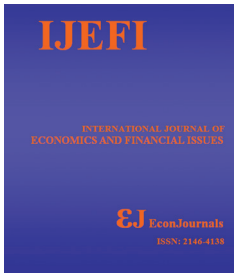

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The Impact of Foreign Direct Investment on the Economic Growth of Egypt (1980-2018)

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ABSTRACT

Many developments had occurred in the global economy. Among these developments is the increase of capital flows across countries. Foreign direct investment (FDI) is considered to be one of the cross border capital flows that countries use in order to enhance their economic growth. This study focuses on how FDI impacts the economic growth of Egypt for a period from 1980 to 2018. The study applies Johansen co-integration, Vector Error Correction Model (VECM) and Ganger causality in the methodology. Johansen co-integration results show that a long run relationship exists among the variables. In addition, VECM shows that FDI exerts a positive significant impact on the economic growth of Egypt. Finally, a bidirectional causality between FDI and the economic growth of Egypt is shown by Granger causality.

Keywords: Foreign Direct Investment, Economic Growth, Johansen Co-integration, Vector Error Correction Model, Granger Causality Test
JEL Classifications: C32, F6, F21, O11, O16

1. INTRODUCTION

The word international became very important to everyone recently. Countries are trying to adapt to the international changes by modifying their structures and developing their strategies. Two main drivers behind these changes; the evolution of globalization and the existence of regional agreements (Calitoiu, 2011).

Financial globalization is considered to be among the most significant developments that occur in the global economy, where the movement of capital became more mobile than it was ever in the past. It is one of the globalization types that existed since the mid of 1980s, where a wave of an increase in the financial flows between industrial countries and with developing countries as well had emerged. This trend arose as a result of liberalizing the capital controls to grab the advantages that might arise from the financial flows across countries, which help economies to share risk and to better allocate their capital. However, some developing countries might face adverse effects from the cross border financial flows more than the developed as they are more sensitive to any crises or disruptions (Kose et al., 2006).

The cross border capital flows could be in the form of foreign direct investment (FDI), portfolio equity or debt flows. However, the most stable form is the FDI, while portfolio equity and debt flows are volatile (Poelhekke, 2016). Prasad et al (2003) also stated that the global capital flows are composed into portfolio flows and bank borrowing that are more volatile than the foreign direct investment component.

Foreign direct investment reflects investing directly in the activity of business to enhance production which can be achieved through setting up a factory or buying equipment for example. It helps in boosting the domestic productivity which in turn would derive economic growth (Winona and Nuzula, 2016). FDI is one of the main factors that drives economic integration among countries,

improves economic growth, increases the financial stability and enhances the social welfare (Nguyen et al 2019). Therefore, the aim of this study is to examine how foreign direct investment impacts the economic growth of Egypt from 1980 to 2018.

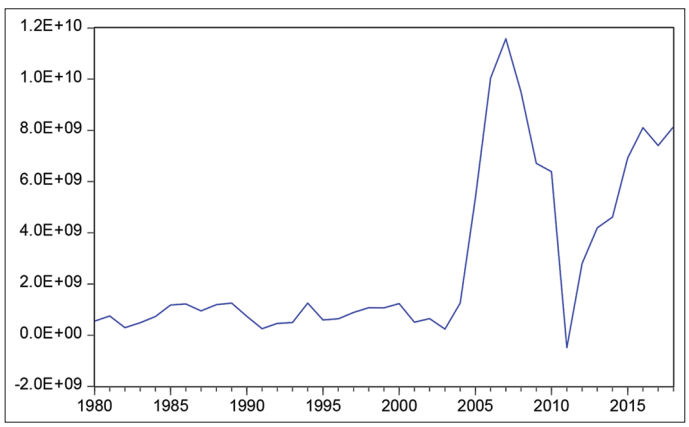
As shown in the Figure 1, the trend of foreign direct investment from 1980 till 2018 in Egypt is not following a specific pattern where it is sometimes increasing and sometimes decreasing sharply. Reasons behind high or low levels of FDI is shown in the following paragraphs.

Since the adoption of the open door policy in 1974, Egypt was trying to enhance the economic performance via higher levels of investments. FDI levels were increasing when adopting laws in the open door policy but it began to decline later when the Gulf war arose in 1990-1991. On the other hand, in the 1990s Egypt established a program that would derive stability, called Economic Reform and Structural Adjustment Program (ERSAP). It focused on foreign direct investment as a main source of capital where an increase in FDI appeared from 1991. Moreover, Egypt enacted an investment law in 1997 that encouraged both domestic and foreign private investments by offering some privileges and exemptions. Also, the government privatize some sectors in the economy which increased FDI from $636 million to $1.23 billion in 2000. However, 11th of September attack in 2001 adversely affected the FDI in Egypt. The government carried out other reforms in 2004 to encourage investment and focused more on foreign direct investment attraction (Hanafy, 2015).

On the other hand, the 2008 global financial crises highly affected the financial markets of countries across the globe (Mansour, 2011). CBE (2009) published that the foreign direct investment declined approximately by 34%. Moreover, FDI continued to fall till the 2011 revolution where it encountered a very sharp decline by 67.6%. After that FDI was recovering, at which it grew from $2.2 billion in 2011 to $13.7 billion in 2019 (CBE, 2011; CBE, 2019).

The remainder of this study is organized as follows: section two focuses on the literature review which explains first the growth theories and then the previous studies related to the FDI-growth relationship, section three focuses on the data and methodology employed in the study including the collection methods, model used and statistical techniques proceeded. After that, the results are explained in section four followed by the conclusion and recommendations in section five.

Figure 1: FDI in Egypt



2. LITERATURE REVIEW

This section is split into two sub-sections: the first illustrates different growth theories and the second focuses on the previous studies carried out on the relationship between foreign direct investment and economic growth.

2.1. Growth Theories

Economic literature devoted much efforts regarding growth. Models and theories of growth were developed over time and their relationship with analyzing the economies, detecting the different economic development stages and the continuous changes that occur in countries over time. Economic theories became a very important part in economic science (Popa, 2014).

2.1.1. Classical growth theory

Classical economics was derived on the early beginning by Adam Smith. David Ricardo (1772-1823), Jean-Baptiste Say (1767-1832), John Stuart Mill (1808-1873) and others contributed to the classical economics as well (Sharipov, 2015).

Smith (1776) clarified that trade is the maim driver behind the nations' wealth. He stated that the process of exchanging valued products between any two parties reflect profit and thus increases the overall wealth. The author added that improving the factors of production's (including; land, labor and capital) output increases also the overall wealth and thus affecting the productivity of labor and capital size positively.

Rostow and Kennedy (1990) summarized what David Ricardo (1772-1823) concluded regarding the classical theories. The authors stated that Ricardo added to the classical theories what is called comparative advantage theory, which gives recommendations to nations to devote all their efforts on products that are competitive worldwide and trade others that are not produced locally anymore. Ricardo added that introducing technological innovations would decrease demand on labor.

Regarding what John Stuart Mill (1808-1873) added to the classical theories, a summary of the previous studies was prepared and called "Classics". John Stuart systemized the classical economics, where accumulating capital in a continuous trend might cause an increase in the demand of labor. Moreover, Stuart added that an increase in wages occur as a result of constant population which in turn would trigger the growth in population on the long run (Sharipov, 2015).

2.1.2. Neo-classical growth theory or exogenous theory (Robert M. Solow's growth model)

Most of the studies that applied research about growth focused on the Neo-Classical Growth Theory. Many scholars studied this theory such as Leon Walras (1834-1910), Alfred Marshall (1842-1924), Irving Fisher (1867-1947) and others. It was developed in the late 1950s and 1960s (Sharipov, 2015).

One of the most important authors who contribute significantly to the neo-classical growth theory is Robert Solow. This theory mainly focuses on the capital accumulation process along with the decisions taken for savings, which are considered to be an important cause for economic growth. Labor and capital are the two factors of production that Solow's (1956) growth model considered as causes of output. Furthermore, technology was added to the production function as an exogenous factor. If technological progress is absent, then income will decrease ceasing the economic growth as well. Also, the growth model highlighted the importance of savings and capital investment, workforce and technical progress (such as, improving the organization and the production scale) to encourage economic growth[1].

In addition, Solow's hypothesis stated that the capacity of an economy could be increased if some of its resources were saved for the future and thus could be utilized to build more. Also, the author added that the transfer of capital, knowledge and labor from rich countries to poor countries helps in enhancing their economic growth.

Popa (2014) stated that the Neo-Classical Growth Theory explains how the economy is affected by both capital accumulation and changes in technology. In addition, the theory has some features such as; a) it considers labor as well as capital as the two factors of production, b) the type of competition in the market that is practiced in perfect competition, c) a relationship exists between economic and population growth rates, d) constant returns exist throughout the factors and e) marginal returns decline for both factors.

2.1.3. Keynesian and post-Keynesian (neo-Keynesian) growth theories

Many scholars studied both Keynesian and Post-Keynesian theories of growth, such as John Maynard Keynes (1883-1946), Roy Harrod (1900-1978), Nicholas Kaldor (1908-1986), Evsey Domar (1914-1997) and others. John Maynard Keynes developed a theory called "The General Theory of Employment, Interest and Money" which was considered to be the base for the following presented theories. All Keynesian theories have two main assumptions. The first is that higher aggregate demand would increase economic growth. The second is that investment drives economic growth as well, at which higher investment brings higher income and thus higher economic growth. However, other factors of production are not considered (Sharipov, 2015).

Keynes (1936) developed a theory stating that economic growth can be fostered by the existence of effective aggregate demand. The author added that in cases of recession, unemployment increases and people's income decreases. As a result, this will cause adverse effects on consumption, savings and investment. So the overall aggregate demand will decline and thus declining the economic activity as well. The author suggested that government intervention should exist in times where leverage is not available and thus conducting macroeconomic policies might help in raising the aggregate demand to stimulate the activities of businesses in the economy. Furthermore, the author clarified these intervention policies especially in times of market turbulence such as that of the Great Depression by inducing market participants to invest. This can be implemented via two ways; using monetary policy by decreasing interest rates or using fiscal policy by increasing governmental investments for example in infrastructure which would increase the employment levels by offering more job opportunities and thus increasing demand as well.

Keynesian theory focused on the short run, while Neo-Keynesian or Post Keynesian extended it and included the long run as well. Evsey Domar and Roy Harrod were the main economists behind the post Keynesian theory. Evsey Domar (1914-1997) focused on investment. The author argued that investment factor does not only increase income, but also encourages production which increases revenue and thus the economic growth (Sharipov, 2015).

Harrod (1939) added to the theory that the economic growth depends on income, investment and savings and on the analysis of entrepreneur's expectations as well. This could be clarified such that if the actual growth rate (rate of growth in productivity of both labor and capital) matched the expected one, then the economy will have the potential to grow faster.

Sharipov (2015) stated that Domar and Harrod reached the same conclusion and thus a theory called Harrod-Domar was revealed. On the other hand, their theory had some limitations. They did not mention the reasons behind their concluded theory analysis, where a linear relationship exists between investment and economic growth, no relationship exists between the higher rate of growth in using labor and economic growth and that advances in technology was not taken into account for initiating the theory. Furthermore, Harrod-Domar theory could be applied for the historical periods (1930s and 1940s), but technological innovations began to appear in 1950s and forward at which the neo-classical theory took into consideration as mentioned above.

2.1.4. Endogenous growth model

Among the well-known contributors to the growth theories are Paul Romer and Robert Lucas, who grabbed the attention towards mentioning what is called "new growth theory." This theory endogenize the technical progress as a cause for growth where internal factors are the main drivers. The authors highlighted that investment in technological innovations and human capital would foster growth. Moreover, the theory was constructed by taking into account technological innovation mathematical explanation (Sharipov, 2015).

To compare this theory to the neo-classical theory, the author argued that the government was not able to affect the economic

1 Solow clarified this by stating that the higher level of savings means higher capital and thus higher level of investments which increases production. Furthermore, higher growth levels of employees drives economic growth but only when the economy is stable. If higher growth rates for employees do not increase investment levels, then the capital stock for each worker is declined which in turn decreases the levels of income. Regarding the third reason for economic growth which is technical progress, it means offering higher levels of education to workers, increasing the scale of production and improving the organization which would result in higher production. On the other hand, technical progress does not require companies to replace workers with machines.

growth except through their impact on the level of savings. However, the endogenous growth theory requires positive externalities as an important driver for economic growth. It exploits the governmental intervention to enhance their development process. Furthermore, endogenous growth theory does not depend only on the technological progress in improving the economic growth. However, it depends on several factors such as; investing in human capital such as health and education, exploiting the government's role in offering better climate for investment and encouraging advances in technology, taking the advantage of the support of the state in developing both science and technology and creating the prerequisite for property rights' protection in cases of imperfect competition.

Two main groups could define the endogenous theories. The first focused on investing in human capital to drive economic growth. A new perspective was added by both Romer (1989) and Lucas (1988) at which human capital, knowledge and skills increases productivity and creativity of workers. The theory assumed that anyone can access the information regarding any invention or discovery. The authors added that consumption today can be used to gain knowledge and expand consumption tomorrow. Therefore, human capital accumulation could foster economic growth. In addition, engaging in trade with foreign countries would increase the probability of exchanging ideas, information and knowledge which drives economic growth as well.

Sharipov (2015) summarized the second group of the endogenous theories which was conducted by J. Grossman and E. Helpman. It focused on subsidies allocated towards Research and Development (R and D) that would result in higher economic growth. Furthermore, the author summarized what P. Aghion and P. Howitt added, where technological progress could be enhanced when higher level of competition exist in the market. Firms would come up with new innovation in technology and new products which makes production more efficient and thus maintaining higher levels of economic growth.

2.2. Foreign Direct Investment and Economic Growth

Basu (2003) stated that the nexus of FDI-Growth has been one of the most important topics that has been studied over the past years. FDI helps economies to increase production, employment, transfer of new technology (VO and Zhang, 2019) and increases competition (Denisia, 2010). Some authors argued that FDI impacts countries' economic growth positively (Shaari et al., 2012; and Hetes et al., 2009), while others argued that no relationship exists among FDI and economic growth (Athukorala and Karunarathna, 2004; Ousseini et al., 2011; Konings, 2001).

Dinh et al. (2019) assessed the relationship for both short run and long run periods among FDI and 30 lower middle income developing countries' economic growth for a period ranging from 2000 to 2014. The authors chose this period to show if the global financial crises exert an effect over this relationship. The dependent variable used was the real GDP per capita. FDI, money supply, financial development, total domestic investments and human capital were used as independent variables. After checking for the stationarity of data and multicollinearity, the authors used Johansen co-integration test which showed an existence of long run relationship between the studied variables. Then the authors used Vector Error Correction Model (VECM) to test the short run relationship and its direction. Moreover, a Fully Modified Least Squares Estimation (FMOLS) was used to detect the long run estimates between the variables. Finally, the authors concluded that a negative impact of lagged FDI for one and two periods on the economic growth exists in the short run. On the other hand, in the long run a positive impact occurs. The authors recommended that policies should be made to encourage FDI in order to improve economic growth in the long run. These results could be supported by (Koojaroenprasit, 2012; Shahbaz and Rahman, 2010).

Tabassum and Ahmed (2014) stated that FDI shares for greater than half of the cross border capital flows. The authors used a multiple regression analysis to test the impact of FDI, trade openness and domestic investment on the economic growth of Bangladesh for a period ranging from 1972 till 2011. They concluded that a positive insignificant relationship occurs among FDI and trade openness and the economic growth of Bangladesh. However, a significant positive relationship exists among domestic investment and the economic growth of Bangladesh.

Chakrabarti (2001) argued that economic growth could be influenced by FDI into two different channels; direct and indirect. The direct channel means that the higher the foreign direct investment, the higher will be the production, exports and employment which in turn will add value to the country. Higher employment means higher income and thus this will be reflected in the GDP of the country. On the other hand, GDP can be affected indirectly by FDI. The more the FDI, the more the sharing of knowledge, technology and thus the higher the productivity and efficiency which in turn will increase the GDP. Behname (2012) investigated FDI and economic growth in Southern Asia for a period ranging from 1977 to 2009. The author used two models; the first includes the real GDP as a dependent variable and FDI as an independent, while the second model includes the opposite. The author included some other variables such as population and trade and inflation as control variables. As a conclusion, it was found that the FDI significantly exerts a positive impact on the real GDP of the Southern Asian countries. The author explained this effect by stating that the higher the FDI, the higher the aggregate demand which reflects higher domestic output. Furthermore, the other way around (model 2) revealed a positive impact of economic growth on FDI. The author stated that when a country has a booming economic growth, this would attract foreign investors to invest in it. This could be supported by Basu (2003) who revealed that in 23 developing countries, a bidirectional causality among FDI and economic growth exists from 1978 till 1996.

Furthermore, Klasra (2011) studied how both FDI and trade openness impact the economic growth in Turkey and Pakistan. Examining the factors that foster economic growth had been the focus of many scholars and policy makers. However, mixed results were reached and thus the author tried to re-investigate the effect of liberalizing the restrictions on trade and investment through FDI and trade openness on the economic growth in both Turkey and Pakistan. Both countries were trying to enhance development

in their economies via applying some reforms since 1980s. For instance, Pakistan had loosen restrictions on trade by decreasing tariffs. Turkey allowed the existence of international trade and decreased the capital controls.

The author used GDP as the dependent variable, while FDI, exports and trade openness were employed as independent variables. The study covered the period ranging from 1975 till 2004. As usual, ADF and PP tests were used with the purpose of stationarity check. In addition, an ARDL model was applied to check whether a long run relationship between the studied variables exists or not. After that, Granger causality was used to determine the causality's direction. The results showed the following; (a) in Pakistan, FDI and economic growth have a significant long run relationship but for Turkey the results were insignificant, (b) for both Turkey and Pakistan, trade openness and economic growth have a significant long run relationship, (c) a significant long run relationship existed between economic growth and exports in Turkey but it was insignificant for Pakistan, (d) in Pakistan a bidirectional causality existed among exports and trade openness and in Turkey, it existed among exports and FDI.

Ilgun et al. (2010) studied the economic growth-FDI nexus in Turkey. They stated that no consensus exists regarding the FDI's impact on countries' economic growth and that's why they held this study. They added that scholars did not only focus on the relationship among the economic growth and FDI, but also the direction of causality between them. The reason behind the importance of this study emerged from the benefits associated with FDI, where unemployment decreases by offering job opportunities in the domestic country, it fills the gap of technology and capital between developing and developed countries (Sala-i-Martin, 1996) and increases the profits of multinational corporations.

GDP annual growth rate was used as the dependent variable. Annual FDI inflows, labor force, gross fixed investment and the balance of payment were used as the independent variables. Data were gathered for a period ranging from 1980 till 2004. Unit root test (ADF) was used to determine whether the data was stationary or not. In addition, VAR and Granger Causality models were used in the methodology. The authors reached a conclusion at which a positive relationship existed among FDI and Turkey's economic growth. Furthermore, a bidirectional causality existed, where FDI granger causes economic growth in Turkey and vice versa. This supported Ozturk and Kalyoncu (2007) who clarified the reason behind this bidirectional causality, where FDI causes an increase in the country's capital which in turn increases production. The other way around reflects that higher levels of production attract foreign investors which in turn enhances FDI.

Moudatsou (2003) argued that FDI impacts economic growth through capital formation, productivity and institutional features. First, through capital formation means that the inflows of the FDI increases capital which is considered to be one of the GDP determinants and a source of finance as well. Second, through productivity means that the more the FDI the more will be the productivity and thus higher exports will occur which in turn will affect growth positively. Third, through institutional features which means that these features such as legal system can affect the inflows of FDI and thus economic growth will be affected as well. In addition, the author stated that FDI is different from other capital sources such as portfolio equity, bank loans or debt as it internalizes the savings of foreign investors and uses it as a method of investment.

Furthermore, the author examined how FDI affects the economic growth of 14 countries in the European Union. The study covered a period of 16 years from 1980 till 1996. Rate of growth was used as a dependent variable, FDI inflows, FDI inflows lagged for one period, trade as a percentage of GDP, education, capital formation and interaction between FDI and education were used as independent variables. Regression analysis was used for each separate country and also pooled for all countries together. Moreover, Granger causality was used to determine the bidirectional effect between variables. Finally, the author concluded that economic growth is positively affected by FDI. Also, it was concluded that the current FDI is affected by the lagged FDI.

3. DATA AND METHODOLOGY

This section includes the research model used in the study with a brief explanation for the variables. In addition, the data collection method is clarified. Finally, this section explains the methodological techniques used to address the study's aim which include, unit root tests (ADF and PP), Johansen Co-integration, Vector Error Correction Model and Granger Causality.

3.1. Research Model

$$RGDP_{it} = \beta 0_{it} + \beta 1FDI_{it} + \beta 2TO_{it} + \beta 3FD_{it} + \beta 4INF_{it} + \beta 5INT_{it} + \beta 6EX_{it} + \varepsilon_{it} \quad (1)$$

Where;

RGDP is Real Gross Domestic Product per Capita for Egypt at period t

β is the coefficient

FDI is Foreign Direct Investment for Egypt at period t

TO is Trade Openness for Egypt at period t

FD is Financial Development for Egypt at period t

INF is Inflation Rate for Egypt at period t

INT is Interest Rate for Egypt at period t

Ex is Exchange Rate for Egypt at period t

ε is the error term.

3.2. Variables' Description

3.2.1. Dependent variable

The dependent variable is Real GDP per capita (RGDP) as a proxy for economic growth of Egypt. It is measured by the ratio of real GDP to mid-year population.

3.2.2. Independent variable

Foreign Direct Investment (FDI) is used as the independent variable. It is measured by the total equity capital, earnings' reinvestments, and other capital.

3.2.3. Control variables

Control variables include, Trade Openness (TO) which is calculated by the ratio of total imports and exports to GDP. Financial Development (FD) measured by an index formed by the International Monetary Fund (IMF). It measures how efficient, stable, deep and easiness of accessibility for both financial institutions and financial markets. The index was created for 183 countries. Banks, mutual funds, insurance companies and pension funds are examples of financial institutions. While, stock market and bonds market are examples of financial markets. If depth, access and efficiency exist, then financial development exist as well. Depth reflects the size and liquidity of the market. Access reflects the extent to which companies and individuals can reach the financial services. Efficiency reflects the extent to which institutions offer low cost financial services and gain sustainable profits, and the level of activity in the market (Svirydzenka, 2016).

Interest Rate (INT) is the lending interest rate less inflation (Neely and Rapach, 2008). Inflation Rate (INF) means an increase in the price level continuously (Bozkurt, 2014). It is measured by calculating the rate of growth of GDP implicit deflator annually which reflects the change in prices of the whole economy. Finally, Exchange Rate (EX) is the rate that is determined by the state authorities. It is measured by calculating a yearly average based on monthly averages (domestic currency units relative to the U.S. dollar).

3.3. Data Collection

In this study, secondary annual time series quantitative data are collected from 1980 to 2018 on Egypt. Real GDP per capita, foreign direct investment, trade openness, interest rate, inflation rate and exchange rate are collected from the World Bank database. Financial development is collected from the International Monetary Fund.

3.4. Methodology

3.4.1. Unit root test

Unit root tests are carried out for the purpose of determining whether the time series data are stationary or non-stationary before identifying if a long run relationship between the examined variables exists or not. If the series has restricted variance, stable mean, tend to return to the equilibrium mean value and have l (0) which means zero order of integration, then the series is considered to be stationary. However, if the series is non-stationary which means that unstable mean and covariance exists, then it should be differenced to reach l (0), and in this case the series is integrated of order 'n' which can be shown as Xt~l(n) (Awe and Olawumi, 2012).

The most commonly used unit root tests are Augmented Dickey Fuller (ADF) and Phillips Perron (PP) which are exercised for the time series data in this study.

3.4.2. Johansen co-integration

After detecting the stationarity of data using the ADF and PP tests, an examination of the existence of long run relationship between the variables is computed. Two different ratio tests which are trace test and maximum eigenvalue test were proposed by Johansen (1988; 1995) for determining the significance of the established correlations. They are shown in equations (2) and (3) that follows.

$$J_{trace} = -T\sum_{i-r+1}^{n} ln(1-\hat{\lambda}_i) \quad (2)$$

$$J_{max} = -T\, ln\,(1-\hat{\lambda}_i) \quad (3)$$

The sample size is reflected by T and $\hat{\lambda}_i$ refers to the i*th* largest established correlation. The null hypothesis of r co-integrating vectors against the alternative hypothesis of n co-integrating vectors is tested by the trace test. While, the null hypothesis of r co-integrating vectors against the alternative hypothesis of r +1 co-integrating vectors is tested by the maximum eigenvalue test (Johansen and Juselius, 1990; Johansen, 1988; 1995). The following two hypothesis reflects the Johansen test:

H_0: No co-integration exists between variables

H_1: Variables are co-integrated.

3.4.3. Vector error correction model (VECM)

After conducting the Johansen co-integration test, the next step depends on if a co-integration exists among the variables or not. If the data is not co-integrated, then a VAR (Vector Auto Regressive) model will be used. However, if co-integration exists among the studied variables, then a VECM (Vector Error Correction Model) will be used. VECM is better as the changes in short-run variables and any deviations from the long run equilibrium is adjusted (Binh, 2013). Therefore, after detecting the existence of long run relationship among the studied variables, VECM is used to investigate the properties of the short run co-integrated series.

3.4.4. Granger causality

The term causality is allied to cause and effect terminologies. This means that "x" variable could be the causal of "y" variable which can be explained as "x" causes "y" or "y" is the effect of "x". In addition, this means that values of "x" (current or lagged) include information which might be used to enhance the predicted values of "y" (Kirchgässner et al., 2013).

Wiener (1956) and Granger (1969) introduced the concept of causality to analyze the time series' dynamic relationship. Granger (1969) defined causality as "x" variable granger causes "y" variable if only the best linear prediction function is applied.

4. RESULTS AND DISCUSSION

Section four addresses the findings and discussion for this study. It starts with explaining the results of unit root tests, followed by Johansen Co-integration test, VECM and finally Granger Causality.

4.1. ADF and PP Results

The following Tables 1 and 2 present the ADF and PP unit root results.

As shown in Tables 1 and 2, all variables are tested both in levels and first difference with an intercept and an intercept with a time trend. The results show that some variables such as (RGDP, FDI, FD, IR and EX) are non-stationary at their levels. All the variables

Table 1: ADF results

Augmented Dickey-Fuller unit root test				
At level				
Variable	Intercept	Prob.	Intercept & Trend	Prob.
RGDP	0.522876	0.9852	–3.146117	0.1115
FDI	–1.401291	0.5715	–3.604711	0.043.5*
TO	–4.233078	0.0022*	–4.411566	0.0068*
FD	–1.337935	0.6019	–1.66881	0.7455
IR	–5.009181	0.0002*	–5.254071	0.0006*
INF	–4.289797	0.0016*	–4.203968	0.0104*
EX	1.952989	0.9998	0.225796	0.9974
At 1st difference				
Variable	Intercept	Prob.	Intercept and Trend	Prob.
RGDP	–3.553275	0.0122*	–3.592479	0.0451*
FDI	–5.065066	0.0002*	–5.021734	0.0013*
TO	–4.706801	0.0005*	–4.76209	0.0025*
FD	–4.82033	0.0004*	–4.759345	0.0025*
IR	–8.964744	0.0000*	–8.931981	0.0000*
INF	–10.94876	0.0000*	–10.77087	0.0000*
EX	–4.681791	0.0006*	–5.087742	0.0011*

Source: Author's computation, using E-views software version 9. *Results are significant at 5% level

Table 2: PP results

Phillips Perron unit root test				
At level				
Variable	Intercept	Prob.	Intercept and trend	Prob.
RGDP	0.275361	0.9738	–1.81630	0.6770
FDI	–1.591886	0.4769	–2.554071	0.3022
TO	–2.733641	0.0778	–2.591570	0.2860
FD	–1.483805	0.5309	–2.103307	0.5275
IR	–1.966246	0.2999	–1.877135	0.6466
INF	–4.429168	0.0011*	–4.356661	0.0071*
EX	2.027548	0.9998	0.225796	0.9974
At 1st difference				
Variable	Intercept	Prob	Intercept and trend	Prob
RGDP	–3.167185	0.0302*	–3.183093	0.1034
FDI	–5.065066	0.0002*	–5.0217334	0.0013*
TO	–4.687190	0.0006*	–4.802858	0.0023*
FD	–4.818313	0.0004*	–4.758557	0.0025*
IR	–6.598021	0.0000*	–6.493151	0.0000*
INF	–11.63220	0.0000*	–11.46865	0.0000*
EX	–4.684563	0.0006*	–5.089357	0.0011*

Source: Author's computation, using E-views software version 9. *Results are significant at 5% level

were differenced at the 1st difference to achieve a trend stationary level. This means that the series is integrated to order 1, which is expressed as I (1).

4.2. Johansen Co-integration

Johansen Cointegration results are shown in the following Table 3.

The results of Table 3 show that the null hypothesis is rejected where a long run relationship between the studied variables exists. The trace value (200.6808) is higher than the critical value (125.6154) at 5%. Moreover, the maximum eigenvalue (95.84860) is higher than the critical value (46.23142) at 5% as well. These results are supported by (Ajie et al, 2019; Dinh et al, 2019; Egbetunde and Akinlo, 2015; Ersoy, 2011; and Klasra, 2011).

Table 3: Johansen Co-integration results

Sample (adjusted): 1982 2018				
Included observations: 37 after adjustments				
Trend assumption: Linear deterministic trend				
Series: RGDP FDI TO FD IR INF EX				
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 *	0.925018	200.6808	125.6154	0.0000
At most 1 *	0.629863	104.8322	95.75366	0.0102
At most 2	0.549577	68.05862	69.81889	0.0685
At most 3	0.337759	38.54859	47.85613	0.2786
At most 4	0.258672	23.29996	29.79707	0.2316
At most 5	0.172253	12.22541	15.49471	0.1464
At most 6 *	0.131831	5.230643	3.841466	0.0222

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 *	0.925018	95.84860	46.23142	0.0000
At most 1	0.629863	36.77362	40.07757	0.1125
At most 2	0.549577	29.51003	33.87687	0.1521
At most 3	0.337759	15.24863	27.58434	0.7283
At most 4	0.258672	11.07455	21.13162	0.6399
At most 5	0.172253	6.994768	14.26460	0.4898
At most 6 *	0.131831	5.230643	3.841466	0.0222

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

Source: Author's computation, using E-views software version 9

4.3. Vector Error Correction Model (VECM)

After detecting the existence of long run relationship among the variables, VECM is computed to detect the direction of this relatioship. The following Table 4 presents VECM results.

Table 4 shows the results of VECM where a significant long run positive impact of foreign direct investment on the economic growth of Egypt exists, which can be supported by many previous studies such as (Ajie et al, 2019; Albulescu, 2015; Shaari et al., 2012; Ilgun et al, 2010; Hetes et al., 2009; Butkiewicz and Yannikaya, 2008).

Dinh et al (2019), Koojaroenprasit (2012) and Shahbaz and Rahman (2010) supported the results for the long run but not for the short run. Moreover, Resulaj (2013) stated that FDI positively affects the economic growth of countries at which it helps countries to allocate their resources more efficiently which would result in higher productivity, more stability and investment and thus higher economic growth rate. This could be interpreted as an indirect channel, while a direct channel states that more FDI leads to higher employment levels which means higher levels of income which is reflected in the GDP of countries (Chakrabarti, 2001).

Behname (2012) added that the existence of higher FDI means higher aggregate demand which means higher domestic output. Baharumshah and Thanoon (2006) revealed that the positive effect

Table 4: VECM results

Vector error correction estimates	
Sample (adjusted): 1983 2018	
Included observations: 36 after adjustments	
Standard errors in ( ) & t-statistics in [ ]	
Cointegrating Eq:	**CointEq1**
RGDP(–1)	1.000000
FDI(–1)	4.74E–08
	(8.3E–09)
	[5.73704]
TO(–1)	15.18130
	(1.23719)
	[12.2708]
FD(–1)	–3549.102
	(300.085)
	[–11.8270]
IR(–1)	–264.8270
	(21.5146)
	[–12.3092]
INF(–1)	–97.18246
	(6.39834)
	[–15.1887]
EX(–1)	–169.4156
	(9.07402)
	[–18.6704]
C	–3.160496
Error Correction:	**D(RGDP)**
CointEq1	–0.023877
	(0.05056)
	[–0.47221]
D(FDI(–1))	5.15E–09
	(3.5E–09)
	[1.46699]
D(FDI(–2))	3.60E–09
	(3.2E–09)
	[1.11744]
C	28.11012
	(10.7286)
	[2.62010]
R–squared	0.728415
Adj. R-squared	0.524726
Sum sq. resids	11125.39
S.E. equation	23.58537
F-statistic	3.576116
Log likelihood	–154.2842
Akaike AIC	9.460232
Schwarz SC	10.16402
Mean dependent	46.40181
S.D. dependent	34.21139
Determinant resid covariance (dof adj.)	1.79E+19
Determinant resid covariance	2.92E+17
Log likelihood	–1081.467
Akaike information criterion	66.69259
Schwarz criterion	71.92700

Source: Author's computation, using E-views software version 9

of FDI on the economic growth can be the result of knowledge and technology transmission among countries and human capital enhancement. In addition, Kose et al. (2004) stated that FDI causes a reduction in the output volatility which in turn enhances the economic growth of countries. Furthermore, Moudatsou (2003) explained that the FDI has a positive effect on the economic growth through three different means; capital formation which is considered to be a source of finance and a GDP determinant, through productivity and through institutional factors at which the legal system affects the inflows of FDI and thus affects the economic growth as well.

FDI positive impact on the economic growth of Egypt supports the neo-classical theory at which it allows the transfer of knowledge and technology between countries and also enhances the human capital (Baharumshah, 2006).

On the other hand, the results show an insignificant short run effect of FDI on the economic growth of Egypt which can be supported by (Henri et al., 2018; and Aga, 2014). Nguyen (2017) reached the same results where a significant long run relationship exists between FDI and economic growth, while an insignificant relationship is found to be in the short run. The author stated that FDI might take much long time to exert an effect on the economic growth. In addition, Mah (2010) stated that the amount of FDI might be relatively small or insufficient to have a strong effect on economic growth in the short run.

The results of the control variables showed that trade openness exerts a significant positive effect on the economic growth of Egypt, which can be supported by (Turan and Seni 2014; and Vamvakidis, 2002). Dao (2014) reached the same conclusion and explained it by stating that as long as the country opens up to more trade, it will exert more effort on Research and Development (R and D) which will lead to higher production and profit margins. Financial development exerts a significant negative effect on the economic growth of Egypt, which is supported by (Law and Singh, 2014; Hye and Islam, 2013; and Hye, 2011). Financial depth is one of the measurements of financial development, which can be represented by the ratio of credit to GDP. High credit to GDP ratio might reflect financial fragility[2] and thus uncertainty which deters economic growth (Wachtel, 2011). Bezemer et al. (2014) added that high levels of credit to GDP ratio has a negative effect on the economic growth as it causes higher volatility, less investment and might cause financial crises. In addition, De Gregorio and Guidotti (1995) stated that financial development requires liberalizing the financial system. When the process of liberalization is carried out under a poor regulatory system, then its effect will be negative on the economy.

Regarding the third control variable which is interest rate, the results show a significant negative effect on the economic growth of Egypt, which is supported by (Di Giovanni and Shambaugh, 2008; Guseh and Oritsejafor, 2007). Hatmanu et al. (2020) reached the same conclusion and explained this inverse relationship by stating that the lower the lending rate, the higher the incentives of taking loan with lower cost which will increase investment and thus reflected in higher economic growth. This illustration could be supported by (Akinwale, 2018) as well. Inflation rate has a significant negative effect on the economic growth of Egypt, which is supported by (Švigir and Miloš, 2017; Kasidi and Mwakanemela, 2013, Quartey, 2010; Berument et al., 2008). Boyd and Champ (2006) stated that inflation reduces savings and increases borrowing which causes an increase in the nominal

2 Crocket (1995) defined financial fragility as the level of debt that increases the economic sensitivity towards any shocks and thus adversely affects the economic growth.

Table 5: Granger causality results

Pairwise Granger Causality Tests			
Sample: 1980 2018			
Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
FDI does not Granger Cause RGDP	37	4.04459	0.0272
RGDP does not Granger Cause FDI		2.65110	0.0860

Source: Author's computation, using E-views software version 9

interest rate. Higher interest rates means lower investments and thus lower economic growth. Barro (1995) and Fischer (1993) had also reached the same conclusion and stated that as inflation increases, investments decrease, productivity decreases which deters the economic growth of countries.

The last control variable which is exchange rate exerts a significant negative effect on the economic growth of Egypt, which is supported by (Obansa et al., 2013; Ahmad et al., 2013; and Younus and Chowdhury, 2006). A. Razzaque et al. (2017) reached the same conclusion and stated that when the value of the local currency depreciates, the economic growth of the country is enhanced. The author explained this relationship through two main reasons; the first is that depreciated currencies enhances the competitiveness globally and thus increases exports, the second is that depreciated currencies shifts the demand towards domestic goods. This is supported by (Karahan, 2020) as well.

The model shows an R-squared of 72.8% which means that the explanatory variables explains 72.8% of the variations in the dependent variable (economic growth).

4.4. Granger Causality Test

The last methodological technique carried out is the Granger causality to determine the direction of the causality among the variables. The results are shown in the following Table 5.

Table 5 shows the existence of bidirectional causality between FDI and economic growth in Egypt. FDI granger causes RGDP which is significant at a 5% level. In addition, RGDP granger causes FDI which is significant at 10% level. These results can be supported by (Egbetunde and Akinlo., 2015; Ilgun et al., 2010; Basu, 2003; and Moudatsou, 2003). Ozturk and Kalyoncu (2007) argued that the reason behind this bidirectional causality is that FDI causes an increase in the country's capital which in turn increases production. Furthermore, the higher the levels of production the higher the attraction for foreign investors which in turn enhances FDI.

5. CONCLUSION AND RECOMMENDATIONS

Foreign direct investment is one of the cross border capital flows that affect the economic growth of countries. It drives economic integration among countries, improves economic growth, increases the financial stability and enhances the social welfare (Nguyen et al., 2019). The aim of this study is to examine how foreign direct investment impacts the economic growth of Egypt from 1980 to 2018.

The study gathers data for 39 years starting from 1980 till 2018. It applies both ADF and PP to check the stationarity of data and reached that they are stationary at the first difference. After that, Johansen co-integration is used which shows an existence of long run relationship among variables. VECM is carried out to detect the direction of the long run relationship and the short run adjustments. The results show that FDI exerts a significant positive impact of the economic growth of Egypt. One of the most significant reasons behind this positive impact is transmitting knowledge, technology and labor between countries through FDI (Baharumshah and Thanoon, 2006) which supports the neo-classical theory. On the other hand, the short run results are insignificant. This could be attributed to the amount of FDI which might be relatively small or insufficient to exert a strong effect on economic growth in the short run (Mah, 2010). In addition, a bi-directional causality between FDI and the economic growth of Egypt is clarified through granger causality test.

Furthermore, the results show that trade openness impact the Egyptian economic growth positively, while all of the other control variables (financial development, interest rate, inflation rate and exchange rate) impact the Egyptian economic growth negatively.

As a result, it is recommended for Egypt to focus on attracting more FDI to boost its economic growth. OECD (2002) recommended three policies to attract FDI as follows:

5.1. Macroeconomic and Institutional Framework Improvement

This could be done through applying sound macroeconomic policies with the aim of reaching higher levels of economic growth, higher levels of employment, stability of prices and a potential external account. In addition, the government should try to maintain a balance between the revenues and expenditures, apply an effective tax system and manage the debt wisely. Furthermore, improve the financial system to increase the availability of financial resources in addition to foreign investment. Developing the capital markets would assist in enhancing the amount of savings and allowing an effective provision of long term credit which smoothen the process of raising capital and thus catching up business opportunities.

5.2. Creating a Regulatory Environment that Attract FDI

Having transparency in the regulatory actions taken by the host country and in the practices of businesses along with non-discrimination are crucial for attracting foreign investments. When foreign investors understand the environment in which they want to operate, this would likely attract them to invest. To enhance the transparency in the host country, the government should take actions towards promoting the rule of law and exerting efforts against corruption. In addition, policies regarding competition, companies' financial reporting and protecting intellectual property should be enhanced. These policies would prepare a transparent environment beneficial for FDI. Eliminating any restrictions on trade between countries would attract FDI as well. Furthermore, the concept of non-discrimination should be applied so that foreigners could compete in the market without any governmental

bias toward domestic enterprises and also domestic companies should not be harmed by the existence of foreign ones.

5.3. Enhancing the Infrastructure, Technology and Human Efficiencies

To grab the benefits of FDI to the maximum, policies should be undertaken to develop technologies, infrastructure and human competences. Enhancing the labor competencies through education and teaching them certain specialized skills, and improving the technological infrastructure would attract multinational enterprises and would allow for integrating their technology to the production of the host country.

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