THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

The Role FDI on Economic Growth intheArab Countries A Panel Data Approach

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Abstract:
The study estimated the effect FDI on economic growth in the Arab countries during the period 1995 to 2013. The study used panel data approach in 17 countries: (Jordan, United Arab Emirates, Bahrain, Tunisia, Algeria, Saudi Arabia, Sudan, Oman, Qatar, Kuwait, Lebanon, Egypt, Djibouti, Mauritania, Morocco, Yemen and Palestine). The study used panel data approach by E views program. The study found the effect FDI has negative effect of economic growth in the Arab countries during the period 1995 to 2013.The study found the effect FDI was negative in the Arab countries during the period 1995 to 2013, sothere is need to Manage and give direction to FDI to productive activities in order to avoid the adverse effect of FDI on GDP of Arab countries.Also the Arab countries need to increase the imports of technology for increasing labor productivity which can directly promote economic growth, and thus improve the standards of living in the Arab countries.

Keywords:*Panel data approach, Housman, FDI, imports.*

1. Introduction

That FDI is positively correlated with economic growth is situated in growth theory that emphasizes the role of improved technology, efficiency and productivity in promoting growth (Lim, 2001: p.175). The potential contribution of FDI to growth depends strictly on the circumstances in recipient countries. Certain host country conditions are necessary to facilitate the spillover effects. Foreign direct investment (FDI) plays an important role in economic growth. The growth of international production is driven by economic and technological forces. It is also driven by the on-going liberalization of foreign direct investment and trade policies. In this context, globalization offers an unprecedented opportunity for developing countries to achieve faster economic growth through trade and investment.

The FDI growth was highest in united Arab emirate followed by, Lebanon, Djibouti, Mauritania, and Kuwait. Also the (FDI) was lowest in Palestine, followed by Tunisia, Yemen, Bahrain and Egypt.
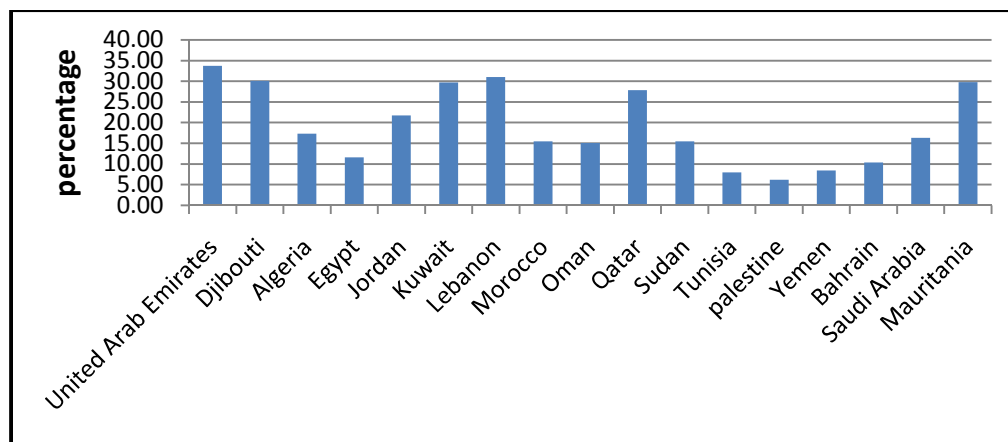

Figure 1: FDI Growth in Arab Countries 1995-2013 (CAGR)
Source: Compound Annual Growth Rate of FDI Calculated
From The Data Given In UNCTAD Data

The main objective of the paper is to estimate the role FDI on economic growth in the Arab countries during the period 1995 to2013, by panel data method.

2. Literature Review

Several studies address the importance of exports and imports on economic growth. The findings of these studies indicate thatFDI have a statistically significant positive and negative impact on economic growth. We can summarize some of these studies that have addressed the issue of effect exports and imports on economic growth as follows:

Al-Nefaie(2012), The Roleof Foreign Direct Investment inthe Saudi Economy Researched is to measure the impact of foreign direct investment (FDI) on the macro economic variables in the Saudi economy, and to examine its effects on the gross national product growth, and the growth of Saudi non-oil exports and labor productivity, during the period 1990 to 2010. The study found correlation coefficient shows that there a positive correlation relationship between (FDI) and (GDP), but the regression analysis either in the linear or log model has shown that the (FDI) has affected on (GDP) negatively, and also it effect on non- oil export inversely. Also the study showed has shown that there is a negative relationship between labor productivity and (FDI). The study recommended there is a necessity to encourage foreign direct investment because, it represented a main stream that to increase the economic diversification of the Saudi economy, because (FDI) can be encouraged through concentrating on new investment packages of rewards that keep pace with international development. Melnyk& others (2014)the study investigates the impact of foreign direct investing on economic development of post Comecon transition economy countries. Neoclassical growth theory model is used to analyze the effects of FDI on economic growth the study found transitional and developing economies do influence economic growth positively. An increase in FDI is Positively correlated with an increase in a specific region's growth rate, well-developed financial and institutional sectors are the important sources of Economic growth. Emmanuel, (2013) investigates the effect of FDI on selected macro-economic variables of GDP, inflation and Exchange Rate in Nigeria during the period 1986 to 2011. The study found that the relationship between FDI and GDP does not follow theoretical and prior expectations where inflows of FDI should have positive and significance influence on GDP. Sukar (2015)examined the effect of foreign direct investment on economic growth in Sub-Sahara African countries. The methodology involves estimating augmented endogenous growth model using panel data for the period 1975-1999.The study found that foreign direct investment has marginally significant positive effect on economic growth. Domestic economic conditions such as macroeconomic policy, openness, and domestic investment have significant positive effect on economic growth.

3. The Model Used in the Present paper

Based on the foregoing explained in the previous chapters, using a variety of applied studies for different models in estimating the FDI on economic growth in addition to the use of different methodologies, accordingly, the standard model in this study, the general equation is the following:

$$GDP = (FDI, IM, K, L)$$

Thus, our growth function becomes;

$$GDP_t = C + \beta_1 FDI_t + \beta_2 IM_t + \beta_3 K_t + \beta_4 L_t + \varepsilon_t$$

Where:

- GDP_t :Economic growth (proxy for Gross domestic product in period t, (current price USD)
- FDI_t : Foreign direct investmentin period t, (current price USD)
- IM_t: Import of goods and servicesin period t, (current price USD)
- K_t:Capital stock proxy for Gross capital formationin period t, (current price USD)
- L_t:Labor force
- C: Constant,ε_t: The standard error

By taking the log of both sides of the equation becomes:

$$LOGGDP_t = C + \beta_2 \log FDI_t + \beta_3 \log Im_t + \beta_4 \log K_t + \beta_5 \log L_t + \varepsilon_t$$

3.1. The data

Data have been collected during the period 1995 to 2013, for17 countries in Arab countries :(Jordan, united ArabEmirates, Bahrain, Tunisia, Algeria, Saudi Arabia, Sudan, Oman, Qatar, Kuwait, Lebanon, Egypt, Djibouti, Mauritania, Morocco, Yemen and Palestine). Number of countries which could have been part of the sample were omitted due to lack of sufficient data on some of the variables under investigation because of the unstable political the situation.The sample under study the required secondary Data was collected from official sources like World Bank data and UNCTAD data.

4. Methodology

The study used the panel data method, through the use of three models is: Pooled regression model (PRM), fixed effect model (FEM) and random effect model (REM). To know any better models to be used in the analysis will be applied tow test: the first test (test LM) Lagrange multiplier proposal from Preusch and Pagan in (1980). This test is used to choose between (PRM), (FEM) or (REM), the second test, Housman test (1978), for choose between (FEM), (REM).

4.1. The Pooled Effect Model

It can clarify the compound regression model as follows:

$$Y_{it} = \alpha_i + \dot{\beta}_{ki} + \varepsilon_{it} \dots \dots (1)$$

Suppose pooled regression model homogeneity of variances random error between the countries under study limits ($\sigma_i^2 = \sigma_\varepsilon^2$), together with zero covariances between countries $\mathrm{Cov}(\varepsilon_{it}it, \varepsilon_{js}) = 0$ for i $\neq$ j. (Alexiou, 2001: p.6).The model also assumes forming Fixed limit transactions ($\alpha_{i,s}$) and slope coefficients (β, s) for all countries

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDI)	0.077046	0.190651	0.404119	0.6864
LOG(IM)	1.519909	0.494955	3.070804	0.0023
LOG(K)	1.371887	0.480574	2.854684	0.0046
LOG(L)	0.073830	0.215985	0.341829	0.7327
C	14.56011	3.035109	4.797230	0.0000
R-Square = / 0.636919a adjusted R-Square = 0.632352				

Table1: Results Pooled Model

As shown table (1) the independent variable (imports and capital stock) was significant at level of 1%, the labour and FDI wasin significant at level of 1%.The foreign direct investment, imports, capital stock and labour had positive effecton economic growth in the Arab countries on during the period 1995 to 2013.Also the R-Square reached 0.637 in the pooled effect model.

4.2. The Fixed Effect Model
The fixed effects model is simply a linear regression model in which the intercept terms vary over the individual units i, (Dinardo, Johnston, 1997:p.397).

$$Y_{it} = \alpha_1 \delta_{1it} + \alpha_2 \delta_{2it} + \cdots + X_{it}\beta + \varepsilon_{it} \dots. (2)$$

Where it is usually assumed that all x_{it} are independent of allε_{it}, we can write this in the usual regression framework by including a dummy variable for each unit i in the model (Hsiao, 2003:p.96). That is,

$$y_{it} = \sum_{j=1}^{N} \alpha_j d_{ij} + x_{it}\beta + \varepsilon_{it} \dots (3)$$

Where $d_{ij} = 1$ if i=j and 0 elsewhere. We thus have a set of N dummy variable in the model. The parameters$\alpha_1 \dots \dots, \alpha_N$ and β can be estimated by ordinary least squares in (3). The implied estimator for β is referred to as the Least Squares Dummy Variable (LSDV) estimator. It may, however, be numerically unattractive to have a regression model with so many repressors

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDI)	-0.038310	0.016158	-2.370966	0.0184
LOG(IM)	0.520009	0.047642	10.91496	0.0000
LOG(K)	0.182855	0.036796	4.969479	0.0000
LOG(L)	0.529194	0.066612	7.944445	0.0000
C	13.35172	0.897461	14.87721	0.0000
R-Square = 0.999/a adjusted R-Square =0.999				

Table 2: Results Fixed Effect Model

As shown in table (2) the independent variablesFDI, import, capital stock and labour was significant at level of 1%, also theimport, capital stock and labour had positive effect on economic growth in the Arab countries during the period 1995 to 2013. The FDI had negative effect on economic growth in the Arab countries during the period 1995 to 2013.The R-Square reached 0.999 in the pooled effect model.

4.3. The Lagrange Multiplier (LM) Test
The Lagrange Multiplier model is as follows (Greene, 2002:p.299)

$$LM = \frac{NT}{2(T-1)} \left[\frac{\sum_{i=1}^{N}\left(\sum_{t=1}^{T}\varepsilon_{it}\right)^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\varepsilon_{it}} \right]^2 \sim x^2 \dots \dots (4)$$

If the value of (p- value) statistical test (LM),is statistically significant for this test, it means that FEM, REM, would be better than PRM. It this value is not statistically significant for the same test, this means that PRM will be better than the FEM, REM.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	9434.910608	(16,302)	0.0000
Cross-section Chi-square	2007.875313	16	0.0000

Table 3: Result LMTest

As shown table (3) the fixed effects models better than the pooled model.

4.4. The Random Effect Model

It is commonly assumed in regression analysis that all factors that affect the dependent variable but that have not been included as repressors can be appropriately summarized by a random error term. In our case, this leads to the assumption that the α_i are random factors, independently and identically distributed over individual distributed over individuals. Thus we write the Random Effects Model as,

$$y_{it} = \mu + x_{it}\beta + \alpha_i + \varepsilon_{it} , \varepsilon_{it} \sim IID(0, \sigma_\varepsilon^2); \alpha_i \sim IID(0, \sigma_\alpha^2) \dots\dots (5)$$

where $\alpha_i + \varepsilon_{it}$ is treated as an error term consisting of two components: an individual specific component, that this not vary over time, and a remainder components, That is assumed to be uncorrelated over time, this is all correlation of the error terms over time is attributed to the individual effects α_i. It is assumed that α_i and ε_{it} are mutually independent and independent of x_{js} (for all j and s). This implies that the OLS estimator for μ and β from (5) is unbiased and consistent. The error components structure implies that the composite error term $\alpha_i + \varepsilon_{it}$ exhibits a particular form of autocorrelation (unless $\sigma_\alpha^2 = 0$) (Verbeek,2000).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDI)	-0.039268	0.016152	-2.431191	0.0156
LOG(IM)	0.520137	0.047595	10.92849	0.0000
LOG(K)	0.183968	0.036790	5.000490	0.0000
LOG(L)	0.532736	0.066386	8.024811	0.0000
C	13.30596	1.238317	10.74520	0.0000
Effects Specification			S.D.	Rho
Cross-section random			3.530975	0.9979
Idiosyncratic random			0.161716	0.0021
R-Square		0.920782		
A adjustedR-Square		0.919785		

Table 4: Results Random Effect Model

As shown in table (4) the independent variable FDI, import, capital stock and labour was significant at level of 1%, The FDI had negative effect on economic growth in the Arab countries during the period 1995 to 2015, the imports, gross capital formation and labour were positive effect on economic growth in the Arab countries on same period. Also the R-Square reached 0.931 in the random effect model.

4.5. The Hausman Test

Hausman test is used decide between Fixed Effect model and Random Effects model.Null hypothesis is that the preferred model is Random Effects Model vs. the alternative is the Fixed Effects model. It basically tests whether the unique errors (ui) are correlated with the regresses; the null hypothesis is they are not, (Chmelarova, 2007:p.6).

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.816617	4	0.0009
Cross-section random effects test comparisons:			
Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(FDI)	-0.038310	-0.039268	0.000000	0.0299
LOG(IM)	0.520009	0.520137	0.000005	0.9521
LOG(K)	0.182855	0.183968	0.000000	0.0824
LOG(L)	0.529194	0.532736	0.000030	0.5180

Table 5: Result Hausman Test

As shown in table (5) the fixed effects models better than the random effects model.So they study was analysed the results fixed effects models:

$$LOGGDP_t = 13.35172 - 0.038310FDI_t + 0.520009Im_t + 0.182855K_t + 0.529194L_t$$

5. Results and Discussion

The study found the all independent variable had significant at level 1%.The study also found that the exports, imports, capital stock and labor had positive effect on economic growth in the Arab countries during the period 1995 to 2013.The coefficient of determination R2 is 0.999which means that the explanatory variables explained a total variation of 99 percent of the dependent variable (GDP).The FDI were a significantat the level of 1% and negative effect on economic growth in the Arab countries during the period 1995 to 2013. Also the elasticity of FDI in the Arab countries reached 0.04% during the period 1995 to 2013. Manning that if the FDI increased 100 % the economic growth decreased 4 %. This negative relationship between the foreign direct investment and economic growth could be as a result of insufficient foreign direct investment fund invested into the Arab countries, which has not been able to exert enough impact to make it positive or growth enhancing. Also this is due to the weakness of foreign direct investment to the Arab countries, and does not make use of them to the extent appropriate, in addition to the novelty of experience the government of Arab countries in foreign direct investment. Also this negative result of foreign direct investment may be because

investment is in sectors that don't achieve development in short run such as investment in construction sector or service sector, which needs a long period of time in order to achieve positive impact sectors. On other hand this result agrees with more studies like Najia&et.al (2013), Alinvie (2012), Hassan(2003) and Awe(2013).

Also the elasticity of imports in the Arab countries during the study period reached 0.52 %, if the exports increased by 100% in the Arab countries the economic growth increased by 52percent. The capital stock was significant at the level 1% and positive effect on economic growth in the Arab countries. Also the elasticity of capital stock in the Arab countries during the study period recorded 0.18 %, if the imports increased by 100% in the Arab countries the economic growth increased by 18 per cent during the period 1995 to 2013. The labour also was significant at level of 1% and had positive effect on the economic growth in the Arab countries. Also the elasticity of labour in the Arab countries during study period recorded 0.53%. It means if labour increase by 100% the GDP in Arab countries increased by 53percent during the period 1995 to 2013.

6. Conclusion and Policy Recommendations

The study aimed to find estimated the effect FDIon economic growth in the Arab countries during the period 1995 to 2013, through a form of panel data which includes economic growth measured by GDP as the dependent variable, and a number of independent variables, which included FDI, imports,capital stockandlabor in 17 Arab countries. The countries studied were Jordan, United ArabEmirates,Bahrain,Tunisia,Algeria,Saudi Arabia,Sudan,Oman, Qatar,Kuwait, Lebanon,Djibouti, Mauritania, Egypt, Morocco, Yemen and Palestine. Number of countries which could have been part of the sample was omitted due to lack of sufficient data on some of the variables under investigation.The study found that the FDI had negative effect on economic growth in the Arab countries during the period 1995 to 2013, the imports, capital stock andlabor had a positive effect on economic growth in Arab countries during the period 1995 to 2013.The study recommends the following policy measures for the economic growth in Arab countries.   The study found the effect FDI was negative in the Arab countries during the period 1995 to 2013, sothere is need to Manage and give direction to FDI to productive activities in order to avoid the adverse effect of FDI on GDP of Arab countries. Also the study recommended as long as the capital stock plays a key role in economic growth in the Arab countries, Arab countries must encourage increase in capital stock, to increase its contribution to economic growth.Support for growth-led import in Arab countries Thus effort should be direct towards policies that will enhance economic growth such as industrialization, in order to impact more on imports,the need to approach the Arab countries, to economic openness to enhance the role of imports and imports in the economic growth policy. Also Arab countries need to focus on vocational education, through the holding of professional training courses, because of its important role in raising the productivity of the worker in Arab countries. It is important indicator for measuring the efficiency and effectiveness of the work element in achieving a certain level of the output in the production process. There is need to increase the imports of technology for increasing labor productivity which can directly promote economic growth, and thus improve the standards of living in the Arab countries.

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