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The Impact of Trade Liberalization on Economic Growth in Iraq: An Empirical Analysis

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Abstract

Trade liberalization is known to be a driving force for countries' growth. Many countries around the world have started opening their borders to trade in the hope of promoting economic growth. Recently, several developing countries have taken a huge step forward towards trade liberalization. The current research attempts to analyze the impact of trade liberalization on economic growth in Iraq. In doing so, this study incorporates gross fixed capital formation (GFCF), human capital (HC), population growth (PG) and oil price (OP) as variables to form a multivariate framework. The study applied the autoregressive distributed lag approach (ARDL) with time series data from 1990 to 2020.

The empirical findings indicate that trade liberalization has a positive and significant impact on economic growth in Iraq in the short run and long run. Therefore, this study recommends that the country should consider diversification of its export sector. Also, there is a need for Iraq to develop strong initiatives for adding value to exports so as to compensate for the level of imports.

Keywords: *Trade Liberalization; GDP growth; gross fixed capital formation (GFCF); human capital (HC), population growth (PG) and oil price (OP); ARDL Model.*

Introduction

Trade liberalization is known to be a driving force in countries' growth. Many countries around the world have started opening their borders to trade in the hope of promoting growth in their economies. Initially, the modern era of trade liberalization began in 1947, with the end of World War II. This was also the origin of the General Agreement on Trade and Tariffs (GATT). The formation of this United Nations agency was negotiated with 23 countries; 12 were industrial countries and the remainder (11) were developing countries. This was considered to be a huge step forward towards trade liberalization. The main purpose of those negotiations was the reduction of barriers to international trade to a minimum. In the year 1994, the World Trade Organization (WTO) succeeded the GATT (Obadan, 2015; Ejeh, 2019, P:11).

From a policy perspective, the ongoing multilateral efforts to liberalize international trade, initially under GATT and later under the World Trade Organization's leadership, have supported strong market access and growth rates of international current account dealings in excess of global economic growth. Moreover, supra-national financial institutions such as the World Bank and IMF have been instrumental in this shift in policy from import substitution towards export promotion, which has led to positive economic performance. These organizations were crucial in promoting free trade in developing

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countries. As a condition for receiving a loan, they proposed implementing structural adjustment programs that would liberalize trade and other domestic policies (Urata, 1994, P:363-364).

Subsequently, many developing nations made an effort to reform their trade policies with the primary goal of enhancing their citizens' standards of living and promoting a well-functioning market that would attract foreign direct investment. This, in turn, would lead to factor allocations and capital accumulation that would support economic growth. In the 1980s, emerging countries and those in East Asia saw positive outcomes from adopting and putting into practice trade liberalization policies as a factor that contributed to their economic growth (Cohen, 1997; Mbingui, 2021, P:725).

A large number of economic studies have focused on the stimulation of economic growth, including Grossman and Helpman (1990), Romer (1990) and Young (1991). An important question in the study of economic growth and international trade is whether increasing the degree of liberalization will always lead to a country seeing improved economic growth.

An increasing number of economic studies suggest that in the long term, free trade can boost economic growth by promoting resource allocation efficiency, enhancing overall productivity, and facilitating the diffusion of technology and knowledge. (Rivera-Batiz & Romer, 1991; Barro & Sala-i-Martin, 1997; and Keho, 2017, P: 1-2).

The concept of trade liberalization driving economic growth is a fundamental belief of the liberal school. The support for free trade stems from the failure of import-substitution strategies used by many developing countries following World War II. In the 1970s, only a small number of developing countries were able to implement trade liberalization policies. The success of East Asia in using outward-oriented policies to promote economic development convinced policymakers in other regions of the world to adopt similar strategies. Consequently, starting in the mid-1980s, other countries in Asia, Latin America, and other parts of the world began to do the same.

In the 1990s, the IMF and World Bank declared trade liberalization to be fundamental to raising economic growth (Shanthi, 2020, P:1-2).

Trade liberalization has several positive effects, including job creation, improved productivity, economic growth, an expanded export sector, and reduced competition for imports between sectors. Additionally, a competitive environment can be created through trade liberalization between regions, as well as bilateral or multilateral trade agreements. These can also facilitate knowledge dissemination, the transfer of technology, improvements in export competitiveness, increased access to international markets, an expansion of the domestic market, wider managerial and technical skills, the transformation of technology, industrialization and the creation of marketing networks. (Duru et al, 2020, P:195).

Trade liberalization can have advantages for developing countries by reducing formal barriers and making it easier for them to enter foreign markets. Increased trade can result from both technological advancements and deliberate efforts to reduce trade barriers. As a result, some developing countries have opened up their economies to fully exploit opportunities for economic growth, while others still struggle to adopt effective trade liberalization strategies. Additionally, producers from developing countries may encounter challenges in entering foreign markets, such as not knowing which markets to target, how to connect with distributors, which product specifications are most likely to be successful in a given market, and how to effectively communicate product offerings (Narula, 2001, P:201).

Trade liberalization involves the elimination or reduction of barriers to the movement of goods and services across national borders, including both tariff and non-tariff barriers.

Tariff barriers are taxes or surcharges on imported goods, while non-tariff barriers can take the form of licensing rules, quotas, or other requirements. (Acharya, 2015, P:393).

On the other hand, some have argued that trade liberalization does not necessarily mean that import tariffs must be zero or extremely low. In fact, it is suggested that it is possible to have an economy that is considered "liberalized" even with high tariffs on imports (Edwards, 1993, p:13).

Several studies have investigated the impact of trade liberalization on economic growth in developing countries, but few have focused specifically on Iraq. As a developing country, Iraq has recognized the significance of trade liberalization in the context of global economic changes, and has begun implementing trade liberalization policies since 2003 with the aim of improving its foreign trade policies (Hasaan, 2008, p:1). In this respect, Iraq has some pressure towards diversifying its economic base and seeking to grow through increasing international trade (Hussein, 2015, p:88)

In conclude, the main objective of this study is to examine the effect of trade liberalization on economic growth in Iraq, during the period 1992-2020, providing appropriate econometric models with regard to the special structure in the case of Iraq. To do so, the following hypothesis is tested: that trade liberalization has a positive effect on economic growth in Iraq: In section 2, we review the existing literature, while describing the methodology and data analysis in section 3. Section 4 reports the results, while section 5 concludes the paper.

Literature Review:

Trade Liberalization and Economic Growth: What Does the Evidence Tell Us?

Trade liberalization has a vital role in promoting economic growth, as observed by a large number of studies investigating the effects of trade liberalization on economic growth (Mohsen & Chua, 2020, p:169).

The main question is whether or not trade liberalization has a positive impact on economic growth. However, there is no consensus among the empirical and theoretical studies on whether trade liberalization promotes economic growth.

Most researchers argue that a country which is highly liberalized in respect to trade can benefit from industrialized economies' technological prowess, and so enhance their own productive capacity so as to grow faster than countries with lower levels of trade liberalization (Alnour et al, 2021, p:124).

Breghish & Ali (2021, p:1) conducted an analysis of the impact of trade openness on economic growth in Iraq, covering the period from 2003 to 2018. The study revealed the existence of a relationship, both in the short-term and long-term, between economic growth and trade liberalization in the country. However, the researchers found that the trade liberalization policies implemented in Iraq since 2003, with or without regulatory restrictions, did not achieve their intended economic goals.

Moreover, Keho (2017,p: 11) examined the impact of trade openness on economic growth in Cote d'Ivoire from 1965 to 2014 using the ARDL bounds test and the Toda and Yamamoto Granger causality tests. The findings indicate that trade openness has a positive influence on economic growth in both the short and long term. The study also confirms a positive connection between trade openness and the formation of fixed capital in improving economic growth.

In addition, Mbingui and Etoka-Beka (2021, p:724) conducted an analysis of the impact of trade openness on economic growth in the Republic of Congo, using the Vector Error Correction Model (VECM) estimation method for the period 1986 to 2016. The study found that trade openness had a negative effect on economic growth in Congo, both in the

short and long run. Therefore, it appears that Congo does not benefit from the trade openness policy.

Hye & Lau (2015, p:188) investigated the effect of trade openness on economic growth in India between 1971 and 2009. The findings indicate that in the short term, a trade liberalization index is positively associated with economic growth. Additionally, the Granger causality test results support the hypothesis that trade liberalization leads to economic growth in both the short and long term.

Likewise, Karras (2003,p :7) investigated this question using two panel data sets: one comprising 56 countries covering the period from 1951-1998, and another 105 countries from 1960-1997. The findings indicate that trade liberalization has a positive and significant impact on economic growth.

Furthermore, Gries & Redlin (2012, p:1) investigated the relationship between trade liberalization and economic growth for 158 countries from 1970 to 2009. They employed panel cointegration tests and panel error-correction models (ECM) in combination with GMM estimation to examine the causal relationship between trade liberalization and economic growth. Their findings showed that there is a long-term association between trade liberalization and economic growth, with short-term adjustments to deviations from equilibrium for both directions of dependence.

Another empirical study into the issues was that of Mohsen & Chua (2020,p: 169), which investigated the impact of trade liberalization on China's economy from 1980 to 2018. They used various methods such as Johansen cointegration and Granger causality tests, impulse response functions, and variance decomposition analysis. Based on their findings, it would appear that there is a positive relationship between economic growth and trade liberalization. The causality test also confirmed the presence of both short-term and long-term causality relationships between trade liberalization and economic growth in both directions.

Meanwhile, employing the Autoregressive Distributed Lag Bounds technique for cointegration using data from 1981 to 2018, Duru et al (2020, p:194), investigated the association between trade liberalization and economic growth in Nigeria. Their findings showed that trade liberalization did not promote Nigerian economic growth.

Likewise, Ali & Abdullah (2015, p:120) investigated whether there was a correlation between trade liberalization and economic growth in Pakistan from 1980 to 2010. They employed the VECM and Johanson multivariate approach to analyze the data. Their findings indicated a positive relationship between trade liberalization and GDP growth in the short run, while in the long run, there was a negative impact of trade liberalization on economic growth in Pakistan.

Additionally, Duru & Ehidiamhen (2018, p:1) investigated the effect of export diversification on economic growth in Nigeria from 1980 to 2016. The ARDL bound testing approach to cointegration was employed in the research. The findings revealed that trade liberalization had an insignificant and negative impact on economic growth.

Moyo, Kolisi and Khobai (2017, p:77) examined the relationship between trade openness and economic growth in Nigeria and Ghana between 1980 and 2016. The autoregressive distributed lag (ARDL) model was employed, and the results indicate a long-term relationship between the variables used in both countries. While trade openness had a positive and significant impact on economic growth in Ghana at the 1% level of significance, in Nigeria, it had a negative effect, but the impact was not statistically significant.

In addition, Gries and Redlin (2012, p:1) analyzed the relationship between trade openness and economic growth in 158 countries between 1970 and 2009. The study revealed a long-term association between trade openness and economic growth.

Additionally, there was a confirmed bi-directional causality between trade openness and economic growth. However, the short-term coefficient indicated a negative adjustment.

Theoretical Framework:

Numerous studies have investigated the relationship between trade liberalization and economic growth, drawing on three main perspectives: the classical theory, the Heckscher-Ohlin theory, and the endogenous growth theory. This study is grounded in the endogenous growth theory, which underscores the contribution of trade liberalization and economic growth. It is based on the premise that the new growth theory proposed by Romer (1986); Lucas (1988); Romer (1990); Grosman and Helpman (1991) and Barro et al (1995) is the primary theoretical framework employed in the literature for analyzing the connections between trade liberalization and economic growth.

The theories of Absolute Advantage by Smith (1776) and Comparative Advantage by Ricardo (1817) were based on the assumption of perfect market conditions (Ahmad, 2017, P: 25), and it is to these that classical theories of free trade may initially be attributed.

Adam Smith's first description of the principle of absolute advantage was in the context of trade. He argued that all countries would enjoy concomitant mutual benefits through practicing free trade and specialization based on their absolute advantage. Smith focused on labour as the sole input, as absolute advantage involves a simple comparison of labour productivities.

The classical view holds that the primary objective of trade liberalization is to enable countries to export the goods and services they can efficiently produce, while importing those they cannot. This idea is based on the theory of comparative advantage, which was developed by David Ricardo. The conventional theories of trade as a driver of growth and its impact on economic development are founded on the principles of comparative advantage (PK et al, 2015, P: 51-54).

Under the classical theory of David Ricardo, 'comparative advantage' explains why countries still engage in international trade even where one country is more efficient at producing all goods than other countries. This theory explains that when two countries with the ability to produce two different goods engage in free trade, they will both benefit by exporting the good for which they have a comparative advantage and importing the other good, provided there are productivity differences between the two countries. This insight, is considered one of the most powerful and counter-intuitive ideas in economics. According to this theory, international trade is primarily driven by comparative advantage, rather than absolute advantage (Ricardo, 1817; Ruffin, 2002; Maneschi, 2004; Tabuchi, 2017; Shiozawa, 2017 & Chinwendu, 2019, P: 14). Therefore, under the classical theory, the model of free trade is based strictly on a single-variable-factor (labour cost).

This simplified free trade model was refined and updated in the nineteenth century by Eli Hecksher and Bertil Ohlin; two Swedish economists. Their changes take into account other variables including land, labour and capital in modeling international specialization. As it became known, the Hecksher-Ohlin theory also analytically describes the impact of economic growth on patterns of trade and the impact of trade on the structure of national economies as well as on the differential returns or payments in respect to various factors of production (PK et al, 2015, P: 54).

The Heckscher-Ohlin theory posits that land should be included as a second input of production to reflect the endowment of resources. This theory argues that economies can engage in international trade by exporting products in which they have a comparative advantage. According to this model, comparative advantage is expressed in terms of

factor abundance and intensity in a given country (Duru , 2021, P: 58). The theory argues that where two countries wish to trade, they should have the same level of technology, show consistent returns to scale, and have a particular factor-intensity relationship between final products. The country that has a comparative advantage due to its better factor endowment should produce goods on a larger scale, which will lead to increased trade and economic growth (Heckscher, 1919 and Ohlin, 1933 Khobai, Kolisi, & Moyo, 2018, p: 78).

The Hecksher-Ohlin theory also suggests that trade will increase demand for the goods produced by a country's abundant resource. As most developing countries have an abundance of labor as, the theory predicts an increase in demand for labor-intensive goods. Furthermore, trade provides an opportunity for developing countries to learn from the advanced technologies of developed economies. The theory argues that when countries move towards free trade, they will experience an overall increase in efficiency (Feenstra, 2004; Maturure, 2019, P: 9).

The endogenous growth theory differs from the classical and the Hecksher-Ohlin theories in that it posits that the growth rate of output is primarily determined by exogenous technological progress. According to this theory, an increase in the savings rate can lead to a temporary rise in the growth rate. However, the long-term growth rate can be impacted by liberalization only if it has a technology-stimulating effect. Additionally, the endogenous growth theory suggests that lower trade restrictions can boost output growth in the global economy as a whole (Rodriguez & Rodrik, 2000, p: 268).

The endogenous growth models suggest that long-term economic growth is determined by factors within the economy such as investment in human capital and technological innovation. These models highlight two key factors: firstly, the positive externalities and spill-over effects of an educated workforce in generating technological innovations and long-term growth. Secondly, the technological advances that result from research and development (R&D) activity by firms with ex-post monopoly power. The idea behind this is that if there is no limit to the creation of new ideas, then growth rates can remain positive in the long term (Barro, 1997; Muhammad, 2016, p:16).

Furthermore, the endogenous growth perspective suggests that trade liberalization can promote economic growth by facilitating the transmission of technology. An open economy is more conducive to technology transfers and other factor movements compared to a closed economy. As a result, trade liberalization can impact economic growth by enabling the flow of international capital and redirecting factor endowments towards more productive purposes (Malefane & Odhiambo, 2018, p 9). The endogenous growth theory suggests that economic growth is driven by internal factors such as innovation, knowledge, and investment in human capital, which can bring significant benefits to an economy (Duru, 2021, p. 38). Moreover, the flow of knowledge or spillovers of knowledge can lead to cultural integration and the exchange of ideas for inventing new products or developing existing ones. Additionally, integrating the product market internationally can make it more affordable to invest in new product and innovation since it provides greater access to the global market, allowing firms to take advantage of increasing returns (Grossman and Helpman, 1991).

The endogenous growth theories take a broad view of capital and include ideas (or knowledge), learning-by-doing, and human capital. These theories highlight that the long-run growth rates are not necessarily limited by a forever-diminishing marginal productivity of capital and can be influenced by government policies (Maturure, 2019, p:9-10).

Additionally, endogenous growth models suggest that there could be a long-term correlation between trade liberalization and economic growth. These models propose that with the liberalization of imports, advanced capital goods can stimulate technology transfer via imports (Erkisi and Ceyhan, 2019, p: 84).

In conclude, the traditional argument for gains from trade is based on the principle of comparative advantage, in which a country that engages in trade can benefit in a static model. The Ricardian model explains welfare gains when a country specializes in producing goods in which it has a comparative advantage. On the other hand, the Hecksher-Ohlin model demonstrates welfare gains in a two-country, two-factor model where each country specializes based on its factor endowments. Classical trade theories emphasize trade as a driver of economic growth, while the endogenous growth theory places greater importance on education, on-the-job training, and the development of new technologies for the global market. This shift in focus accounts for the increasing relevance of endogenous growth theory (Obadan & Elizabeth, 2010, p:7-9).

Moreover, classical and H-O trade theories do not provide a definitive framework for the hypothesis that trade liberalization can impact the long-term growth rate through a technology-stimulating effect. They also do not offer any certain implications for long-term growth. On the other hand, only endogenous growth theories focus on the implications of trade liberalization on long-term growth, as liberalization allows for easier access to new technology via imported inputs, as well as directing a country's domestic resources towards more research-intensive sectors, and increasing the size of its market (Ulasan, 2008, P:6-7).

Econometric Methodology and Data:

The study will use time series data to determine the impact of trade liberalization on economic growth of Iraq. The study follows a sequence of steps starting from a unit root test to determine whether the variables are stationary or not. An augmented Dickey-Fuller and PP test will be used to test whether a unit root is present.

Cointegration tests will follow to determine whether there exists a long-run relationship between gross domestic product and the explanatory variables in the model (Sun, 2011, p:227). The Johansen test and Bound test are preferred in this case, because there is more than one explanatory variable. After testing for cointegration and establishing the existence of cointegration, the ARDEL model, will be used to test the short run and long run adjustments.

To summarize, the study examined the effect of trade liberalization, GFCF, PG, HC and OP on economic growth in Iraq. Secondary annual time series data was used, covering the period 1990-2020. Also, the paper will test for the relevance of trade liberalization to economic growth, which is expressed by the following formula:

$$\mathrm{GDP}_{\mathrm{pc}_t} = \propto 0 + \propto_1 \mathbf{TL}_t + \propto_2 \mathbf{OP}_t - \propto_3 \mathbf{PG}_t + \propto_4 \mathbf{GFCF}_t + \propto_5 \mathrm{HC}_t + \boldsymbol{\varepsilon}_t$$

Where:

$\boldsymbol{\varepsilon}_t$ is the error term.

$\propto 0$: ntercept of the relationship in the model or the constant

GDP: is the GDP per capita. Hozouri (2017, p:92) , Raghutla (2020,p:4), Alhakimi (2017,p:451), Gries & Redlin (2012, p:1), Altaee & Al-Jafari (2015, p:59), and Muzaffer Mustafa (2016, p:12).

TL: is an indicator of the degree of trade liberalization and is defined as the percentage of total exports and imports relative to GDP. Duru & Ehidiamhe, (2018), Gries & Redlin (2012, p:1), Alhakimi (2017,p:451), Issa (2019, p:2), Nketiah et al (2019, p:47), and Iheanacho (2017, p:146) .

OP: is the oil price per barrel (Mohsen & Chua, 2020, p:72).

PG: is total population growth (Manteli, 2015, p:17).

GFCF is the gross fixed capital formation as a proxy of domestic investment (Duru & Ehidiamhen 2018, p:7; Nguyen & Bui 2021, p:7; Mbingui & Etoka-Beka 2021, p:732).

HC is the human capital index (Muzaffer 2016, p16 and Taleb 2018, p:163).

Table 1 Summary Table of Variables, Variable Definitions and Data Sources

Variables	**Variable definition**	**Formula**	**Data source**
Trade liberalization (TL_{it})	Trade liberalization is the total of exports and imports of goods and services measured as a share of GDP i.e., imports plus exports divided by GDP. As the exchange rate depreciates, it is expected that the country's exports will be higher, which means more trade in the economy. For the robustness tests, the world trade share and composite trade share are interchangeably utilized to measure trade liberalization (Oloyede et al., 2021).	$\frac{Import + Export}{GDP}$	World Bank (2021)
Per capita income is used as the proxy for Economic Growth (GDP/population)	GDP per capita is gross domestic product divided by the total population. According to the World development indicators, GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	$\frac{GDP}{Population}$	World Bank (2021)
OP:	is the oil price per barrel		World Bank (2021)
GFCF: is the Gross fixed capital formation	Gross fixed capital formation, which is proxied by private investment (% of GDP)	$\frac{Gross\ capital\ formation}{GDP}$	World Bank (2021)
HC: is the human capital index	represented by public expenditure in education as a percentage of GDP (Githanga, 2015).	Percentage	World Bank (2021)
PG: is the total population growth	the total population growth	Percentage	World Bank (2021)

GDP per capita annual growth = dependent variable

GDP per capita is when the income for the whole population is totalled and divided on the population to give an average income per person which is identified as the GDP per capita; the growth of which can contribute to higher living standards and might lead to further development.

Trade liberalization (+) sign (expected sign of coefficient)

Integration is a key concept for the global economy. International economic integration indicators can be classified into two categories: price – based and quantity-based indicators. The degree of liberalization, which is typically measured based on quantities, is most commonly evaluated using the formula of dividing the sum of exports and imports by the Gross Domestic Product (GDP) (Marginean, 2015, p:733).

Liberalization refers to the process of reducing constraints on economic activity, which typically involves the reduction of tariffs and/or the elimination of non-tariff barriers to trade (Deardorff, 2014, p:162).

In the recent empirical literature, researchers focus on identifying dependable indicators of trade liberalization. Some of the commonly used indicators in this literature include the percentage of income represented by exports, the percentage of income represented by imports, the percentage of income represented by the combined total of exports and imports (i.e. trade volume), and tariffs (Kar et al, 2008, p:29). If this holds true, it suggests that the policy identified as "liberalization" has effectively increased the level of economic liberalization. This is significant because announced reforms can sometimes be inadequately implemented or offset by the introduction of substitute trade barriers (Wacziarg & Welch, 2008, p:16).

Population growth (-) sign (expected sign of coefficient)

Population growth refers to the increase in the number of individuals in a population within a specific period of time. Given that economic growth is the benchmark for improving living standards on a global scale, the impact of population growth on the development of living standards is an important area of policy concern (El Muharromy & Auwalin, 2021, p:539). Population growth pertains to the annual increase in the number of individuals within a population. The impact of population growth on GDP remains a debatable issue. Historically, economists have often overlooked the influence of the underlying demographic shift on economic growth. Recently, there have been more studies conducted on how population growth affects economic growth. Lower mortality rates, resulting in longer life expectancy and increased investment for future innovation, can support economic growth. However, based on research and data, population growth has mostly had an adverse effect on GDP growth. Institutional factors can play a critical role in altering this outcome. In my analysis, I am assuming a negative impact (Muzaffer Mustafa, 2016, p:16).

Gross fixed capital formation (+) sign (expected sign of coefficient)

Gross fixed capital formation, which is also referred to as gross domestic investment, encompasses the expenses incurred on increasing fixed assets, as well as the net fluctuations in inventory levels (Kamsin et al, 2020, p:45). Such an increase in household income can often result in greater investment. At the firm level, the additional income will typically be invested in capital goods, while at the government level, it may be used to invest in capital stock. The addition of accumulated capital in each accounting period is known as capital formation.

Index for human capital (+) sign (expected sign of coefficient)

Human capital refers to the quality of workers who possess advanced skills, professional knowledge, and expertise, which ultimately enhances their productivity in the production

process. The human capital index adopts a life-course perspective, evaluating the education levels, skills, and employment opportunities available to individuals across five age categories, spanning from under 15 years old to over 65 years old. The objective of this index is to evaluate the results of prior and current investments in human capital, and provide a comprehensive understanding of a country's present talent pool (Muzaffer Mustafa, 2016, p:16).

Oil price (+) sign. (expected sign of coefficient)

Similar to the price of other commodities, the price of oil is also determined by the law of demand and supply in the global market. Moreover, global events such as the U.S. invasion of Iraq or the Iran-Iraq war in the 1980s can impact oil prices (Bahmani-Oskooee et al., 2018, p. 1). Additionally, the price of oil is expressed in monetary terms as a dollar value per barrel of crude oil, and is tied to the U.S. dollar. It can be influenced by several factors, such as the actual price obtained, the declared price, the tax rate, and the price signal, amongst other things (AKTUĞ, et al, 2018, p:277)

Analysis and Discussion of Results:

Table 2 Unit Root Test Analysis

Variable	Augmented Dickey-Fuller (ADF)			Phillips-Perron (PP)		
	Level	First Difference	I(d)	Level	First Difference	I(d)
TL	(0.1696)	(0.0001)	I(1)	(0.0885)	(0.0001)	I(1)
GDPP	(0.4495)	(0.0000)	I(1)	(0.3406)	(0.0000)	I(1)
GFCF	(0.3573)	(0.0006)	I(1)	(0.4495)	(0.0013)	I(1)
HC	(0.9984)	(0.0000)	I(1)	(0.3253)	(0.0000)	I(1)
OP	(0.5174)	(0.0001)	I(1)	(0.5174)	(0.0001)	I(1)
PG	(0.0187)	--	I(0)	(0.0000)	--	I(0)

The results of the unit root tests are shown in Table 2. The findings show that the variables were either I(0) or I(1). The variables RGDPP, TL, GFCF, HC and OP were integrated at the first difference I(1), while PG was integrated at the level I(0). The ADF results were validated through the PP unit root test. The results show that the findings of the PP unit root test are a corroboration of those realized utilizing the ADF. The unit root test results of I(1) and I(0) exhibited by our variables justify the usage of the ARDL technique.

Co-integration Test:

Co-integration analysis consists of examining whether the dependent and independent variables are in a long-term relationship or not. The results of the cointegration rank test by trace and max-eigenvalue are given in Table-3 and those of the F-Bounds test are reported in Table 4

Table 3 (Johansen Test)

Variables	**Prob.**	**Critical Value (0.05) Trace statistic**	**Prob.**	**Critical Value (0.05) Maximum Eigenvalue**
GDPP	0.0000	332.8026	0.0000	111.9514
TL	0.0000	220.8512	0.0000	74.10492
GFCF	0.0000	146.7463	0.0000	58.80708
HC	0.0000	87.93924	0.0007	38.42475
OP	0.0000	49.51449	0.0042	26.29936
PG	0.0006	23.21513	0.0006	23.21513

The Johansen cointegration method was applied to estimate the long-run relationship among the variables of Equation 1. Two test statistics have been derived for cointegration; namely the maximum eigen value and trace statistics. The calculated maximum eigen value statistics and trace statistics, together with their parallel critical values, are presented in Table 3.

Following the null hypothesis of no cointegration amongst the variables, Table 3 shows that there are six cointegration equations based on the trace test and the maximum eigenvalue test; the null hypothesis of no cointegration is rejected as they are greater than their critical values at a 5% level of significance. Therefore, the results demonstrate that there exists a unique cointegrating vector among the variables. Hence, the results from both test statistics suggest that there exists a stable long-run relationship between economic growth and its explanatory variables TL, GFCF, HC, OP and PG.

Additionally, the bounds test estimates the impact of explanatory variables on the dependent variable in the long run. The bounds test is applied to determine the long run relationship between variables. The results are shown in Table 4:

Table 4 (ARDL Bounds Testing: Cointegration Test)

	Value	**Significant level**	**I(0) Lower**	**I(1) Upper**
F-Bounds Test	**7.7426** (**Upper**)	10%	2.26	3.35
		5%	2.62	3.79
		2.5%	2.96	4.18
		1%	3.41	4.68

To test the null hypothesis and to investigate the long-run relationship amongst the series variables, the F-statistics test is used. The estimated F-statistic values confirm that co-integration exists amongst the variables. On the basis of this result, the null hypothesis of no cointegration is rejected if the calculated F-test statistics exceeds the upper critical bound value. This shows that all the relevant variables employed in the study show cointegration in the case of Iraq.

In Table 3 there are four significance values (10%, 5%, 2.5% and 1%), and if the calculated value of F- test is bigger than the value of I (1) bound at each specific significance level, showing that the null hypothesis of no long-run relationship is rejected at all critical levels. The F-Bounds test shows the calculated F test value is 7.7426, which is higher than the upper bound critical value of 4.68 as tabulated in Pesaran et al. (2001, P:4). The ARDL results suggest the rejection of the null hypothesis of no cointegration in the model because the value of the F-statistic is greater than the upper bound critical value at the 1 per cent level of significance, in favour of the alternative hypothesis that a valid long-run relationship exists among variables in Iraq. So, we can apply auto regressive distributive lag (ARDL) regression for short-run and long-run results.

Econometrics Model Estimation: Long Run Relationship

Since the variables of the model were cointegrated, the relationship between the dependent and explanatory variables can be estimated in the long run and short run. The

(ARDL) regression was used in order to measure and analyze the impact of trade liberalization on economic growth in Iraq for the period 1990-2020.

Table 5. Long-Run and Short-run Results of ARDL Regression

Dependent variable	**Independent variable**	**Short run**		**Long run**	
		Coefficient	**Prob.**	**Coefficient**	**Prob.**
	(C)	-5.7431	0.0231	-4.5980	0.0002
GDPP	TL	0.8115	0.0001	0.6497	0.0001
	HC	0.8186	0.8787	-0.6103	0.0108
	GFCF	0.2490	0.0028	-0.3801	0.0004
	OP	0.5163	0.0017	0.3241	0.0024
	PG	-2.6416	0.0003	0.6093	0.0002
	Through the process (step wise) the value of GFCF and HC was as follows:				
	Independent variable	Short run		Long run	
		Coefficient	**Prob.**	**Coefficient**	**Prob.**
GDPP	GFCF	0.2278	0.0001	0.0586	0.0006
	HC	0.0944	8.5762	0.0284	12.8192
	R-Squared = 0.9737				
	Adjusted R-Squared = 0.9213				
	F- statistic = 18.5793 (0.0000)				
	S.E of regression = 0.0854				
	SSR = 0.0657				
	AIC = -1.8595				

The findings for the long-run estimates are presented in Table 5. According to the results, there is a positive and significant relationship between trade liberalization and economic growth in Iraq.

The long-run result estimated in Table 5 indicates that the overall growth model is relatively well-fitted as the explanatory variables explained over 97 percent (R2) of the variation in economic growth, which means that all the independent variables included in the models have a strong relationship with the dependent variable and they explain most (about 97%) of the change that occurs in the dependent variable (GDPP). The result is appropriate to theoretical and a prior expectations. The coefficient of trade liberalization (TL) had a positive and significant impact on economic growth in the case of Iraq in both the short and long run. These results are in line with the findings of Hussein and Khder Aga (2022); Khobai et.al (2018, P:2), Keho and Wang (2017, P:11) and Hozouri (2016, P:94) for Ghana and Nigeria, Cote D'Ivoire, and 17 MENA countries, respectively.

Specifically, a 1% increase in trade liberalization leads to a 0.8% and 0.64% increase in economic growth in the short and long run, respectively. The plausible reason for this result is the dominance of crude oil exports in Iraqi's foreign trade, the value of which is susceptible to the fluctuations of international market.

Also, in the long run, the population growth (PG) and oil price (OP) had a positive and significant impact on economic growth. This means that a 1% increase in population growth (PG) and oil price (OP) would increase economic growth by 0.60% and 0.32%, respectively. It further shows that a 1% increase in gross fixed capital formation (GFCF) and human capital (HC) would decrease economic growth by 38% and 0.61%, respectively, in the long run. This may be as a result of the weakness of the productive sector and the inefficiency of the educational sector in Iraq.

Additionally, the coefficients (HC, GFCF, OP) were positive during the short run. This is in line with theoretical and a priori expectations. On the contrary, the coefficient of

population growth (PG) reports negative and significant impact on economic growth in the short term, which became positive and significant in the long run. The logic behind this result is that it may be related to the role of population growth in stimulating productivity and having a more educated population in the long run compared to the short run.

Table 6: Summary of Long-Term Outcomes

(1) a 1% raise in TL boosts the GDPP by 0.64%	a 1% ⇧ in TL	⇒	a 0.64% ⇧ in GDP
(2) a 1% raise in HC reduces GDPP by 0.61%	a 1% ⇧ in HC	⇒	a 0.61%⇩ in GDP
(3) a 1% raise in GFCF reduces GDPP by 0.38%	a 1% ⇧ in GFC	⇒	a 0.38% ⇩ in GDP
(4) a 1% raise in OP boosts GDPP by 0.32%	a 1% ⇧ in OP	⇒	a 0.32% ⇧ in GDP
(5) a 1% raise in PG boosts GDPP by 0.60%	a 1% ⇧ in PG.	⇒	a 0.60%⇧ in GDP

Diagnostic and Statistical Checking for Economic Growth Model:

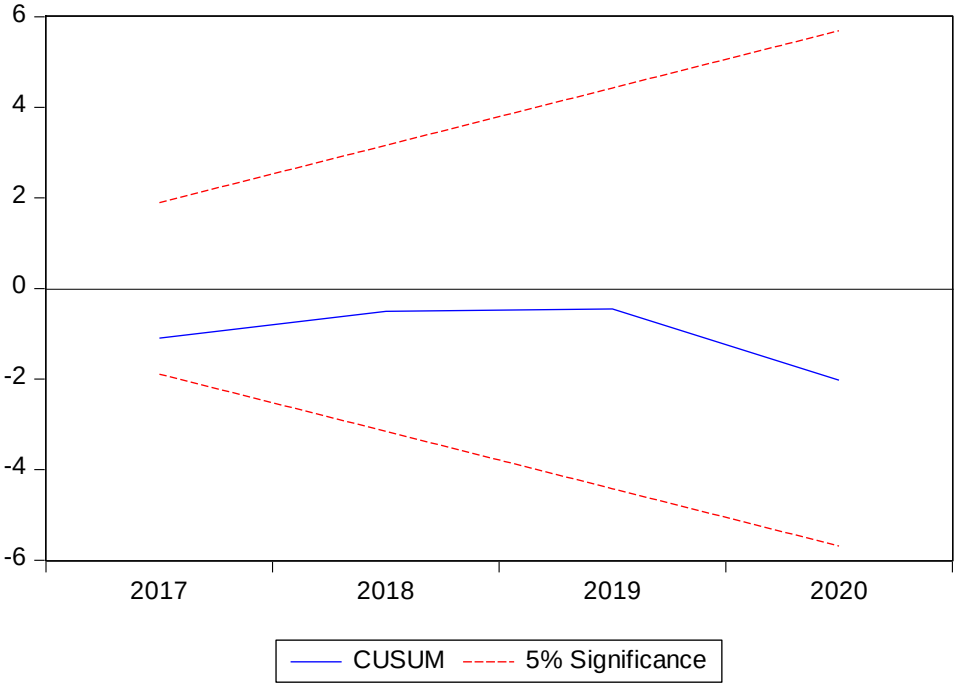
To establish the goodness of economic growth models, and to ensure that they can be used for forecasting purpose, diagnostic tests and some of most important statistical indictors are used. The results of the diagnostic tests and statistical indictors are presented in the table below:

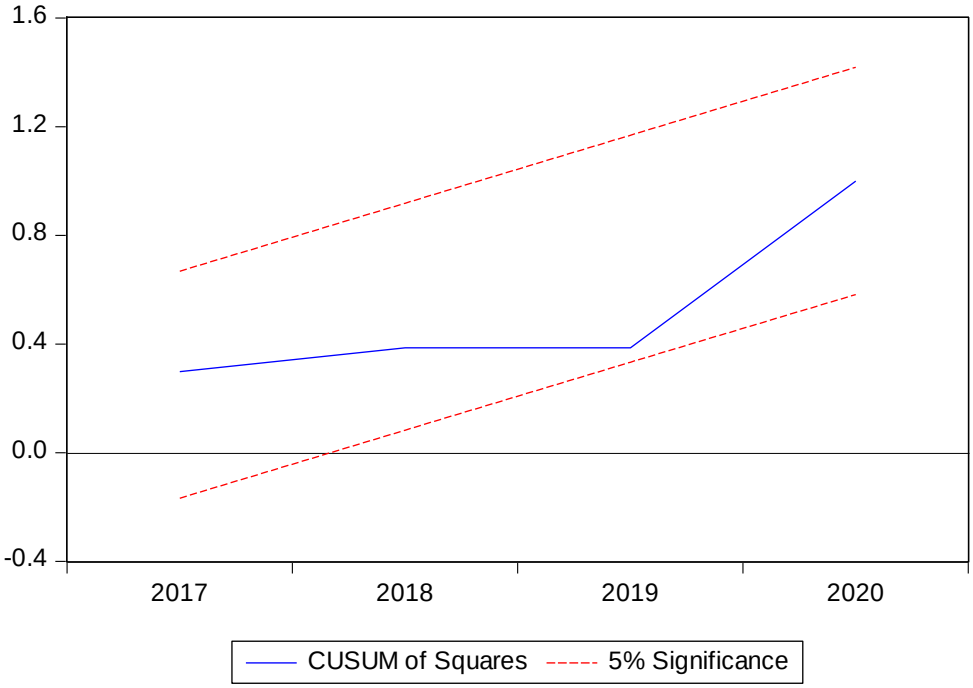
Table 7: Diagnostic test and statistical indicators for an accurate economic growth model

Results of diagnostic tests for estimated models

Test statistics:	LM test (Serial correlation)	VIF Centered test	Ramsey RESET test (Function form)	Breusch-Pagan-Godfrey test (Heteroscedasticity test)	Jarque-Bera Test (Normality)
	0.3546	Between (1.08-1.23)	0.4841	0.6215	0.7300

The results of the diagnostic tests are shown in Table 7. The serial correlation of the residuals was tested through the Lagrange Multiplier (LM). The null hypothesis of no serial correlation was sustained because the probability value of 0.3546 was more than the 5 per cent significance level. Thus, there was no serial correlation in our model. The probability value of 0.4841 against the Ramsey Regression Equation Specification Error Test (RESET) was greater than the proposed 5 per cent level of significance. Thus, the null hypothesis that the model was correctly specified was sustained. Thus, there was no possibility of the model not being specified correctly, which may result in the omission of certain variables. Again, the model has no wrong functional form. Besides, there was no relationship between the explanatory variables and the residuals. Under the Jarque-Bera normality test, the probability value of 0.7300 was larger than the proposed level of significance. This suggests that the errors were normally distributed due to the upholding of the null hypothesis of normal distribution. The result of the Breusch-Pagan-Godfrey test showed that there was no heteroscedasticity in our model. This is because we accepted the null hypothesis of homoscedasticity. A probability value of 0.6215 showed that the errors were homoscedastic and independent of the explanatory variables. The value of the estimated parameters of VIF is between 1.08-1.23, which is less than 10, and so evidence of good use of the models. Hence, the model has a good fit and is adequate for analysis.





Summary and Conclusion

The impact of trade liberalization on economic growth is a subject of debate in the existing literature. The impact was found to be positive in some research but nonsignificant or even negative in other studies.

The objective of this study was to analyze the impact of trade liberalization on economic growth in Iraq over the period 1990–2020. In addition to trade liberalization (TL), the variables HC, GFCF, OP and PG were taken into account as additional exogenous variables.

To achieve our objective, annual frequency data spread over 31 years (from 1990 to 2020), were employed and associated with a multi-step procedure: from stationarity analysis (ADF and PP tests).

After the stationary test, the co-integration analysis was conducted, which consisted of examining whether the dependent and independent variables are in long-term relationship or not through using Johansen and Bounds Tests. After the variables of the model were tested for cointegrated, the relationship between dependent and explanatory variables could be estimated in the long run and short run. Then the (ARDL) regression was used in order to measure and analyze the impact of trade liberalization on economic growth. The diagnostic tests were also carried out, followed by the CUSUM and CUSUMSQ tests to check the stability of the models.

The results confirm that trade liberalization has a positive and significant impact on economic growth in the short and long run. This implies that trade liberalization stimulates economic growth in Iraq, Additionally, the coefficients of HC, GFCF, OP were positive and significant during the sample period. On the contrary, we found that the coefficient of population growth (PG) reports negative and significant impact on economic growth in the short run, which became positive and significant in the long run. Therefore, the results of the study validate the trade-led growth hypothesis in the case of Iraq. This implies that a substantial portion of the economic expansion of Iraq is external.

Since our study evidenced that trade liberalization contributes to economic growth, it is recommended that the government and policy makers should pursue policies that will promote trade liberalization in Iraq. This can be achieved by diversification of the economy through boosting sectors of activity other than oil production. Therefore, the country should modify the composition of trade by switching from the export of oil to high valued-added goods, which will not only increase trade volume but also reduce the worsening trade balance. Moreover, it should be noted that sustainable and sustained economic growth cannot be achieved without political stability in Iraq. The lack of accountability in economic management, lack of transparency, the absence of the rule of law and an improper balance of power and counterpowers are among the main factors or sources of conflict.

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