

-RESEARCH ARTICLE-

AN EMPIRICAL ANALYSIS OF THE EFFECT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH: A CASE OF IRAQ'S ECONOMIC PERSPECTIVE

Ahmed Zaki Yehia1*

College of Law/ Ahl Al Bayt University / Kerbala / Iraq
Email: azaki7145@gmail.com

Ahmed Hatem

College of Administration and economics, Al-Farahidi
university/Iraq

Rana Saad Shaker

Department of Law, AlNoor University College, Bartella, Iraq

Ayad Abas Hasan

College of media/ The Islamic university in Najaf, Iraq

Ahmed Abdulateef Sabti

Al Nisour University College, Baghdad, Iraq

Mohammed Yousif Oudah Al- Muttar

Scientific Research Center, Al-Ayen University, Thi-Qar, Iraq

Saoud Jayed Mashkour

Mazaya University College/ Iraq

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—Abstract—

This study aimed to examine the impact of foreign direct investment (FDI) on Iraq's economic growth (EG) from 2011 through 2021 utilizing a quantitative research technique and longitudinal study design. The unit root, co-integration, and Granger causality tests were used to examine the long-term and short-term association between FDI and EG. Principal findings indicate that variables were non-stationary at level but stationary at first difference. The co-integration results indicate no long-term link between FDI and EG. Other Granger causality tests imply that the association between FDI and EG is temporary. In addition to these findings, the current work is a significant contribution from both a theoretical and practical standpoint, allowing future researchers to understand the significance of FDI and EG. The researcher might also assist policymakers and government organizations in understanding the significance of FDI, which could help boost the gross domestic product and strengthen the economy.

Keywords: Economic Growth, Foreign Direct Investment, time series, Iraq.

1. INTRODUCTION

Every nation, whether established or developing, endeavors to increase foreign direct investment (FDI) due to its perceived significance in promoting economic growth (EG) (Wang et al., 2022). Iraq has tried to improve its investment climate to attract FDI through deregulation, liberalization, and privatization (Mahdi et al., 2021). These efforts highlight the significance of FDI to Iraq (S. H. Ali et al., 2021). The importance of foreign direct investment (FDI) to the growth of the Iraqi economy cannot be overestimated, according to Daraj et al. (2022), as it considerably contributes to the expansion of the labor market and the dissemination of new information. Orjiakor et al. (2022) argue that FDI motivates EG because it enhances competitiveness by creating jobs, importing necessary technologies, and developing infrastructure. The FDI bridges the gap between available and required resources to attain the intended EG. Dadu et al. (2022) highlighted that FDI significantly contributes to the host country's development by encouraging local savings and investment and boosting foreign exchange revenues.

Additionally, it increases EG and generates a source of real income in the country hosting the event. Oyegoke et al. (2021) identified FDI as a source of bolstering foreign reserves via investments, trade, and aid from developed nations. They also believed that FDI was essential for finance and capital formation, acquiring technology and skills, and promoting international trade. The spillover effect causes FDI recipient countries, such as Iraq, to receive creative inventions (Hameed et al., 2022). According to Abbas (2021), FDI is a vital source of investment capital in rising economies such as Iraq. Regardless of its resources, it was seen as a vehicle for economic expansion. These initiatives generated much-needed income for the host nation. They increased revenue through research and technology sectors, such as technological know-how, new skills, and increasing the productivity of local enterprises, which may have enhanced EG (S. H. Ali

et al., 2021). It fostered an environment favourable to attracting FDI, which secured rapid economic growth in any nation (J. H. Ali et al., 2022). The purpose of any nation is to attract sufficient investment to sustain its EG via the efficient production of goods and distribution of services (J. H. Ali et al., 2022).

Unquestionably, Iraq has not been able to attract sufficient investment to advance its EG procedure, so the country's administration has been pursuing overseas investors to attract more efficient sources of investment (J. H. Ali et al., 2022). According to Hameed et al. (2022), the ideal place for FDI is Iraq's host economy. In addition, they asserted that Iraq had implemented various new trade strategies to diversify the economy and minimize its reliance on oil revenues. However, the industrial sector-improving initiatives resulted in austerity, which decreased FDI from approximately USD 3.5 billion in 2019 to USD 1.9 billion in 2020. (Abdulla et al., 2022). At the end of October 2021, FDI accounted for 3.37 percent of total capital inflows of \$200.08 million. As a result, Iraq cannot expand its industries and attract large FDI during its time of exchange rate volatility due to a continuing decline in oil revenues (Ostic et al., 2022). It needs FDI to bridge the gap between its present and desired resources. Consequently, FDI is considered the essential economic factor is influencing a nation (Hanna et al., 2014). Iraq's economy, like many other developing nations, suffers from a shortage of domestic savings; therefore, FDI is viewed as a means of bridging the domestic savings gap by bringing in the necessary capital, which could increase real GDP. Based on experience from other rising economies, FDI might aid in creating additional jobs, innovative manufacturing processes that could expand services, and exploiting cost-effective domestic resources to the greatest extent possible (Lin et al., 2018).

Surprisingly, empirical studies on the effects of FDI in developing nations have produced inconclusive results. Some studies have demonstrated a positive association between DI and EG (Abdouli et al., 2017; Aga, 2014; Noori, 2019). Other studies have shown that FDI negatively affects EG (Abu-Eideh, 2014; Aga, 2014; El-Wassal, 2012). Due to a lack of empirical research in the literature, the empirical relationship between FDI and EG in Iraq remains ambiguous; this may be related to the absence of FDI in Iraq before 2003. (Hanna et al., 2014; Mahdi et al., 2021). In addition, prior studies on FDI and EG in various countries, like Iraq, provided inconclusive findings, as some suggested a positive association between FDI and EG, thereby leaving a gap in the literature. Consequently, it is vital to study the impact of FDI on the Iraqi EG. The primary purpose of this study is to determine the effect of FDI on EG in Iraq.

In particular, the study aimed to assess the impact of FDI on EG in Iraq. The study is anticipated to combine prior research on the relationship between FDI and EG. Existing research may investigate the short- and long-term effects of FDI on EG, enhancing the empirical evidence from Iraq. Moreover, due to the verifiable character of the study, the results of this study would aid policymakers and regulatory authorities in economic modeling, policy formulation, and simulation of the variables under consideration. As a

result of the scarcity of empirical research in this area from Iraq and other emerging economies, it will also drive public dialogue. In addition, it would serve as a platform for other researchers interested in the topic. The study will analyze the major concepts that comprise FDI, as well as the conceptual and empirical effects of FDI on Iraq's economic growth. This research will be limited to the years 2011 through 2021.

2. THEORETICAL AND EMPIRICAL REVIEW

2.1 Foreign Direct Investment

Foreign direct investment (FDI) has become a key source of cross-border resource flow due to the convergence of domestic and foreign policy toward a shared international economic order brought about by globalization. To take advantage of this influx, [Orjiakor et al. \(2022\)](#) assert that, since the mid-1980s, developing nations have been steadily enhancing the enabling conditions for foreign direct investment (FDI) through structural adjustment programs that could lead to greater economic openness. In the first and most likely scenario, parent corporations might inject equity capital by acquiring overseas affiliate shares. Reinvesting affiliate revenues is a second possibility, followed by short- or long-term loans between affiliates. Therefore, he argued that foreign investment as a proportion of GDP has rapidly expanded, becoming the primary source of money flowing from developed to developing nations. From 18% in 1990 to 36% in 2005, it rose.

FDI refers to investments made in a foreign country through a resident entity to acquire management control of an enterprise. [\(Borensztein et al., 1998\)](#) define FDI as investments in multinational corporations from developed nations. [Amadi \(2002\)](#) states it is a hallmark of worldwide businesses. According to him, it involves a global transfer of capital and the extension of a company from its home country. [Liu et al. \(2001\)](#) define foreign direct investment as transferring capital, technology, and entrepreneurial skills to the beneficiary country, combined with domestic variables, to produce items for local and international markets. FDI is also considered an investment, including a long-term partnership through the purchase of interest and control by a foreigner (or parent firm) of a local entity residing in an economy different from the investor's ([A. Rahman, 2015](#)). FDI is an investment made by multinational corporations in foreign countries to manage their assets and development projects ([Mallampally et al., 1999](#)). FDI is often accompanied by technological progress. According to [Awolusi et al. \(2017\)](#), an offshore corporation may allow local enterprises to use its technology in exchange for benefits in the host nation, such as the chance to receive business advantages and access to major local technologies. This assists the developing nation in acquiring the scientific and technological know-how required to strengthen its industrial sector, resulting in economic growth. Foreign direct investment (FDI) creates direct, stable, and long-term linkages between economies as a major component of global economic integration. It promotes the transfer of technology and expertise across nations and enables the

recipient economy to promote its products more aggressively on global marketplaces. Foreign direct investment (FDI) is another source of investment capital, and in the right economic and policy environment, it can be a crucial tool for development (Bermejo Carbonell et al., 2018). According to Barros et al. (2013), multinational companies (MNCs) operations attract foreign direct investment (FDI). Improving the returns of multinational firms can increase the savings and investments of host nations, as well as advance technology and build capacity by transferring technical and managerial expertise from the home country. Ajagbe and Bamidele, Foreign direct investment may be considered an additional component of manufacturing and a supplement to efforts to import capital through national savings, reducing the constraint placed on the GDP growth rate of the host nation by a lack of foreign currency and savings. Agada et al. (2012) define FDI as an endeavor by governments, groups, corporations, and individuals of a country to transfer factors of production across international borders in the hope of generating a profit. This migration contributes to the recipient nation's capital formation, which aids economic development. At the same time, the surplus (return on investment) may be reinvested for future capital growth or repatriated for other purposes. According to Caves et al. (1996), an increase in efforts to attract more foreign direct investment (FDI) is based on the realization that FDI has several positive effects, including higher efficiency, transfers of advanced technologies, new manufacturing techniques, management capabilities within the market, employee training, and access to international production and professional networks, as well as improved access to global markets.

2.2 Economic Growth

Economic growth (EG) was defined by Samuelson (2006) as "the extension of a country's potential GDP or national production." This, according to him, occurs when a nation's productivity frontier shifts further from its prior location. Ogbulu et al. (2012) defined economic growth as an increase in the number of people employed and the quantity of goods and services produced, with the ultimate goal of enhancing the material conditions of the populace. Adeagbo (2021) described EG as an increase in a nation's productive capacity, characterized by a steady increase in national income. EG is the standard for enhancing people's quality of life and is often the result of technological advancement and good external conditions. According to Awoyemi et al. (2015), economic progress should result in a rise in the standard of life of citizens or the human development index. In theory, EG should result in reduced poverty and increased production, capital formation, and human capital growth. EG is a crucial topic because it is viewed as a prerequisite for accomplishing the primary purpose of economic policy, which is enhanced public welfare. Therefore, it is crucial to long-term development.

2.3 Empirical Review

In addition to the theoretical explanation, the investigations include actual correlations. For example, Nyoni et al. (2018) examined the impact of FDI on Nigeria's economic

growth from 1990 to 2013. This was accomplished via regression analysis of the Ordinary Least Square (OLS). The results of the study indicate a clear relationship between FDI and EC. [Adigwe et al. \(2015\)](#) analyzed the links between FDI and EC from 2008 to 2015 using Pearson correlation. Their investigation revealed a significant correlation between FDI and GDP. Using time series data from 1990 to 2013, ([Levi-Oguike et al., 2022](#); [Ng'Andwe et al., 2017](#)) "examined if 80% of all FDI directed to the mining sector may alter the magnitude of FDI's impact on economic growth in Zambia." The study's data were analyzed using the OLS regression approach. Even though the mining sector's output increased due to FDI-driven recapitalization, the economy as a whole did not experience robust growth. The study reached the following conclusion: "FDI has not contributed to dynamic economic growth; rather, it has increased reliance on the mining industry." [Louzi et al. \(2011\)](#) conducted a study to "test the FDI-led growth hypothesis of the Jordan economy." In this study, time series data from 1990 to 2009 are utilized. The bidirectional relationships between the variables of interest were determined using co-integration error correction.

Between 1981 and 2010, [Z. U. Rahman \(2014\)](#) evaluated data to determine how FDI affected Pakistan's EC. The approach used to analyze the study's data was multiple regression analysis. GDP was the dependent variable, whereas FDI and the Consumer Price Index were the independent variables (CPI). While CPI and GDP have a negative link, FDI and GDP have a positive correlation, according to the data. [Malik \(2015\)](#) used time series data from 2008 to 2013 to examine the influence of FDI and trade openness on Pakistan's economic growth. They utilized co-integration analysis, regression analysis, correlation, and the Durbin-Watson test to explore the variables' long-term relationship and association. The findings demonstrate that FDI, trade openness, and domestic capital positively influence Pakistan's economic growth. [Koojaroenprasit \(2012\)](#) conducted a case study of South Korea between 1980 and 2009 to examine the influence of FDI on economic growth. Using the estimate method of multiple regressions, the data were analyzed. According to the study, FDI had a considerable and favorable impact on South Korea's economic growth over the time under consideration. Other research conducted in Pakistan to determine the effect of FDI on GDP demonstrates that FDI has a positive and statistically significant impact on GDP ([Khan et al., 2011](#)). Similar results were discovered in the investigation ([Yeboua, 2021](#)) of the effects of FDI on the economic growth of African economies. Other research, however, indicated a negative impact of FDI on GDP ([Wang et al., 2022](#)).

Even though the relationship between FDI and economic growth has been studied in the past in Iraq and other countries, as indicated in the literature review summary, there appears to be a deficiency in the level of aggregation and selection of subject matter proxies. Utilizing FDI as the independent variable and GDP as the dependent variable, this study provides an update on the influence of FDI on economic growth, thereby filling a gap in the literature. The relationship between FDI and EG ordinary least square

was examined, but the short- and long-term effects of FDI on economic growth have received less consideration. The following research hypothesis is developed based on these gaps:

H1: Foreign direct investment has a relationship with economic growth

3. RESEARCH METHODOLOGY

The sample period for this quantitative study, which utilized longitudinal time series data from Iraqi yearly statistics from 2011 to 2021, was from 2011 to 2021. Ten years were selected for the sample because it allowed for sufficient statistical sampling and interpretation. In this research, FDI (FDI) net inflows are used as an exogenous variable, whereas GDP is used as an endogenous variable. The data used in this analysis was obtained from the World Bank Database. The study of time series data begins with a test for stationarity using unit root tests, commonly the ADF test. As a second stage, the regression coefficients are estimated using the ordinary least squares (OLS) regression model. The econometric model of regression is presented below;

$$GDP_i = \beta_0 + \beta_1 FDI_i + \mu_i \quad (1)$$

Table 2. Measurement of the Variables

Variables		Proxy	Data Source
Economic Growth	GDP in Iraq in a million US dollars. We transformed the values into natural logarithm form to avoid sharpness in time series data	Natural log of GDP	World Development Indicators
FDI	FDI provides external resources and advanced technology to the economy, which act as an engine for economic growth. The data was collected in US dollars.	Natural log of FDI	World Development Indicators

The equation determines how FDI affects GDP. During model estimation, the unit root test determines whether the variables are stationary (ADF). The unit root test is undertaken to determine whether or not variables are stationary. Non-stationary variables may result in incorrect regression (Aga, 2014). The unit root ADF test was utilized to determine the stationary; when the unit root test decided that the data was stationary or I(0), the OLS regression model was employed (Gujarati et al., 2010). If the data for the variable is not static or I(1), we conducted the Johansen co-integration test to determine whether the variable's linear combination is stationary. Additionally, this

method could convert non-stationary data into stationary data to achieve a dependable result (S. H. Ali et al., 2021).

3.1 Unit Root Test

The application of the Dickey-Fuller test could lead to an autocorrelation issue. Dickey and Fuller created the Augmented Dickey-Fuller (ADF) test to address the autocorrelation problem. Table 1 presents a summary of the unit root results. The GDP unit root suggests that time series data cannot be rejected as non-stationary because the ADF absolute test statistic value is 2.057, which is less than the 5 percent absolute crucial value of 4.000. Since the GDP data at the level is regarded as non-stationary, the first difference might now be derived from the same methods used to outline the stationary. The ADF has also demonstrated that the results are stationary at the first difference since the absolute value of the test statistics is bigger than the total value at 5 percent, which is 4000.

In contrast, the ADF test results are below the threshold value of 4, indicating that the time series for FDI is not stationary. Therefore, the first might be stationary as the data are not level stationary. The first difference value of 4.783% in the test statistics is more than the absolute critical threshold of 5% and 4.00, indicating that the data is stationary at the first difference but not level. The projected outcomes are shown in Table 1 below.

Table 1. ADF Test

ADF test	GDP		FDI	
	Test Statistic	Critical value at 5%	Test Statistic	Critical value at 5%
1 st level	2.057	-4.00	- 1.673	-4.00
1 st difference	- 9.762	-4.00	- 4.783	-4.00

3.2 Long-run Relationship

The co-integration test of Johansen is required because the data for all variables of interest are non-stationary at the level but stationary after the first differentiation. Table 2 shows the predicted values of the Johansen Co-integration test, which indicates that the null hypothesis could not be rejected for the endogenous variable, GDP, and the exogenous variable because the trace value is less than the absolute critical value at 5 percent, which is 17.82. This indicates that there is no long-term relationship between the variables, and they could move together due to the absence of co-integration. As the data lack long-term co-integration between variables, the Vector Error Correction Model (VECM) cannot be applied; however, an unrestricted VAR model can be employed to estimate the short-run relationship between variables.

Table 2. Johansen Test for Co-integration

Maximum Rank	Trace Statistic value	5% critical
0	7.7893	17.82
1	1.9304	4.903

3.3 Short-run Relationship

Several tests may be conducted to assess the relationship between the variables in the short term. The Vector Auto-regression (VAR) model is well-documented as a versatile and effective model for analyzing multivariate time series; consequently, it may be used to analyze data. Sims presented this concept to applied econometrics as a game-changer (1980). Using vector autoregression (VAR), the estimating and robust behavior of economic variables and financial time series may be accurately defined and projected. It provides better accurate forecasts than most conventional time series models (Aga, 2014). VAR models are commonly perceived as delivering a more adaptive estimate based on the future patterns of various parameters. Moreover, Vector is a backward word; normally, the VAR model may forecast future variables using past values (Aga, 2014).

The co-integration test proves that the variables have a long-term equilibrium relationship. Additionally, it will affect the growth of the alliance. "According to Hussain et al. (2011), granger causality occurs when one series variable fluctuates before another, and if the F-statistic is significant when testing for causation in both directions using hypothesis testing, then granger causality exists in both directions." This test is significant because it allows us to discover which series leads to others and because variables derived from leading series are especially valuable for estimations. The Granger causality hypothesis, for instance, can be examined using the VAR model. To pass the Granger Causality Test, all selected variables must be in a state of constancy. Additionally, the test's applicability depends on the number of lags incorporated in the VAR model. If two lags are picked based on the selection order requirement, the Granger causality test can provide either of the following outcomes:

Table 3. Granger Causality Test

		Coefficient	Chi-Square	Prob. Value
dFDI	Lag1	0.023891	3.7832	0.182
	Lag2	-0.007823		
dGDP	Lag1	1.89341	139.27	0.000
	Lag2	-3.78383		

Table 3's expected results indicate that coefficients are not statistically significant, as the p-value of 0.182% is more than 5%. The results demonstrate that the initial difference in FDI is not a result of the first difference in GDP that is lagging. In addition, Table 3's

projected values indicate that p values (0.000) are significantly less than 0.05, allowing us to reject the null hypothesis and conclude that a lag causes the first difference in GDP in FDI. In addition, the coefficients demonstrated statistical significance. Therefore, FDI is a Granger cause of GDP, and the two are causally related in the short run. Based on the size of the coefficients, an annualized increase of 1 percent in FDI has a positive effect on GDP of 1.893% of a percentage point. In conclusion, our data indicate that FDI is exclusively associated with a rise in GDP.

4. DISCUSSION

Utilizing secondary annual time series data from 2011 to 2021, the study indicated that foreign direct investment (FDI) had a favorable impact on Iraq's economic growth (EG). Gross domestic product (GDP) was utilized for measuring economic growth. The findings of a Johansen Cointegration test indicate that FDI and GDP do not have a stable, long-term relationship. The findings are similar to those of the research [Gupta et al. \(2016\)](#) evaluated. The results, however, contradict those of [Baharumshah et al. \(2009\)](#).

In contrast, the FDI granger causes GDP in the short run, suggesting a short-run causal relationship between FDI and GDP. It was also observed that the findings were consistent ([S. H. Ali et al., 2021](#)). [Borensztein et al. \(1998\)](#) discovered the same positive and statistically significant relationship between FDI and GDP. These results imply that the association between FDI and EG is not long-term.

5. CONCLUSION AND RECOMMENDATION

This study analyzed the influence of FDI on Iraq's GDP from 2011 to 2021. FDI was the exogenous variable in the study, while GDP was the endogenous variable. Initially, the stationary validity of the study's data was determined using the Unit Root Test, often known as the ADF test. The results revealed that the two investigated variables were not stationary at the level but became stationary after the initial discrepancies were accounted for. The Johansen Co-integration test was then used to evaluate the long-term relationship between the variables. The test results revealed no long-term relationship between the variables under investigation, i.e., no long-run co-integration, and they do not move together over time. To generate additional growth in Iraq, it is crucial to enact policies that make the country more attractive to foreign investors by reducing taxes and removing other regulatory impediments, according to the report. To attract more FDI, Iraqi policy should focus on boosting the business climate, restoring the country's infrastructure, and encouraging increased private sector participation. It is recommended that Iraq allocate more funds to human capital development by enhancing its educational and economic infrastructure. In addition to fostering a liberalized market environment, it must decrease lending rates, transportation costs, and political and economic uncertainty. As proposed, if Iraq wants to attract more FDI, it should push for internal market reforms.

Additionally, the study has limitations that could improve the validity of future research. First, the analysis was limited to the direct influence of FDI on EG, while other moderating and mediating variables could enhance the model's explanatory ability. Consequently, future research could incorporate moderating and mediating variables. A prospective study on emerging economies on a panel could strengthen the generalizability of the work. Secondly, the research was primarily focused on Iraq and consisted of a time series analysis. Thirdly, the time frame was limited to 2011 to 2021; further study might be conducted by extending the period, which could alter the conclusions from short-term to long-term.

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