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DEVELOPMENT OF INDUSTRIAL INVESTMENT IN IRAQ RELATED TO ECONOMIC GROWTH

Mohammed N. AL-Chaabawi
Faculty of Economics, University of Mazandaran, Babolsar, Iran
mohammedalkaby87@gmail.com

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Abstract: Economic growth, in Iraq, as in any other developing country, is a target which is constantly aimed at. industrial investment is an important instrument which has been used by Iraqi Governments during the last two decades in order to try and achieve economic growth. Iraq as a country is in need of research into the many different aspects of its urban and regional structure. The effects of industrial investment have not been studied in a careful way, especially the effects of investment on economic growth. So the aim of the current research was to identifying the impact of industrial investment on economic growth in Iraq. Data was collected from Central Bank of Iraq. The current study included, the impact of industrial investment as an independent variable on the Iraqi economic growth described by dependent variables (Foreign direct investment, manufacturing, value added current US, GDP growth annual %).The applied side focuses on three sections, where the first section focused on the mathematical description of the models under study. The second section dealt with the test of some standard problems suffered by the studied standard model. while the third section focused on estimating the models under study in the style of autoregressive distributed lag (ARDL). The findings of research based on estimation of the regression model using ARDL showed that the industrial investment has a positive and statistically significant effect on Iraqi economic growth.

Keywords: Industrial investment; Economic growth; ARDL, Iraq.

Abstrak: Pertumbuhan ekonomi, di Irak, seperti halnya di negara berkembang lainnya, merupakan target yang terus menerus diupayakan. investasi industri merupakan instrumen penting yang telah digunakan oleh Pemerintah Irak selama dua dekade terakhir untuk mencoba mencapai pertumbuhan ekonomi. Irak sebagai sebuah negara membutuhkan penelitian tentang berbagai aspek struktur perkotaan dan regionalnya. Dampak dari investasi industri belum diteliti secara seksama, terutama dampak investasi terhadap pertumbuhan ekonomi. Jadi tujuan dari penelitian ini adalah untuk mengidentifikasi dampak investasi industri terhadap pertumbuhan ekonomi di Irak. Data dikumpulkan dari Bank Sentral Irak. Penelitian ini mencakup, dampak investasi industri sebagai variabel independen terhadap pertumbuhan ekonomi Irak yang dijelaskan oleh variabel dependen (investasi asing langsung, manufaktur, nilai tambah saat ini di Amerika Serikat, pertumbuhan PDB tahunan %). Bagian kedua berkaitan dengan pengujian beberapa masalah standar yang diderita oleh model standar yang diteliti, sedangkan bagian ketiga difokuskan pada estimasi model-model yang diteliti dengan menggunakan metode autoregressive distributed lag (ARDL). Temuan penelitian berdasarkan estimasi model regresi dengan menggunakan ARDL menunjukkan bahwa investasi industri berpengaruh positif dan signifikan secara statistik terhadap pertumbuhan ekonomi Irak.

Kata kunci: Investasi industri; Pertumbuhan ekonomi; ARDL, Irak**.**

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Introduction

Since 1950, emerging nations, including Iraq, have placed a greater emphasis on industrialization for a number of reasons. Many emerging nations, particularly former colonies, viewed industrialization as equating to civilization, independence, and a factor in obtaining status. Over time, more enlightened and pragmatic leaders of emerging countries implemented industrial development strategies to focus on the needs of the people and to achieve greater economic prosperity as the driving forces of the country's development. But what bolstered industrialization efforts was the nature of industry itself, which alters the entire social fabric and generates distinctions between industrialized and developing civilizations. Additionally, industrialization can be viewed as a factor influencing the economic progress of nations. In this chapter, broad information regarding the topic of research, its significance and necessity, research methods, and time and place for conducting research will be presented. Prior to the US-led invasion of Iraq in 2003, Iraq's industrial income comprised 23 percent of GDP. The Iraqi Central Statistical Organization (CSO), the government organization tasked with keeping statistical data to inform policy and scientific research, reported in 2021 that the proportion of industrial production proceeds decreased to 2.03 percent of GDP (1).

1-1 The Importance and Necessity of Research

The significance and urgency of the current study to investigate the impact of industrial investment on economic growth in Iraq are based on the following factors: First, many economists believe the unique role of the industry sector in economic growth and development, which is attributable to the sector's distinctive qualities. These characteristics include the provision of machinery, production tools, and intermediate products to other sectors, the high direct and indirect dependence of other sectors on this sector, employment and the creation of high added value, the high impact of economic growth and export development resulting from industry growth, and other similar characteristics that may be one of the important aspects and necessity of this study. Iraq is also a single-product economy that is susceptible to a great deal of damage, so the development of industrial investments in this country and its effects on Iraq's economic growth can provide useful insights in this regard; this is the third aspect of the significance and necessity of this research.

1-2 The purpose of the research

Identifying the impact of industrial investment on economic growth in Iraq.

1-3 The main question of research

The question is: What is the impact of industrial investment on economic growth in Iraq?

1-4 Research Territory

This will includes thematic territory, time domain and spatial territory

1-4-1-Thematic territory

The subject area of the present study is in the field of macroeconomics with a focus on industrial investment and economic growth.

1-4-2 Time domain

To test the hypotheses, a period between 1970 and 2022 has been selected.

1-4-3 Spatial territory

Iraq has been selected as the spatial territory of the present study.

1-5 Analysis Tools

In order to estimate the research model, time series econometric models are estimated by ARDL method. The statistical basis for using ARDL-wide lag self-exprocessing models was the existence of collective co-operation between economic variables. Self-exprocessing models with wide lag provide the possibility of determining long-term relationships between endogenous variables. In addition, these models relate the short-term behavior of variables to their long-term equilibrium values and show how imbalances related to long-term equilibrium relationships of variables affect

their short-term dynamic changes. If the time series variables are all sum of order d or l(d), if a linear regression can be defined between them that the disturbing sentence has a collective order b in which b<d, it is said that the time series are the sum of the order d and b i.e. CI(d,b). For example, if all time series variables are unsustainable and collectively of the order of one l(1) but there is a linear relationship between them that is a constant disruption and a group of zero l(0) order, then the usual econometric methods can be used to estimate the parameters and also use statistical inferences based on t and F statistics (Tashini, 2017). It should be noted that all analyses will be performed using Eviews9 software.

1-6 Research Applications

The results of this study can be considered by policy makers and activists in the industry, policy makers and government of Iraqi men as well as other stakeholders and help to clarify the relationship between industrial investment and economic growth in Iraq.

1-7 Problem Statement

There is a declining trend of about 70% in industrial investment in Iraq during the last fifteen years, there is need to urgent solving this problem, this research will try to find the main cause that created the downturn in investment of industrial sector. The Industrial sector has been proven to be one of the main source of economic growth. A more advanced industrial sector leads to greater GDP value, higher income, and better services provided by efficiently-trained labor. Improving the industrial sector in a country encourages indirect improvements in services as well as agriculture sector.

1-8 Research Hypothesis

Industrial investment has positive impact on Economic Growth of Iraq

Methods

2-1 The conceptual framework

2-1-1 Neoclassical growth patterns

From a historical perspective, growth theories date back to 1928, when Ramsay published a paper. After Ramsay (and Fischer) proposed the theory of business cycles and growth theory with the issue of optimalization, Harud (1939) and Domar (1946) attempted to link Kinsey's study with economic growth variables. The lack of downward efficiency relative to accumulating inputs is the defining characteristic of endogenous growth models; this attribute permits growth to continue indefinitely (2).

In the neoclassical growth model, the long-term growth status (uniform) is attained through dynamic optimalization, so that, taking into account the interaction between generations, each family strives to maximize its time desirability. This model explains economic growth in terms of population expansion and technological change, both of which are external to the system (3).

The primary issue with the neoclassical growth pattern is its inability to describe the most crucial real behavior of growth. This incapability is largely attributable to the forecast of the pattern in which per capita production is directed toward the path of uniformity and rises at an exogenous pace along it. This indicates that the growth rate outside of the economic system is predetermined and irrespective of preferences, production function features, and the behavior of other variables (4).

2-1-2 Endogenous growth patterns

The primary characteristic of endogenous growth models is the absence of input-accumulating downward efficiencies. This property propels development eternally forward. Then, with the aid of neoclassical growth literature and the dynamic optimum issue, a number of models associated with endogenous growth theory will be discussed.

2-2 Industrial Investment

2-2-1 Investment Models

- Theory or principle of acceleration

Before it is a full investment theory, the principle of acceleration has been used to explain business cycles, particularly by Harrods. Business cycles have been evaluated using the principle of acceleration and the idea of plurality coefficient has been analyzed by Samuelson.

- Neoclassical theory of investment

Developed by Jurgenson in the 1960s, the neoclassical theory of investment tried to explain investment behavior using traditional optimization theory in microeconomics and a more comprehensive theory than theories of acceleration and Keynes theory. The foundation of this neoclassical theory of investment is that it is not necessary to rely on unrealistic assumptions, such as the constant of the capital-to-production ratio, in order to determine the desired inventory of capital. Rather, the optimal inventory of capital can be determined using the principles of production optimization in microeconomics.

- Investment Theory

James Tobin proposed in 1926 an investment analysis theory that focuses primarily on the stock market and company pricing. This theory gives a perspective on investor decisions about the selection of an investment project that appears more reasonable than the original acceleration model, i.e., this theory briefly highlights three components of the acceleration principle model that were overlooked.

- Investment cash flow pattern

Recognizing this reality differentiates the cash flow pattern from past investing patterns. Investors rely on three primary sources of capital. Internal cash flow, the sale of bonds and stocks, and the cost of utilizing each of these resources reveal the amount of revenue and return derived from these resources. In reality, a company's cash flow is derived from after-tax profit + depreciation reserve, which was financed by reducing shareholder payouts.

-Self-correlation pattern

The self-correlation concept was predicated on the non-utilization of production, pricing, or taxes to explain investment expenditures; investment expenditures have been explained by a delay in past investment expenditures. The findings of investigations on classical, neoclassical, and Keynesian investment theory demonstrated that diverse investment theories created for distinct situations are compatible and do not contradict one another. In general, it may be derived from investment theory that the economic literature of investment is relatively abundant and that different sorts of these patterns have been implemented with varying degrees of success in different countries (5).

2-3 Economic Growth of Iraq

Economic expansion is one of the discipline's most essential objectives. In this sense, the study of nature, causes, and obstacles to growth is of utmost significance. Despite adverse home conditions and severe economic issues, many developing nations are attempting to achieve a continuous and sustainable economic growth at now. Control by the government in these countries has reduced the efficiency of the economy, and while governments are attempting to exploit available facilities to increase investment, sustainable growth is not possible because such investments are made in sectors of the economy that are inefficient. A sustainable economic expansion necessitates the accumulation of resources, but it also encourages their effective utilization. In this regard, it is necessary to first define economic growth in order to obtain a deeper grasp of this topic (6).

3- Research Methodology

This is an example of applied research because the results can be utilized to inform the actions

of macronational authorities. Also, based on the inference method regarding the research hypotheses, it will be placed in the descriptive-correlation research group, as the regression correlation coefficient will be utilized to determine the correlations between the research variables.

Also, as we will reach a conclusion by analyzing existing data, this is a cross-sectional study from a temporal standpoint. Regarding the executive stages of the research, the sources, such as the existing Persian and Latin papers, will be analyzed and translated in order to enter the major conversation and collect the theoretical material pertinent to the subject of discussion. The data gathering approach is essentially a library that can be accessed through a survey of resources and references and the acquisition of data from well-known websites such as the World Bank and the Iraqi Statistics Office.

3-1 Population and Statistical Sample

Considering that the statistical population refers to the entire group of individuals, events, or objects that the researcher wishes to analyze and is comprised of all variables that have been studied, Iraq will serve as the statistical population for the present investigation. In this investigation, no particular sample was conducted.

Techniques and instruments for data collection

To collect information regarding the explanation of the research literature, the library technique and documentary studies were utilized, and data from the WDI World Bank database were used to process the research hypotheses.

3-2 Research Models and Variables

This study employs the basic neoclassical growth framework of Solow (1956), which has been widely employed in prior research on the impact of public and industrial investment on long-term economic growth in developing nations. Numerous studies have thus attempted to modify or expand the original model by incorporating additional explanatory variables, such as human capital and macroeconomic stability. State investment (si), domestic private investment (di), and foreign direct investment (fdi) are the three types of investment sources that make up the economy's investment composition (FDI). The author utilized the production function of Cobb-Douglas to carry out the research analytical framework for improvement. Cobb-manufacturing Douglas's function:

$Y = F(si, di, fdi, l, x)$ (3-1)

Where, Y is the income of the economy - the usage target, GDP (Gross Domestic Product) is the gross domestic product. “l” is labor, “ x” is other factors such as trade openness, recurrent expenditure of local governments.

Some authors in the world, namely Wei (2008) and Nguyen (2014), when developing an experimental research model with their dialectics, have added explanatory variables to the model to demonstrate the impact of factors on economic growth. The author of the article conducts an experimental research model as follows:

$gdpt = \propto + \beta 1sit + \beta 2dit + \beta 3fdit + \beta 4set + \beta 5opent + \beta 6lbt + et$ (3-2)

Where “t” is the year of study from 1970 to 2022. The symbol “gdp” is an expression of economic growth, using real gross domestic product per capita to reflect economic health. “si” is a public investment; “di” is a private investment; “fdi” is a foreign

direct investment; “Se” is the government expenditure; “open” is the total value of imports and exports to gdp; “lb” is labor force.

3-2-1 Model Estimation Method

The statistical method used in this study is ARDL distributed lag autoregressive method. In this study, Ives software version 10 was used to test the hypotheses.

3-2-1-1 Self-regression method with ARDL distributed lags

In applied time series, there are a variety of dynamic models. In addition to vector error correction model, extended lag models, adaptive expectation models, partial adjustment models and rational expectations models are also dynamic models. Wide lag models include simple extended lag models (Allman or Polynomial), broad-based intellectual lag models and wide-ranging autoregressive models

The statistical basis for using self-exegetic models with widespread lag is the existence of accumulation between economic variables. Therefore, further explanation of the concept of synergy is necessary, which is mentioned below.

Also, self-exprocessing models with wide lag provide the possibility of determining long-term relationships between endogenous variables. In addition, these models relate the short-term behavior of variables to their long-term equilibrium values and show how imbalances related to long-term equilibrium relationships of variables affect their short-term dynamic changes. These unique features are widely interrupted self-exegesis models that distinguish them from other structural and non-structural models of econometrics and have caused these models to experience their evolutionary growth rapidly in the 1990s.

In the past two decades, several methods have been proposed to investigate the long-term accumulation between time series variables and were widely used in empirical research. For example, the univariate co-accumulation method includes parasite and granger test (1987) and phillips and Hansen modified OLS method (1990). Multivariate accumulation was also investigated by Johansen and Josilius (1990) and Johnson (1996).

In the ARDL band test method, if Yt is the dependent variable and Xt is the explanatory variable, then in order to analyze the convergence, we need to estimate the following error correction model (UECM):

$$\Delta Y_t = \beta_0 + \pi_{yy} Y_{t-1} + \pi_{xy} X_{t-1} + \sum_{i=1}^{p} \vartheta_i \Delta Y_{t-i} + \sum_{i=0}^{p} \varphi_i \Delta X_{t-i} + \theta W_t + \mu_t$$

In which π_{yy} and π_{xy} are long-term coefficients, β from origin and Wt is the vector of exogenous components such as virtual variables, etc. ΔY lag values and ΔX timeout and flow values show short-term dynamics. The bond test process for the absence of surface relationship between Y and X is available by zero placement of surface coefficients with the interruption of the mentioned variables in the above equation. Therefore, the zero assumption that there is no convergence and the opposite assumption are defined as follows:

$\pi_{yy} = 0$, $\pi_{xy} = 0$

In this method, two critical limits were presented, the upper limit for time numbers (1) I and the lower limit for the number (0) I, if the value of the calculated statistic is greater than the upper limit value, the zero-convergent assumption is rejected, and if the F value is less than the lower limit, the zero assumption is not rejected, and if the F statistic is placed within the ranges, it is not possible to conclude that, the degree of accumulation Know the variables (Pesaran and others, 2001, p. 290). When the long-term equilibrium relationship is proved, in the second stage, the long-term coefficients and ECM corresponding to it was estimated by ARDL method.

After investigating the permanence of the research variables with generalized Dickey Fuller and Phillips Peron methods, in order to investigate the existence of long-term relationships of variables in order to investigate the existence of long-term relationship in dynamic pattern and another

test for the accumulation of variables, the co-integration test of variables should be performed. The condition that the variables were aggregated is that the sum of the coefficients of the dependent time variables that have appeared as the explanation variable in the model is smaller than one. The test criteria was defined as follows:

$$t = \frac{\sum_{i=1}^{s} \hat{\alpha}_i - 1}{\sum_{i=1}^{s} Se\hat{\alpha}_i}$$

In which, α_i and $Se\alpha_i$ the coefficients were related to the values associated with the lag of the dependent variable and the standard deviation is related to the coefficients. The above statistics were compared with the crisis quantity provided by Banrji, Doladow Master, and if the absolute value of the above statistics is greater than the crisis quantity, the hypothesis H_0 is rejected and as a result, it is proved that the dynamic model will be directed towards the long-term equilibrium model. Therefore, if there is a long-term excellence relationship, the ARDL model will be presented in three conditions: short-term, long-term and ECM.

3-2-1-2 Co-accumulation test

Although the manic condition of time series variables of a regression relationship can be provided through differentiation, but there is nothing special to maintain long-term information about the level of variables, it is here that the co-accumulation method is used to estimate regression without fear of being false based on the level of time serial variables.

When the time serial variables were managed, adding the T time trend among the variables or reducing the definite trend of variables will not manize these variables, and as a result, applying the methods The usual economean-metrics using inferentior data will cause the t and f tests to not have the necessary validity and the researcher will draw the wrong inferences about the severity and extent of the relationship between variables and even The coefficient of determination of DW<R2 can be the only solution, in this case, the only solution is to use a differential method that itself has problems that lead to the loss of valuable information about the level of variables. That's where the co-accumulation method comes to the aid.

Now we define co-accumulation based on theoretical foundations. We know that if a time after d times of difference becomes mana, it has d root of the unit, which is their accumulation of order d. Now the two sets of time xt and yt, both converging on the order d or I(d), then each combination is a line of xt and yt is also I(d)

Now fixed coefficients such as α and β the disruption of regression related to xt and yt means $U_t = y_t - \alpha - \beta x_t$ that the collective order is less than d(d-b) (b>0) then parasite and granger (1987) defines that xt and yt converge from the order (d,b), in which case the collective order must be both like and equal to I(d) and there is a line combination of them that A sum of the order d-b means I(d-b) (b>0).

This definition can also be generalized in more than two time scenarios. The valuable help that concepts have accumulated is that it has forced us to make sure that the sentences are disturbing if we are to check the error sentences related to the equation I regression() 0) It means mana can be used common econoмeanmetric methods in estimating parameters using time series data and in statistical inferences, statistics t and f can be used.

Several methods have been proposed for co-accumulation test so far, one is ADF test on estimated (ut)sentences of cointegration regression, which is known as Angel-granger test and the other is D-Watson test (CRDW). Of course, weaknesses and limitations were also imposed on the analysis of co-accumulation, including:

- Under some special conditions, some test methods (such as ADF test), especially for the values of real parameters, have a near cumulation of 1.
- Co-accumulation regression of OLS residents in small samples may have considerable torsion.
- The role of co-accumulation in model evaluation is limited, its advantage lies in providing long-term information.
- Structural changes in the time series of the study may lead to problems in the results.

For example, suppose the time series xt and yt are both a sum of order I(1). To test the accumulation of these two variables, we estimate the following relationship by OLS method:

$y_t = \beta x_t + u_t$

The co-accumulation method, which has been presented since the second half of the 1980s, can test the stability of long-term communication in experimental work by emphasizing on time-dwelling analysis. Long-term communication can be considered as the result of internal mechanisms of an economic system that acts concurrently and the final result of their performance in the direction of acceleration and ups and downs of behavior of a variable can be pursued. On the other hand, long-term communication is a reduced form of a number of concurrent equations that represent a equilibrium relationship (Babakr, 1998).

The zero hypothesis, which states the absence of accumulation between the two variables xt and yt, is written as follows:.

H_1: U_1 ~(?)

Assumption zero: ut has a single root and xt and yt are not convergent or convergent.

H1: U1 ~(?)

The opposite assumption: xt and yt converge.

- Determining the number of co-accumulation vectors:

Johansson Joselius method was used to find the number of co-stacked vectors using johansson joselius method, two statistics of maximum specific value test

Effect Test: This test investigates that the number of co-accumulation vectors is maximum and is based on Likelihood function.

$-ZLnQ_2 = -T \sum_{i=1} Ln (I - \lambda_{I+I})$

Maximum specific value test

This test investigates that the number of co-accumulation vectors is equal to r+1 and is calculated through the following:

-ZLnQ 2 =-T ∑i=1 Ln (I – λ I+I)

Results and Discussion

First: Description of the study models:

In the current study, the focus was on studying the impact of industrial investment as an independent variable on the Iraqi economic growth described by three dependent variables (Foreign direct investment, Manufacturing , value added current US, GDP growth annual %).

1- The impact of industrial investment on the Foreign direct investment index

According to the current standard model, (Foreign direct investment) (FDI) represents the dependent variable that is affected by industrial investments (value (IIV) (the independent variable) after determining the variables of this model, it can be formulated mathematically according to the following model:

$FDI = \beta_0 + \beta_1 (IIV)_i + e_i \quad , i = 1,2 \ldots . n$

Where

FDI is the Foreign direct investment as dependent variable

: is the intercept term β_0

Is the regression coefficient β_1

IIV is the industry investment value as independent variable

e_i is the random error term that it is distributed normal distribution with mean (0) and variance (σ^2)

2- The impact of industrial investment on Manufacturing value added current US

According to the current standard model, (MVAC) (Manufacturing value added current US) represents the dependent variable that is affected by industrial investments (independent variable) after determining the variables of this model can be formulated mathematically according to the following model:

$$MVAC = \beta_0 + \beta_1(IIV)_i + e_i \quad , i = 1,2 \ldots . . n$$

Where

MVAC is Manufacturing value added current US

Is the intercept term β_0

Is the regression coefficient β_1

IIV is the industry investment value as independent variable

e_i is the random error term that it is distributed normal distribution with mean (0) and variance (σ^2)

3- Impact of industrial investment on GDP growth annual

According to the current standard model, (GDP GA) GDP growth annual represents the dependent variable that is affected by industrial investments (independent variable) after determining the variables of this model can be formulated mathematically according to the following model

$$GDPGA = \beta_0 + \beta_1(IIV)_i + e_i \quad , i = 1,2 \ldots . . n$$

Where

GDPGA is GDP growth annual

: is the intercept term β_0

Is the regression coefficient β_1

IIV is the industry investment value as independent variable

e_i is the random error term that it is distributed normal distribution with mean (0) and variance (σ^2)

Second: Chain Stability Test

1- Augmentented Dickey-Fuller

For the purpose of verifying the time series dormancy of the studied variables (MVAC, IIV, FDI GDPGA) and in the light of the Dickey-Fuller extended test (ADF), it is clear from the data of Table (1) that the time series of the variables mentioned are not static at the At level, so we accept the null hypothesis that states the existence of a unit root, Since the value of (Prob) was greater than (0.05), but when calculating the first difference of these variables, it appears that they were non-static except for the variable (GDPGA) that was static at the first difference, and here we can reject the null hypothesis and accept the alternative hypothesis towards the dormancy of the time series of the GDP growth annual variable.

Table 1 shows the stability test of the data of the model variables according to the (ADF) Augment Dickey Fuller test

Var	Augmentented Dickey-Fuller(ADF) Test	Augmentented Dickey-Fuller(ADF) Test	Decision
	Level	At first difference	

	None	Trend and intercept	Intercept	None	Trend and intercept	Intercept	
IIV	-1.342 (0.239)	-2.424 (0.451)	-1. 421 (0.241)	-1.521 (0.342)	-1.747 (0.143)	-1.631 (0.342)	**Unstable**
FDI	-1.241 (0.342)	-2.342 (0.231)	-1.421 (0.453)	-1.245 (0.242)	-1.251 (0.231)	-2.346 (0.152)	**Unstable**
MVAC	-1.341 (0.231)	-1.567 (0.114)	-2.032 (0.212)	-1.832 (0.122)	-2.324 (0.201)	-1.451 (0.211)	**Unstable**
GDPGA	-1.041 (0.121)	-2.441 (0.221)	-1.451 (0.114)	-4.221*** (0.005)	-5.232** (0.003)	-5.542** (0.000)	**Stable at The first difference**

Note The values in parentheses are p-value at a significant level (0.05,0.01).
Source: Preparing the student based on the program Eviews

2- Phillips Perron Test

Moving to the Phillips Perron Test, and through the data of Table (1), it is clear that the time series of the studied variables were all non-static at the level (At level), so we accept the null hypothesis that states the existence of the unit root, and since the value of (prob) was greater than (0.01,0.05) When calculating the first difference of these variables, it appears that they were static in all cases, and at a significant level between (0.01, 0.05), through which we reject the null hypothesis and accept the alternative hypothesis towards the dormancy of the time series for all variables. Accordingly, the ARDL methodology will be adopted for the estimation of parameters in both the long term and in the short term.

Table 2 shows the stability test of the data of the model variables
According to the Phillips Perron Test

Var	Phillips Perron Test			Phillips Perron Test			Decision
	Level			At first difference			
	None	Trend and intercept	Intercept	None	Trend and intercept	Intercept	
IIV	-1.453 (0.629)	-1.232 (0.734)	-2. 545 (0.953)	-3.591*** (0.048)	-3.789*** (0.034)	-4.935*** (0.003)	**Stable at The first difference**
FDI	-2.341 (0.852)	-1.563 (0.742)	-2.653 (0.663)	-2.163 (0.375)	-1.876 (0.455)	-1.564 (0.363)	**Unstable**
MVAC	-1.562 (0.563)	-2.677 (0.634)	-1.119 (0.677)	-4.832*** (0.002)	-3.945*** (0.001)	-5.862*** (0.003)	**Stable at The first difference**
GDPGA	-2.344 (0.853)	-1.667 (0.554)	-2.274 (0.622)	-5.778*** (0.001)	-4.341*** (0.002)	-6.771*** (0.000)	**Stable at**

	The first difference

Note The values in parentheses are p-value at a significant level (0.01 ,0.05)

Source: Preparing the student based on the program eviews

From the above results, we find that the time series of all variables under study is unstable at the level. But the time series data for the variables under study were stable at the first difference.

Third: Estimation of the distributed deceleration autoregression model ARDL

1-1 Estimation of the distributed deceleration autoregression model (ARDL) of the variable (IIV) to (FDI)

One of the results shown in the table below is due to the estimation of the features of the distributed deceleration autoregression model. For the first model (the effect of IIV on FDI) where we note that this model is largely identical with statistical tests and the quality of the model. In addition, it can be seen from the above table that the coefficient of determination (R^2) reached (70.3%) and the corrected coefficient of determination is (67.4%) This shows that the interpretability of our model is very strong, which indicates that (67.4%) Of the changes that occur in the FDI are due to the IIV variables and the remaining (32.6%) is due to uncontrolled external factors. Through the calculated value of (F) (25.401) and the corresponding probability value equal to (0.000000), which is a significant value below the level of significance 0.05, we conclude that the studied model between (IIV) and FDI is a significant model, i.e. this standard model fits with the phenomenon under study very much.

The value of Durbin Watson (DW) was equal to (2.933054), which means that the model is free of the problem of autocorrelation.

Table 3 shows the results of estimating the parameters of the distributed deceleration autoregression model ARDL for the IIV effect model on FDI

Dependent Variable: FDI
Method: ARDL
Date: 12/29/22 Time: 13:06
Sample (adjusted): 1973- 2020
Included observations: 48 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): IIV
Fixed regressors: C
Number of models evalulated: 20
Selected Model: ARDL(3, 0)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI(-1)	1.131312	0.148504	7.618061	0.0000
FDI(-2)	-0.609734	0.224369	-2.717547	0.0094
FDI(-3)	0.329359	0.166105	1.982836	0.0538
IIV	-2592707.	20593937	-0.125897	0.9004
C	-68059227	1.26E+09	-0.053828	0.9573

R-squared	0.702639	Mean dependent var	-8.93E+08
Adjusted R-squared	0.674978	S.D. dependent var	2.76E+09
S.E. of regression	1.57E+09	Akaike info criterion	45.29090
Sum squared resid	1.07E+20	Schwarz criterion	45.48582
Log likelihood	-1081.982	Hannan-Quinn criter.	45.36456
F-statistic	25.40139	Durbin-Watson stat	2.933054
Prob(F-statistic)	0.000000		

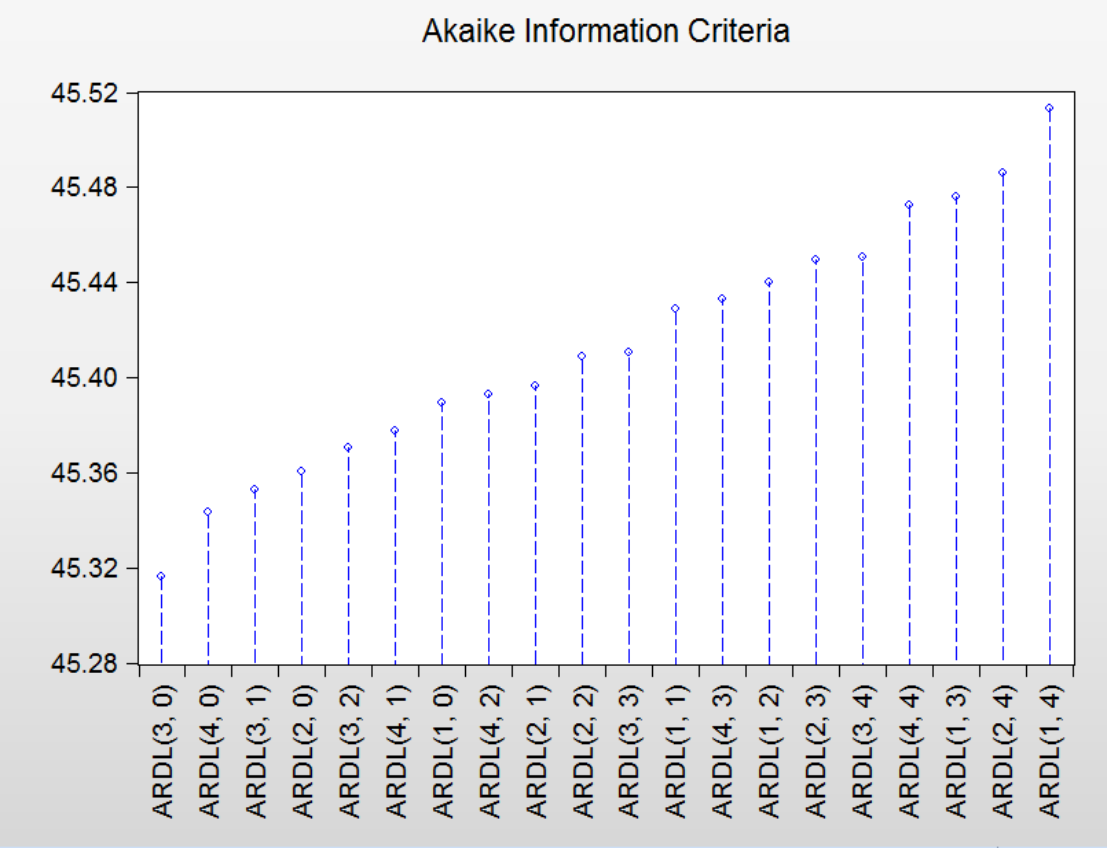
*Note: p-values and any subsequent tests do not account for model selection.

Source: Student preparation based on the program Eviews12

When see the coefficients estimation of industrial investment is negative sign

2-1 Criterion for the temporal backwardness of the fiscal policy model with the three gaps (AIC: Akaike)

It is clear from the figure shown below, that the lowest value of the standard (AIC: Akaike) is at (3.0)ARDL, which means that the best slowdown period (optimal slowdown period) is (3.0) which is determined automatically by the Eviews12 program.



Source: Student preparation based on the program Eviews12

Figure (1) shows the standard (AIC: Akaike) for the time lag of the IIV effect model on FDI

1-3 Boundary Test for Cointegration of the IIV Impact Model on FDI

From the results presented in the table below, we find that the value of (F-statistic) reached (10.617236), which is greater than the upper and lower limits of the tabular statistical values at a significant level (1%, 2.5%, 5%, 10%) respectively.

According to the data of this result, we will reject the null hypothesis that states (the absence of common integration or equilibrium relationship between the variables of the model) and accept the alternative hypothesis that states (the existence of a common complementarity or equilibrium

relationship between the variables of the model).

Table 4 ARDL Bounds Test for the IIV Effect Model on FDI

ARDL Bounds Test
Date: 12/29/22 Time: 13:34
Sample: 1973- 2020
Included observations: 48
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	10.617236	1

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Source: Student preparation based on the program Eviews12

1-4 Error Correction Model according to the ARDL methodology

This model is one of the important models in the ARDL methodology, which focuses on describing the form of the relationship between the variables of the economic model in the short-term and long-term time period, because this model measures the effect of the time regression of the original model variables. This model is effective in estimating even with small sample sizes compared to other models. One of the conditions for the application of this model is the existence of joint integration. After our studied model passes the statistical tests, it can be used to estimate the short-term and long-term relationship of the ARDL model as shown in the table below. We find that the value of (CointEq(-1)) or the value of (error correction coefficient) (ECt-1) was -0.149063) and its corresponding p-value was (0.0000). Observing the CointEq value(-1) is negative and significant, which means that our model is moving towards long-term equilibrium. In other words, 1.49% of short-term errors can be corrected within one year.

Table 5 shows the error correction model (Error Correction Regression) for the IIV effect model on FDI according to the ARDL methodology.

ARDL Cointegrating And Long Run Form
Dependent Variable: FDI
Selected Model: ARDL(3, 0)
Date: 12/29/22 Time: 13:55
Sample: 1970 2020
Included observations: 48

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI)	0.280375	0.152870	1.834079	0.0736
D(FDI)	-0.329359	0.166105	-1.982836	0.0538
D(IIV)	-2592707.222534	205939.769125	12.58963	0.0000
CointEq(-1)	-0.149063	0.034278	-4.348703	0.0000

R-squared	0.998950	Mean dependent var	834.0357
Adjusted R-squared	0.995450	S.D. dependent var	23226.54
S.E. of regression	1566.651	Akaike info criterion	17.58225
Sum squared resid	7363185.	Schwarz criterion	18.08437
Log likelihood	-112.0758	Hannan-Quinn criter.	17.53577
F-statistic	285.4379	Durbin-Watson stat	2.233054
Prob(F-statistic)	0.000306		

Source: Student preparation based on the program Eviews12

When see the coefficients estimation of industrial investment is negative sign

1-5 Estimation of the long-term relationship according to the ARDL methodology

From the results shown in the table below, we find that the independent variable (IIV) has a clear direct effect on the dependent variable (FDI) in the long term, and this is evident from its p-value of (0.0000) and this value indicates the significance of the effect relationship between IIV FDI. Also, we find that the independent variable and according to the results data in the table below, the standard model is defined according to the following equation:

$$FDI = -4557.7395 + 4.45231 * \text{IIV} + e$$

Table 6 hows the results of estimating the long-term relationship according to the ARDL methodology for the IIV effect model on FDI

ARDL Long Run Form and bounds test
Dependent Variable: FDI
Selected Model: ARDL(3, 0)
Date: 09/07/22 Time: 13:35
Sample: 1971- 2020
Included observations: 48

Cointeq = FDI – 4.45231 *IIV -456579913.7395)

Long run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IIV	4.45231	0.461658	9.644173	0.0000
C	-4557.73951	984.5682	-2.29659	0.0182

Source: Student preparation based on the program Eviews12

Conclusion

The total investment in Iraq has a beneficial effect on economic growth since a significant amount of this investment is foreign, which implies that the profits from this investment contribute to the development and growth of the Iraqi economy.

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