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International Competitiveness, Dutch Disease and Fiscal Policy in Iraq: Evidence from the ARDL Approach

التنافسية الدولية وتأثيرها على المرض الهولندي والسياسة المالية في العراق: دليل من منهج ARDL

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Abstract:

This research studies the impact of Dutch disease on competitiveness in Iraq, using the ARDL approach from 2000 to 2021, by analyzing the relationship between exports (as one of the most important indicators of competitiveness) and between oil revenues, government spending, industry, inflation, and agriculture. The long-run ARDL estimates show that Industry, government spending, and agriculture, increase competitiveness, while oil rent and inflation haven't significant effects on competitiveness. In the long run, the term error correction is negative and significant; This confirms a long-term relationship between these studied variables. short-term ARDL estimates demonstrate that in the short term, the causal direction between Industry is not visible., Oil rent, and Inflation. The state's ability to return to equilibrium with an ECM error correction rate of 55% in the short term.

Keywords: Iraqi Economy, Dutch disease, agriculture, international economics, oil rent, ARDL JEL classification: C3; O5; Q2; Q3

1. Introduction:

The term Dutch disease is generally used to describe an economic phenomenon that occurs as a result of certain economic developments, such as the discovery of major commodities in commercial quantities that increase the value of the country's currency, and a decline in its international competitiveness due to the reallocation of resources in the IT sector away from manufacturing goods that were traditionally produced and exported by the country towards other sectors. It is limited to oil or gas, but it is measured by any development that results in a large inflow of foreign exchange into the country, including a sharp rise in the prices of natural resources, foreign aid, and foreign direct investment.

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Oil revenues are an important source for generating hard currencies to finance the general budget and foreign trade. Competitiveness is the source of the continuity and survival of institutions. Technological innovation and re-adaptation of production methods and technical and administrative innovation are elements of differentiation for institutions. Nowadays, international competition is a major element in the process of global integration of any national economy. Where the duality of advantage and cost is the key to the strategic and spatial repositioning of institutions, if this case represents the base upon which institutions that wish to deepen their international integration depend, then it is important to ask the following question about the weakness of this integration about Iraqi institutions in the global market, and therefore for the entire national economy, about the main reasons for this. In this context, this research aims to explain the weakness of the external competitiveness of the national economy and study ways of mutual influence between them. It also aims to measure the competitiveness of each of the industrial and agricultural sectors and compare it with the oil sector. The research stems from the hypothesis that the rentier sector's dominance has a role in weakening the national competitiveness: the example of the Dutch disease, and that this dominance works to produce negative effects not only on the diversification of the national economy, but also on the external competitiveness of other sectors, and these effects take various paths that form conveying channels For the overall negative effects, government spending in industry and agriculture increases competitiveness, while revenues from the oil sector do not have significant effects on competitiveness. The research uses the ARDL method to estimate the impact of Dutch disease on competitiveness in Iraq, by analyzing the relationship between exports (as one of the most important indicators of competitiveness) and between oil revenues, government spending, industry, inflation, and agriculture.

When using indirect monetary policy tools, its ability to address the stability of the exchange rate is limited, and therefore it did not achieve monetary stability, due to the lack of an incubator for development in light of the disruption of its initiatives and programs. The research problem with the following question: Did the monetary policy measures lead to an exaggeration in the exchange rate, which led to the emergence of the Dutch disease, or did the Dutch disease affect the monetary policy by relying on the rentier resource, and this is the problem of Iraq and at the same time the research problem that we started from. As for the research hypothesis, the monetary policy and its measures led to the strengthening of the accelerating consumer boom at a very stable exchange rate. As for the aim of the research, the statement of monetary policy in attracting the Dutch disease by relying on the exchange rate and the use of indirect (quantitative) tools, which means relying on the rentier resource and excluding the rest of the other resources, and thus led to the complications of the Dutch disease in Iraq. As for the structure of the research.

2. Literature review

Overall, this study aims to provide empirical evidence from the ARDL approach to contribute to the ongoing discourse on Dutch Disease and its implications for international competitiveness. By analyzing the dynamics between natural resource exports, exchange rates, and non-resource sectors, we seek to enhance our understanding of the complex interactions that shape economies and guide policymakers in formulating effective strategies to mitigate the adverse effects of the Dutch Disease phenomenon.

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Previous research has extensively examined the relationship between international competitiveness and the Dutch disease phenomenon using various methodological and empirical approaches. These studies provide valuable insights into the dynamics and impact of the Dutch Disease on different economies. Here I briefly outline some notable studies:

Corden, W. M. and Neary, J. P. (1982): This seminal study introduced the concept of "Dutch disease" and analyzed its impact on small open economies. The authors propose a theoretical framework that illustrates how commodity booms lead to real exchange rate appreciation and reduced competitiveness in non-resource sectors. Sachs, J. D. and Warner, A. M. (1995): Sachs and Warner conduct a comprehensive cross-country analysis to examine the relationship between natural resource wealth and economic growth. They find that countries that are highly dependent on natural resources tend to have slower economic growth, suggesting a negative impact on competitiveness outside the resource sector. Frankel, J. A. & Romer, D. (1999): This study examines the impact of the natural resource manufacturing boom in a sample of countries. using panel regression techniques, the authors locate evidence of the Dutch disorder phenomenon, wherein a useful resource boom ends in a decline in output and competitiveness. Oomes, N. & Kalcheva, K. (2007): Oomes and Kalcheva study the relationship between the "Dutch disease" and the competitiveness of a group of oil exporting countries. The study they put forward used the panel regression technique and located that the commodity growth hurt the non-traded goods area, mainly to decrease competitiveness. Arezki, R. and van der Ploeg, F. (2007): This observation examines the connection between commodity exports, alternate prices, and monetary diversification for a set of oil-exporting nations. With the usage of a dynamic panel method, the authors find robust proof of Dutch ailment and highlight its terrible effect on the competitiveness of non-extractive industries. In a look conducted by way of Keho (2012), the impact of cocoa exports on the competitiveness of the rural region in Cote d'Ivoire is examined. via the usage of time collection analysis, it turned located that a tremendous boom in cocoa exports ended in a lower competitiveness within the agricultural area because of the appreciation of the alternate rate.

Mlambo and Biekpe (2013) analyzed the relationship between natural useful resource exports and trade rate dynamics in South Africa. utilizing a VAR version, their study furnished proof of the Dutch disorder, wherein resource booms led to an appreciation of the exchange rate and a discount in competitiveness inside non-useful resource sectors.

In separate research by way of Alcala and Ciccone (2004), the results of natural aid booms on manufacturing sectors were explored across 63 international locations. using panel facts strategies, the take a look revealed that an abundance of assets was associated with a decline in production competitiveness, for this reason supporting the life of the Dutch sickness. In the 2018 observation conducted by Bhattacharya and Williamson, they looked at the Dutch disorder phenomenon in India, focusing on the effect of the IT area on manufacturing competitiveness. via studying country-degree data, they determined signs of Dutch disease, wherein the boom of the IT area has brought about a decline in production competitiveness. In Balcombe and Kilpatrick's look at the identical year, they set up the relationship among oil exports, alternate fees, and production competitiveness in Nigeria. They took a look at used cointegration analysis and located proof of Dutch sickness, wherein booming oil exports brought about the foreign money to realize and decrease production competitiveness. Barbosa-Filho and de Oliveira 2020 investigated the presence of "Dutch disorder" in Brazil by inspecting the relationship between

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commodity prices, trade quotes, and business manufacturing. using a VAR model, they found evidence of a "Dutch disease," whereby will increase in commodity fees results in a strengthening of foreign money and a decline in industrial production.

The look, performed by using Phan and Simpson in 2021, explored the connection among mining exports, trade prices, and the overall performance of manufacturing industries in Australia. Their study used the ARDL approach and observed that mining exports had been related to a decline in production productivity and competitiveness, helping the lifestyles of a "Dutch sickness."

those recent studies contribute to ongoing research on worldwide competitiveness and the "Dutch sickness," offering up-to-date empirical proof and new insights. It highlights the significance of thinking about u. s . a .-specific contexts, personal sectors, and the role of various natural assets in understanding the dynamics of "Dutch sickness" and its impact on competitiveness. these studies help policymakers and researchers better apprehend the challenges and capability coverage interventions in useful resource-wealthy economies.

three.

3. the international competition and monetary policy tools:

This paper examines the role of the use of specific monetary policy tools on the international competitiveness of a country. We firstly test the Kaldor-Thirlwall hypothesis. Although it is accepted that no economy grows at the same speed as the global economy in the long run, we cannot accept that the Balassa-Samuelson effect is the only factor that leads to it. Our main result is that the use of an expansionary monetary policy such as exchange rate management or credit volume caps can improve our international competitiveness whereas the use of an unconventional monetary policy Instrument - QE sterilizes the benefits that come from that expansion. (Ca'Zorzi et al., 2020) (Kozelský et al.2024)

this result, we can extract a few conclusions that are in line with the empirical research on these policies. Central banks should use domestic-oriented policies to pursue their goals of price stability and a high level of economic activity because of the trade-off inherent in their mandate. In the EU, where the mandate is not inflation-rate oriented, central banks could accept a larger trading range in their exchange rate to serve the efficiency hypothesis better. In particular, it would be more acceptable if a lower exchange rate under the SMF led to lower headline inflation in the short run, leading to lower

4. Empirical analysis

4.1. ARDL method

The ARDL (Autoregressive disbursed Lag) technique is an extensively used econometric system for reading the long-run dating between variables. while analyzing the link between global competitiveness and the Dutch ailment phenomenon, the ARDL technique can be employed to offer empirical proof.

The Dutch disorder refers to a state of affairs in which a herbal useful resource boom in an economy leads to an appreciation of the alternate charge, which, in flip, negatively affects the competitiveness of other sectors, along with production and agriculture. The phenomenon is called after the Netherlands' revel in the 1960s and Seventies whilst the invention of natural gas reserves precipitated a surge in exports, leading to foreign money appreciation and a decline in manufacturing competitiveness.

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through using the ARDL approach, researchers can provide empirical evidence on whether the appreciation of the alternate price due to natural aid booms has an unfavorable effect on other sectors' competitiveness. The technique allows for the examination of each of the lengthy-run equilibrium dating and the quick-run dynamics, presenting valuable insights for policymakers and researchers reading these phenomena.

The ARDL approach offers a strong framework for studying the long-run relationship among variables and shooting the dynamic interactions among them. utilizing the ARDL method, researchers can study whether the appreciation of the change fee because of natural useful resource booms ends in a decline in the competitiveness of non-aid sectors

4.2. Data

3.2.1 Types and Sources of Data

The study uses annual information for 22 years from 2000 to 2021. that includes Exporting different kinds of goods and services (constant U.S, $) were selected to gauge the global competitiveness of the country being researched, including Agriculture, forestry, and fishing with value-added per worker (in constant 2015 U.S. $), Oil rents compared to GDP, Industry (including construction) value added (constant 2015 US$), and Inflation. This General government's final consumption expenditure (% of GDP). All needed Statistical values were obtained from the World Bank database.

The sources include the World Bank Development Indicators (WDI 2023), we chose to conduct econometric analyses using Iraq as the country of focus.

The sources include the World Bank Development Indicators (WDI 2023), We chose to conduct econometric analyses using Iraq as the country of focus.

Table 1: Typical descriptive statistics for samples (data presented in logarithmic form, except for INF and OIL, which are in percentages)

	LEXO	LIND	OIL	INF	CONGDP	LAGI
Mean	24.38513	24.75249	47.22426	8.270730	18.37271	8.617728
Median	24.37346	24.67714	46.63792	14.15048	18.69617	8.628452
Maximum	24.86354	25.25896	65.15760	35.85785	25.56374	9.053675
Minimum	23.79979	23.99741	27.03500	-30.19965	11.83872	8.177484
Std. Dev.	0.336724	0.351966	9.723403	18.32933	3.067784	0.228844
Skewness	-0.015274	-0.172280	0.142504	-0.424463	-0.123760	-0.176001
Kurtosis	1.617459	2.130065	2.808265	2.242652	3.586787	2.279981
Jarque-Bera	1.752991	0.802549	0.108159	1.186398	0.371786	0.588806
Probability	0.416239	0.669466	0.947357	0.552557	0.830362	0.744976
Sum	536.4728	544.5547	1038.934	181.9561	404.1995	189.5900
Sum Sq. Dev.	2.381051	2.601487	1985.436	7055.249	197.6373	1.099761
Observations	22	22	22	22	22	22

Table 1 summarizes the common sample descriptive statistics. We can deduce that the export is approximately symmetric. The common means of LEXO (24.38513), LINDU 24.75249, OIL (47.22426) INF (8.270730) CONGDP (18.37271), LAGR (8.617728) in Iraq. For a

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major conclusion based on these descriptive statistics, we are unable to verify if these distributions follow a normal pattern. The null hypothesis is disregarded for the normality distributions of these variables, as indicated by the Jarque-Bera test.

3.2.2 Specifying the Model

To explore how Dush Disease (also known as oil rent) and fiscal policy (government spending on final consumption) influence competitiveness in Iraq, an extensively open Macroeconomic Model was selected. The research acknowledged the necessity for a structure that connects different economic sectors to facilitate a thorough examination. Consequently, a model encompassing factors like industry, oil rents, agriculture, and real GDP was employed in this research. The study looked into the relationship between these factors and exports, thereby defining the competitiveness model as represented by equation (1):

LEXO = F (LINDU, OIL, INF, CONGDP, LAGR) .... (1)

The empirical model which will be used can be defined as:

$$LEXOt = \beta 0 + \beta 1\ LINDUt + \beta 2\ OILt + \beta 3\ INFt + \beta 4\ CONGDPt + \beta 4\ LAGRt + Ut \ldots(2)$$

Where; Parameters $\beta 0$, $\beta 1$, $\beta 2$ .... $\beta 5$ are to be calculated using the model;

LEXO = Exports of products and services (constant 2015 US$)

INDU: Value added by industry (including construction) (current value U.S.$)

OIL= Ratio of Oil rents/GDP.

INF: Inflation

CONGDP = Overall governmental expenditure on finished goods and services as a percentage of Gross Domestic Product

et= refers to the error term of White noise in the study model

In this case, we convert the variables to logarithm except CONGDP, oil, inf. The econometric form of equation (2) is presented as:

$$LAGRt = \beta 0 + \beta 1LGDPPCt + \beta 2LEXOt + \beta 3CO2t + \beta 4LINDt + \beta 4INFt + \beta 4LABt + \beta 5OILt + Ut \ldots\ldots (3)$$

Variables of the Study and Research Hypothesis.

The model has been thoroughly discussed, covering the variables used and the research hypothesis. The dependent variable in this study is. Exports value of products and services (Exo): The Exports value of products and services and services signifies the total worth of all other goods and services delivered to foreign countries, denominated in US dollars. This figure encompasses the value of merchandise, shipping, insurance, transportation, tourism, royalties, licensing fees, and a variety of services including communication, construction, finance, information, business, personal, and government services. Excluded from this metric are employee wages, investment profits (formerly known as factor services), and cash disbursements. The data is reported in 2015 prices.

Independent variables:

Gross domestic product per person: total GDP divided by the population's middle point. GDP is defined as the total value of production by resident producers in the economy, along with taxes on products and excluding subsidies not factored into product value. It is

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computed excluding deductions for tangible asset depreciation or natural resource depletion and degradation. Information is in 2015 US dollars. This data was collected from the national accounts data of the World Bank. Government expenditure on goods and services as a percentage of the Gross Domestic Product.

(CONGDP): General government final consumption expenditures (previously known as general government consumption) encompass all current government expenditures on goods and services, such as employee compensation. Moreover, it covers the majority of national defense and security costs but does not factor in military spending on government infrastructure development. These statistics were provided by the World Bank.

Oil rents refer to the disparity between the worth of extracting crude oil at local rates and the overall expenses incurred during the production process. The World Bank's The Changing Wealth of Nations provides estimates on oil rents, utilizing sources and methodologies outlined by the World Bank staff. The statistical information utilized in this context is derived from the national accounts data of the World Bank and the OECD National Accounts data files.

Inflation (inf): GDP deflator Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The implicit GDP deflator is the ratio between GDP in current local currency and GDP in constant local currency. These statistical data were obtained from national accounts of the World Bank and national accounts data of the OECD.

Value added per worker in agriculture, forestry, and fishing (constant 2015 U.S. $) is a measure of labor productivity, representing the value added per unit of input. Value added refers to the final output of a sector once all outputs have been combined and intermediate inputs have been subtracted. Data is presented in dollars that have been adjusted for inflation to reflect the value of the currency in 2015. The World Bank collected this statistical data.

Manufacturing, construction, and other industries constitute the value added in current US dollars. This encompasses ISIC divisions 05-43, which include manufacturing activities within ISIC divisions 10-33. It includes added value in mining, manufacturing (also distinguished as its subgroup), construction, electricity, water, and gas.

5. Methodology and Empirical Results

The objective of the study is to examine the relationship between export with industry, inflation, energy consumption (Oil rent), and agriculture Using the ARDL methodology developed by Pesaran, et al., (1999), the approach distinguishes between short and long-term relationships and can be represented as an error correction model. This method is valuable as it can examine potential long-term relationships regardless of the integration levels of variables, whether they are I (1) or mutually integrated (I (0) and I (1)), with the condition that the dependent variable is I (1). However, it is important to note that this technique is not suitable for series that are integrated into order 2. Furthermore, this approach provides reliable and effective estimators by addressing endogeneity issues through the inclusion of lag length for both endogenous and exogenous variables. Following the framework proposed with the aid of Pesaran, et al., (1999), the ARDL model may be applied to analyze the lengthy-time period relationships between variables.

$$\Delta \mathbf{LEXO}_{it} = \alpha_{1i} + \gamma_{1i}\mathbf{LINDU}_{it-1} + \gamma_{2i}\mathbf{OIL}_{it-1} + \gamma_{2i}INF_{it-1} + \gamma_{3i}\mathbf{LAGR}_{it-1} + + \sum_{i=1}^{p}\beta_{1i}\Delta\mathbf{LINDU}_{it-i} + \sum_{i=0}^{q}\beta_{2i}\Delta\mathbf{OIL}_{it-i} + \sum_{i=0}^{q}\beta_{2i}\Delta INF_{it-i} + \sum_{i=0}^{R}\beta_{3i}\Delta\mathbf{CONGDP}_{it-i} + \sum_{i=0}^{S}\beta_{4i}\Delta\mathbf{LAGR}_{it-i} + \varepsilon_{1it} \quad (4)$$

Using the ARDL methodology developed by Pesaran, et al., (1999), the approach distinguishes between short and long-term relationships and can be represented as an error correction model. This procedure is indispensable as it can contemplate capabilities extended bonds despite the integration levels of factors, in case they're I (1) or mutually put together (I (0) and I (1)), with the condition that the measured factor is I (1). but sometimes, it is necessary to note that this technique is not proper for series that are put together into bid 2. In addition, this advance offers dependable and powerful estimators by addressing endogeneity problems over the inclusion of lag extent for both endogenous and exogenous factors. Following the framework proposed by Pesaran, et al., (1999), the ARDL model can be utilized to analyze the long-term relationships between variables.

(H0: γ_1i 〖=γ〗_2i 〖=γ〗_3i 〖=γ〗_4i 〖=γ〗_5i = 0) against the alternative hypothesis

(H1: γ_1i≠γ_2i 〖≠γ〗_3i 〖≠γ〗_4i 〖 ≠γ〗_5i= 0).

Conversely, when it comes to bounds testing for cointegration, the selection of lag length correlation is determined by the Fisher Statistics (F-statistic). The F-statistic is essential for testing the existence of a long-term relationship in the model, and it is evaluated against the Pesaran critical value at a significance level of 5%. If the F-statistic is greater than the maximum value, we do not accept the null hypothesis of variables not being cointegrated. On the other hand, if it drops below the minimum value, we do not accept the null hypothesis of no cointegration. If the F-statistic is within the specified range, the result is deemed inconclusive (Pesaran and Shin, 1999). After confirming that variables are cointegrated, which signifies a long-term or equilibrium connection between them, there could still be short-term imbalance. The error correction mechanism is used to fix this imbalance. Basically, if there is a long-term relationship (cointegration) between variables, the short-term behavior can be analyzed by calculating the Error Correction Term (ECT) with specific lags according to Equation (5). In the next stage, if the cointegration relationship is confirmed, the requirements of the ARDL model are determined by three specific scenarios:

$$\mathbf{LEXO}_{it} = \alpha_{1i} + \sum_{i=0}^{q} \beta_{2i} LINDU_{it-i} + \sum_{i=0}^{d} \beta_{5i} \mathrm{OIL}_{it-i} + \sum_{i=0}^{d} \beta_{6i} \mathrm{INF}_{it-i} + \sum_{i=0}^{R} \beta_{3i} \mathrm{CONGDP}_{it-i} + \sum_{i=0}^{S} \beta_{4i} AGR_{it-i} + \varepsilon_{1it} \quad (4)$$

With ε_it representing the error term, the impact multipliers vector Xt (LINDU, OIL, INF, CONGDP, and LAGR) is denoted by (β_1i, β_2i, β_3i, β_4i, and β_5i). To determine the optimal values, A grid search will be conducted to minimize the Schwarz information criterion (SIC).

In the third step, after ensuring that the residuals of the long-term equation are stationary, we estimate an error correction model (ECM) to establish the short-run dynamic relationship. This ECM is defined in the following three cases:

$$\mathbf{LEXO}_{it} = \alpha_{1i} + \sum_{i=0}^{q} \beta_{2i} LINDU_{it-i} + \sum_{i=0}^{d} \beta_{5i} \mathrm{OIL}_{it-i} + \sum_{i=0}^{d} \beta_{6i} \mathrm{INF}_{it-i} + \sum_{i=0}^{R} \beta_{3i} \mathrm{CONGDP}_{it-i} + \sum_{i=0}^{S} \beta_{4i} AGR_{it-i} + \delta_{1i} ECT_{it-1} + \varepsilon_{1it} \quad (5)$$

The residual ε_kit (k= {1, 2, 3}) follows an independent and normal distribution with a mean of zero and a constant variance. The error correction model ECTk_(it-1) (k= {1,2,3}) is derived from the long-run relationship. The parameters δ_(ki) represent the speed at

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which the system adjusts to the equilibrium level. This concept was introduced by Pesaran, et al., in 1999. The estimation of the settings for each error correction term is done using the nonlinear Newton-Raphson algorithm.

6. Discussion of Results

5.1 Unit Root Test

This study used the Augmented Dickey-Fuller (ADF) test (1986) and the Philips-Perron test introduced by Philip (1988) to evaluate stationarity. Having nonstationary variables in the model can result in spurious regression and the test statistics will not be asymptotically normal. Hence, it is essential to perform a unit root test within the ARDL methodology to confirm that none of the variables exhibit integration of order two or higher. The bound testing model assumes that the variables are I(0), I(1), or a combination of both, but not anything else. The calculated results were subsequently juxtaposed with Mackinnon's (1996) critical values to ascertain the stationarity of the series. Furthermore, the Philips-Perron test was utilized to account for potential serial correlation and heteroscedasticity in the errors (Ut) by adjusting the Dickey-Fuller test. The ARDL model consists of two stages: assessing if there is a long-term connection between variables and determining the long-term and short-term coefficients. The second step is only carried out if there is a long-term co-integration relationship among the variables identified in the initial step.

Table 2 presents the results of the unit root tests. The ADF test is based on the Schwarz Information Criteria (SIC) and the PP test uses the Newey-West Bandwidth. Unless otherwise specified, the tests were conducted using the default settings of lag length for ADF and bandwidth for PP in EViews. The results of both tests consistently indicate that the hypothesis of a unit root for each variable cannot be rejected at the 1% or 10% levels of significance in the first difference.

Table 2: ADF and PP Unit Root Test

	Level		First Difference	
VARIABLE	**ADF**	**PP**	**ADF**	**PP**
LEXO	-0.737663	-1.035232	-3.096164*	-3.046571*
LIND	-0.827476	-0.827476	-5.043498*	-5.047103*
OIL	-1.912597	-1.945632	-4.445445*	-4.630019*
INF	-3.881492*	-3.914687*	--	--
CONGDP	-5.751142*	-6.078931*	--	--
LAGR	-2.782425	-1.864502	-3.665516*	-3.635092*

Notes: *, **, and *** refer to 1%, 5%, and 10% level of significance, respectively

Diagnostics Tests:

Table 4 shows that there are no autocorrelation and heteroscedasticity problems in the ARDL (1, 2, 2, 2, 1, 2), the error term has a normal distribution, and there is no distress in the functional form of the model.

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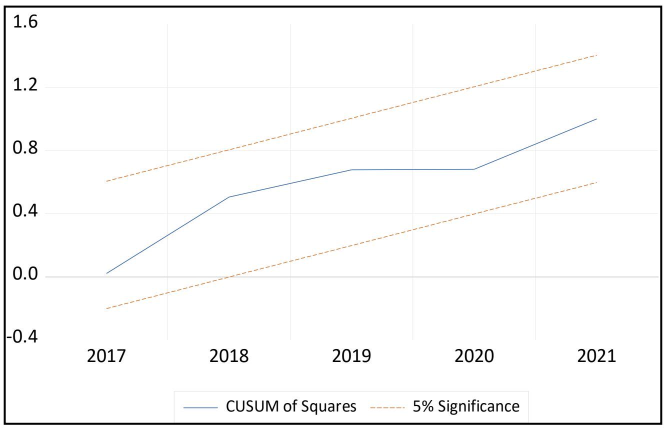
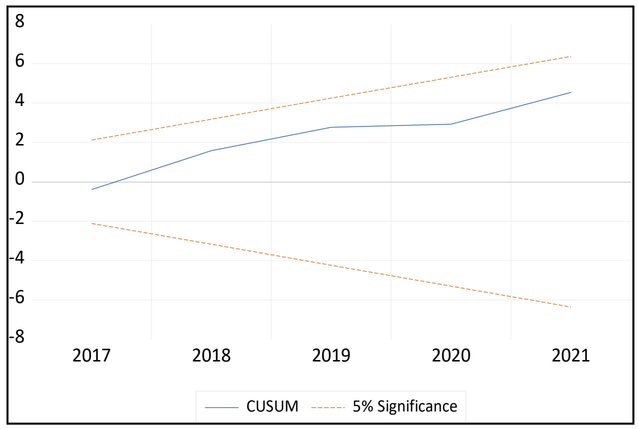
The analysis of whether the coefficients obtained by the ARDL (1, 2, 2, 2, 1, 2) are stable during the examined period has been investigated by using CUSUM and CUSUMQ analysis.

Table 3: Diagnostics Tests

Test	Calculated Statistics	Prob.
Heteroskedasticity Test: Breusch-Pagan-Godfrey	2.229746	0.228
Breusch-Pagan-Godfrey Test	1.725078	0.3172
Jargue-Bera Test of Normality	1.2356	0.539105





The long-term model (Table 3) shows that there are variables that have a positive sign with the export variable, such as industry, government consumption, excluding agriculture, and inflation, which had a positive sign, but without statistical significance. The analysis also showed that there is a negative relationship between oil revenues and exports but without statistical significance. These relationships come within the expected context as predicted by economic theory. It gave an important result that oil revenues, which is known as the Dutch disease phenomenon, have no direct effect on competitiveness, as revenues increase due to oil exports, which positively affects the current account of the petroleum countries, but without an increase in real production. On the other side.

A growth of 1% in industry results in an average long-term increase of 0.92% in exports, showcasing a strong correlation between the two. What is crucial is to work under the new economic policy, which involves free trade and implementing market mechanisms and economic standards in resource allocation, creating a significant impact. Determining Iraq's position within global competitiveness indicators affects the competitiveness of the Iraqi industry.

In our research, we discovered a significant correlation between government spending and exports. Specifically, for every 1% increase in government spending, exports are expected to increase by an average of 0.06% over the long term. Therefore, it is possible to argue that the increased government expenditure is linked to the structural changes being implemented in Iraq, as productivity improves due to the shift of workers from less efficient sectors like agriculture to more modern and efficient sectors. This boosts workers' earnings and has a positive impact on enhancing production levels.

Table 3 Long-run model

Dependent Variable: LEXO

Variable	Coefficient	Std. Error	t-Statistic	Prob.
L(IND)	0.922113	0.055994	16.46805	0.0000
OIL	-0.01623	0.011877	-1.366484	0.2300
INF	0.005469	0.006435	0.849889	0.4342
CONGDP	0.063016	0.024363	2.586571	0.0490

EISSN: 3005-3625, PISSN: 2790-2560, DOI: doi.org/10.58564/EASJ/3.3.2024.20

L(AGR)	0.130885	0.186206	0.702905	0.5135

F-Bounds Test	Null Hypothesis: No levels of relationship			
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.374704		Asymptotic: n=1000	
k	5			
		10%	1.81	2.93
		5%	2.14	3.34
		2.50%	2.44	3.71
		1%	2.82	4.21

5.3 Error Correction Model for Export:

The results from the cointegration tests permit us to conduct an error correction model (ECM). The results of which are presented in Table 4,

Table 4 ARDL Error Correction Regression

Dependent Variable: DLOG(EXO)
Selected Model: ARDL(1, 2, 2, 2, 1, 2)
Case 1: No Constant and No Trend
Sample: 2000 2021
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DL(IND)	0.43426	0.070429	6.165927	0.0016
DLIND(-1))	0.205127	0.066888	3.066729	0.0279
D(OIL)	-0.001137	0.003093	-0.36757	0.7282
D(OIL(-1))	0.012279	0.002052	5.985057	0.0019
D(INF)	0.001579	0.001188	1.329849	0.2410
D(INF(-1))	-0.002451	0.000624	-3.925394	0.0111
D(CONGDP)	0.022319	0.003156	7.072576	0.0009
DL(AGR)	-0.413808	0.0374	-11.06426	0.0001
DL(AGR(-1))	-0.110275	0.044679	-2.468161	0.0567
CointEq(-1)*	-0.555208	0.055384	-10.02479	0.0002

R-squared	0.974798	Mean dependent var	0.015166
Adjusted R-squared	0.952117	S.D. dependent var	0.131021
S.E. of regression	0.02867	Akaike info criterion	-3.959058
Sum squared resid	0.00822	Schwarz criterion	-3.461191
Log-likelihood	49.59058	Hannan-Quinn criteria.	-3.861869

EISSN: 3005-3625, PISSN: 2790-2560, DOI: doi.org/10.58564/EASJ/3.3.2024.20

Durbin-Watson stat	1.918466

* p-value incompatible with t-bounds distribution.

6. Summary and Conclusions

The ARDL analysis investigates the long-run relationship and error correction model for the dependent variable (LEXO). The long-run model (Table 3) provides insights into the coefficients, standard errors, t-statistics, and probabilities associated with the independent variables.

The long-run model suggests a positive and statistically significant relationship between industrial growth (LIND) and exports (LEXO). Where the coefficient for (LIND) is 0.922113, showing a significant correlation between the growth of industries and exports. Nevertheless, the variable OIL, representing the impact of oil prices, shows a coefficient of -0.01623, which is not statistically significant. Similarly, the variables (INF) and (LAGR) (agricultural growth) do not have statistically significant coefficients in explaining export growth. On the other hand, CONGDP (government consumption) demonstrates a statistically significant positive relationship with exports, with a coefficient of 0.063016.

The F-Bounds test is conducted to assess the presence of a long-run relationship. The calculated F-statistic of 8.374704 exceeds the critical values at various significance levels, suggesting the existence of a long-run relationship between the variables.

Moving to the error correction model (Table 4), the coefficient of error correction term CointEq(-1)* is shown to be statistically significant, indicating the presence of an error correction mechanism that adjusts for deviations from the long-run equilibrium by 55%.

In the error correction model, variables such as D(LIND), D(OIL), D(INF), and D(CONGDP) show statistically significant coefficients, indicating their influence on export growth. Additionally, the lagged variables D(LAGR -1) and CointEq(-1)* also display statistically significant coefficients. However, the variable D(OIL-1) does not have a statistically significant coefficient.

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The error correction model reveals that changes in industrial growth DL(IND), government consumption D(CONGDP), and lagged agricultural growth D(LAGR-1) significantly affect export growth D(LEXO).

These findings highlight the importance of industrial growth and government consumption in driving export growth hence the international competitiveness. The results suggest that policymakers should focus on fostering industrial development and maintaining stable government consumption to promote exports. Further analysis and robustness checks may be required to validate these conclusions and explore additional factors influencing long-term economic growth and exports.

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Conflicts of Interest

The author declares no conflict of interest.

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Appendix: Diagnostics Tests

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	2.229746	Prob. F(15,4)	0.228
Obs*R-squared	17.8636	Prob. Chi-Square(15)	0.2699
Scaled explained SS	0.437178	Prob. Chi-Square(15)	1

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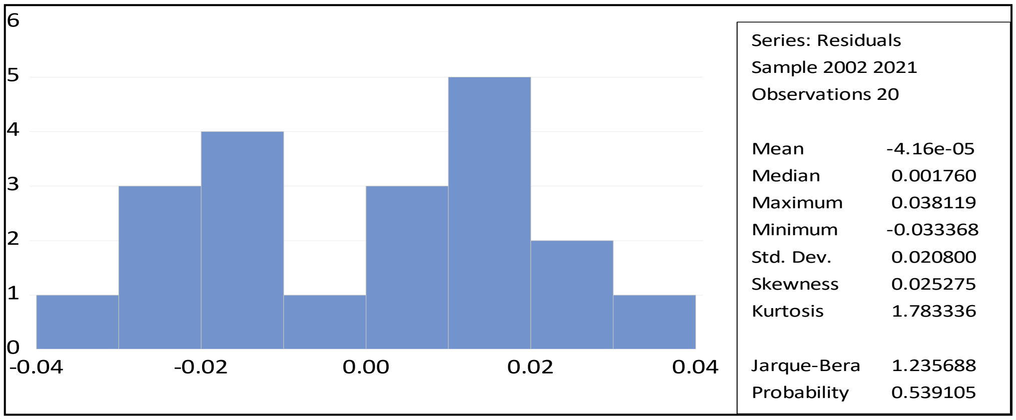
Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.725078	Prob. F(2,3)	0.3172
Obs*R-squared	10.6979	Prob. Chi-Square(2)	0.0048



Date: 06/04/23 Time: 12:50
Sample (adjusted): 2002 2021
Included observations: 20 after adjustments

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	0.313	0.313	2.2736	0.132
		2	0.026	-0.080	2.2901	0.318
		3	-0.028	-0.013	2.3110	0.510
		4	0.116	0.147	2.6822	0.612
		5	-0.194	-0.319	3.7815	0.581
		6	-0.202	-0.033	5.0600	0.536
		7	-0.204	-0.137	6.4713	0.486
		8	-0.218	-0.221	8.2177	0.412
		9	-0.058	0.182	8.3532	0.499
		10	-0.055	-0.191	8.4882	0.581
		11	-0.019	0.022	8.5067	0.667
		12	-0.010	0.020	8.5123	0.744

*Probabilities may not be valid for this equation specification.