

## DETERMINANTS OF JORDANIAN ECONOMIC GROWTH: TIME SERIES APPROACH

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### Abstract

This paper examines the dynamic relationship between domestic investment, foreign direct investment, economic openness, labour and economic growth in Jordan. Time series data for 1985-2017) period and autoregressive distributed lag model is used. The results of the study reveal that, domestic investment, foreign direct investment, economic openness and labours lead to increase the level of the economic growth in Jordan in the long run and short run. Thus, the policy makers in Jordan have to give more attention to attract more foreign direct investment from side and encouragement the domestic investment form other side to improve the level of economic growth in Jordan.

**Keywords:** economic growth; domestic investment; foreign direct investment; economic openness; labours; autoregressive distributed lag (ARDL) model; Jordan.

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### INTRODUCTION

Over the past decades, the economic growth (EG) has become one of the most importance factors in both developing and developed countries. Moreover, the economic growth could be affected by a variety of political, social and economic factors. Therefore, many researchers have argued that the investment is the main driver of all economic activities and used to stimulate and increase economic growth, bring more necessary capital, creating new jobs, technology and skills to facilitate higher levels of productivity (Bekhet, Yasmin, and Al-Smadi, 2017; Bekhet and Al-Smadi, 2016; Mugableh, 2015; Findlay, 1978). Also, the economic theory explained that in the short run, especially during recessions, economic output is strongly influenced by aggregate demand or total spending in the economy and the amount of income is equal to the value of output (GDP). Furthermore, Keynes (1936) was the first economist who gave attention to the existence of an independent investment function in economic growth.

However, many studies has been discussed that investment broadly has a long run relationship with economic growth and the economic growth is effect by many factors such as domestic investment (DI), foreign direct investment (FDI), economic openness (EO) and labour (L), for example Bekhet and Al-Smadi, (2016), Solow (1957), Romer (1986), Lucas (1988) and Rebelo (1991). These studies found that there is a long run relationship between economic growth and the other variables.

Some researchers explained that the economic growth is reinforcing by the human capital and the positive externalities and spill over effects of a knowledge-based economy that will lead to economic development as well as the economic growth is depends on policy measures (Aghion, Ljungqvist, Howitt, Howitt, Brant-Collett, and García-Peñalosa, 1998; Romer, 1986). Moreover, the economic growth is depending on some basic conditions like institutional development, financial market development, macroeconomic reform (Hirata, Kose and Otkrok, 2013).

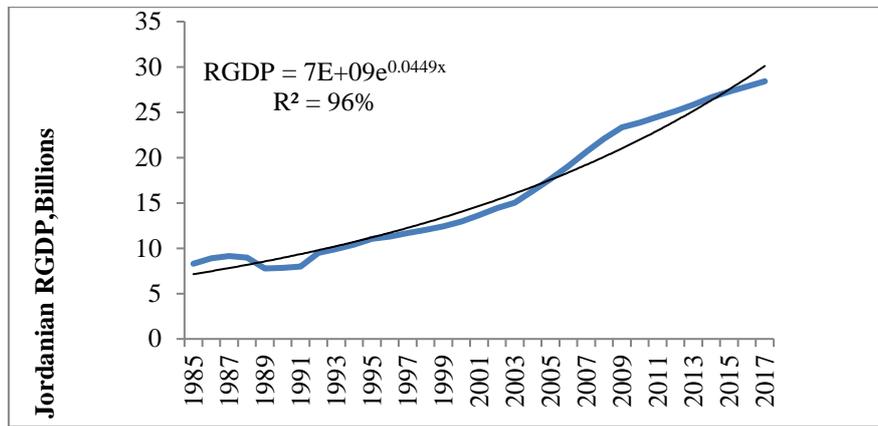
Moreover, the previous literatures are argued the relationship among economic growth and domestic investment (DI), foreign investment (FDI), economic openness (EO) and labour (L) and found that there is a long run and short run relationship among these variables (Osabuohien, Soogun and Urhie, 2017; Shawa

and Grafoote, 2014; Anyanwu, Olise, Anigbogu and Okoli, 2013). However, this paper attempts to examine the long run and short run relationship among economic growth and (DI, FDI, EO and L) in Jordan. Section 2 is presented Jordanian economic overview. In section 3 the literature review are discussed. Data and model construction presented in section 4. Econometric framework is presented in section 5. Results and conclusion are argued in sections 6 and 7.

### JORDANIAN ECONOMIC OVERVIEW

During the last 10 years, Jordan faced many economic challenges, which were the result of an economic crisis experienced by Jordan at the beginning of the global financial crisis in 2007 and worsened with the start of the Arab Spring in many Arab countries. Moreover, the closure of borders with Iraq and Syria and the decline in oil prices, which affected the economic growth, rates in Jordan, as well as the Jordanian exports. Also, Jordan's public finances were also affected by the decline in grants and public revenues as a result of the slowing economic cycle, which has exacerbated public debt in recent years. This economic slowdown was also reflected in the shrinking volume of jobs generated in the local market, which in turn led to an increase in unemployment rates which reached 18.6% in the third quarter of 2018 (Amman Chamber of Commerce, (2019).

Minister of Industry, Trade and Supply Tariq Hammouri (2019) confirmed that the most important problems suffered by the Jordanian economy is that it is an unproductive economy where it depends only on the services sector, tourism, trade and some extractive industries such as pharmaceuticals and fertilizers, which makes the volume of exports a small relative to the volume of imports in addition to the budget deficit and high public and internal debt that arrived to 29 Billions in 2018. He noted that despite these difficulties, Jordan still enjoys security stability. Maintain a kind of economic stability, and a real economic growth rate of 1.9%. Generally, Jordanian RGDP at constant prices achieved stable performance for the 2010, 2011, 2012 and 2018 periods with an annual growth rate of 2.3%, 2.6%, 2.7% and 1.9%, respectively (CBI, 2018). Figure 1 shows that Jordanian RGDP at constant prices recorded an annual growth rate of 0.04% for the 1985-2017 period.

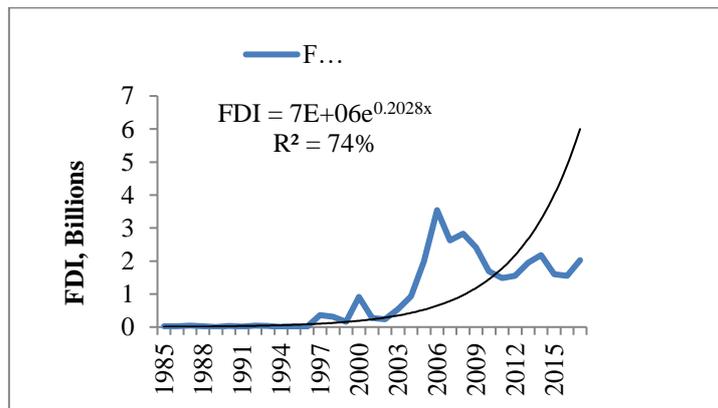


**Figure 1: Jordanian RGDP for the (1985-2017) Period.**

Source: World Bank (2019) Database, available online at: <http://data.worldbank.org>, accessed on July 2019.

Figure 1 represents that Jordanian RGDP started in 1985 with a value of JD 8.30 billion and increased to JD 8.98 billion in 1988. Due to the 1991 Gulf War and instability in the Middle East region, Jordanian RGDP was greatly affected. These conflicts caused massive resource shortages in the Jordanian economy, limited economic relations with other neighbour countries and reduced the recruitment of Jordanian workers. Besides, there was a decrease in the inward oil supply and a decline in the traditional Jordanian export markets (Bekhet and Matar, 2011). As a result of these conflicts, Jordanian RGDP decreased in 1989 to JD 7.77 billion. However in 1992, Jordanian RGDP improved again to reach JD 9.48 billion and continued increasing to reach JD 28.42 billion in 2017.

Jordan was one of the countries that recognized the importance of foreign direct investment as a key tool for economic growth rectification and openness, and in order to achieve the desired objectives of these foreign investments, the Jordanian government has taken many corrective measures, and enacted laws and legislation in order to provide the appropriate investment climate to attract foreign investment in the light of competition. According to Tariq Hammouri (2019) confirmed that the volume of FDI in Jordan has decline in 2018, a decrease of 53.2%, compare with the year of 2017. while the total capital of companies registered with the Ministry of Industry, Trade and Catering last year to reach the value of JD 150 million compared to JD 350 million in 2017, a decrease of 57.1%. Thus, the Jordanian FDI inflow recorded an annual growth rate 0.20. % for the 1985-2017 period (Figure 2).



**Figure 2: Jordanian FDI for the (1985-2017) Period.**

Source: World Bank (2019) Database, available online at: <http://data.worldbank.org>, accessed on July 2019

However, Jordan has adopted in its foreign trade policy the approach of economic openness and keeping pace with the developments of the global economy and the rapid expansion of globalization. Also, Jordan's economy has been geared towards a free market economy, mainly through a policy of openness and activation of the leadership role of the private sector. Jordan has adopted a series of privatizations of enterprises

owned by the state, and the most important step taken was restructuring the investment rules that led to encouraging the business environment. As a result, Jordan was ranked 111 of 183 countries that were studied in attractiveness to businesses in the world (IMF, 2014). Figure 3 shows the level of (EO) as % of GDP in Jordan for the 1985-2017 period.

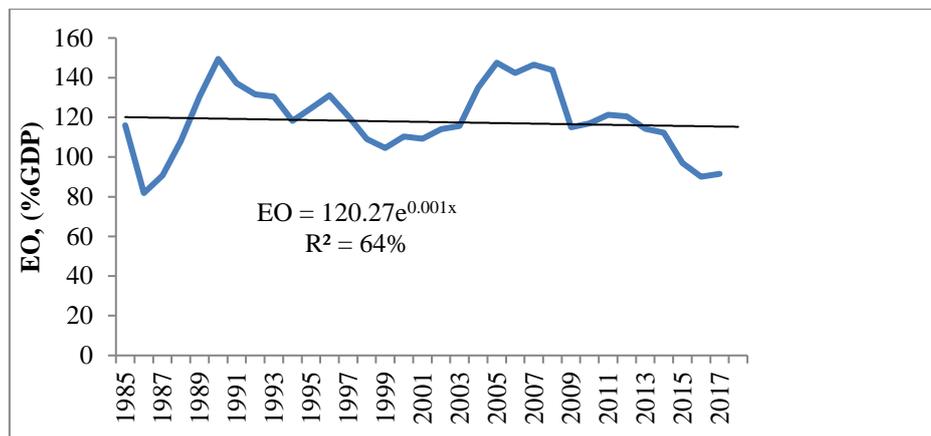


Figure 3: Jordanian EO for the (1985-2017) Period.

Source: World Bank (2019) Database, available online at: <http://data.worldbank.org>, accessed on July 2019

In general, Jordan has been a member of the World Trade Organization since 2000, in addition to signing five free trade agreements with the most important economic poles and blocs in the world such as the United States, the European Union, the Arab League countries, the EFTA countries and Singapore. Free trade agreement between the Arab Mediterranean countries (Agadir) and the signing of a free trade agreement with Canada

Also, Jordan is committed to the protection of investors' rights irrespective of national origin. Jordan has one of the most impartial and efficient legal systems in the region, comparable to international standards. Therefore, the Jordanian economy achieved a high rank among other Middle East countries in the implementation of contracts within the appropriate time frames and ease of access to financial facilities (Jordan Investment Board, 2012). This is despite the challenging environment that directly affected the Jordanian economy recently, which is the political uncertainty and other economic obstacles that have faced the Jordanian economy. Jordan registered its sixth consecutive year of progress toward greater economic freedom (EF), achieving mostly free status for the first time. Moreover, Jordanian EF reflects gains in half of the 10 economic freedoms including notable progress in business freedom and the control of government spending. In addition, Jordan is ranked 4th out of 15 countries in the Middle East and North African regions in terms of EF (Jordanian Economic Freedom, 2013).

#### LITERATURE REVIEW

In the past decades, the world struggled to rise from a global recession and financial crisis. So far, many countries are looking for solutions to improve their domestic economies and their performance. However, many researchers have confirmed that there are many factors that lead to improve the growth of the economic such as, domestic investment, foreign direct investment, economic openness and labour (Bekhet and Al-Smadi, 2015; Khan, Khan, Zaman, Irfan, and Khatab, 2014; Bekhet and Mugableh, 2013; Onuorah and Nnenna, 2013; Bekhet and Al-Smadi, 2012; Acaravci and Ozturk, 2012).

Generally, some studies have examined the relationship between FDI, DI and economic growth and also some other examined the relationship between the EO, L and economic growth. Gungor and Ringim, (2017) examined the relationship between FDI, DI and economic growth in Nigeria. This study have used vector error correction model (VECM) for the 1980-2015 period to analyse the relationship between the study variables. However, this study found that there are long run relationship between FDI, DI and economic growth in Nigeria. Hanif and Jalaluddin, (2013) investigated the relationship between FDI, DI and economic growth for the 1970-2011 using VECM model. This study found that there is long run relationship between FDI, DI and economic growth. Sbia, Shahbaz, and Hamdi, (2014) explored the relationship among EO, FDI and economic growth in UAE for the 1975-2011 period.

They found that these variables are co-integrated and there is a positive relationship between FDI, EO and economic growth.

Onuorah and Nnenna (2013) examined the relationship between FDI inflows and economic growth in Nigeria including GDP, exchange rate (EX), interest rate (IR), inflation rate (INF) and money supply (M2) for the 1980-2010 period. The results pointed out a negative relationship between FDI and GDP while the other variables had direct impact on FDI inflows. Alfa and Garba (2012) examined the relationship between DI, exports and economic growth in Nigeria for the 1981-2010 period. This study confirmed that there is evidence of relationship between DI and economic growth. Also, this study found that there is long run relationship between exports and economic growth in Nigeria.

Seetanah and Rojid (2011) explored the relationship between EO, L, FDI and economic growth in Mauritius for the 1972-2006 period. This study confirmed that there is a long run relationship between the study variables. Kiran (2011) investigated the direction of causality among FDI, EXP, import (IMP) and economic growth using causality test for 1992-2008 period. The results showed a bidirectional causality relationship between FDI, GDP, EXP and IMP. Faras and Ghali (2009) examined the relationship between FDI, EO, gross fixed capital formation (GFCF) and economic growth in Gulf Cooperation Council (GCC) countries for the 1970-2006 period. They found that there is long-run relationship between the study variables

Baek and Koo (2009) examined the short and long-run relationships among FDI, economic growth and environment in China for the 1978-2007 period. The results showed that there are short and long run relationships between FDI and GDP. Besides, Chandran and Krishnan (2008) analysed the relationship between FDI inflows and manufacturing growth in Malaysia including labour force and GFC for the 1970-2003 period. They found that there is positive short and long-run relationship among the variables. Fosu and Magnus (2006) examined the long-run relationships between FDI, GDP, EO, labour force and GFCF in Ghana for the 1970-2002 period. The results showed that FDI has a negative impact on economic growth while, the other variables have a positive impact on economic growth.

Therefore, many other studies have confirmed that the relationship between FDI inflows and domestic investment is still imprecise. For example, (Bekhet and Mugableh, 2016; Singhania and Gupta, 2011; Fedderke and Romm, 2006; Agosin and Mayer, 2000; Chudnovsky and Lopez, 1999) these study argued that FDI inflows can stimulate technological change through the adoption of foreign technology, with necessary capital and skills to facilitate high levels of productivity while, other studies like, (Nourbakhshian, Hosseini, Aghapour and Gheshmi, 2012; Krstevska and Petrovska, 2011; Lipsey, 2004; Kumar and Pradhan, 2002) have assumed that FDI might have

a crowding effect on domestic investment, external vulnerability and dependence, destructive competition of foreign affiliates with domestic firms and a market-stealing effect as a result of poor absorptive capacity.

Almsafir, Abdul Latif and Bekhet (2011) investigated the relationship among FDI, GDP, M2 and domestic investment using GFCF in Malaysia, using an ARDL model for the 1970-2009 period. The results showed there is a negative relationship between FDI and GFCF in Malaysia. However, strong crowding out has showed in Latin America. Apergis, Katrakilidis and Tabakis (2006) identified the dynamic linkages between FDI and GFCF for 30 countries from America, Asia, Europe and Africa, using panel data analysis for the 1992-2002 period. The results showed that there is a negative relationship between FDI and GFCF.

However, the economic theory confirmed that economic openness, domestic investment, FDI inflows and labour force lead economic growth. From this point of view, the recent studies have looked to the relationship among these factors to confirm if there are long run and short run relationship among the studies variables. Thus, to achieve the objectives of this study the following hypotheses can be formulating:

H<sub>1</sub>: There are significant long-run equilibrium relationships between GDP and (i.e., FDI, DI, EO, L) in Jordan.

H<sub>2</sub>: There are significant short-run equilibrium relationships between GDP and (i.e., FDI, DI, EO, L) in Jordan.

**DATA AND MODEL CONSTRUCTION**

**Data collection**

In order to investigate the long run and short run relationship between the economic growth and (FDI, DI, EO, L) in Jordan annual time series data was collected from the World Bank database for all the variables study. Moreover, all the study variables transformations into natural logarithmic (Ln) to reduce the hetrosecedasticity problem (Bekhet and Al-Smadi, 2017; Bekhet and Matar, 2012; Chen et al., 1986). This study used Micro-fit 4.1 and E-views 7.2 statistical packages for analysis.

**Model construction**

In this study the production function theory is used to examine the relationship between economic growth and (FDI, DI, EO, L) in Jordan. This theory has been discussed by many researchers, for example Solow (1957), Romer (1986), Lucas (1991) and Rebelo (1991). These studies argued that investment broadly has a positive long run effect on economic growth. In detail, the output economic growth (GDP) is influenced by the input factors such as capital, inward FDI, technology, labour, or by joining a vector of extra variables within the approximating equation, like institutional dummies, exports and imports. Thus, the production function theory is modelled as in equation (1):

$$Y = A K^{\alpha_1} L^{\alpha_2} \varepsilon \tag{1}$$

Where Y is the production of the economy (GDP), L is the labour, K is the domestic investment (DI) peroxide by gross fixed capital formation (GFCF), ε is the error term, α<sub>1</sub> and α<sub>2</sub> are partial elasticities of the respective variables and A is the total factors productivity generated by additional variables. However in this study, the production function can be augmented by assuming that A represents FDI and EO. Then the A variable in Equation (1) can be rewritten as in Equation 2:

$$A = \delta + FDI^{\beta_1} + EO^{\beta_2} \tag{2}$$

where δ is time-invariant constant and β<sub>i</sub>s (i= 1, ..., 2) are the partial elasticities of the respective variables. However, merging Equation (2) into Equation (1) then, the production function can be shown in Equation (3):

$$GDP = \delta + FDI^{\beta_1} + EO^{\beta_2} + DI^{\beta_3} + L^{\beta_4} \tag{3}$$

Where β<sup>3</sup>= α<sup>1</sup> and β<sup>4</sup>= α<sup>2</sup>. To achieve the objectives of the this paper, equation (3) can be rearranged to be in the linear form by transforming all the variables into natural logarithms (Ln) as in equation (4)

$$\text{LnGDP}_t = \delta + \beta_1 \text{LnFDI}_t + \beta_2 \text{LnEO}_t + \beta_3 \text{LnDI}_t + \beta_4 \text{LnL}_t + \varepsilon_t \tag{4}$$

where δ is the intercept, β<sub>i</sub>s (i= 1, ..., 4) are the partial elasticities of GDP and ε<sub>t</sub> is the residual term that is assumed to be normally distributed.

**ECONOMETRIC FRAMEWORK**

**Unit Root Test**

As discussed in many studies if the time series data is not stationary, the analysis of regression would not be true (Spurious regression). Moreover, if the time series data is not stationary, it means that its mean, variance and covariance are not constant over the time period (Bekhet, Yasmin and Al-Smadi, 2017; Gujarati and Porter, 2009). In the current study, augmented Dickey-Fuller (ADF) (1979, 1981) and Phillips-Perron (P-P) (1988) statistical tests are used to detect the level of stationarity at I(0), I(1) and I(d). The general form can be shown in Equation (5):

$$\Delta Y_t = \beta_0 + \beta_1 t + \beta_2 Y_{t-1} + \sum_{i=1}^p \alpha_i Y_{t-i} + \varepsilon_t \tag{5}$$

where; Y<sub>t</sub> is the vectors of the selected variables as defined earlier, β<sub>0</sub> presents the intercept, β<sub>1</sub>t presents the time trend, β<sub>2</sub> is used to measure the stationary level, P denotes the lag length, α<sub>i</sub> represents the parameters that will be tested or the coefficient of ΔY<sub>t-1</sub> and ε<sub>t</sub> denotes the estimation error term. The test is done by running OLS regression, if the value of t statistic is greater than the relevant critical value, then the H<sub>0</sub>: β<sub>2</sub> = 0 is rejected. This means that the series dose not contains a unit root (Gujarati and Porter, 2009).

**Co-integration Test**

Co-integration means that despite individual time series being non-stationary, a linear combination of two or more time series can be stationary, which means these two variables are co-integrated. Thus, the concept of co-integration in an economic view is the variables will be co-integrated if they have a long-run equilibrium relationship between them (Hamdi *et al.*, 2014; Bekhet and Mugableh, 2012).

Pesaran, Shin, and Smith (2001) developed the co-integration test to determine the co-integration among the variables based on standard F-statistics test. The decision rule is based on comparing the calculated F-statistics values with the critical F-statistics values tabulated at statistical tables in Pesaran *et al.* (2001). If the calculated F-statistics values are greater than the upper bounds F-statistics values at I(1), H<sub>0</sub> of no co-integration would be rejected. This means that the variables included in the models are a shared long-run relationship.

Conversely, if the calculated F-statistics values fall below the lower bounds F-statistics values at I(0), the H<sub>0</sub> of no co-integration would be accepted. This means that the variables included in the models do not share a long-run relationship among themselves (Pesaran *et al.*, 2001). Moreover, if the calculated F-statistics value falls in the range I(0) ≤ F-statistics value ≤ I(1), the decisions are inconclusive with regard to accepting or rejecting the long-run relationship. In this case, using the error correction term (ECT<sub>t-1</sub>) is an efficient way to establish the co-integration among the variables (Boutabba,

2014; Banerjee *et al.*, 1998; Kremers *et al.*, 1992) and confirm it with past studies.

**Long-run and Short- run Coefficient Estimation**

Over the past decades, considerable attention has been given in empirical economics to examine the long and short-run relationships among the variables by using different time series models. Thus, autoregressive distributed lag (ARDL) model.

Pesaran and Shin (1999) and Pesaran *et al.* (2001) developed ARDL model to examine the long-run and short-run relationships among the variables. Besides, the ARDL model is an unrestricted error correction model (UECM), which helps to integrate the short-run with the long-run equilibrium without losing any long-run information (Hamdi *et al.*, 2014). However, in this paper, ARDL model is used to examine the long run and short run relationship between the GDP and (FDI, DI, EO, L) in Jordan. The general form of the ARDL model could be formulated as in the following equation (6).

$$\Delta \text{LnGDP}_t = \mu_1 + \sum_{j=1}^k \beta_{11} \Delta \text{LnGDP}_{t-j} + \sum_{j=0}^k \beta_{12} \Delta \text{LnFDI}_{t-j} + \sum_{j=0}^k \beta_{13} \Delta \text{LnEO}_{t-j} + \sum_{j=0}^k \beta_{14} \Delta \text{LnDI}_{t-j} + \sum_{j=0}^k \beta_{15} \Delta \text{LnL}_{t-j} + \eta_{11} \text{LnGDP}_t + \varepsilon_t$$

$$+ \eta_{12} \text{LnFDI}_{t-1} + \eta_{13} \text{LnEO}_{t-1} + \eta_{14} \text{LnDI}_{t-1} + \eta_{15} \text{LnL}_{t-1} + \varepsilon_t \quad (6)$$

Where,  $\mu$  denote intercept;  $\beta_{ij}$ s ( $i,j= 1, \dots, 5$ ) represent the short-run coefficients of the variables;  $\eta_{ij}$ s ( $i,j= 1, \dots, 5$ ) represent the long-run coefficients, which are used to test the co-integration among variables;  $\varepsilon_t$  represent the error term. Furthermore, to utilize the ARDL model, all the variables should be co-integrated and stationary, either I(0), I(1) or mutually level (Pesaran *et al.*, 2001).

**EMPIRICAL RESULTS**

**Unit Root and Co-integration Tests Results**

Firstly, this study examined the level of integrating among the study variables by using Augmented Dicky-Fuller (ADF) and Philip Perron (PP) tests to ensure that the variables are not stationary at I(2) (Ohlan, 2017; Bekhet, and Al-Smadi, 2015). The results of ADF and PP tests are presented in Table 1.

**Table 1: Result of stationary test**

Variables	ADF		PP		Decision
	I(0)	I(1)	I(0)	I(1)	
LnGDP	-2.92	-3.05**	-2.20	-3.06**	I(1)
LnFDI	-2.20	-5.09***	-2.32	-5.09***	I(1)
LnEO	-1.77	-5.51***	-2.11	-5.46***	I(1)
LnDI	-2.37	-4.11***	-1.95	-4.09***	I(1)
LnL	-2.23	-3.11**	-1.98	-3.22**	I(1)

Notes: Significance levels at 1%, 5% and 10% are \*\*\*, \*\*, \* respectively.  
Source: Output of the Eviews 7.2 econometric software.

The results of stationary indicates that all the study variables (LnGDP, LnFDI, LnEO, LnDI and LnL) are stationary at I(1) in both ADF and PP tests at (1% and 5%) significant levels. However, this results are consistent with some studies finding see (Gungor, and Ringim, 2017; Bekhet, Yasmin, and Al-Smadi, 2017; Bekhet and Al-Smadi, 2016). Generally, as the result of this tests confirmed that all the variables are stationary at I(1) the bounds F-statistics test would be utilized to test whether the variables are co-integrated or not (Al-Smadi and Omoush, 2019).

The results of the cointegration among the variables (LnGDP, LnFDI, LnEO, LnDI and LnL) are presented in Table 2. The estimated value of F-statistics are greater than the upper bounds F-statistics values at I(1), for the LnGDP model. This means that the variables included in the model is a shared long-run relationship.

**Table 2: Result of Co-integration test**

Model	F-statistic	I(0)	I(1)	Decisions
$\text{LnGDP}_t = f(\text{LnFDI}_t, \beta_2 \text{LnEO}_t, \beta_3 \text{LnDI}_t, \beta_4 \text{LnL}_t)$	4.78**	2.16	4.73	Co-integration

Notes: (1) F-statistics critical values were selected from Pesaran and Pesaran, 2009, case II: intercept and no trend, p.544). (2) The significance statistical level at 5% is \*\*.  
Source: Output of the Micro-fit 4.2 econometric software.

Table 2 confirmed that the H0 of no co-integration among the study variables in the LnGDP model is rejected at 5% significance level. The above results are consistent with the findings of Al-Smadi and Omoush (2019) for Jordan; Ohlan (2017) for India; Bekhet, Yasmin and Al-Smadi (2017) for Malaysia.

short run relationship between the study variables can be examined (Al-Smadi and Omoush, 2019; Osabuohien, *et al.*, 2017; Khan *et al.*, 2014). However, in this paper, ARDL model is used to examine the long run and short run relationship between the GDP and (FDI, DI, EO, L) in Jordan. Table 3 shows that there is a significance long-run and short run relationship among the variables at 1%, 5% and 10% levels.

**Results of the Long and Short run**

As mentioned in many studies, if the co-integration relationship among the variables in models warranted, then the long run and

**Table 3: Result of Long and Short run**

Model			
$\text{LnGDP}_t = f(\text{LnFDI}_t, \beta_2 \text{LnEO}_t, \beta_3 \text{LnDI}_t, \beta_4 \text{LnL}_t)$			
Long Run Results	Coefficient	T-Statistic	Sig.level
LnFDIt	0.11***	3.77	0.001
LnEOt	0.60**	1.81	0.081
LnDI	0.67**	1.76	0.091
LnLt	1.44***	4.65	0.001
Constant	12.44***	3.90	0.001
Short Run Results			
$\Delta \text{LnFDI}_t$	0.02***	5.24	0.000
$\Delta \text{LnEO}_t$	0.12**	2.44	0.024
$\Delta \text{LnDI}_t$	0.90***	4.45	0.000
$\Delta \text{LnL}_t$	0.47**	2.04	0.045

Constant	2.61***	4.49	0.000
ECT <sub>t-1</sub>	-0.21***	-4.70	0.000

Notes: (1) The significance statistical level at 1%, 5% and 10% are\*\*\*, \*\* and \* respectively; (2) multiplier test of residual serial correlation = 0.78; (3) autoregressive conditional heteroskedasticity test = 3.77; (4) Normality test = 2.91; (5) RESET test using the square of the fitted values = 0.01; (6) F-statistics = 13.4; (7) R2 = 79%; (8) Durbin Watson = 2.43.

Source: Micro-fit 4.2 econometric software

Table 3 shows that the long run relationship between the economic growth and (FDI and L) variables in Jordan is positive at 1% significance level and the long run relationship between the economic growths and (EO and DI) variables are positive at 5% significance level. This means that an increase in FDI, L, EO and DI will lead to increase the level of the economic growth in Jordan. However, these results are confirmed by other studies see Gungor and Ringim, (2017) for Nigeria; Bekhet, and Al-Smadi, (2015) for Jordan; Yilmaz, (2014) for Turkey; Moses, et al., (2013) for Nigeria.

In the short run the results shows that all the variables are positively associated with economic growth. At 1% significance levels, the FDI and L variables are positively associated with

economic growth. Also, at 5% levels the EO and DI variables are positively associated with economic growth. In addition, the coefficients of ECT<sub>t-1</sub> are significant with appropriate signs in absolute value with 21%. This implies that this model is corrected from the short-run towards the long-run equilibrium by 21% see table 3.

The results of stability test are displayed in Figure 4 by using CUSUM and CUSUMQ tests. The result shows that the cointegration estimates are reliable and consistent because both diagrams are within critical bounds at (5%) of significance level (Shahbaz, 2013; Shahbaz et al., 2015).

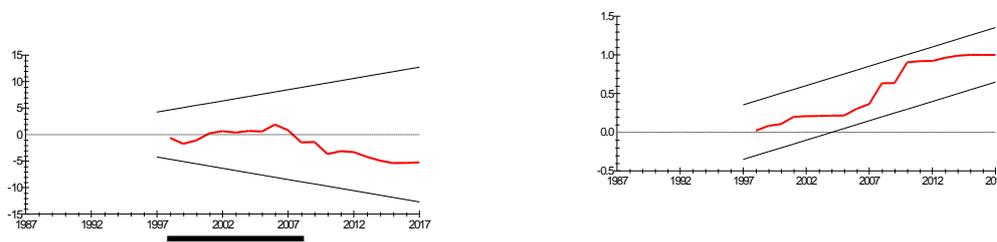


Figure 4: LnGDP model for CUSUM and CUSUMQ for the (1985-2017) period.

Note: (1) plot of cumulative sum of recursive residual is (CUSUM). (2) plot of cumulative sum of square of recursive residual is (CUSUMQ).

Source: Micro-fit 4.1 econometric software

**CONCLUSION AND POLICY RECOMMENDATIONS**

This paper empirically examined the dynamic relationship between domestic investment, foreign direct investment, economic openness, labour and economic growth in Jordan. Time series data for (1985-2017) period and autoregressive distributed lag model is used. The results of stationary tests show that all the variables are stationary at I(1) in both augmented Dickey-Fuller (ADF) (1979, 1981) and Phillips-Perron (P-P) (1988) tests at (1% and 5%) significant levels. The empirical results of autoregressive distributed lag (ARDL) model reveal that, domestic investment, foreign direct investment, economic openness and labours lead to increase the level of the economic growth in Jordan in the long run and short run.

Generally, the result confirmed that the domestic investment, foreign direct investment, economic openness and labour promote economic growth in a capital scarce economy by increasing the volume of money supply as well as efficiency of the physical investment. In the policy context, the finding of this study offer justification for Jordanian Government to give more attention to attract more foreign direct investment from side and encouragement the domestic investment form other side to improve the level of economic growth in Jordan. Jordanian policy makers should give more attention for the current regulations and continue implementing the economic plans that ultimately lead to create more productivity power in the Jordanian economy.

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