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The Effect Of Foreign Investment On The Iraqi National Income

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Abstract

The aim of research is to explore the direct foreign investment in the long and short terms, so the reserach included data series in the time period (1980-2019), and co-integration test Granger causality and error correction vector being utilized to display the direction of the relation between the study variables and the relation nature of balance in the term long or short and it is noted that there is a relation of a one-way causation. As transmission is achieved via a long-term from foreign direct investment to the economic growth. A probable explanation being belonged to the drop in oil prices, as Iraq based directly and mainly on oil exports in its economy, as well as because of the rampant administrative corruption in the country, that is expanded its effects on all sectors.

Keywords: direct foreign investment, national income, ,vector error correction.

Introduction: The study of the large and causal relationships between the size ofThe failure to participate in the returnIt is called a pseudo-regression.

Introduction

This is done by using a multi-equation error correction model (VECM) (Error Vector .).

Model Correction, {To estimate the relationships between variables in both the long-run and the short-run

(581). P, 2010, Adamopoulos & Vazakidis), (VECM model) is also distinguished in that it

It helps in determining causal relationships between variables, as through the Test Wald test (a

Causal relationships are in the short run, and by a significant error correction coefficient

(ECT) (determined

Causal relationships in the long run (249. P, 2011., al et & Zaman), using the . method

Causality Granger Multivariate

Four to pray: First, unit root tests, to determine the stability or instability of variables:

The degree or rank of integration is determined for each variable

Separately. This is in addition to determining the optimum length lag periods for the variables

The model is by vector autoregressive (VAR).

To test the availability of the co-integration feature among the model variables, where:

The application of the VECM model requires that the variables included in the model be interrelationships

Relationship integration-Co, which ensures equilibrium in the long run

Through the Johansson analysis (procedure probability maximum Johansen).

Three is the estimation of the quantitative relationships between the variables in the long and short run through a correction model:

Multiple Error Equation (VECM) from

It is a simultaneous dynamic analysis model, which includes a number of

The number of variables included in the model.

Time-series stability test:

These values are recorded from first left to right, x2, x3, and. ..., xn.).

The chains are also considered at the top of the roads and mechanisms for predicting what will happen in the future, through a set of facts yesterday and today.

Mathematically: the temporal time (time) and that the set of corresponding values and the corresponding dates is the dependent variable (y), and that each value in time corresponds to it.

One of the most important time series are those time series of economic indicators as well as annual sales related to companies in all aspects of their activities as well as education, population size and what leads to this, and the change that occurs in the content of variable values within the time series or in relation to the values of its variables is considered as a function in the content of time that can be represented Graphically by taking the horizontal axis of time and considering that the vertical axis is the values carried by the variable

False regression:

Most of the macroeconomic time series are vector and accordingly most of them are

unstable,

The problem with unstable data is that

Ordinary least squares method leads to incorrect results3 In these cases it is possible

And high values from the t-statistic, sometimes higher than 1 2 obtain a high coefficient of determination

While the variables used in the analysis have no relationship 3

Many time series have a growth rate that may or may not be constant for example

GDP, money supply, and price index tend to grow at a regular annual rate 3

These series are unstable as mean 3 increases, but they are not integrated, and they will settle at

Any level of taking the differences 3 This gives a major reason to take the logarithms of the data before subjecting them

To standard analysis 3. If we take the logarithm of the time series, which includes an average growth rate, let's convert

To an integral linear vector tracing series, suppose there is a series X which is increasing at a rate of 15%

for 3 . time

$$x_t = 1.1x_{t-1}$$

$$\log(x_t) = \log(1.1) + \log(x_{t-1})$$

Now the lag coefficient is one and for each time period it is incremented with a constant value equal to (1.1(log) which is

Of course, the categorical, and this time series integrated of the first degre

Cointegration:

Macroeconomic studies often include unstable variables such as income, demand for

Money, prices, trade, and the exchange rate. From time series analysis, it is necessary to use

differences to convert them into stable series. But this is not the best solution. There are two problems

and x

There are two main points when using differences, if the model is correctly defined for the relationship between

For example, the differences are taken for both variables, so implicitly we will take the differences to the point of error

in decline. This will produce an inverted series of moving averages of the bounds of error

It will present a series of difficulties in estimation. The second problem is that if the differences are taken for the variables,

The model does not give a unique solution to the long-term relationship. By this we mean that if a specific value of x is taken

$X_t \sim I(d)$

$Y_t \sim I(d)$

The Problem of Autocorrelation:

One of the basic assumptions of the linear regression model is that there is no autocorrelation

Between the values of the random variable (U), the autocorrelation problem appears when:

1- Some independent variables are deleted from the studied relationship (diagnosis).

inaccurate(.

2- The presence of random factors that affect the successive values of error, (wars, or instability or natural disasters).

3- Not formulating an accurate linear relationship for the mathematical model.

The Durbin-Watson test:

The Watson-Durbin test is used as the best test

The existence and hypothesis of autocorrelation are:

$H0: \rho = 0$

$H1: \rho \neq 0$

Vector Error Correction Model (VECM):

Error correction vector model is a self-regression using to describe the dynamic, reciprocal relation between stable variables, and when the results of co-integration indicate the existence of equilibrium relation, in the long run, the direction of this relationship is determined by the error correction vector model. (VECM) in the sense knowing convergence of the time series of equilibrium in the long term and the dynamic series changes in the short term, meaning that this test has the ability to estimate and test the relation in the long and short terms between the model variables, as well as it avoids standard problems caused by Spurious correlation. (William, 2003)

The existence of the co-integration between the variables mean the probability of designing a Vector Autoregressive Model (VAR) in form of initial differences for the variables with the addition of the slowing time gap (error correction limit (ect-j) which measures the speed of adaptation of imbalances short term equilibrium and in the long term, Johansen explained that the effect of the causal relationship in the short term is represented by the time-lagging values of the change in the independent variables while the error correction limit represents the effect of the causal relationship in the long term

The vector error correction model (VECM) It is being used to ascertain the direction of

equilibrium relationship (short and long term) between variables, and as it can be applied in the small samples. The most important condition of this application is the existence of a common integration of the study variables according to the Johansen method.

To test the direction of relationships in the long and short term for the variables of our current study (foreign direct investment IF, gross domestic product GDP, it will be estimated the vector error correction model (VECM) according to the following:

The first case: The existence of relation from the growth of foreign direct investment to economic growth is tested, according to the following:

The second case: The existence of a relation from economic growth to foreign direct investment is tested,

The value of this parameter and its statistical significance verify the long-term relation between the study variables in the following cases:

- θ1: When it is the negative and important sign, the long-term causal relationship is one-way from IF to GDP, meaning that the IF variable has an impact on the GDP variable.
- θ_2: When it is negative and significant, the long-term causal relationship is one-way from GDP to IF, meaning that the GDP variable affects the IF variable.
- If the values of θ_1 and θ_2 in both equations are negative and significant, then the long-term causal relationship, in particular, is bidirectional (reciprocal).
- When the value of this coefficient for either of the two equations separately or for both equations is positive, then that makes this coefficient unexplainable in the sense that it is without any statistical meaning

Granger's Causality test:

After making sure that there is a co-complementarity relationship between the variables, we test the existence of the reciprocal causation relationship in the short term and determine its direction using the Granger causality test, so the following steps are taken:

1. We consider that the self-regression vector model consisting of the variables of the study GDP, IF, and degree of delay p

whereas:

$(\beta_1)_2$, $(\beta_1)_1$, $(\alpha_1)_2$, $(\alpha_1)_1$, β_0, α_0

Nihilistic hypotheses are tested according to the following:

H_{01}: IF not cause GDP

H_{02}: GDP not cause IF

The null hypothesis is accepted or rejected depending on the (F) statistical values, where null hypothesis rejected in the case likelihood value less than 0.05

Standard and statistical tests and analysis of results:

Before discussing the results of statistical and standard tests and methods, it is necessary to clarify the relationship between the value of economic growth and expected investment flows (foreign direct investment):

Economic growth: Rate economic growth (gross product), which is a standard that measures or monitors the total value of various goods and services provided, private and public, during a specific time period, and is symbolized by the symbol (GDP).

Foreign direct investment: means Arab and foreign capital inflows into the country or means expected capital flows that go back to Arab and foreign citizens or intangible Arab and foreign institutions outside the host country, and it is symbolized by the symbol (IF).

whereas:

IF: expected investment flows (foreign direct investment).

GDP: gross domestic product.

Before doing the analysis, we must pay attention to the fact that the value of foreign direct investment in the year 2003 is missing, so it will be estimated using a geometric increase model, as this model assumes that the change in the value of foreign direct investment is in a complex manner according to an annual rate of increase of r, as the pattern of increase It takes the form of a geometric sequence from year to year as follows:

$$IF_0, IF_0(1+r), IF_0(1+r)^2, ..., IF_n = IF_0(1+r)^n$$

In general, it can take the following formula:

$$IF_n = IF_0(1+r)^n$$

whereas:

IG: It represents the value of expected investment flows (foreign direct investment) for year n.

IG: It represents the value of investment flows in the base year

N: The number of years

R : The rate of increase in the value of investment flows.

Accordingly, the value of investment flows in the year 1980 was (1530000) dollars, and in the year 2019 it reached (3009600000) dollars. Therefore, we will calculate the annual rate of increase and then estimate the value of investment flows for the year 2003 using the geometric progression method according to the following:

$$IF_n = IF_0(1+r)^n$$

$$\left(\frac{-326000}{1530000}\right)^{1/22} - 1 = r$$

1. Stability tests for time series of the two study variables.

test	VAR	status					
		intercept		trend and intercept		none	
		t-value	p-value	t-value	p-value	t-value	p-value
ADF	IF	0.654	0.99	-8.125	0.000	1.076	0.922
	GD	-0.201	0.654	-8.023	0.250	-0.136	0.631
PP	IF	-1.654	0210.	-2.445	0.141	-2.084	0.037

				1			
	G D	0 . 3 9 5 1	0.888	- 1 . 4 7 3	0 . 7 2 1	1 . 3 2 1	0 . 9 4 9

first difference, and this result is consistent with the standard theory. Which assumes that most of the economic variables are not stable at the original level and take their stability at the first or second difference.

This indicates the possibility of applying the Johansen test of co-integration and the error correction vector model to reveal the nature of their interrelationship.

2. Co-integration test

To assess and test the existence of a long-term relation between growth rate and foreign direct investment and to know the number of vectors and the nature of the equilibrium relation between them in long term, joint complementarity test was performed by the Johansen method, as shown in table (2)

table (2)**:** Johansen cointegration test results

Source: Prepared by the researcher based on the results of the program (Eviews v.7).

Table (2) shows the impact tests and the greatest potential of the proposed model. It is possible to know the existence of the joint complementarity between the growth rate and foreign direct investment in both tests, so we find the value calculated in each of the two tests for the first null hypothesis is greater than the critical values at a significant level less than the pre-determined level of significance (0.05) Which leads to rejecting the null hypothesis, which states the absence of a long-term equilibrium relationship, and we accept the alternative hypothesis that states the existence of at least an equilibrium relationship.

As for the calculated value for the two tests at the second hypothesis, it is less than the critical values at the same level of significance specified in advance. In this hypothesis, we accept the null hypothesis, meaning the existence of a single long-term equilibrium relationship.

We conclude from Table (2) that there is at least one (long-term) joint complementarity relationship between the growth rate and foreign direct investment, but the nature of this relationship has not been determined and to determine this must be estimated the model VECM vector

3. Slow down period

Before approaching the estimation of the vector error correction model, it is necessary to determine the optimal slowdown of the model by determining the degree of lag for the vector autoregressive model (VAR), as in table (3):

4. Corrected the estimation VECM:

Tests integration-Co

Co-integration will be revealed by Johansen's analysis

Procedure probability maximum, through two tests (Max ., Test Trace)

Test Eigen. These two tests are performed to test the null hypothesis that there is a maximum number (r).

From the co-integration relations between the model variables, where (r) expresses the number of integration relations

The commonality between the variables, and is equal to zero in the absence of any co-integration relationship between the variables

The model or equal to 1, 2, 3 with a maximum (1-k), where (k) is the number of variables in the model, which is

There are five variables in this model, and the results of these two tests are summarized in Table RP (5).

5. Estimating relationships between variables

Long-term relationships are measured using the VECM model, which is a stigma expression

$$ln\ GDPpc_t = \alpha_0 + \alpha_1 ln\ GFC_t + \alpha_2 ln\ GE_t + \alpha_3 ln\ CO_t + \alpha_4 ln\ PIS_t + u_{1t} \ldots (2)$$

$$ln\ GFC_t = \beta_0 + \beta_1 ln\ GDPpc_t + \beta_2 ln\ GE_t + \beta_3 ln\ CO_t + \beta_4 ln\ PIS_t + u_{2t} \ldots (3)$$

$$ln\ GE_t = \lambda_0 + \lambda_1 ln\ GDPpc_t + \lambda_2 ln\ GFC_t + \lambda_3 ln\ CO_t + \lambda_4 ln\ PIS_t + u_{3t} \ldots (4)$$

$$ln\ CO_t = \theta_0 + \theta_1 ln\ GDPpc_t + \theta_2 ln\ GFC_t + \theta_3 ln\ GE_t + \theta_4 ln\ PIS_t + u_{3t} \ldots . (5)$$

$$ln\ PIS_t = \delta_0 + \delta_1 ln\ GDPpc_t + \delta_2 ln\ GFC_t + \delta_3 ln\ GE_t + \delta_4 ln\ CO_t + u_{5t} \ldots (6)$$

After determining the existence of a single long-term causal relationship from IF to GDP, a Cranger causal test is performed to test the existence and direction of the causal relationship in short term, and the results are shown in table (5).

table (5)**:** Granger test

	null	**N**	**F-**	**Pro.**	**resul**

hypothesis	. Obs	statistic		t
H_0: GDP → IF	37	1.894	0.1669	**Acceptance**
H_0: IF → GDP	37	0.616	0.5462	**Acceptance**

Source: Prepared by the researcher based on the results of the program (Eviews v.7)

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