

## Dynamic Relationship between Foreign Direct Investment & Economic Growth in Iraq: Evidence from ARDL Bound Testing Approach

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### Abstract

The connection between economic development and FDI has been very popular among economists and academia. The importance of this relationship is more significant in developing countries particularly with high unemployment rate and low technological advancement. This investigation is an effort to highlight the issue in Iraqi context by applying ARDL bound test estimation approach. For this purpose, yearly time series data over the period of 1971 to 2016 has been utilized to apply ARDL long run estimation. The results provide robust evidence supporting the view that Iraqi GDP is affected by foreign direct investment in long run. Further, bound test affirm the non presence of short-run causality relationship from foreign direct investment to GDP.

**Keywords:** FDI; GDP; ARDL; Iraq; Economic growth.



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### 1. Introduction

Economic development has been a prime attention in the previous couple of decades particularly in underdeveloped nations. Investment is a way to lubricate the economic system especially foreign investment which is known as FDI. Countries are always finding new ways to attract FDI to increase national productivity. The productivity increase always stimulates the economic growth hence overall efficiency of country increases (Findlay, 1978). Furthermore, FDI builds the rate of specialized advancement in the host nation through a learning dispersion and administration rehearses.

Conclusively, inward FDI is a gigantic source to elevate the domestic funds for investments. Hence, new investment directly affects the economic growth in many ways like Research and Development investments to enhance the technical innovation. Human capital also strengthens with the increase in productive efficacy due to foreign firms which increase exports level. Therefore, holistically FDI effect the domestic growth by uprising the domestic investment level by technological advancement in human capital. The technological advancement stimulates the export level due to competitive advantage over technologically deprived nations. The increase in export level introduces new employment opportunities (Ewe-Ghee, 2001).

It is worth mentioning that the domestic players also improve their quality and quantity using the human capital which is developed by foreign firms. Furthermore, the spillover effect created by foreign firms creates the environment of competition for local firms (Glass and Saggi, 2002). The diverse effect of foreign direct investment on economic growth has been witnessed around the globe. Previous studies have also reported negative effect of FDI on economic growth. The focus of past researches was on the co-integration of FDI-growth using different statistical tools. In addition to this, previous researches focused on cross country data where country specific characteristics were ignored. Furthermore, there is a dearth of literature on the causal relationship among FDI and economic growth.

Therefore, this study is an effort to bridge the gap in literature to investigate the FDI and growth relationship using ARDL-bound testing approach. There is a little attention drawn on the subject in Iraqi context. Although, many of the studies have focused on developing countries, there is negligible empirical evidence in Iraqi context. By investigating the role of FDI for economic growth this study can draw important guidelines for policy makers to cope the economic challenges faced by Iraq. Iraq is facing a challenging time since after a long period of war. A high unemployment ratio is also the key challenge for Iraq.

The rest of this study structures as section 2 provides conceptual insights. Section 3 focused on the method used to investigate the research phenomenon. Section 4 presents and discusses the results and section 5 concludes the research.

## 2. Literature Review

The impact of FDI on the host country's economic growth has been debated because of inconclusive evidence. The definition of FDI in previous literature is merely different. FDI reflects the "fairness of foreign investors (residents) in establishing and developing companies in various fields of activity in other countries". The capitals emphasize that entities wishing to gain long-term benefits reside in an economic business resident in another economy and investors are engaged in the business of influencing and controlling it. It is evident that the developing and transition countries benefiting from FDI penetration have a strong investment leap: technology transfer, Industrial restructuring, labour force development skills, impact on production, incomes, prices and the economy as a whole (Ranjan and Agrawal, 2011). It is conducive to improve the quality of production factors, enhance the "based on professional production factors of some competitive advantage" (Anghel, 2002). The active role of the host country is determined by long-term implementation to ensure high levels of stability. A significant advantage to host countries by preferring FDI over other sources of funding is, it is helpful reducing deficit by increasing by increasing balance of payment. Hence, public debt is negatively affected by balance of payment.

According to the basic determinants and types of investment, the impact of FDI on the welfare of host countries is significant through the creation of new productive capacity, new working capacity. Although most of the time foreign investors take over the business means a significant reduction in employment (Bonciu, 2003). Studies at the macroeconomic level emphasize that FDI externalities are affected by the absorptive capacity of the host country, constrained by local conditions, financial market development or educational levels (De Mello, 1999; Johnson, 2006). The existence of direct correlation between the absorbing forces of the foreign capital by the authority and the higher economic expansion level is evident. The quadratic relationship of FDI-economic growth allows researchers to approach the issue (Chong and Baharumshah, 2010; Moran *et al.*, 2005). The development of beneficiary countries highlights the role of foreign direct investment in the development of human capital skills, technology and knowledge transfer, expansion of financial markets. Furthermore, the enhancement of local enterprise productivity increases due to foreign competition to ensure equitable distribution of income (Abzari *et al.*, 2011). Similarly, the relationship between growth rate and rate of national income positively impact the balance of payments (Ericson and Irandoust, 2001).

Conversely, a Negative connections between FDI and growth has also reported (Carkovic and Levine, 2005; Lyroudi *et al.*, 2004). Similarly, an insignificant relationship between the foreign investment inflows to GDP and the rate of national growth has been reported by (Lipsej and Sjöholm, 2005). However, A large number of studies have shown that FDI and economic growth are positively correlated between developed and developing countries. Blomstrom asserted a positive correlation between FDI and growth requires the lowest level of human capital, economic and financial stability and market liberalization in the host country. The foreign capital contributions stimulate the GDP rates by improving competitiveness, human resource development and influencing capital formation (Blomstrom *et al.*, 1994).

There is a general recognition that FDI has a positive and negative impact, involving costs and benefits, but the latter is higher than the cost of investment. Foreign investment has a strong impact on national welfare by promoting competition in the domestic market by increasing innovation (Herman *et al.*, 2004). The view of the relationship between FDI and economic growth reveals the important position of foreign capital in the host economy, and different methods vary depending on the choice of variables. The goal of developing countries is to create an environment that attracts FDI and may lead to technology transfer, increased production, creating new employment opportunities and exports. This objective is the main motive for our investigation of the relationship between FDI and Iraq's economic growth. In this study, we tried to find out whether changes in FDI had a favorable impact on economic growth of Iraq. Table.1

## 3. Data and Model Estimation

This study aimed to investigate the relationship between foreign direct investment and economic growth variables. Following equation is used to measure the model of this study

$$GDP = f(FDI, H, K) \quad (1)$$

Where FDI stands for foreign investment and measured as Gross FDI inflows to GDP ratio, H is understood as human capital and K is Gross Fixed Capital Formation. GDP is considered as GDP per Capita. This equation explains that economic growth is the function of FDI. The annual data on FDI, GDP and Gross Capital Formation and Human Capital was utilized to estimate the underlying relationship aimed at time period of 1971 to 2016. The data has been extracted from World Bank open access database.

### 3.1. Econometric Model

The study uses the ARDL technique to measure the relationship between the underlying variables i.e. GDP and FDI. For different integration orders and small samples, this is an important method. Even though some explanatory variables are endogenous (Odhiambo, 2009), the method provides long-term unbiased estimations. Before ARDL assessment, the no co-integration need to be assess at second order difference  $I(2)$ . To obtain vigorous results ADF and PP unit root tests has been utilized. To avoid ambiguous results, Zivot-Andrews test (ZA) is useful to consider break point. The traditional unit root is unable to detect the breaks in unit root test whereas; ZA detects the breaks of the unit root structure. We utilize Baum's (2015) modification method to detect a unit root in an alternate trend for a time series with a steady change in average, changing the time trend and shifting in the slope and interception. The unit root and stationary test results are illustrated in Table 2. The ADF and PP tests show that the correlation variable

is the integral of GDP in first difference  $I(1)$ , and mixed integration has been recorded by all independent variables, i.e.  $I(0)$  or  $I(1)$ . Therefore, the prerequisite that applies the ARDL co-integration, i.e. the variable of interest must be at  $I(1)$ , and the explanatory variable  $I(0)$  or  $I(1)$ . The null hypothesis in the unit root is also denied at the existence of all variables at level 1%, 5%, or 10% as resulted by ZA test. In addition, the series has not been found significant at second order  $I(2)$  integration, It also satisfies an important condition to execute the ARDL program (Kouakou, 2011).

**Table-2.** Unit root and stationary test results

Variables	ADF test		PP test		ZA test					
	I(0)	I(1)	I(0)	I(1)	Z <sub>d</sub>	Break	Z <sub>t</sub>	Break	Z <sub>dt</sub>	Break
K	-2.372	4.491*	-2.315	-3.816**	-4.220	1994	-4.50**	2001	-4.89***	1997
FDI	-3.626**	-7.331*	-3.217***	-12.587*	-4.69***	1995	-3.92	2005	-4.70	1994
H	-2.215	-3.829**	-2.018	-3.936**	-6.73*	2010	-2.87	2001	-4.02	2000

\*, \*\* and \*\*\* denote significance level at 1%, 5% and 10%, respectively.

In the first stage of ARDL long run estimation is to bound the test process. The statistical significance of variables at lagged level has been examined to estimate long run relationships by unrestricted ECM. Following equations is used to explain ECM to explore the relationship between GDP and FDI:

$$\Delta GDP_t = \vartheta_1 + \vartheta_2 GDP_{t-1} + \vartheta_3 FDI_{t-1} + \vartheta_4 H_{t-1} + \vartheta_5 K_{t-1} + \sum_{i=1}^p \vartheta_i \Delta GDP_{t-i} + \sum_{j=0}^q \vartheta_j \Delta FDI_{t-j} + \sum_{k=0}^r \vartheta_k \Delta H_{t-k} + \sum_{l=0}^s \vartheta_l \Delta K_{t-l} + \mu_{1t} \tag{2}$$

$$\Delta FDI_t = \delta_1 + \delta_2 FDI_{t-1} + \delta_3 GDP_{t-1} + \delta_4 H_{t-1} + \delta_5 K_{t-1} + \sum_{i=1}^p \delta_i \Delta GDP_{t-i} + \sum_{j=0}^q \delta_j \Delta FDI_{t-j} + \sum_{k=0}^r \delta_k \Delta H_{t-k} + \sum_{l=0}^s \delta_l \Delta K_{t-l} + \mu_{2t} \tag{3}$$

In Equation (2), no co-integration is defined as  $H_0: \vartheta_2 = \dots = \vartheta_5 = 0$  whereas,  $H_1$  states:  $\{\vartheta_2 \neq 0\} \dots \dots U$  ( $\vartheta_5 \neq 0$ ). Likewise, for the equation (3), no co-integration has defined as  $H_0: \delta_2 = \dots = \delta_5 = 0$  whereas,  $H_1: \{\delta_2 \neq 0\} \dots \dots U$  ( $\delta_5 \neq 0$ ). In the constraint process, the joint meaning of the lag layer is tested by using the F-test method with non-standard asymptotic distribution. When an independent variable is integrated into a combination of order  $I(0)$  or  $I(1)$  or both, the two asymptotic thresholds provide a test for co-integration. When all series are assumed to be  $I(0)$ , the lower limit is appropriate while the upper limit is  $I(1)$ . The null hypothesis is therefore rejected if the calculated F statistic value is higher than the upper bound, hence, indicating co-integration. The null hypothesis of no co-integration is accepted if the calculated F statistic value is lower than the lower limit. In contrast, if the calculated F statistic is in the boundary range, the inference will be Indeterminate. Further, Breusch-Godfrey LM test to establish length of lag.

**Table-3.** ARDL bounds test results

Specifications	Max. lag length	F-test	Lower-upper bound (1%)	Lower-upper bound (5%)	Lower-upper bound (10%)
Model 1. GDP/(FDI, H, K)	3	2.89	5.19-6.84	3.62-4.91	2.91-4.10
FDI/(GDP, H, K)	3	3.14	5.19-6.84	3.62-4.91	2.91-4.10

- Dependent variable is shown outside the brackets.

**Table-4.** Long run coefficient estimation

Independent	1
FDI	1.16 (0.43)
H	1.07* (7.56)
K	0.30* (5.90)
Constant	46.26 (1.62)
Adj. R <sup>2</sup>	0.94
F-statistics	32.99*

- The t-statistics are presented in parenthesis. AIC is utilized for selection of lag.

Table 3 shows the results of bound test on the basis of variables selected for this model. Model 1 Controls H and K, and we fail to reject the hypothesis of no co integration. Hence, Table 3 show that proposed model presented in equation (2) has co integration among variables of the study. Therefore, long run relationship among FDI and GDP has been confirmed when GDP is considered a dependent variable. Consequently, equation (3) consider the FDI as a dependent variable, we find that there is absence of co integration in the long run. In next stage Granger causality test is executed based on the following specifications;

$$\Delta GDP_t = C_0 + \sum_{i=1}^p C_i \Delta GDP_{t-i} + \sum_{j=1}^q C_j \Delta FDI_{t-j} + \sum_{k=1}^r C_k \Delta H_{t-k} + \sum_{l=1}^s C_l \Delta K_{t-l} + \omega ECT_{t-1} + \mu_{4t} \tag{4}$$

$$\Delta FDI_t = d_0 + \sum_{i=1}^p d_i \Delta FDI_{t-i} + \sum_{j=1}^q d_j \Delta GDP_{t-j} + \sum_{k=1}^r d_k \Delta H_{t-k} + \sum_{l=1}^s d_l \Delta K_{t-l} + \mu_{5t} \tag{5}$$

The equation (4) consists to diagnose long run causality on the basis of Granger Causality test on the basis of FDI as dependent variable. The equation (5) argues that FDI may affect GDP in the short term without a long-term co-integration. Table 4 shows the results of the long-term causal relationship. This discovery provides strong evidence of the long-term causal relationship between independent variables and foreign direct investment. These results confirm the results of bound tests that establish a long-term relationship between GDP and foreign direct investment only when GDP is considered as dependent variable.

Table-5. Long run Granger causality

Dependent	1
GDP	0.77*
	(4.20)

\* sig. at 1% level. Values in parenthesis are t-values.

The short run causality results are presented in table 6. F-statistics is used to determined causality by testing the significance of all lagged values at I(1). Furthermore, by adding up the coefficients of all independent variables lag, direction of relationship is determined (Lee, 2010; Zhang, 2001). As can be learned from the significance of F-statistics, short run Granger causality between GDP and FDI is not observed.

Table-6. Short run Granger causality

Dependent	1
GDP	0.81
FDI	0.03

\* and \*\* denote significance at 1 and 5 percent, respectively.

In general, we have found that in the long run, Iraq’s GDP to FDI positive and unidirectional causal relationship. Conversely, no causal relationship has noticed in short-term. The induction of control variables i.e. H and K provides a powerful result and also improves overall model fitness. Conclusively, we can say that in the long run, gross domestic product is positively correlated with foreign direct investment. The result of this investigation is consistent with previous literature on FDI and Economic Growth (Hisarçiklilar et al., 2006; Narayan, 2005). Hence GDP and FDI has a positive and unidirectional casual relationship in the long run for Iraq. At the same time we did not notice any short run causality among the variables under study. Inclusion of Hand K provides robust results and also improves the goodness of fit of the models.

### 4. Conclusion

This paper analyzes the dynamic causal connection between foreign direct investment and economic growth since 1970 to 2016 in Iraq. It actualizes an ARDL co-integration model to look at the presence of long run connections between FDI and GDP and the Granger causality is utilized to inspect the direction of causal relationship. This subject merits extraordinary consideration due to the conceivable interrelationship between this arrangement and the effect on economic progress. The outcomes demonstrate that when FDI is a related variable, there is a co-integration connection between the GDP and FDI. The outcomes demonstrate that there is Granger causality among FDI and GDP in the presence of underlying control variables.

The fact that there is an across the board conviction that FDI can create positive efficiency externalities for the host nation, our experimental outcomes affirm to this. Foreign capital flow is the principle driver of economic development in Iraq. These outcomes can produce critical ramifications and proposals for policymakers in Iraq. The study recommends that for FDI to anticipate positive effect on economic development, Iraq should embrace genuine changes with clear goals. It needs to enhance its fascination of FDI through a progression of more eager auxiliary arrangements. The findings of this investigation could be extremely fascinating for developing nations to take in the exercise that the fascination of FDI is essential to advance economic development.

### References

Abzari, M., Zarei, F. and Esfahani, S. S. (2011). analyzing the link between financial development and foreign direct investment among d – 8 group of countries. *International Journal of Economics and Finance*, 3(6).  
 Anghel, I. E. (2002). Investițiile străine directe în România, Editura Expert, București.

- Blomstrom, M., Lipsey, R. and Zejan, M. (1994). *What explain developing country growth?*, In: *baumol, w., nelson, n., wolff, e. (eds.), convergence and productivity: Cross – national studies and historical evidence*. Oxford University Press: Oxford 11.
- Bonciu, F. (2003). Investiții străine directe, Editura Lumina Lex, București.
- Carkovic, M. and Levine, R. (2005). *Does foreign direct investment accelerate economic growth?*, in: *Moran, t.H., graham, e.M., blomstrom, m. (eds.), does foreign direct investment promote development?* : Institute of International Economics Press: Washington DC.
- Chong, K. and Baharumshah, A. Z. (2010). Private capital flows, stock market and economic growth in developed and developing countries: a comparative analysis. *Japan and the World Economy*, 22.
- De Mello, L. R. (1999). Foreign Direct Investment – led growth: evidence from time series and panel data, *Oxford Economic Papers*. 51.
- Ericson, J. and Irandoust, M. (2001). On the causality between foreign direct investment and output, a comparative study. *International Trade Journal*, 15.
- Ewe-Ghee, L. (2001). Determinants of, and the Relation Between, Foreign Direct Investment and Growth. IMF Working Papers 01/175, International Monetary Fund.
- Findlay, R. (1978). Relative backwardness, direct foreign investment, and the transfer of technology, a simple dynamic model. *Quarterly Journal of Economics*, 92: 1–16.
- Glass, A. and Saggi, K. (2002). Multinational firms and technology transfer. *Scandinavian Journal of Economics*, 104(4): 495–514.
- Herman, M., Chisholm, D. and Leavell, H., 2004. "Fdi and the effects on society,." In *Allied Academies International Conference, Proceedings of the Academy for Studies in International Business, New Orleans*.
- Hisarciklilar, M., Kayam, S. S., Kayalica, M. O. and L., O. N. (2006). Foreign direct investment and growth in Mediterranean countries.
- Johnson, A. (2006). The effects of fdi inflows on host country economic growth, cesis electronic working paper series.
- Kouakou, A. K. (2011). Economic growth and electricity consumption in Cote d'Ivoire: Evidence from time series analysis. *Energy Policy*, 39(6): 3638–44.
- Lee, C. G. (2010). Outward foreign direct investment and economic growth Evidence from Japan. *Global Economic Review*, 39(3): 317–26.
- Lipsey, R. and Sjöholm, F. (2005). *The impact of inward fdi on host countries: Why such different answers?* In: *Moran, t.H., graham, e.M., blomstrom, m. (eds.), does foreign direct investment promote development?* : Institute of International Economics Press: Washington DC.
- Lyrouti, K., Papanastasiou, J. and Vamvakidis, A. (2004). Foreign direct investment and economic growth in transition economies. *South Eastern Journal of Economics*, 1:
- Moran, T. H., Graham, E. M. and Blomstrom, M. (2005). *Does foreign direct investment promote development?* : Institute of International Economics Press: Washington DC.
- Narayan, P. K. (2005). The saving and investment nexus for China, Evidence from cointegration tests. *Applied Economics*, 37(17): 1979-90.
- Odhiambo, N. M. (2009). Energy consumption and economic growth nexus in Tanzania, An ARDL bounds testing approach. *Energy Policy*, 37(2): 617–22.
- Ranjan, V. and Agrawal, G. (2011). FDI Inflow Determinants in BRIC countries, A Panel Data Analysis. *International Business Research*, 4(4):
- Zhang, K. H. (2001). Does foreign direct investment promote economic growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy*, 19(2): 175–85.