, Latin American and Asian regions 1996-2005	OLS Estimation	The level of FDI inflows is significantly positively influenced by all governance indicators.
Yassaman Saadatmand, Jeremy Choquette (2012)	51 African countries 1998-2009	Panel Data Regression	Economic freedom discourages FDI inflows to the selected African countries.
Sedik, W. M. (2012)	MENA countries 1999-2010	Multiple Linear Regressions, Panel data Analysis, OLS Method	Government effectiveness has a positive and significant impact on FDI inflows. 'Voice & accountability' is significantly negatively related to the inward FDI.

Source : *Constructed By Authors*

3. Foreign Direct Investment Inflows, Political and Economic Institutional Quality in Algeria

3.1. *Foreign Direct Investment Inflows in Algeria*

Figure 1: FDI Net Inflows (*% of GDP*) in Algeria, 1995-2011.

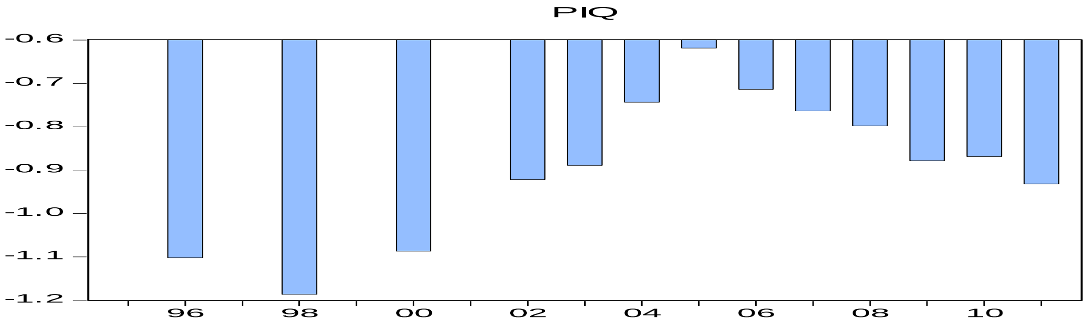


Source : World Bank, World Development Indicators, the data are available online at : http://data.worldbank.org (accessed 01/09/2013).

As is clearly visible in the graph above, Algeria has seen a slight increase in inward FDI. In the 80's, the entry of FDI was only allowed in the hydrocarbon sector. In the 90's, the Algerian economy received a small size of FDI inflows due to their weak political situation characterized by violence and instability. Thus this situation has prevented the arrival of foreign investors in all economic sectors (*OECD, 2006*). High oil prices have contributed to reducing foreign debts and improving the Algerian financial situation (*Darbouche, 2011*). In 2001, Algeria witnessed considerable FDI inflows, especially with the issuance of a new investment act which included a package of incentives, privileges and guarantees for foreign investors. Also, the economic recovery support programme launched in April 2001 has helped to attract more FDI inflows through the promotion of infrastructure (*Economist Intelligence Unit, 2007*). Moreover, Algeria has made several steps to ease doing business, such as the commercial law amendment, the reduction of tax burden and business registration procedures. Then, the inward FDI has decreased due to persistent problems such as high youth unemployment, rigid labor regulations, regulatory complexity, and high transaction costs resulting from complicated administrative procedures (*African Development Bank Group, 2011*). It rose again because of the stable business environment associated with its good financial situation, thanks to large oil revenues. Furthermore, the Algerian economy was less influenced by the 2008 global financial crisis compared to other countries.

3.2. ***The Political Institutional Quality in Algeria***

Figure 2: The Political Institutional Quality (*The Simple Average of Six Worldwide Governance Indicators)* in Algeria.

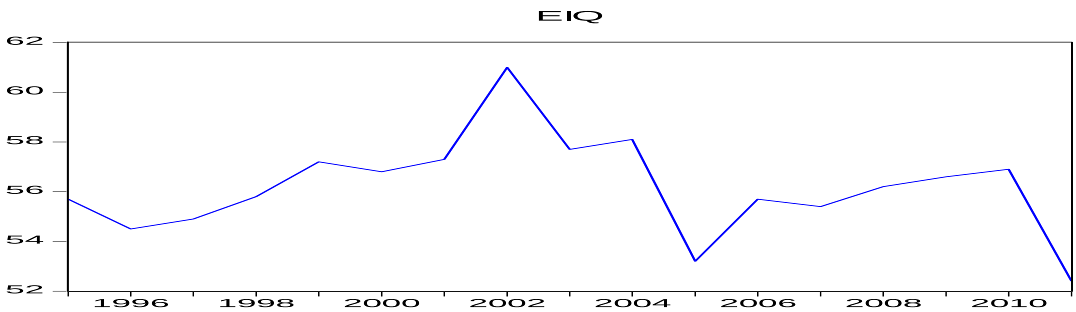


Source : World Bank Governance Indicators, the data are available online at : http://info.worldbank.org/governance/wgi/index.asp (accessed 01/09/2013).

This graph clearly shows that the political institutional quality in Algeria still occupied the negative field despite some reform efforts. The following reasons stand behind the long-standing institutional weaknesses: the past dark decade was characterized by extreme violence and social unrest, pervasive corruption, and a lack of economic diversification due to the great dependence on hydrocarbons sector. However, the Algerian government has made a few steps in order to revitalize the institutional environment, such as the repeal of the emergency law, some improvements in press freedom, and the expansion of participation in parliamentary elections (*Freedom House, 2013*). It is important to point out that the abundance of natural resources is often associated with weak institutional quality, but it encourages FDI inflows, because large MNCs also engaged in rent-seeking behavior (*Subasat and Bellos, 2013*).

3.3. ***The Economic Institutional Quality in Algeria***

Figure 3: *Economic Freedom Score in Algeria, 1996-2011.*



Source : Heritage Foundation's Index of Economic Freedom, the data are available online at : http://www.heritage.org/index/explore?view=by-region-country-year (accessed 01/09/2013).

Algeria's economic freedom has witnessed considerable fluctuations, and it receives a low ranking compared to most MENA countries for several reasons, such as expansionary government spending, inefficient business regulations, foreign ownership restrictions, restrictive trade barriers, an underdeveloped financial sector, an independent judicial system, and widespread corruption. It is important to note that the dominant hydrocarbons sector does not generate the incentives needed to open up the Algerian economy (*Heritage Foundation, 2013*).

4. Data and Econometric Model

This study aims to test the effect of institutional quality on FDI inflows in Algeria over the period (1995-2011) using the following variables:

FDI: represents foreign direct investment net inflows (*% of GDP*) from the World Bank's World Development Indicators (WDI).

PIQ: Political Institutional Quality, which is calculated as a simple average of the following six Worldwide Governance Indicators.

- ***VA:*** Voice and Accountability
- ***PSAV:*** Political Stability and the Absence of Violence
- ***GE:*** Government Effectiveness
- ***RQ:*** Regulatory Quality
- ***RL:*** Rule of Law
- ***CC:*** Control of Corruption

EIQ: Economic Institutional Quality proxied by Heritage Foundation's Index of Economic Freedom.

In order to investigate whether all the variables included in the model are cointegrated, the Johansen cointegration test (*which is based on two likelihood test statistics, namely the trace and the maximum eigenvalue statistics*) has been used. Then we employ a Vector Error-Correction Model (VECM) to examine the long-run and short- run dynamic relationships among the various time series. Moreover, both impluse response functions and variance decomposition have been applied for scrutinizing the restricted VAR model results, by using the Eviews 6.0 software package.

5. Analysis of Empirical Results

5.1. Phillips Perron Unit Root Test

	Level			First Difference		
	Intercept	**Trend & Intercept**	**None**	**Intercept**	**Trend & Intercept**	**None**
FDI	-2.536614 (-3.065585)	-4.818089* (-3.733200)	-0.417815 (-1.964418)	-7.005691* (-3.081002)	-7.690984* (-3.759743)	-6.293251* (-1.966270)
PIQ	-1.279678 (-3.065585)	-0.824648 (-3.733200)	-0.734504 (-1.964418)	-2.988866 (-3.081002)	-3.063073 (-3.759743)	-3.067656* (-1.966270)
VA	-1.413172 (-3.065585)	-1.681956 (-3.733200)	-1.146239 (-1.964418)	-4.066878* (-3.081002)	-5.542777* (-3.759743)	-3.899552* (-1.966270)
PSAV	-1.336998 (-3.065585)	-1.933000 (-3.733200)	-1.400882 (-1.964418)	-3.212299* (-3.081002)	-3.703104 (-3.759743)	-3.193157* (-1.966270)
RL	-1.582212 (-3.065585)	-1.201790 (-3.733200)	-1.019573 (-1.964418)	-3.783206* (-3.081002)	-3.556024 (-3.759743)	-3.826314* (-1.966270)
RQ	-0.401181 (-3.065585)	-0.375560 (-3.733200)	0.585136 (-1.964418)	-2.420845 (-3.081002)	-3.224423 (-3.759743)	-2.402046* (-1.966270)
GE	-1.809660 (-3.065585)	-1.823483 (-3.733200)	-1.539604 (-1.964418)	-4.172141* (-3.081002)	-5.951983* (-3.759743)	-3.784924* (-1.966270)
CC	-1.673457 (-3.065585)	-2.489671 (-3.733200)	-0.329867 (-1.964418)	-3.522329* (-3.081002)	-3.653570 (-3.759743)	-3.651100* (-1.966270)
EIQ	-2.336867 (-3.065585)	-2.162898 (-3.733200)	-0.481207 (-1.964418)	-4.969918* (-3.081002)	-5.088760* (-3.759743)	-5.088760* (-1.966270)

**indicates statistically significant at 5% level of significance.*
(Test critical values at 5% level of significance).

From the table above, the Phillips Perron test indicates that the null hypothesis of a unit root cannot be rejected for the following variables: FDI, PIQ, EIQ, because the PP value is greater than the critical t-value at 5% level of significance, hence, we can conclude that these variables are not stationary at their levels. Then again, after first differencing FDI, EIQ, the null hypothesis of a unit root in the PP test was rejected at the 5% significance level, so these variables are stationary at their first differences.

The Phillips Perron unit root test has been applied on the six elements comprising political institutional quality, because PIQ was found to be integrated of the order two, thus it is considered as an inappropriate variable for the Johansen cointegration test. According to the Phillips Perron test, GE and VA are stationary at their first differences, in contrast the other political variables are not integrated of the order one I(1).Thus, we can proceed to the long run cointegration analysis between FDI, EIQ, GE and VA by employing the Johansen cointegration test.

5.2. Trace and Max Eigenvalue Tests

The null hypothesis indicates 1 cointegrating equation has been accepted because both Trace and Max Eigenvalues are less than the critical values at the 5% significance level. Hence, it can be concluded that there is a long-run relationship between the following variables: FDI, EIQ, GE and VA **(*see appendix 1*)**.

5.3. Cointegrating Equation

FDI= 0.089223*EIQ - 18.49491*GE + 15.05337*VA **(*see appendix 2*)**

According to the cointegrating equation, EIQ and VA have the expected positive impact on FDI inflows to Algeria. In contrast, there is an unexpected negative relationship between inward FDI and government effectiveness.

5.4. Vector Error Correction Model

Most of the VAR lag order selection criteria suggested that 1 lag is the relevant lag length for the vector error correction model **(*see appendix 3*)**.

The table in appendix 4 does not show the probability value of all coefficients. For this reason we have estimated the VECM equation (*where FDI is a dependent variable*) using an OLS regression, because this method provides an obvious view about the significance of variables.

5.4.1. The Long Run Causality

The error correction term C (1) carries the expected negative sign, moreover it is significant at 5% level of significance, and this confirms the existence of a long run relationship between FDI, EIQ, GE and VA. In other words, there is a long-term impact of the explanatory variables included in the model on FDI inflows in Algeria **(*see appendix 5*)**.

5.4.2. The Short Run Causality

Government effectiveness has a significant positive impact on attracting FDI inflows in Algeria in the short term at the 10% significance level. In contrast, EIQ and VA have a negative short run effect on FDI, but EIQ's effect is insignificant at 5 % level of significance **(*see appendix 5*)**.

- ***The short run causality of economic institutional quality***

The probability value (0.4667) that accompanies the Wald Chi-square is greater than 0.05. Hence, the null hypothesis which indicates that EIQ doesn't cause FDI inflows in the short term has been accepted **(*see appendix 6*)**.

- ***The short run causality of government effectiveness***

The probalibity value (0.0243) that accompanies the Chi-square test statistic is less than 0.05. Thus, the null hypothesis can be rejected and GE has short run causality on inward FDI in Algeria **(*see appendix 7*)**.

- ***The short run causality of voice and accountability***

The probability value (0.0187) that accompanies the Chi-square test statistic is smaller than 0.05. Thus, the null hypothesis can be rejected and VA causes FDI inflows in the short term **(*see appendix 8*)**.

5.5. Diagnostic Tests of Vector Error Correction Model (VECM)

5.5.1. Heteroskedasticity Test: Breusch-Pagan-Godfrey

Breusch-Pagan-Godfrey test indicated that there is homoskedasticity because the Prob (CHi^2) = 0.8473 that accompanies the amount ($Obs*R^2$) is greater than 0.05 **(*see appendix 9*)**.

5.5.2. Heteroskedasticity Test: ARCH

ARCH test confirmed the absence of an ARCH effect as a result of accepting the null hypothesis (Prob (CHi^2) = 0.4190> 0.05) **(*see appendix 10*)**.

5.5.3. Breusch-Godfrey Serial Correlation LM Test

Prob (CHi^2) = 0.1996 is greater than 0.05. Therefore, the null hypothesis of no serial correlation cannot be rejected **(*see appendix 11*)**.

5.5.4. Jarque Bera Normality Test

According to Jarque Bera normality test, the residuals are normally distributed because Prob (Jarque Bera) = 0.7998 is greater than 0.05 which leads us to accept the null hypothesis **(*see appendix 12*)**.

All these diagnostic tests indicate that the Vector Error Correction Model is well specified.

5.6. Impluse Response Function of FDI, EIQ, GE, VA Relation (*see appendix 13*)

5.6.1. The Response of FDI to One Standard Deviation FDI Shock

A positive FDI shock causes a fall of 0.29 units in FDI inflows in the second year, then it rises slowly to reach its highest value of 0.50 units in the fourth year, after that it sees smooth fluctuations in the positive area.

5.6.2. The Response of FDI to One Standard Deviation EIQ Shock

By giving one positive EIQ shock, the inward FDI enters to the negative field with a value of -0.0097 units in the next second year, and witnesses a slight rise to 0.14 units in the third year but it falls again to -0.03 units in the fifth year,then it continues fluctuating around the zero line.

5.6.3. The Response of FDI to One Standard Deviation GE Shock

By giving one standard deviation GE shock, the inward FDI becomes negative for one-time during the ten years with a value of -0.01 units in the next second year, then it rises to its highest positive value (0.05 units) in the next fifth year, then it keeps fluctuating in the positive field.

5.6.4. The Response of FDI to One Standard Deviation VA Shock

A positive VA shock leads to rise FDI inflows by 0.26 units in the next third year, then it sees remarkable fluctuations in the positive area.

5.7. Variance Decomposition of FDI, EIQ, GE, VA Relation (*see appendix 14*)

The forecast error variance in FDI reaches 0.47 units in the first period, and then it sees a slight increase to 1.36 units in the tenth period due to the combination of the following independent variables: EIQ, GE, and VA.

In the short term (the second year), 98.48 % of the forecast error variance of FDI is explained by its own innovations, while only 0.029% of the innovations in FDI is due to EIQ, followed by GE (0.116%) and VA (1.366%) .

In the medium term (the fifth period), the variance decomposition of FDI shows that the innovations in FDI are largely explained by its own shocks (86.74%), 2.31% of EIQ's shocks, 0.53% of GE's shocks and 10.39% of VA's shocks.

In the long term (the tenth period) FDI's innovations explain almost 87.94 % of its forecast error variance while EIQ, GE and VA explain about 1.60%, 0.43% and 10.01% of the total variation, respectively.

These results reflect the major role played by FDI in explaining its forecast error variance. Although the ratios converge, VA's contribution is slightly more important than both EIQ and GE's contributions in interpreting the forecast error variance of FDI, especially in the long term.

6. Conclusion

In this paper we have analysed the impact of institutional quality in attracting FDI in Algeria over the period 1995-2011 using the following tests: Phillips Perron unit root test, Johansen cointegration test, vector error correction model, some diagnostic tests, impluse response functions and variance decomposition. The initial findings reveal that there is a long run relationship among the following variables: FDI inflows, economic institutional quality, (government effectiveness and voice and accountability that reflect the political institutional quality), according to the cointegrating equation, EIQ and VA have the expected positive impact on FDI inflows in Algeria. In contrast, government effectiveness negatively affects the inward FDI.

Furthermore, the vector error correction model (VECM) confirmed the existence of a long-run relationship between FDI inflows, EIQ, GE and VA. Moreover it suggested that government effectiveness has a positive and significant short run impact on FDI inflows at the 10% level of significance. On the other hand both EIQ and VA appear to have unexpected negative effects.

In the light of the results obtained from this study, it can be concluded that economic institutional quality and voice and accountability are essential factors in attracting FDI inflows to Algeria in the long term. Additionally, it is important to point out that the control of government actions in Algeria can reduce the violation of foreign investors' rights, and the improvement of Algerian economic freedom plays a vital role in reducing legislation that could hamper business productivity and profitability, increasing the freedom of dealing with the outside world, decreasing the tax burden and crowding out effects, and encouraging innovation and competition. Thus it is a priority to provide a good investment climate for FDI inflows.

References

African Development Bank (2011), "People's Democratic Republic of Algeria", *Dialogue Note 2011-2012, African Development Bank Group*.

Alonso, J.A. and Garcimartín, C. (2013), "The Determinants of Institutional Quality. More on the Debate", *Journal of International Development*; 25: 206.

Amal, M., Tomio, B.T., and R. Raboch, H. (2010), "Determinants of Foreign Direct Investment in Latin America", *GCG: Journal of Globalization, Competitiveness and Governability*, 4(3): 116–33.

Azman-Saini, W.N.W., Baharumshah, A.Z., and Law, S.H. (2010), "Foreign Direct Investment, Economic Freedom and Economic Growth: International Evidence", *Economic Modelling,* 27(5), 1079–1089.

Borensztein, E., De Gregorio, J., and Lee, J.W (1998), "How Does Foreign Direct Investment Affect Economic Growth?", *Journal of International Economics 45,* 115– 135.

Caetano, J.M. and Caleiro A.B. (2009), "Economic Freedom and Foreign Direct Investment: How different are the MENA countries from the EU? ", *Economics Working Papers no.02,* University of Évora, Department of Economics, Portugal.

Darbouche, H. (2011), "Algeria's Failed Transitions to a Sustainable Polity Coming to Yet Another Crossroads", *MedPro Technical Report N°7 October*.

De Mello, L (1999), "Foreign Direct Investment Led Growth: Evidence from Time Series and Panel Data", *Oxford Economic Papers 51,* 133– 151.

Dunning, J.H. (1993), "Multinational Enterprises and the Global Economy", *Wokingham: Addison-Wesley*.

Economic and Social Commission for Asia and the Pacific (2003), "Managing Globalization in Selected Countries with Economies in Transition", *United Nations Publications,* USA.

Economist Intelligence Unit (2007), "World Investment Prospects to 2011: Foreign Direct Investment and the Challenge of Political Risk", *Economist Intelligence Unit written with the Columbia Program on International Investment*.

Fazio, G., Talamo, G.M.C. (2008), "How Attractive is Good Governance for FDI?", in J. Jay Choi, Sandra Dow (ed.) , "Institutional Approach to Global Corporate Governance: Business Systems and Beyond", *International Finance Review,* Volume 9, Emerald Group Publishing Limited, pp.33-54.

Freedom House (2013), "Freedom in the World 2013", available online at: http://www.freedomhouse.org/report/freedom-world/2013/algeria (accessed 01/09/2013).

Heritage Foundation (2013), “2013 Index of Economic Freedom”, *The Heritage Foundation and Dow Jones & Company, Inc*, Washington, DC, USA.

Heriot, K.C., Theis J. and Campbell, N.D. (2008), “Foreign Direct Investment and Economic Freedom: An Empirical Investigation”, *Economy Jouranl , no.85*.

Hoff, K. and Stiglitz, J.E. (2005), “The Creation of the Rule of Law and the Legitimacy of Property Rights: The Political and Economic Consequences of a Corrupt Privatization”, *Policy Research Working Paper Series 3779*, Washington DC: The World Bank.

Inter American Development Bank (2001), “Competitiveness: The Business of Growth: Economic and Social Progress in Latin America”, *2001 Report, Research Department, Inter American Development Bank*, Washington D.C, USA.

Kahai, S. K. (2011), “ Traditional and Non – Traditional Determinants of Foreign Direct Investment in Developing Countries”, *Journal of Applied Business Research*, 20(1).

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010), “The Worldwide Governance Indicators: Methodology and Analytical Issues”, *Policy Research Working Paper no. 5430*, Washington DC: World Bank.

Koen Berden, Jeffrey H. Bergstrand and Eva van Etten (2012), “Governance, Globalization, and Selection into Foreign Direct Investment”, *ECORYS and Erasmus University*.

Marta Bengoa, Blanca Sanchez-Robles (2003), “Foreign direct investment, economic freedom and growth: new evidence from Latin America”, *European Journal of Political Economy Vol. 19 (2003) 529–545*.

Meier, L. (2006), “Factors Driving U.S Foreign Direct Investment”, *Washington University in ST. Louis, Center for Research in Economics & Strategy*, USA.

Méon, P.G. and K. Sekkat (2005), “Does corruption grease or sand the wheels of growth? ”, *Public Choice*, 122(1): 69–97.

Méon, P.G. and K. Sekkat (2007), “Revisiting the Relationship between Governance and Foreign Direct Investment”, *Brussels Economic Review – Cahiers Economiques De Bruxelle*s, VOL. 50 - N°1.

Pearson D., Nyonna, D. and Kim, K. (2012), “The Relationship between Economic Freedom, State Growth and Foreign Direct Investment in US States”, *International Journal of Economics and Finance*, 4(10).

Pourshahabi, F., Mahmoudinia, D., and Soderjani E.S. (2011), “FDI, Human Capital, Economic Freedom and Growth in OECD Countries”, *Research Journal of Internatıonal Studıes - Issue 19*.

Mohamed Adaya Salism (2004), “Foreign Direct Investment: Sub- Sahara Africa”, in Ying Qi Annie Wei, V.N Bela Subramanyam (ed.), “Foreign Direct Investment: Six Country Case Studies”, *Edward Elgar Publishing Limited*, UK.

Murat M. Kenisarin and Philip Andrews-Speed (2008), “Foreign direct investment in countriesof the former Soviet Union: Relationship to governance, economic freedom and corruption perception”, *Communist and Post-Communist Studies 41*,301-316.

Mushfiq us Swaleheen and Dean Stansel (2007), “Economic Freedom, Corruption and Growth”, *Cato Journal, Cato Institute*, vol. 27, issue 3, pages 343-358.

Nasir Z.M., and Hassan, A. (2011), “Economic Freedom, Exchange Rates Stability and FDI in South Asia”, *The Pakistan Development Review*, Pakistan Institute of Development Economics, 50(4), 423-433.

Nassima Debab and Ali Al Mansoor (2011), “Determinants and Impact of FDI on Bahrain’s Economy”, *Research Journal of Internatıonal Studıes*, Issue 21.

Nidal Rachid Sabri (2008),“Financial Markets and Instututions in the Arab Economy”, *NOVA Science Publishers*, New York, USA.

Nis Siddharthan (2009), “Determinants, Constraints and Impact of Foreign Direct Investment: India – China Comparison”, in Manmohan Agarwal (ed.), “India’s Economic Future: Education, Technology, Energy and Environment”, *Esha Beteille Social Science Press*, India.

OECD (2002), “New Horizons for Foreign Direct Investment, Global Forum on International Investment ”, *OECD Publishing*, France.

OECD (2006), “MENA-OECD Investment programme: investment climate and regulation of international investment in MENA countries”, *OECD Publishing*, France.

Ourvashi Bissoon (2012), “Can Better Institutions Attract More Foreign Direct Investment (FDI)? Evidence from Developing Countries”, *International Research Journal of Finance and Economics*, Euro journals publishing, pp. 59-70.

Quamrul Alam, Mohammed Emdad Ullah Mian, Robert F.I. Smith (2006), “The Impact of Poor Governance on Foreign Direct Investment : The Bangladesh Experience”, in Raza Ahmed (ed.), “ in, “The Role of Public Administration in Building A Harmounious Society”, *Asian Development Bank*, Network of Asia-Pacific Schools and Institutes of Public Administration and Governance, Philippine.

Romer (1993), “Iidea gaps in economic development”, journal *of monetary economics*, 2(3), 543-73.

Saadatmand, Y., Choquette, J. (2012), “Neo-Liberal Policy and Foreign Direct Investment in Africa”, *International Journal of Business and Social Science*, 3(17).

Saeed Rasekhi, Zeinab Seyedi (2010), “ An Examination of Economic Liberalization Impact on Foreign Direct Investment in Selected Developing Countries”, *Iranian Economic Review*, vol. 15, issue 1, pages 1-17.

Sedik, W. M. (2012), " The Impact of Country Risk and New Institutional Economics on Foreign Direct Investment: A Panel Data Analysis for Middle East and North Africa Region", *The 16th Meeting of the International Society for New Institutional Economics*, University of Southern California on June, 2012.

Stephen D. Cohen (2007), "Multinational Corporations and Foreign Direct Investment: Avoiding Simplicity, Embracing Complexity", *Oxford University Press*, USA.

Steven Globerman and Daniel Shapiro (2002), "Global Foreign Direct Investment Flows: The Role of Governance Infrastructure", *World Development Vol. 30*, No. 11, pp. 1899–1919.

Steven Globerman, Daniel Shapiro and Yao Tang (2006), "Foreign Direct Investment in Emerging and Transition European Countries ", *International Financial Review*, Vol. 6, pp.439-468.

Subasat, T. and Bellos, S. (2013), "Governance and Foreign Direct Investment in Latin America: A Panel Gravity Model Approach", Latin America Journal of Economics, 50(1), 107–131.

Subasat, T. and Bellos, S. (2011), "Economic Freedom and Foreign Direct Investment in Latin America: A Panel Gravity Model Approach", *Economics Bulletin*, 31(3), 2053-2065.

Serin, V. and Caliskan, A. (2012), "Economic Liberalization Policies and Foreign Direct Investment in Southern Europe", *Journal of Economic and Social Research* 12(2), 81-100.

Singh A., Jain-Chandra S., and Mohommad, A. (2012), "Inclusive Growth, Institutions, and the Underground Economy", *IMF Working Paper*, WP/12/47, Washington, D.C.

Tiwari, A.K. (2011), "Foreign Aid, FDI, Economic Freedom and Economic Growth in Asian Countries", *Global Economy Journal*, 11(3), Article 4.

Williams A., Siddique, A. (2008), "The Use (and Abuse) of Governance Indicators in Economics: A Review", *Economics of Governance* 9:2, 131-175.

Appendix 1: *Trace and Max Eigen Value Tests*

Sample (adjusted): 1997 2011
Included observations: 15 after adjustments
Trend assumption: Linear deterministic trend
Series: FDI EIQ GE VA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.941049	78.64645	47.85613	0.0000
At most 1	0.627968	23.36079	29.79707	0.2288
At most 2	0.233198	7.490330	15.49471	0.5214
At most 3	0.208502	3.507428	3.841466	0.0611

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob. **
None *	0.941049	42.46583	27.58434	0.0003
At most 1	0.627968	14.83161	21.13162	0.3009
At most 2	0.233198	3.982902	14.26460	0.8611
At most 3	0.208502	3.507428	3.841466	0.0611

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

Appendix 2 : *Cointegrating Equation*

Normalized cointegrating coefficients (standard error in parentheses)

FDI	EIQ	GE	VA
1.000000	-0.089223	18.49491	-15.05337
	(0.11010)	(1.73110)	(1.46497)

Adjustment coefficients (standard error in parentheses)

D(FDI)	-0.257224
	(0.08121)
D(EIQ)	-0.182223
	(0.30329)
D(GE)	-0.058984
	(0.01829)
D(VA)	0.027455
	(0.02777)

Appendix 3: *VAR Lag Order Selection Criteria*

VAR Lag Order Selection Criteria
Endogenous variables: FDI EIQ GE VA
Exogenous variables: C
Sample: 1995 2011
Included observations: 16

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-22.38216	NA*	0.000318	3.297770	3.490917*	3.307660
1	-5.440949	23.29416	0.000308*	3.180119*	4.145854	3.229572*

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

Appendix 4 : *Vector Error Correction Model (VECM)*

Vector Error Correction Estimates
Sample (adjusted): 1997 2011
Included observations: 15 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
FDI (-1)	1.000000
EIQ (-1)	-0.089223
	(0.11010)
	[-0.81035]
GE (-1)	18.49491
	(1.72110)
	[10.6529]
VA (-1)	-15.05337
	(1.46497)
	[-10.2756]
C	0.332053

Error Correction:	D(FDI)	D(EIQ)	D(GE)	D(VA)
CointEq1	-0.257224	-0.152223	-0.056954	0.027455
	(0.08121)	(0.30329)	(0.01529)	(0.02777)
	[-3.16749]	[-0.50052]	[-3.22568]	[0.98862]
D(FDI(-1))	-0.219599	2.848713	-0.024929	-0.032244
	(0.25280)	(0.94418)	(0.05692)	(0.08645)
	[-0.86866]	[3.01722]	[-0.43793]	[-0.37297]
D (EIQ (-1))	-0.048966	-0.636903	0.004119	-0.006309
	(0.06727)	(0.25123)	(0.01519)	(0.02300)
	[-0.72793]	[-2.53515]	[0.27121]	[-0.27429]
D (GE (-1))	3.409580	-3.105397	0.561253	-0.309427
	(1.51336)	(5.65203)	(0.34077)	(0.51754)
	[2.25299]	[-0.54943]	[1.64711]	[-0.59788]
D (VA (-1))	-2.962977	-5.759305	-0.497259	0.224277
	(1.26027)	(4.70679)	(0.28378)	(0.43099)
	[-2.35107]	[-1.22362]	[-1.75228]	[0.52038]
C	0.035881	-0.063529	0.015036	0.023290
	(0.12560)	(0.46909)	(0.02828)	(0.04295)
	[0.28568]	[-0.13543]	[0.53172]	[0.54223]
R-squared	0.627902	0.648017	0.580252	0.123407
Adj. R-squared	0.421182	0.452471	0.315947	-0.363555
Sum sq. resids	2.000499	27.90050	0.101432	0.233980
S.E. equation	0.471463	1.760602	0.106161	0.161231
F-statistic	3.037441	3.313853	2.232281	0.253405
Log likelihood	-6.174176	-25.92942	16.15904	9.920544
Akaike AIC	1.623223	4.256590	-1.355539	-0.522779
Schwarz SC	1.906444	4.541810	-1.075319	-0.232559
Mean dependent	0.053006	-0.140000	0.019308	0.016976
S.D. dependent	0.619693	2.379518	0.128358	0.138073

Appendix 5: *Vector Error Correction Model (VECM) using Least Squares Method*

Dependent Variable: D(FDI)
Method: Least Squares
Sample (adjusted): 1997 2011
Included observations: 15 after adjustments
D(FDI) = C(1)*(FDI (-1) - 0.0892234722068*EIQ (-1) + 18.4949137283*GE(
-1) - 15.0533709327*VA (-1) + 0.33205264539) + C(2)*D (FDI (-1)) +
C(3)*D (EIQ (-1)) + C(4)*D (GE (-1)) + C(5)*D (VA (-1)) + C(6)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.257224	0.081207	-3.167492	0.0114
C(2)	-0.219599	0.252801	-0.868664	0.4076
C(3)	-0.048966	0.067268	-0.727933	0.4852
C(4)	3.409580	1.513359	2.252987	0.0508
C(5)	-2.962977	1.260267	-2.351071	0.0432
C(6)	0.035881	0.125602	0.285676	0.7816

R-squared	0.627902	Mean dependent var	0.053006
Adjusted R-squared	0.421182	S.D. dependent var	0.619693
S.E. of regression	0.471463	Akaike info criterion	1.623223
Sum squared resid	2.000499	Schwarz criterion	1.906444
Log likelihood	-6.174176	Hannan-Quinn criter.	1.620207
F-statistic	3.037441	Durbin-Watson stat	2.002381
Prob(F-statistic)	0.070363		

Appendix 6: *The Short run Causality of Economic Institutional Quality*

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	0.529886	(1, 9)	0.4852
Chi-square	0.529886	1	0.4667

Appendix 7: *The Short run Causality of Government Effectiveness*

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	5.075952	(1, 9)	0.0508
Chi-square	5.075952	1	0.0243

Appendix 8: *The Short run Ccausality of Voice and Accountability*

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	5.527536	(1, 9)	0.0432
Chi-square	5.527536	1	0.0187

Appendix 9: *Breusch-Pagan-Godfrey Test*

F-statistic	0.282840	Prob. F(8,6)	0.9484
Obs*R-squared	4.107702	Prob. Chi-Square(8)	0.8473
Scaled explained SS	0.967625	Prob. Chi-Square(8)	0.9984

Appendix 10: *ARCH Test*

Heteroskedasticity Test: ARCH

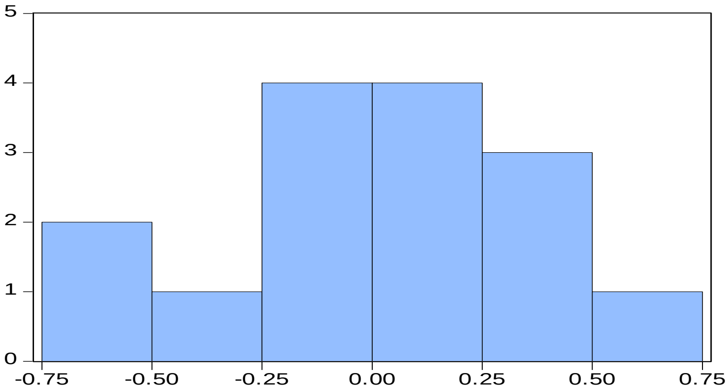
F-statistic	0.587281	Prob. F(1,12)	0.4583
Obs*R-squared	0.653194	Prob. Chi-Square(1)	0.4190

Appendix 11: *Breusch-Godfrey Serial Correlation LM Test*

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.985580	Prob. F(1,8)	0.3499
Obs*R-squared	1.645270	Prob. Chi-Square(1)	0.1996

Appendix 12: *Jarque Bera Normality Test*

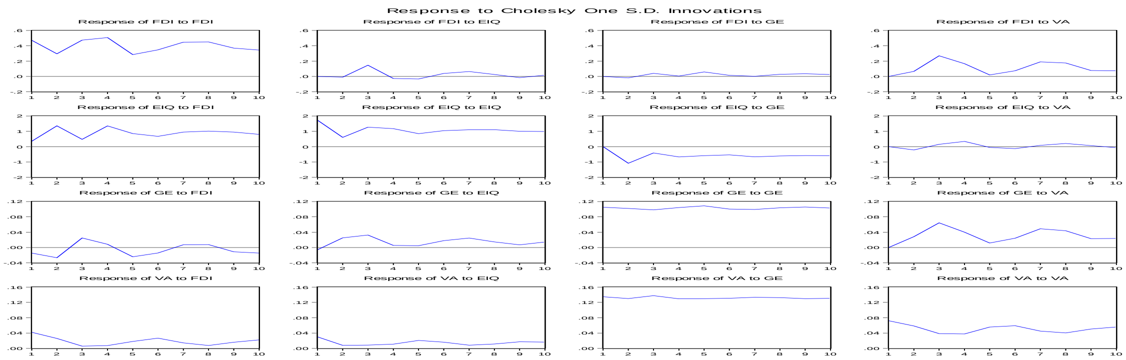


Series: Residuals
Sample 1997 2011
Observations 15

Mean	-4.26e-16
Median	0.005168
Maximum	0.644025
Minimum	-0.693031
Std. Dev.	0.378012
Skewness	-0.243303
Kurtosis	2.308686
Jarque-Bera	0.446688
Probability	0.799840

Appendix 13: *Impluse Response Function of FDI, EIQ, GE, VA Relation*

Response of FDI: Period	FDI	EIQ	GE	VA
1	0.471463	0.000000	0.000000	0.000000
2	0.295292	-0.009706	-0.019105	0.065519
3	0.473205	0.146112	0.039965	0.268667
4	0.506125	-0.027130	0.004524	0.165782
5	0.284907	-0.033120	0.058522	0.018939
6	0.346337	0.038898	0.013683	0.074355
7	0.447014	0.063937	0.002127	0.189498
8	0.449606	0.025713	0.028096	0.174810
9	0.368777	-0.015998	0.035280	0.076819
10	0.343342	0.016038	0.024302	0.072787



Appendix 14: *Variance Decomposition of FDI, EIQ, GE, VA Relation*

Variance Decomposition of FDI: Period	S.E.	FDI	EIQ	GE	VA
1	0.471463	100.0000	0.000000	0.000000	0.000000
2	0.560559	98.48772	0.029983	0.116158	1.366139
3	0.795788	84.22813	3.386012	0.309845	12.07601
4	0.957957	86.03873	2.416842	0.216050	11.32838
5	1.001865	86.74942	2.318928	0.538741	10.39291
6	1.063443	87.60033	2.191938	0.494711	9.713025
7	1.170784	86.85148	2.106670	0.408486	10.63337
8	1.266843	86.77537	1.840503	0.398073	10.98605
9	1.322229	87.43672	1.704180	0.436617	10.42249
10	1.368327	87.94071	1.605027	0.439238	10.01502