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# THE IMPACT OF FDI ON ECONOMIC GROWTH IN SAUDI ARABIA

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## ABSTRACT

This research examines the role of foreign direct investment (FDI) to influence the macro economy of Saudi Arabia. This research considers gross domestic product (GDP), inflation and unemployment as the selected macroeconomic variables to evaluate the role of foreign direct investment while including other independent variables like gross fixed capital formation (GFCF), real effective exchange rate and exports. This research covers the sample period from 1992 – 2017, using autoregressive distributed lag (ARDL) model which is appropriate when selected macroeconomic series are not of similar order of integration. This research also employs ARDL bound test and related error correction model to further validate the analysis. All the estimated parameters from ARDL, F bound test and error correction term confirm the positive and statistically significant long run impact of foreign direct investment on GDP. This study also finds positive and statistically significant impact of exports and real effective exchange rate on GDP in Saudi Arabia. This research provides an important insight for policy makers to facilitate more foreign direct investment in Saudi Arabia along with large exports volume. This research is an important contribution to the existing literature pertaining to the role of FDI to influence macro economy of Saudi Arabia, especially in the context of Vision 2030 which aims to facilitate foreign direct investment in the country.

## INTRODUCTION

Foreign Direct Investment helps boost growth of an economy through the transfer and transmission of technology from one country to another. According to Dimelis [1], Growth of the economy of the host country is

realized because the technology transferred from one country to another brings with its new production methods, revolutionized managerial skills and evolved business processes to the host country. Another theoretical linkage between economic growth and multinationals in a country is that FDI fast tracks the modernization of a country [2]. Foreign investment can be in form of real estate; infrastructure etc. Such kind of businesses set up in a host country help spearhead modernization especially because of the improved infrastructure that results from the new businesses [3]. One of the positive impacts of FDI in an economy is that it aids the improvement of labor quality in an economy [4]. This usually happens when the multinationals established in a country bring with them new and a great working culture from their countries. The citizens of a country get assimilated with great working cultures brought in by foreign companies. High quality labor improves the productivity in a country and eventually raises GDP.

Almazari [5] investigated the impact of FDI on Saudi Arabia's financial sector. They argued that the increase in FDI in the economy has relatively increased capital inflow. This thus further motivates our research to try to find out its economic impact in the economy. Bellack [6] outlined the major role that foreign direct investments play in the economic development of a country. The study stated that FDIs promoted economic development owing to its higher productivity and the employment of more administrative personnel compared to local industries. His analysis further discovered that multinationals are more profitable than local firms. Due to this, the Saudi Arabian government has formulated incentives to foreign firms in order to promote Foreign Direct Investment hence economic development [7].

Hvidt [8] highlights how FDI has largely contributed to solving unemployment crisis in Saudi Arabia. The Saudi Arabian government has largely been encouraging FDI by developing infrastructure for the m to invest in a bid for foreign companies to transfer technology and also employ workforce from Saudi Arabia. This way; it eliminates the overdependence on government subsidies by its citizens. When multi-nationals establish their businesses in the country, they have to employ local citizens to work on their industries. FDI in Saudi Arabia have reduced the unemployment rates crisis that had hit the country a while back.

The culture is assimilated through the interaction of foreign employees with other local employees and fellow citizens. The contribution of the foreign direct investment to the Saudi Arabian community is through projects that promote education and health [9]. Foreign Direct Investments have also funded sponsorship programs in the Saudi Arabian Communities. According to Abdulrahim [10], foreign investors normally consider the cultures and practices of a host country before making a decision on whether to invest in that country.

According to Al-Iriani [11], the growth of FDI in Saudi Arabia has been on tremendous rise over the recent years. The reason behind the increase is the government's effort to diversify non-oil income generating activities. Other reasons that can be attributed to the growth of FDI over the years include

creation of job opportunities, technological transfer, improvement of the quality of manpower and strengthening of the private sector as a whole. There are several challenges facing the development of FDI in Saudi Arabia. The Saudi Arabian government has for a long time wanted to steer the economic growth of the country to reach the standards of other first world countries and thus have been creating infrastructure to attract foreign direct investment (FDI) that can help spearhead this agenda. Therefore, this research aims to explore empirically whether FDI has a role to affect economic growth, inflation and unemployment in the country.

## METHODOLOGY

This research paper employs the numerical measures of economic growth, unemployment, real effective exchange rate, inflation, gross fixed capital formation, Export and FDI for the time period 1992 to 2017. Data on the development of Saudi Arabia were gathered from the World Bank Website.
The FDI has included the equity capital, reinvested earnings and other capital (mainly intra-company loans). GDP contains the market value of all gods and services produced in a given year, unemployment is percentage of total labor force unemployed, and inflation is the percentage change in consumer price index. REER is the weighted average of a country's currency in relation to an index or basket of other major currencies, adjusted for the effects of inflation. Gross fixed capital formation (GFCF) refers to the net increase in physical assets (investment minus disposals) within the measurement period.

### *Hypotheses*

This study investigates the impact of foreign direct investment, inflation and unemployment on the macroeconomic variables in Saudi Arabia.
H0a: FDI does not affect the GDP growth
H1a: FDI effect on the GDP growth
H0b: FDI does not affect Inflation
H1b: FDI effect on Inflation
H0c: FDI does not affect unemployment
H1c: FDI effect on unemployment

### *Autoregressive Distributed Lags Model (ARDL)*

This study aims at finding out the relationship between foreign direct investment and economic growth in Saudi Arabia. This study utilize quantitative data to determine the causal relationship between FDI and economic growth in Saudi Arabia while using autoregressive distributed lags model (ARDL) which is usually denoted with the notation ARDL (p, q1, qk), where is the number of lags of the dependent variable q1, is the number of lags of the first explanatory variable, and qk is the number of lags of the k-th explanatory variable. An ARDL is a least squares regression containing lags of the dependent and explanatory variables. The formula may write as:

$$y_t = \alpha \sum_{i=1}^{p} \gamma_i y_{t-i} + \sum_{j=1}^{k} \sum_{i=0}^{qj} X_{j,t-i}{}' \beta_{j,i} + \varepsilon_t$$

Some variables are called static or fixed repressors which could be the explanatory variables Xj that have no lagged terms in the model (qj = 0). The dynamic repressors are explanatory variables with at least one lagged. To specify an ARDL model, there is a need to determine how many lags of each variable should be included. The good thing that simple model selection procedures are available for determining these lag lengths. Since an ARDL model can be valued via least squares regression, standard Akaike, Schwarz and Hannan-Quinn information criteria could be used for model selection. On the other hand, one could employ the adjusted from R2 the various least squares regressions. Since an ARDL model estimates the dynamic relationship between a dependent variable and explanatory variables, it is probable to convert the model into a long-run representation, showing the long run response of the dependent variable to a change in the explanatory variables. The calculation of these estimated long-run coefficients is given by:

$$\theta_j = \frac{\sum_{i=1}^{qj} \hat{\beta}_{j,i}}{1 - \sum_{i=1}^{p} \gamma i}$$

The standard error of these long-run coefficients can be considered from the standard errors of the original regression using the delta method. Traditional methods of estimating cointegrating relationships, such as Engle-Granger [12] or Johansen's [13, 14] method, or single equation methods such as Fully Modified OLS, or Dynamic OLS either require all variables to be I(1), or require prior knowledge and specification of which variables are I(0) and which are I(1). Pesaran and Shin [15] stated that cointegrating systems can be estimated as ARDL models, with the advantage that the variables in the cointegrating relationship can be either I (0) or I (1), without needing to pre-specify which are I (0) or I (1). Pesaran and Shin also showed that unlike other methods of estimating cointegrating relationships, the ARDL representation does not require symmetry of lag lengths; each variable can have a different number of lag terms. The cointegrating regression form of an ARDL model is obtained by transforming into differences and substituting the long-run coefficients from

$$y_t = \alpha_0 \alpha_1 t + \sum_{i=1}^{p} \psi y_{t-i} + \sum_{j=1}^{k} \sum_{lj=0}^{qj} \beta_{j,lj} X_{j,ljt-lj} + \varepsilon_t$$

Where,

$$EC_t = y_t - \alpha - \sum_{j=1}^{k} X_{j,t}{}' \hat{\theta}_j$$

$$\hat{\phi} = 1 - \sum_{i-1}^{p} \hat{\gamma}_l$$

$$\gamma_i{}^* = \sum_{m=i+1}^{p} \hat{\gamma}_m$$

$$\beta_{j,i}{}^* = \sum_{m=i+1}^{qj} \beta_{j,m}$$

The standard error of the cointegrating relationship factors can be calculates from the standard errors of the original regression using the delta method.

## RESULT AND DISCUSSION

### *Descriptive Statistics*

Table 1 shows the descriptive statistics of the data. This study calculates the median value as the average of two middle scores. The range for the Skewness for most of the data series is around zero and kurtosis value surrounds 3, indicating the normal distribution for the selected variables in the sample.

**Table 1**: Data of descriptive statistics

| | EXPORT | FDIG | GDP | GFCFG | INFLATION | REER | UNEMPL |
|---|---|---|---|---|---|---|---|
| Mean | 2.7 | -3.9 | 3.0 | 1.0 | 1.7 | 110.4 | 5.7 |
| Std. Dev. | 6.7 | 10.1 | 3.7 | 7.6 | 2.2 | 10.8 | 0.6 |
| Skewness | 0.3 | -2.5 | 0.2 | 0.5 | 0.3 | 0.0 | 0.2 |
| Kurtosis | 3.5 | 8.1 | 2.7 | 1.5 | 2.0 | 1.4 | 3.8 |
| Jarque-Bera | 0.8 | 53.7 | 0.2 | 3.1 | 1.4 | 2.7 | 0.8 |
| Probability | 0.7 | 0.0 | 0.9 | 0.2 | 0.5 | 0.3 | 0.7 |

In all cases the p-value is greater than 0.05, so this study accepts the null hypothesis of the normal distribution of data. FDIG has mean of -3.921with standard deviation of 10.08 the skewness and kurtosis of the distribution of FDIG data are -2.54 and 8.066. The Jarque-Bera test-statistic value for FDIG is 53.7 with p-value of 0. The p-value is less than 0.05 and then the null hypothesis of the normal distribution of data is rejected.

### *Unit Root Test*

To examination the stationarity of the data, this study used Augmented Dickey-Fuller test at level and at first difference. A stationary series has a mean (to which it tends to return), a finite variance, shocks are transitory, autocorrelation coefficients die out as the number of lags grows, whereas a non-stationary series has an infinite variance (it grows over time), shocks are permanent (on the series) and its autocorrelations tend to be unity. If the series is ‘stationary’, the demand-side short run macroeconomic stabilization policies and financial development are likely to be operative and endorse economic growth but if the series is ‘non-stationary’, the supply-side policies are more likely to be effective in promoting growth with the accumulation of financial and human capital in the long run. Table 2 shows that the result of ADF unit root test at levels the P-value of GDP, Export, unemployment and inflation are less than 0.05, so the null hypotheses of unit root test is rejecting or the data is stationary at level. In case of FDI, REER and GFCF the result of P-value is more than 0.05, so the null hypotheses of unit root test are Accept or the data is not stationary.

Table 2 also shows that the result of ADF unit root test at 1st difference The P-value of GDP, Export, unemployment, GFCF and inflation are less than 0.05,

so the null hypotheses of unit root test is reject or the data is stationary at level, but in FDI and REER the P-value more than 0.05 so the null hypotheses of unit root test is Accept or the data is not stationary.

**Table 2**: ADF Unit Root Test at Levels and at 1st difference

| Variables | ADF Unit Root Test at Levels | | ADF Unit root test at 1st difference | |
|---|---|---|---|---|
| | P-value for z(t) | Decision | P-value for z(t) | Decision |
| GDP | 0.0007 | Reject | 0.0001 | Reject |
| FDI | 0.2803 | Accept | 0.3507 | Accept |
| REER | 0.6026 | Accept | 0.078 | Accept |
| Exports | 0.0008 | Reject | 0.0002 | Reject |
| Unemployment | 0.0366 | Reject | 0.0005 | Reject |
| GFCF | 0.351 | Accept | 0.0094 | Reject |
| Inflation | 0.057 | Reject | 0.0000 | Reject |

### *ARDL test*

### *ARDL test for GDP*

In restricted model, the coefficient of FDI is 0.11 with t-statistic value of 2.659. The P value is 0.026 which is less than 0.05. Hence the null of no impact of FDI on GDP is rejected. FDI has an impact on GDP. In unrestricted and liner trend the coefficients of FDI are 5.32 and 1.08 with t-statistic are 0.527 and 0.608. P values are 0.60 and 0.569, so there is no impact of FDI on GDP. The ARDL of GDP for restricted constant, unrestricted constant and restricted linear trend models are:

GDP = ∝1 +.11FDIg + 5.94GFCFG - 0.102REER + 0.418Export + 0.121FDIG (-2) + 0.258 REER (-2) +εt
GDP= ∝1 + 5.32FDIg + 7.33GFCFG - 0.10REER + 0.354Export +εt
GDP= ∝1 + 1.08FDIg - 5.39GFCFG - 0.2REER + 0.22Export - 0.179Export (-2) +εt

### *ARDL test for Inflation*

The long-term relationship between inflation and foreign direct investment with other selected macroeconomic variables while estimating the coefficients with restricted constant, unrestricted constant and restricted linear trend models were executed. These estimates show a positive and but statistically insignificant impact of foreign direct investment on inflation under all three models. P values are 0.961, 0.772 and 0.298, so there is no impact of FDI on Inflation. The ARDL of inflation for restricted constant, unrestricted constant and restricted linear trend models are:

Inflation = ∝1 - 0.001FDIg + 6.31GFCFG - 0.179REER + 0.008Export – 0.087REER (-1) + εt
Inflation = ∝1 + 3.27FDIg - 3.27GFCFG - 0.084REER + 0.018Export + εt

Inflation = ∝1 + 1.58FDIg + 4.5GFCFG – 0.044REER + 0.157Export + 1.63GFCF (-1) + 0.374REER (-2) + εt

### *ARDL test for Unemployment*

The long-term impact of foreign direct investment and other selected macroeconomic variables on unemployment in Saudi Arabia, while estimating the coefficients with restricted constant, unrestricted constant and restricted linear trend models. These estimates show a positive and but statistically insignificant impact of foreign direct investment on inflation under all three models. P values are 0.597, 0.98 and 0.985, so there is no impact of FDI on unemployment. The ARDL of unemployment for restricted constant, unrestricted constant and restricted linear trend models are:

Unempl= ∝1 - 0.015FDIg + 4.64GFCFG + 0.032REER + 0.0325Export - 0.105REER (-2) + εt
Unempl= ∝ 1 + 6.42FDIg - 7.58GFCFG + 0.030REER + 0.039Export + 2.87GFCFG (-2) + εt
Unempl= ∝ 1 + 9.38FDIg + 1.69GFCFG - 0.081REER + 0.032Export - 0.166 REER (-2) +εt

### *Identification of the Long Run Relationship - ARDL Bounds Test*

To evaluate the long run relationship between the variables, this study follows the approach suggested by Pesaran and Shin [15] and Narayan [16] and employs the ARDL "Bounds Test" approach. Pesaran, Shin, and Smith [17] identify the lower bounds and upper bounds for the asymptotic critical values for the selected independent variables. The F statistics is estimated through the specification of the models specified by:

GDP = $\propto \mathbf{1} + \propto \mathbf{2}\boldsymbol{FDI} + \propto \mathbf{3}\boldsymbol{GFCF} + \propto \mathbf{4}\boldsymbol{REER} + \propto$5Export +εt
Unemployment = $\propto \mathbf{1} + \propto \mathbf{2}\boldsymbol{FDI} + \propto \mathbf{3}\boldsymbol{GFCF} + \propto \mathbf{4}\boldsymbol{REER} + \propto$5Export + εt
Inflation = $\propto \mathbf{1} + \propto \mathbf{2}\boldsymbol{FDI} + \propto \mathbf{3}\boldsymbol{GFCF} + \propto \mathbf{4}\boldsymbol{REER} + \propto$5Export +εt

If the F-statistic is greater than the upper bound at specific level of significance that indicates the existence of a long-run relationship between the variables and if it is lower than the lower bound that indicates the absence of long-run relationship between the variables. Also, if it is in between that indicates non-determined relationship. Tables 3, 4 and 5 show the estimated F statistics and their related critical values. The critical value bounds for F-statistic are specified by Pesaran et al. (2001) at significance level 1%, 5%, and 10% for both lower bound I (0) and the upper, bounds I (1) [17].

**Table 3**: Bounds Test for GDP

| GDP | Restricted constant | | | Unrestricted constant | | | Restricted liner trend | | |
|---|---|---|---|---|---|---|---|---|---|
| Significance level | 1% | 5% | 10% | 1% | 5% | 10% | 1% | 5% | 10% |
| F-statistic | 6.249 | | | 7.483 | | | 5.631 | | |
| I (0) | 3.29 | 2.56 | 2.2 | 3.74 | 2.86 | 2.45 | 3.81 | 3.05 | 2.68 |
| I (1) | 4.37 | 3.49 | 3.09 | 5.06 | 4.01 | 3.52 | 4.92 | 3.97 | 3.53 |

**Table 4**: Bounds Test for unemployment

| GDP | Restricted constant | | | Unrestricted constant | | | Restricted liner trend | | |
|---|---|---|---|---|---|---|---|---|---|
| Significance level | 1% | 5% | 10% | 1% | 5% | 10% | 1% | 5% | 10% |
| F-statistic | 2.296 | | | 2.7144 | | | 1.603 | | |
| I (0) | 3.29 | 2.56 | 2.2 | 3.74 | 2.86 | 2.45 | 3.81 | 3.05 | 2.68 |
| I (1) | 4.37 | 3.49 | 3.09 | 5.06 | 4.01 | 3.52 | 4.92 | 3.97 | 3.53 |

**Table 5**: Bounds Test for Inflation

| GDP | Restricted constant | | | Unrestricted constant | | | Restricted liner trend | | |
|---|---|---|---|---|---|---|---|---|---|
| Significance level | 1% | 5% | 10% | 1% | 5% | 10% | 1% | 5% | 10% |
| F-statistic | 1.947 | | | 2.334 | | | 2.187 | | |
| I (0) | 3.29 | 2.56 | 2.2 | 3.74 | 2.86 | 2.45 | 3.81 | 3.05 | 2.68 |
| I (1) | 4.37 | 3.49 | 3.09 | 5.06 | 4.01 | 3.52 | 4.92 | 3.97 | 3.53 |

The estimates of F-statistics reveal that in case of GDP equation is 6.249 it is bigger than all critical value in all (Restricted, Unrestricted and Restricted linear trend). Hence all variables have long term relationship. In case of unemployment equation, The F-statistic of the restricted constant is 2.296, which is less than all the lower bound at 1% and 5% critical value. Hence, there is no long relationship. However, at 10% level it is between the upper and lower bound, so the result is non-determined relationship. Unrestricted constant model is 2.714, which is less than the lower bound critical value of 3.74 and 2.86 at 1% and 5%. In case of restricted liner trend F-statistic is 1.603 it is lower than all critical value, so there is no long-term relationship between unemployment and selected macroeconomic variables. The F-statistics in Inflation for restricted and unrestricted constant are 1.947 and 2.334 respectively which are lower than all critical value, but is linear trend F-statistic between lower and upper bound at 10% value, then non-determined relationship. Such relationship doesn't exist for both the cases of unrestricted constant and restricted constant models.

Restricted linear trend reveals the cointegration results estimated through the specified ARDL model. It is important to examine the error correction term (ECT) coefficient which indicates the long run relationship between the variables, this coefficient of error correction term (ECT) is supposed to be negative, significant, and its magnitude should be between 0 and -1 which indicates the existence of long run relationship.

Table 6 indicates that the estimated coefficient of the error-correction term is negative and significant for GDP equation which indicates a long-term relationship between the gross domestic product and selected macroeconomic variables including foreign direct investment in Saudi Arabia. It is interesting to note that error correction term shows a long-term relationship between FDI and both inflation and unemployment. This might be attributable to the impact of GDP on unemployment and inflation. An increase in GDP will reduce the

unemployment in the country whereas an increase in GDP will lead to higher level of inflation in the economy.

**Table 7**: ARDL Error correction Regression with ECT (-1)

| Eqn. | Restricted constant | | Unrestricted constant | | Restricted liner trend | |
|---|---|---|---|---|---|---|
| | Coeff. | t-Stat | Coeff. | t-Stat | Coeff. | t-Stat |
| GDP | -1.29 | -7.68 | -1.29 | -7.39 | -1.30 | -7.40 |
| Inflation | -0.80 | -3.13 | -0.80 | -2.95 | -1.28 | -4.17 |
| Unemployment | -0.77 | -3.91 | -0.77 | -3.64 | -1.11 | -4.13 |

## CONCLUSION

The estimates of specified ARDL equations reveal a positive and significant impact of FDI on gross domestic product in Saudi Arabia. The results also reveal a positive and significant impact of gross fixed capital formation on GDP in Saudi Arabian economy. Therefore, an increase in foreign investment will enhance economic growth in the country. However, this research finds no linkages between foreign direct investment and unemployment as well as inflation. These findings are consistent with the earlier studies related to Saudi economy.

A bound test was conducted, which show a long-term relationship between FDI and gross domestic product but does not indicate any impact of FDI on inflation and unemployment. The ARDL approach was employed to cointegration to present the long-term relationship between the selected variables and the error correction term indicates the speed of adjustment or feedback effect. A positive error correction term shows divergence, a negative implies convergence. When error correction term is zero that has implied no long-term relationship between the variables. However, all the estimated coefficients for error correction term are between zero and minus one, which show a quick convergence to equilibrium point and revealing a long-term relationship between FDI and GDP. Our error correction model also shows the long-term impact of FDI on unemployment and Inflation, which can be attributed to indirect relationship between GDP and inflation as well as unemployment. An increase in GDP reduces the unemployment and increases the inflation in the economy. Henceforth if GDP levels are augmented by the increased foreign direct investment then it will also affect the unemployment and inflation over a long horizon.

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