The impact of non-oil exports on the structure of sectorial contribution to GDP: Iraq: An econometric study (2004-2023) using the ARDL model

Munaf marza neama
munaf.neama@qu.edu.iq
University of Al-Qadisiyah

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Abstract:

The issue of oil exports in renter economies has gained significant attention due to the fact that many countries, including renter ones, have come to recognize the significant imbalances and distortions in their economic structures caused by their reliance on crude oil exports as their main source of income. This has led to their characterization as a unilateral economy. The purpose of this study is to investigate how Iraq's crude oil exports have altered the country's sectoral contributions. Using the Ardl model, the study found that oil exports and agricultural contributions have a long-term joint integration connection, but that oil exports do not contribute to the growth of the agricultural sector in the long run. Contrary to economic theory, the agricultural sector's contribution to the economy is declining. What's more, there is no long-term equilibrium relationship between oil exports and the contributions of the industrial and service sectors, which confirms the absence of joint integration.

Introduction Since many rentier states have come to terms with the fact that their economies are severely skewed and imbalanced because of their reliance on a single revenue stream—oil in this case—the correlation between crude oil exports and the contribution of economic sectors has taken on more significance in recent years. In light of the potential consequences of this aspect—the resource curse—it is imperative that measures be put in place to diversify the state's production, commerce, and financial resources; after all, natural resources may be finite and subject to extreme price fluctuations, which can reduce exchange limitations. By studying these nations' structural features, we may learn how to diversify their revenue streams via development strategies that seek to create an economy where natural resources are less dominant, which in turn leads to stability and growth. The study's difficulty started here.

Research Problem: Iraq's heavy reliance on a single source of income, crude oil, makes its economy unstable، For example, many oil-producing countries face occasional shocks due to the correlation of oil prices with global markets, which impacts economic growth and stability.

Research Hypothesis: Research Hypothesis: The study is based on the hypothesis that reliance on crude oil exports alone negatively affects the contribution of other economic sectors to GDP.

H1: Non-oil exports have an impact on the share of the manufacturing sector.

H2: Non-oil exports have an impact on the share of the agricultural sector.

H3: There is a positive or negative impact on the share of services (trade-supporting services).

Research Objective: The study seeks to achieve several objectives, the most important of which is to understand the impact of crude oil exports on reshaping the contribution ratios of economic sectors to

GDP and the foundations of diversification using economic measurement methods.

Research Methodology: The descriptive approach was used to identify the study variables, while the statistical method was used to examine the impact of the relationship between the studied variables.

Research Structure: To achieve this goal, the study was divided into two sections. The first section addressed exports and economic sectors, including the theoretical and conceptual framework. The second section analyzed the impact of the relationship between crude oil exports and the contribution of economic sectors. The study concluded with conclusions and recommendations.

The first requirement: the theoretical and conceptual framework of the research

1-The concept of foreign trade : Foreign trade consists of two main pillars: exports and imports, which is known as the exchange of goods and services between countries. Numerous concepts have been mentioned in foreign trade, including:(**Harbi Muhammad Musa Araikat, 2006, p. 233.)**

A: The concept of foreign trade: A branch of economics that specializes in the study of economic transactions taking place across national borders. Trade transactions include the following:

A. The exchange of physical goods across countries, represented by the movement of raw materials, semi-manufactured goods, consumer goods, and investment goods.

B. The exchange of services across countries, which includes transportation, insurance, financing, the provision of technical expertise, the movement of individuals, and others.

C. The exchange of money, which includes the movement of capital across countries for long- and short-term investments, and direct and indirect investments.

2-Foreign Trade Theories: There is a difference between countries in the availability of natural and human resources, as well as the difference in the costs of producing goods between them. This is due to many factors. In light of this, many researchers have attempted to understand trade exchange and develop the best policies and methods to achieve gains and enhance the state's power through foreign trade, starting with the proponents of mercantilism and the natural school and its pioneers, such as David Hume, who advocated for free trade and prohibited restrictions on it (Ezzat, 2005, pp. 19-31). In the second half of the eighteenth century, more advanced writings appeared explaining how and why countries specialize in producing goods and exchanging them for other goods with other countries. This was particularly the writings of Adam Smith, whom some consider a pioneer in establishing the foundations of sound scientific foreign trade, and Ricardo. This period was called the Classical or Traditionalist period, as he stated that the division of labor and specialization have significant benefits in increasing production and trade exchange and achieving benefits from them (Emon, 2014, pp. 34-39).

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Adam Smith pointed out that consumption is the sole purpose and goal of all production, and that specialization helps increase labor productivity, increase trade between countries, increase consumption, raise living standards, and increase economic well-being. He argued that the main advantage of international trade is that it helps expand the scope of trade. If people were forced to consume only what they produce domestically, the world would become poorer. Furthermore, many theories have emerged to explain international trade scientifically, including the theory of automatic equilibrium by David Hume, the theory of absolute advantage or absolute costs by Adam Smith, the theory of comparative advantage or comparative costs by David Ricardo, the theory of international values by John Stuart Mill, the theory of relative abundance of factors of production by Heckscher and Ohlin, the theory of factor prices by Heckscher-Ohlin-Samuelson, the theory of similarity of tastes by Staffan Linder, the theory of product life cycle by Vernon, and the technological theory by H.G. Johnson (Ghania, 2018). - 2019)).

It is clear from the above theories that countries continue to expand the scope of trade in an attempt to achieve economic and social gains related to human well-being and strengthening relations between countries, which is reflected in other political, cultural, and scientific aspects. It is clear from this that the most important reason for the emergence of international trade is the difference in production costs between countries. This is clearly evident in the difference in labor wages from one country to another, and labor wages are part of the costs of production. This leads to differences in product prices from one country to another, which facilitates trade between countries according to specialization, which is the basis of international trade. Countries can efficiently export the goods and services they produce and import goods and services produced by other countries with greater efficiency. (Samuelson & Nordhaus, 2009, p. 341)

3-The Impact of Exports on the Sectorial Contribution to GDP : In both established and emerging economies, exports have a significant role in determining growth. Natural resources, like oil, are the main exports of developing nations, while capital products are the main exports of industrialized nations. Merchandise that does not rely on natural resources are the primary emphasis of export-led growth policies. Growth is mostly driven by increased exports since these exports encourage a more efficient institutional structure and industrial processes, which in turn provide positive externalities. In addition to lowering obstacles to entry for foreign markets and achieving economies of scale, exports also lower exchange rates. In addition, exports may boost economic development in the long term by introducing innovative technology and gaining valuable knowledge from other countries. A paradigm that promotes developing nations' long-term development via the production of non-natural resources is the export-led growth hypothesis. Reasoning behind this theory is that, In contrast to the export-led growth paradigm, natural resources deplete quickly. Long-term research shows that export revenues from non-renewable natural resources hurt economic growth. According to "Dutch disease," "natural resource export income raise the real exchange rate, weakening the non-tradable resource sector and increasing import demand." Equally important as developing renewable natural resource exports is finding methods to increase exports of non-renewable resources. The Kingdom of Saudi Arabia, an oil-rich emerging nation that has exported crude oil for almost 40 years, is a prime example of why this study's core findings are so important. We see that the Iraqi states have shifted the state's function from development to rentier return control and distribution as a result of oil income. Therefore, the state now controls the employment market, investments, and the labor force in every way imaginable. Because of this, government expenditure rates have risen dramatically, which has a detrimental impact on the economic structure and is most noticeable in

the agriculture sector. After the government began to place a higher value on oil revenues from total exports, its employment policy shifted to benefit the political class rather than the private sector. This has had a negative impact on the structure of local production outside the rentier sector, including in vital sectors like agriculture, which is crucial for any economy's development. When natural resources are discovered, rentier nations often experience what is known as the Dutch illness. This disease shows the negative impact on productive sectors, particularly industrial and agricultural sectors. The Dutch sickness is seen by Jan Priewe, an economics professor at the University of (HTW Berlin) as: The resource curse occurs when new natural resources are discovered or when the prices of existing resources skyrocket, leading to a real increase in the currency and impeding the growth of various commercial sectors such as manufacturing, agriculture, and others. This is because, in the short term, there are negative effects from the Dutch disease, and in the long run, there are negative consequences from a lack of technological progress, which negatively affects agricultural production and the manufacturing industry.

4-The importance of exports in economic thought : Any economy, established or developing, may use exports as a growth indicator. The majority of poor nations' exports are oil and other natural resources, while the majority of wealthy nations' exports are capital products. The export-led growth theory argues that policies should prioritize products that do not rely on natural resources. Growth is primarily driven by an increase in exports, since this sector generates positive externalities via the adoption of more efficient production processes and institutional frameworks. Furthermore, exports facilitate economies of scale, lower obstacles to foreign exchange, and open doors to international markets. Furthermore, exports have the potential to boost economic development in the long term by bringing in highly innovative technologies and dynamic knowledge from other countries. In the long term, developing

nations may benefit from development that is not based on natural resource extraction, according to the export-led growth hypothesis. This idea is based on the following reasons:

4.1. To start with, whereas the exhaustion of natural resources is a short-term phenomena, the export-led growth theory is more of a long-term phenomenon.

4.2-. The research shows that export gains from nonrenewable resources hurt GDP growth over time. The Dutch disease concept states that increasing revenues from natural resource exports raise the real exchange rate, which reduces the competitiveness of the non-resource tradable sector and increases import demand. Therefore, non-renewable resource exports must be developed alongside renewable natural resource exports. For a growing nation that is wealthy in oil and exports, this research is crucial. (**Mohammed A Aljebrin, 2017,p398)**

5-An Overview of the Economic Structure: Francois Perrault defined the economic structure as the set of ratios and relationships between the elements of economic life that characterize an economic entity in a particular place and at a particular time. "Ratios may indicate the relative importance of the elements that make up the economic structure. These ratios include the ratios of wages and profits to income, as well as the ratios of the agricultural and industrial sectors' output to the gross domestic product. Economists have studied and scrutinized the concept of economic structure. Some have focused on understanding the surrounding environment, while others have examined variables in a comparatively static state. The final group has addressed the factors influencing the economic structure and the variables that determine it (Majid, 2011, p. 6). Structural imbalances are defined as: the lack of balance in the proportional relationships between the elements and components of the economic system. This demonstrates the extent of the impact of these imbalances and the

length of time over which they occur, thereby limiting their impact on the process of economic growth and development (Younis, 2017, p. 16). They have been described by others as a widespread economic imbalance that threatens to destabilize economic development and cause a cascade of crises and difficulties to arise within the framework of the national economy.

Economic growth stability is at risk, which might cause a cascade of crises and challenges for the country's economic infrastructure (Al-Muhanna, 2014, p. 10).

There are several reasons that lead to structural imbalances in the economy.

- Economic reasons: Economic reasons are among the most important reasons that explain structural imbalances. Through them, we can derive the general frameworks that cause economic problems in developing countries. These reasons can be explained as follows:

- High population growth rates compared to low economic growth rates: Population growth rates range between 2.5% and 3% in developing countries, compared to 0.7% in developed countries.

B. Low production levels and low productivity in other economic sectors, such as agriculture, industry, and services. This leads to the inability of the domestic product (GDP) to meet aggregate demand. This leads to a supply shortage, as the production system is inflexible in developing countries' economies. This in turn leads to an inability to meet societal needs, resulting in greater inflation. This, in turn, leads to a need to meet local demand through imports, creating an internal imbalance that gradually leads to other external imbalances. C. Lack of coordination between the public and private sectors, which is the foundation for establishing economic projects that play a role in a country's economic progress.

The second requirement: The second requirement: the standard aspect of the research

First Sectorial :First requirement: Describing and formulating standard models

This is one of the most important stages in building an economic model, as it works to identify the variables included in the model based on economic theory. Through this, the relationship between the independent and dependent variables is determined. In this research, the variables were described as follows:

1. The independent variable (oil exports), symbolized by (Exo).

2. The dependent variable (contribution of the agricultural sector), symbolized by (Ag).

3. The dependent variable (contribution of the industrial sector), symbolized by (Ds).

4. The dependent variable (contribution of the services sector), symbolized by (Sr).

Thus, the economic variables will be utilized to determine how oil exports affect diversification indicators (agriculture, industrial, and services sectors). Based on economic theory, the usual model formula is:

$Yi=\beta 0 +\beta 1X1+ \mu i$ ……..(1)

$Ag=\beta 0+ \beta 1\ Exo + \mu i$ …….(2)

$Ds=\beta 0+ \beta 1\ Exo + \mu i$ …….(3)

$Sr=\beta 0+ \beta 1\ Exo + \mu i$ …….(4)

Second requirement: Estimating the models and analyzing their results according to the ARDL methodology.

First: Results of the stationary test (unit root) for the research variables.

Table (1) shows the stationary test for the time series of the dependent variables (Ag), (Ds), and (Sr), and the independent variable (Exo).

Table (1) Results of the augmented Dickey-Fuller (ADF) test for the research variables

Variables	Lag	At Level			At First Difference		
		a	B	C	A	b	C
Exo	١	-٥,٢٠٤٩	-٥,٢٠٤٩	-٢,٢٧٩٢	-٦,٧٤٨١	-٧,٢٤٠٢	-٦,٧٥٣٩
Prob		٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٢٣٠	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠
Ag	١	-٢,٦٣٥٣	-٦,٠٣٩٤	-٢,٢٤٦٣	-٨,٩٩٣٥	-٨,٩٠٦٤	-٧,٦٧١٩
Prob		٠,٠٩١٤	٠,٠٠٠٠	٠,٠٢٤٩	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠
Ds	١	-٣,١١٤٩	-٢,٦٨٦٦	-١,١٧٩٣	-٨,٥٩٨١	-٩,٣٩٩٦	-٨,٥٦٤٠
Prob		٠,٠٣٠٥	٠,٢٤٥٦	٠,٢١٥٤	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠
Sr	١	-٦,٨٦٠١	-٦,٨٤٢٤	-٦,٨٤٢٤	-٩,١٢٢٩	-٩,١٤٨٦	-٩,١٣٤٨
Prob		٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠	٠,٠٠٠٠

Source: - Researched by researchers based on Eviews10 outputs. a: It means the presence of a fixed term. b: The presence of a fixed term and a general trend. c: There is no fixed term and no general trend.

Second: Model estimation using the Autoregressive Distributed Lag (ARDL) model.

1- Agricultural sector contribution model.

The model consists of an independent variable and a dependent variable, as follows:

$$Ag = \beta 0 + \beta 1\ Exo + \mu i$$

Table (2) displays the estimatory findings of the Autoregressive Distributed Lag (ARDL) model for the agriculture sector contribution function. These results demonstrate that the model is compatible with conventional and statistical tests, indicating its quality. R2 was close to 0.99, which indicates that the independent variable explains almost all of the variance in the dependent variable (by 99%). Since the overall significance of the model was 0.000000, the model is completely acceptable, and the Fisher statistic reached 13867.22, which is very significant. (D.W.) attained a value of 1.763042. Along with the lag periods being (4,1) for both variables, this proves that the model is not affected by autocorrelation.

Table (2) Estimation results of the (ARDL) model for the agricultural sector contribution model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
AG(-1)	3.272675	0.087089	37.57838	0.0000
AG(-2)	-4.404769	0.230547	-19.10569	0.0000
AG(-3)	2.877794	0.230919	12.46234	0.0000
AG(-4)	-0.752263	0.087167	-8.630095	0.0000
EXO	-1.42E-06	9.41E-07	-1.505732	0.1383
EXO(-1)	1.85E-06	9.75E-07	1.897756	0.0634
C	-0.006842	0.033431	-0.204669	0.8386

R-squared	0.999387	Mean dependent var	4.462787
Adjusted R-squared	0.999315	S.D. dependent var	1.234539
S.E. of regression	0.032303	Akaike info criterion	-3.914569
Sum squared resid	0.032303	Schwarz criterion	-3.665895
Log likelihood	120.5225	Hannan-Quinn criter.	-3.817706
F-statistic	13867.22	Durbin-Watson stat	1.763042
Prob(F-statistic)	0.000000		

Table (3) demonstrates the limits test for the presence of a cointegration connection between the independent variable (oil exports EXO) and the dependent variable (contribution of the agriculture sector Ag). The computed value of F, which came to 5.260090, was higher than the upper limit (4.95), lower limit (4.145) at the 10% significance level, and lower limit (5.125) at the 5% significance level, in the first difference. Since a long-term equilibrium link between the two variables is confirmed by the alternative

hypothesis that indicates the presence of cointegration, we reject the null hypothesis and accept it.

Table (3) Bounds test for cointegration of the model of contribution of the agricultural sector.

ARDL Bounds Test Sample: 2004Q1 2020Q4 Included observations: 58 Null Hypothesis: No levels relationship		
Test Statistic	Value	K
F-statistic	٥,٢٦٠٠٩٠	١
Critical Value Bound		
Signif.	I(0)	I(1)
٪١٠	٤,١٤٥	٤,٩٥
٪٥	٥,١٢٥	٦
٪١	٧,٤	٨,٥١

The results of the heterogeneity test (Heteroskedasticity Test: ARCH) were not statistically significant, as shown in Table 4, as the probability value (Prob. Chi-Square(1)) reached (0.8756), which is more than (0.05). Therefore, we will accept the null hypothesis that the model is not heterogeneity unstable and that the residuals are homogenous. The model (the agricultural sector's contribution) does not have any autocorrelation issues, according to the results of the serial autocorrelation test (LM Test). Specifically, the value of (Prob. Chi-Square(1) reached about 0.5203) is higher than the significance level of 0.05, so this problem does not exist in the model. Table (4) displays the given data. Accordingly, we accept the null hypothesis as true and reject the alternative that states the issue.

Table (4) Results of the heterogeneity of variance test and the serial autocorrelation test for the agricultural sector contribution model

Heteroskedasticity Test: ARCH			
F-statistic	٠,٠٢٣٦٤٧	Prob. F(1,55)	٠,٨٧٨٣
Obs*R-squared	٠,٠٢٤٤٩٦	Prob.Chi-Square(1)	٠,٨٧٥٦
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	٠,٣٥٨٨٧٥	Prob. F(1,50)	٠,٥٥١٨
Obs*R-squared	٠,٤١٣٣٢٨	Prob.Chi-Square(1)	٠,٥٢٠٣

Table (5) shows the results of the error correction model (short and long term) according to the (ARDL) methodology for the agricultural sector contribution model. It is clear that the value of the error correction coefficient (EC t-1) reached (-0.006563) with a probability of (0.0019), and through the availability of the negative and significant condition, this means that the model is heading towards equilibrium in the long term, i.e. (0.6563%) of the errors in the short term can be corrected in one semester, and thus (2.63%) of the short term errors can be corrected in one year, and this percentage is considered very low. Table (5) shows that the independent variable, oil exports (Exo), has no significant effect on the dependent variable, the contribution of the agricultural sector (Ag), in the long run. This is evident from the (Prob) value, which reached (0.38), which is very high, confirming the insignificance of the relationship between oil exports and the contribution of the agricultural sector in Iraq. This indicates that oil exports do not contribute to the development of the agricultural sector. On the contrary, there is a decline in the contribution of the agricultural sector to the economy, which contradicts economic theory.

Table (5) Results of the error correction model (short and long term) according to the (ARDL) methodology for the sector contribution model Agriculture

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXO)	-1.42E-06	9.28E-07	-1.527007	0.1329
CointEq(-1)*	-0.006563	0.002004	-3.275127	0.0019
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXO	6.61E-05	7.49E-05	0.882463	0.3817
EC = AG - (0.0001*EXO)				

2-Industrial Sector Contribution Model

$Ds = \beta 0 + \beta 1\ Exo + \mu i$

Table (6) shows that the results of the estimate of the Autoregressive Distributed Lag (ARDL) model for the industrial sector contribution function corroborate the model's quality, as it is compatible with conventional and statistical tests. A value of R2 close to 0.99 indicates that the independent variable explains almost all of the variance in the dependent variable, which is about 99%. The overall significance of the model was 0.000000, which means that the model is completely acceptable, while the Fisher statistic obtained a high significance level of 4936.484. The model is free of the autocorrelation issue, since the value of (D.W) reached (1.981757). Furthermore, for every one of the variables, the lag times were (4.4).

Table (6) Estimation Results of the (ARDL) Model for the Industrial Sector Contribution Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DS(-1)	3.419586	0.096852	35.30737	0.0000
DS(-2)	-4.648013	0.263086	-17.66726	0.0000
DS(-3)	3.032258	0.264606	11.45953	0.0000
DS(-4)	-0.798087	0.102181	-7.810535	0.0000
EXO	-2.57E-05	6.79E-06	-3.784423	0.0004
EXO(-1)	8.40E-05	2.32E-05	3.612959	0.0007
EXO(-2)	-0.000104	3.34E-05	-3.119806	0.0030
EXO(-3)	5.74E-05	2.36E-05	2.435863	0.0184
EXO(-4)	-1.17E-05	2.36E-05	-1.730177	0.0896
C	0.007431	0.014623	0.508194	0.6135

R-squared	0.998853	Mean dependent var	2.090235
Adjusted R-squared	0.998651	S.D. dependent var	0.471337
S.E. of regression	0.017311	Akaike info criterion	-5.126101
Sum squared resid	0.015284	Schwarz criterion	-4.780056
Log likelihood	166.3461	Hannan-Quinn criter.	-4.990483
F-statistic	4936.484	Durbin-Watson stat	1.981757
Prob(F-statistic)	0.000000		

Source: Prepared by the researchers based on the outputs of the Eviews10 program.

Table 7 illustrates the results of the boundary test, which indicate that the two variables, oil exports (EXO) and industrial sector contribution (Ds), do not have a cointegration relationship. (F) was smaller than both the lower and higher bounds, as shown by its computed value of (1.627072). We reject the alternative hypothesis and accept the null hypothesis, which indicates that the two variables do not have a long-term equilibrium connection and verifies that there is no cointegration.

Table (7) Bounds test for the joint integration of the industrial sector contribution model

ARDL Bounds Test Sample: 2004Q1 2020Q4 Included observations: 61 Null Hypothesis: No levels relationship		
Test Statistic	Value	K
F-statistic	١,٦٢٧٠٧٢	١
Critical Value Bound		
Signif.	I(0)	I(1)
٪١٠	٤,١٧٥	٤,٩٣
٪٥	٥,١٣	٥,٩٨
٪١	٧,٣٢	٨,٤٣٥

The results of the heteroskedasticity test (ARCH) are shown in Table (8). Because it is higher than the significance level of 0.05, the probability value (Prob. Chi-Square(1)) reached 0.1088, indicating that it is not significant. We conclude that the model does not suffer from heteroskedasticity instability and accept the null hypothesis that the residuals are homogeneous.

Table 8 shows that the model (industrial sector contribution) does not have autocorrelation issues, according to the results of the serial autocorrelation test (LM Test). This is because the value (Prob. Chi-Square(1)) reached approximately (0.9591), which is higher than the significance level (0.05). This eliminates the issue of residual serial autocorrelation from the model. So, we take the null hypothesis at its value and dismiss the problem-stating alternative. Table (10) shows the results of the tests for serial autocorrelation and heteroskedasticity conducted on the industrial sector contribution model.

Table (8) Results of the heterogeneity of variance test and the serial autocorrelation test for the industrial sector contribution model

Heteroskedasticity Test: ARCH			
F-statistic	٢,٥٩٧٧٨٥	Prob. F(1,58)	٠,١١٢٤
Obs*R-squared	٢,٥٧٢١٥٨	Prob.Chi-Square(1)	٠,١٠٨٨
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	٠,٠٣٣٦٠٥	Prob. F(2,49)	٠,٩٦٧٠
Obs*R-squared	٠,٠٨٣٥٥٤	Prob.Chi-Square(2)	٠,٩٥٩١

Table (9) shows the results of the error correction model (short term) according to the (ARDL) methodology for the model of the contribution of the industrial sector. It is clear that the value of the error correction coefficient (EC t-1) reached (0.005744) with a probability of (0.0744), and through the lack of the negative condition, this means that the model is heading towards imbalance in the long term, meaning that the imbalance increases after each period, which confirms the absence of a clear relationship in the long term between oil exports and the contribution of the industrial sector.

Table (9) Results of the error correction model (short term) according to the (ARDL) methodology for the industrial sector contribution model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXO)	-2.57E-05	6.09E-06	-4.223156	0.0001
CointEq(-1)*	0.005744	0.003153	1.821524	٠,٠٧٤٤

- Service Sector Contribution Model

$Sr = \beta 0 + \beta 1\ Exo + \mu i$

In Table (12), we can see that the results of the estimate of the Autoregressive Distributed Lag (ARDL) model for the service sector contribution function are in agreement with conventional and statistical tests, indicating that the model is credible. A value of R2 close to 0.99 indicates that the independent variable explains almost all of the variance in the dependent variable, which is about 99%. With a total model significance of 0.000000 and a Fisher statistic of 5728.686, we can say that this model is completely acceptable. This model does not have an autocorrelation issue since the value of (D.W.) reached 1.821942. Furthermore, for every one of the variables, the lag times were (4.4).

Table (10) Estimation Results of the ARDL Model for the Service Sector Contribution Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
SR(-1)	3.262349	0.093994	34.70806	0.0000
SR(-2)	-4.327787	0.248173	-17.43861	0.0000
SR(-3)	2.744755	0.244368	11.23206	0.0000
SR(-4)	-0.701138	0.090040	-7.786985	0.0000
EXO	-0.000382	9.19E-05	-4.159371	0.0001
EXO(-1)	0.001326	0.000324	4.092080	0.0002
EXO(-2)	-0.001790	0.000473	-3.782917	0.0004
EXO(-3)	0.001131	0.000338	3.349540	0.0015
EXO(-4)	-0.000286	9.86E-05	-2.901402	0.0055
C	0.480140	0.203367	2.360949	0.0221

R-squared	0.999012	Mean dependent var	20.54285
Adjusted R-squared	0.998837	S.D. dependent var	8.147513
S.E. of regression	0.277803	Akaike info criterion	0.425013
Sum squared resid	3.935905	Schwarz criterion	0.771058
Log likelihood	-2.962897	Hannan-Quinn criter.	0.560631
F-statistic	5728.686	Durbin-Watson stat	1.821942
Prob(F-statistic)	0.000000		

Table (11) shows the boundary test (Bound Test) that there is no cointegration relationship between the dependent variable (services sector contribution SR) and the independent variable (oil exports EXO), as it shows us the calculated value of (F) which amounted to (4.025484) was less than the

lower and upper limits, and thus we accept the null hypothesis which states that there is no cointegration, which confirms the absence of a long-term equilibrium relationship between the two variables, and we reject the alternative hypothesis.

Table (11) Boundary test for cointegration of the services sector contribution model

ARDL Bounds Test Sample: 2004Q1 2020Q4 Included observations: 61 Null Hypothesis: No levels relationship		
Test Statistic	Value	K
F-statistic	٤,٠٢٥٤٨٤	١
Critical Value Bound		
Signif.	I(0)	I(1)
٪١٠	٤,١٧٥	٤,٩٣
٪٥	٥,١٣	٥,٩٨
٪١	٧,٣٢	٨,٤٣٥

The results of the heteroskedasticity test (ARCH) are shown in Table (12). Because it is higher than the significance level of 0.05, the probability value (Prob. Chi-Square(2)) reached 0.0659. Since the model does not suffer from heteroskedasticity instability, we may conclude that the residuals are homogenous, and so we can accept the null hypothesis. The model (the services sector's contribution) does not have an autocorrelation issue, according to Table (12), which is a serial autocorrelation test (LM Test). That is, the probability of a chi-squared test reaching a result close to 0.6977 is higher than the 0.05 threshold of significance. This eliminates the issue of residual serial autocorrelation from the model. So, we take the null hypothesis at face value and dismiss the problem-stating alternative hypothesis.

Table (12) Results of the heteroskedasticity test and serial autocorrelation test for the service sector contribution model.

Heteroskedasticity Test: ARCH			
F-statistic	٢,٨٤٢٩٩٥	Prob. F(2,56)	٠,٠٦٦٧
Obs*R-squared	٥,٤٣٨٤٠٦	Prob.Chi-Square(2)	٠,٠٦٥٩
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	٠,٢٩٢٦٢٥	Prob. F(2,49)	٠,٧٤٧٦
Obs*R-squared	٠,٧١٩٩٧٨	Prob.Chi-Square(2)	٠,٦٩٧٧

Table (13) shows the results of the error correction model (short-term) according to the ARDL methodology for the service sector contribution model. It is clear that the value of the error correction coefficient (EC t-1) reached (-0.021821) with a probability of (0.0060). The availability of the negative and significant conditions means that the model is heading towards equilibrium in the long term. That is, (2.1821%) of the errors in the short term can be corrected in one quarter, and thus (8.73%) of the short-term errors can be corrected in one year. This percentage is very low.

Table (13) Results of the error correction model (short-term) according to the ARDL methodology for the service sector contribution model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXO)	-0.000382	8.55E-05	-4.472726	0.0000
CointEq(-1)*	-0.021821	0.007616	-2.865106	0.0060

Conclusions:

1. The results of the econometric analysis showed a long-term cointegration relationship between oil exports and the contribution of the agricultural sector. However, the error correction ratio from the short to the long run was 2.63%, which is very low. Furthermore, oil exports do not contribute to the development of the agricultural sector in the long run. On the contrary, there is a decline in the contribution of the agricultural sector to the economy, which contradicts economic theory.

2. There is no cointegration relationship between oil exports and the contributions of both the industrial and service sectors in the long run. This confirms the absence of a long-term equilibrium relationship.

3. The results for the contribution of the industrial sector show that the model tends toward imbalance in the long run, and that the imbalance increases with each period. This confirms the lack of clarity regarding the long-term relationship between oil exports and the contribution of the industrial sector.

4. The error correction ratio from the short to the long run for the contribution of the services sector was 8.73%, which is considered very low.

Recommendations:

1. The Iraqi economy possesses many potentials and assets if it seeks to advance and implement a policy of economic diversification and structural imbalance. This is due to the availability of cheap local raw materials, which can create backbones that will create local industries, thereby expanding diverse industries across the country and stimulating the Iraqi economy. 2. The need for government agencies to commit to increasing financial resources directed to other non-oil economic sectors in order to improve the deteriorating situation of these sectors, especially after 2003, and to encourage local and foreign private sector investment. This will be reflected in the development of these sectors,

enabling them to play their role in diversifying the economic base and developing sources of income for the Iraqi economy.

3. It is imperative that less developed areas with tourist resources employ tourism to improve their level of life and achieve balanced regional development. Adopting the planning concept is critical for achieving integrated growth across all sectors, making the most direct and indirect economic advantages feasible, and modernizing and developing economic sectors.

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