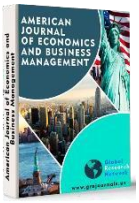

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Article

Trade Openness And Its Impact on Unemployment and Inflation Rates of The Iraqi Economy: An Econometric Study

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Abstract: The research aims to explain and analyze the relationship between trade openness and unemployment and inflation rates, as they are economic variables, On this basis, the VECM error correction model was used based on data on openness, unemployment, and inflation for the period 2004-2022, and it was concluded that there is a long-term relationship between trade openness and unemployment and inflation rates, as well as the model being free of the problem of heterogeneity of variance, because the probability value of the chi-sq was (0.4811) which is greater than (0.05) and on this basis we accept the null hypothesis and reject the alternative hypothesis, and then a group was reached Of conclusions and recommendations.

Keywords: Trade Openness, Unemployment, Inflation Rates, Iraqi Economy

1. Introduction

In recent years, Iraq has witnessed major transformations in its economic structure as a result of local and international political and economic changes. Among the most prominent of these transformations is Iraq's pursuit of trade openness as part of the efforts made to rebuild its economy after years of isolation and challenges, Trade openness is also considered an important means of promoting economic growth, as it contributes to increasing trade exchange with other countries, attracting foreign investments, and improving production efficiency [1], [2]. However, this openness carries with it many challenges, including its impact on local sectors such as industry and agriculture, in addition to the rise in Unemployment rates and increased inflation as a result of intense competition with imported goods.

Search problem: The research problem revolves around the impact of trade openness on unemployment and inflation rates [3], [4]. With the acceleration of globalization and global economic integration, trade openness has become a major option for countries seeking to improve their economic performance. From this standpoint, the research problem can be defined: (Does trade openness have a negative or positive impact on unemployment rates? And inflation in the Iraqi economy for the period [5], [6], [7].

Research hypothesis : The research is based on the hypothesis that trade openness has a negative impact on unemployment and inflation rates during the research period.

Research objective : The research aims to achieve a set of goals, including

1. Identify the economic concepts represented by trade openness, unemployment rates, and inflation, as well as the goals and indicators included in the above concepts.
2. Explaining the relationship between trade openness, unemployment and inflation rates.

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3. Explaining the impact of trade openness on unemployment and inflation rates in Iraq for the period.

Temporal and spatial limits of research:

Time limits: 2004-2022

Spatial borders: Iraq

Research structure : In order to cover the topic, the research was divided into three sections [8]. The first section included the theoretical and conceptual framework of trade openness, unemployment rates, and inflation. The second section provided an analysis of the reality of changes in trade openness, unemployment rates, and inflation in Iraq for the period (2004-2022), while the third section included the relationship Standardizing the impact of trade openness on unemployment and inflation rates in Iraq for the period (2004-2022) using the VECM model, and then the research was concluded with a set of Conclusions and recommendations.

Part One: The theoretical and conceptual framework of trade openness, unemployment rates, and inflation

First: The theoretical aspect of trade openness:

1. **The concept of trade openness**: Trade openness is defined as the establishment of trade relations with the outside world, which in turn works to develop local and foreign capital with the aim of removing customs restrictions on the movement of trade between countries that restrict the entry of foreign goods and services into local markets [9], [10], [11]. These restrictions are represented by taxes, fees, etc, The purpose of trade openness is to encourage trade exchange and attract foreign investments as well as economic cooperation between countries. Trade openness also contributes to encouraging economic growth by facilitating ways for local markets to export their products and import new materials.
2. Trade openness is also defined as the participation of foreign trade in building the gross domestic product and the extent to which the economic activity of any country depends on import and export operations, that is, in the sense of encouraging exports and imports through reducing fees and import licenses, and this is not limited to the exchange of goods, but rather it is the openness of technology, expertise, services, culture, and more. Money and foreign investment as well .
3. **Objectives of trade openness: The objectives of trade openness are represented by a set of points:**
    a. Trade openness contributes to getting rid of customs restrictions with the aim of increasing the rates of trade exchange between countries, as well as expanding global markets, raising the level of income and improving the level of well-being [12], [13].
    b. Working to increase income with the aim of improving the living conditions of community members, especially in developing countries.
    c. Striving to achieve financial surpluses for countries exporting various goods and services through an increase in the volume of trade exchange.
    d. Trade openness prevents goods from being sold at prices lower than their production costs on the international market. This means protecting local goods from dumping in the market.
    e. Trade openness aims to liberalize trade and thus provide job opportunities for the workforce through the introduction of modern technical methods and equipment, as well as the access of local workers to new experiences and skills [14], [15].
4. **Indicators of trade openness:**
    a. Ratio of exports to GDP: Exports are one of the indicators that show openness in foreign trade. When the value of a country's exports is high compared to the gross domestic product, this means that there is great importance for

exports according to this indicator in increasing economic growth, and that this indicator reaching 25% of GDP means that the economy of this country Open to the outside world, and we can express this indicator according to the following equation:

b. **Exports = value of exports / GDP x 100**

Ratio of imports to GDP: This indicator shows the extent of the country's dependence on the outside world for the purpose of meeting the needs of local demand. When the percentage of this indicator is more than 20% of the gross domestic product, this means that the country is economically open to the outside world, and the following equation explains the calculation of this indicator:

c. **Imports = value of imports / GDP x 100**

Trade openness index: This indicator is considered one of the most prominent indicators that show the extent to which the country's economy is linked to the economy of the outside world , When the percentage of this indicator is high, this means that the country's economy is exposed to the outside world, and the ratio of 40% of foreign trade to the gross domestic product can be adopted as a measure of the exposure of the external economy, while if the percentage ranges between (12 and -20%), then the country's economy is considered closed , and this indicator is calculated according to the following equation:

Trade openness index = exports + imports / GDP x 100

1. Types of trade openness: There are several types of trade openness that can be explained as follows:

a. **Complete trade openness:** This means that there are no restrictions on the movement of production factors, specifically complete freedom of movement of capital and foreign investments, in addition to freedom of entry and exit of goods and services . This is called freedom of trade [16], [17].

b. **Partial trade openness**: means using a policy of substituting imports and encouraging exports, as this type depends on bilateral agreements between two countries, and on this basis, customs restrictions and barriers are not completely abolished, but are reduced .

c. **Multilateral trade openness:** This type falls within the trade liberalization of international organizations that work to abolish all restrictions on foreign trade. There is also a country that is open to other countries as a result of trade agreements between them, or it works to open its commercial relationship according to commercial transactions and exchanges, and they are members of The same organization (Ajja, previous source:

Second: Unemployment, its concept, types, and causes

1. **The concept of unemployment:** Unemployment is defined as the lack of full employment of available human and non-human economic resources, that is, the presence of unemployed capacity for people who want to work at various levels of wages [18], [19], [20], It can also be defined as the lack of work for those willing and able in a given society. In addition to that, there are those who are counted as unemployment and join the queues of the unemployed who do not want to work if there is one, such as a beggar, There are also those who are not serious about searching for work, in addition to the fact that those who are unable to work may be able to do so at another time, such as the sick , Through this definition, it becomes clear to us that the person is even considered among the number of unemployed. The following conditions must be met :
   a. Be able to work.
   b. He has a desire to work.
   c. Search seriously for work.

1. **Types of unemployment:** There are different types of unemployment. Some of them have a characteristic that clearly distinguishes some societies due to the nature of the composition of their economy, the stage of their growth, the nature of productive relations, and the prevalence of some social characteristics in them, and they are of different types, including:
   a. **Periodic unemployment:** It appears as a result of economic cycles or fluctuations in business that have affected industrialized countries since the Industrial Revolution, but it is no longer an inherent characteristic of the capitalist economy only, but rather its impact has expanded to include developing countries due to the high degree of interconnection and dependence between the economies of these countries with developed countries. Developing countries are in Mostly, raw materials are exported, as the stagnation affecting industry in developed countries inevitably leads to a decrease in demand for raw materials [21].
   b. **Seasonal unemployment:** It is found in projects and sectors in which work is affected by changing seasons or climatic conditions, as is the case in the agricultural sector and the activities that depend on it, as well as the tourism sector and the fishing industry [22], [23].
   c. **Frictional unemployment:** It appears as a result of the lack of training of unemployed workers in the professions and jobs that society needs. It represents the period of unemployment until they return to practicing the same work or obtaining a new job. The reason for its occurrence is the emergence of new industries and the disappearance of old industries, or as a result of technological progress and the replacement of machines. Workers' place.
   d. **Sectoral unemployment:** It occurs in some sectors as a result of changing production and market conditions. The industrial sector is particularly affected when there is a shortage of raw materials or a decrease in demand for products. Some factories close and lay off workers [24], [25]. This type of unemployment can also affect the commercial sector, which is affected when any circumstance occurs due to the closure of import and export, which affects the activity of this sector, causing this type of unemployment .
   e. **Disguised unemployment:** This type of unemployment is an expression of the imbalance between the size of workers and the extent of their productivity and their role in the production process, i.e. a significant decline in the marginal product of workers, perhaps reaching zero [26]. This problem is exacerbated in developing countries in the public sector in particular and appears in the form of overcrowding of state departments and offices with large numbers of workers.
   f. **Temporary unemployment:** It arises accidentally. This type of unemployment is linked to casual and temporary workers who do not have specific skills. It arises due to the continuous change that occurs in the volume of work, which sometimes requires dispensing with the services of some workers for specific periods .

1. Reasons for the emergence of unemployment:

   a. Employing expatriate workers from outside the country more than local workers due to the lack of a properly trained and qualified worker to work.
   b. Low wages offered by private sector companies are unsatisfactory to the worker, especially if he has experience and skill.
   c. The failure of some individuals to work, even if wages are high, due to the social customs and traditions of the country, because some unemployment rates result from social or external circumstances of the country.

d. The decline in demand for labor as a result of technological development, which was the reason for the widespread emergence of unemployment as a result of the presence of capital-intensive productive arts that replace human labor.
e. There is no link between the preparation and evaluation of training and educational programs with the social and economic reality, and there is a failure to keep pace with developments taking place in the labor market.
f. An increase in population numbers, even if this increase is a national wealth that must be preserved and benefited from.

Third: The concept of inflation, its types, and effects

1. **The concept of inflation:** Inflation is one of the economic problems that societies and countries have faced throughout the ages, due to its negative effects on the political, social and economic levels. Therefore, monetary authorities seek, through their policies, to take appropriate measures to focus on inflation rates, with the aim of achieving price stability in the long term, which is the ultimate goal. What these authorities aspire to, There are many definitions that explain the concept of inflation, as it can be defined as "an irregular rise in prices". Kardener-Akle defined it as "a continuous and noticeable rise in the general level of prices," and it is also known as "a continuous rise in the prices of goods and services, accompanied by a decrease in the purchasing power of monetary units".
   Inflation rate = price level in the current year - price level in the previous year / price level in the previous year * 100%
2. **Types of inflation:**
   a. **Creeping or gradual inflation:** This type of inflation is the least severe and most manageable among the other types of inflation, as it is characterized by a gradual and slow increase in the price level, even in the presence of normal and moderate aggregate demand. It has been clarified that rising prices at a rate not exceeding 3% annually does not cause an imbalance in the economic structure.
   b. Suppressed inflation: This type of inflation occurs when a state adopts policies, such as laws, legislation, or regulatory measures, with the aim of controlling the general level of prices. However, these measures may pose a risk to the country's economy, as their failure could lead to a rapid and sudden rise in prices. In addition, the accumulation of liquid cash could constitute a burden on the national economy in the event of a decline or failure of the controls and restrictions used to control it [27], [28].
   c. Hyperinflation: Known as hyperinflation, it is considered one of the most dangerous forms of inflation. It is characterized by a sharp and continuous rise in prices, which leads to the collapse of the monetary system and the currency losing its value. This type of inflation usually occurs during periods of major crises, such as wars or economic and political crises. The continuation of this rise in prices leads to money losing its function as a store of value, causing the collapse of savings, whether current or future .
   d. Inflation cost: This type of inflation occurs as a result of an increase in the prices of factors of production, which leads to an increase in the prices of final products. There are several factors that contribute to this, including the rise in wage rates due to the strength of trade unions, which seek to increase wages in proportion to the rise in the general level of prices in order to maintain the standard of living of workers [29]. Increased profits for entrepreneurs often prompt workers to demand higher wages as well.
   e. Imported inflation: This type of inflation occurs as a result of an increase in the prices of imported goods, which leads to a direct impact on the prices of domestic goods, whether they are consumer goods or production inputs. This

is due to economic openness, which is measured by the ratio of foreign trade to GDP. The higher this ratio, the greater the economic openness, and vice versa.

f. **Accelerating inflation:** This type of inflation results from the persistence of creeping inflation for a long period, causing inflation rates to rise sharply and rapidly. This inflation has a greater impact on economic activity, as high rates of creeping inflation over time lead to accelerating inflation that may reach rates ranging from 20% to 100% and even 200% annually. This leads to severe economic crises that negatively affect the value of the currency.

g. **Stagnant inflation:** In the 1970s, a new phenomenon emerged in advanced capitalist countries, as these countries began to face severe economic crises represented by a combination of high unemployment rates and a continuous rise in the price level. This phenomenon led to the emergence of the term "stagflation" in economic literature. **Before that, the prevailing view was that there was an inverse relationship between unemployment and inflation, where it was believed that if unemployment was high, inflation would be moderate or low. However, this phenomenon has raised controversy over its interpretation, and its occurrence is attributed to the simultaneous occurrence of a group of natural factors, such as high oil prices or raw materials, which led to an increase in production costs.**

2. Materials and Methods

1- **The effects of inflation:** Inflation results in many economic effects, including:

A- The effect of inflation on income: Inflation negatively affects some groups in society more than others, as those with fixed incomes are more affected by the decline in the real value of their incomes as a result of rising prices, which reduces their ability to meet their needs. In return, freelancers and entrepreneurs benefit from this rise.

B- The effect of inflation on the balance of payments: Inflation has a negative impact on the balance of payments, as the products of a country that suffers from high prices become less competitive compared to the products of other countries. This leads to a decline in exports and an increase in imports, which causes a deficit in the trade balance within the balance of payments, or reduces the size of its surplus.

Part Two: Analysis of the reality of changes in trade openness, unemployment rates, and inflation in Iraq for the period (2004-2022)

First: Trade openness in the Iraqi economy for the period (2004-2022):

Trade openness shows the size of economic openness to the global economy, and Table (1) shows the size of trade openness in Iraq for the period (2004-2022), as we note from the table data below that the Iraqi economy is in a state of openness to the global economy throughout the study period, reaching the highest Trade openness rate (134.5%) in 2012, While the lowest rate of trade openness was (54)% in 2016, the remaining years had similar rates of trade openness. This indicates the continuation of economic openness in Iraq to exports during the research period.

As mentioned above, the continued high rates of trade openness in Iraq has a negative and fundamental impact on the country's economy, which leads to making the Iraqi economy more vulnerable to global economic fluctuations and thus the country's inability to control and mitigate the extent of damage to the economy, In addition, the continuation of this openness would make the Iraqi economy an easy prey to the economic policies pursued by advanced industrial countries, and thus the Iraqi economy would be affected by the crises that afflict those countries.

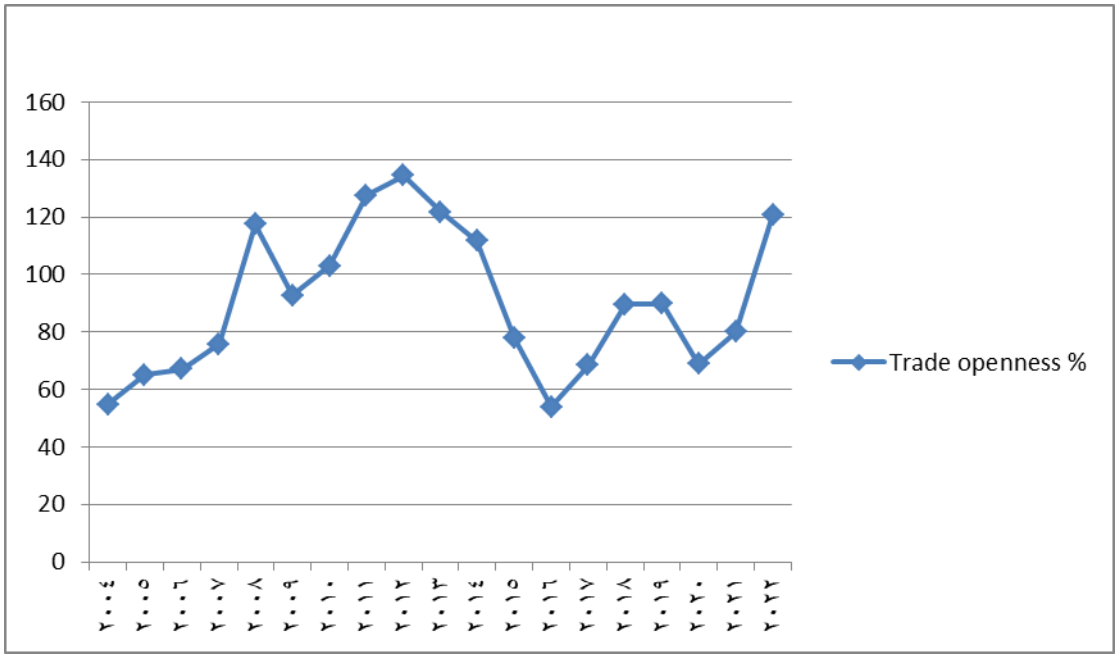
Table 1. The volume of trade openness in Iraq for the period (2004-2022) (million dollars)

years	Exports	GDP	Ratio of total exports to GDP %	Imports	Ratio of total imports to GDP %	Trade openness %
2004	17810	71291	24.9	21302	29.8	54.7
2005	23697	72485	32.6	23532	32.4	65
2006	30529	76579	39.8	20892	27.2	67
2007	39587	78019	50.7	19556	25.1	75.8
2008	63726	84438	75.4	35496	42.1	117.5
2009	39430	87291	45.2	41512	47.5	92.7
2010	51764	92880	55.7	43915	47.2	102.9
2011	79681	99890	79.7	47803	47.8	127.5
2012	94209	113811	82.7	59006	51.8	134.5
2013	89769	122493	73.2	59349	48.5	121.7
2014	83981	122734	68.4	53177	43.3	111.7
2015	51328	127435	40.2	48010	37.7	77.9
2016	41298	139633	29.5	34208	24.5	54
2017	57559	141069	40.8	38766	27.5	68.3
2018	86360	147373	58.5	45736	31.1	89.6
2019	81585	155498	52.4	58138	37.4	89.8
2020	46811	137889	33.9	48150	34.9	68.8
2021	72822	141727	51.3	40736	28.7	80
2022	11804	143256	82.3	55194	38.5	120.8

Source: Central Bank of Iraq, General Directorate of Statistics and Research, annual bulletins for different years (2004-2022).

The following graph shows the changes in the rate of trade openness in Iraq during the period (2004-2022):

Figure 1. Changes in the volume of trade openness in Iraq during the period (4200-2022)



Source: Worked by the researcher based on the data in Table (1).

Second: Analysis of unemployment rates in Iraq during the period (2004-2022):

Unemployment is one of the problems that Iraq suffers from, as it causes many problems on the economic and social levels. On this basis, many studies have developed development plans to reduce the phenomenon of unemployment, but these plans have no application in reality, The statistics showed a widespread increase in the unemployment rate among graduates, at a rate of 17%. This demonstrates the lack of preparedness of the educational systems as a result of the failure of government plans between the outcomes of education and the need for them in the labor market. As for the global level, we find that the permissible unemployment rate is 6%, but at the level The Arab countries reached a rate of 14% to 22% .

From observing the data in Table (2), we find that unemployment rates tend to decrease during the period (2004-2022), as unemployment rates decreased from (26.80)% in 2004 to (17.97)% in 2005, and unemployment rates continued to decline successively during the years (2008). , 2007, 2006), where the percentage reached (17.5, 16.3, respectively). 15.34)% The reason behind this decline is the increase in the relative public revenues of the general budget and thus achieving a surplus in the trade balance through increasing exports and thus reflecting positively on unemployment rates in Iraq by creating job opportunities for unemployed workers and thus reducing unemployment rates.

While the reports of the Central Bureau of Statistics showed a decline in unemployment rates during the years (2013, 2012, 2011, 2010), reaching (12.3, 11, 14, 12)% respectively, while in 2014 unemployment rates reached (12.8)% as a result of the situation. The political and economic situation that the country was going through at that time, that is, the war that Iraq waged with the terrorist entities that were present in many Iraqi regions and controlled them. Thus sabotaging and destroying the infrastructure of these areas, especially the oil fields, After this period, unemployment rates continued to rise gradually, increasing by (10.8)% in 2015. The reason for this rise in unemployment rates is due to the cessation of economic activity in most economic sectors as a result of the conditions that the country is going through, and this in turn was reflected in the economic and social situation of Iraq during that period , In addition to the increase in government spending during the period (2015-2016) on military equipment to equip the security forces to confront terrorist gangs, which resulted in the displacement of large numbers of the population and thus their loss of their jobs. However, after 2019, unemployment rates rose as a result of the Corona pandemic, which had a major impact on Unemployment rates will rise to reach (27)% in 2022.

Table 2. Development of unemployment rates in Iraq for the period (2004-2020)

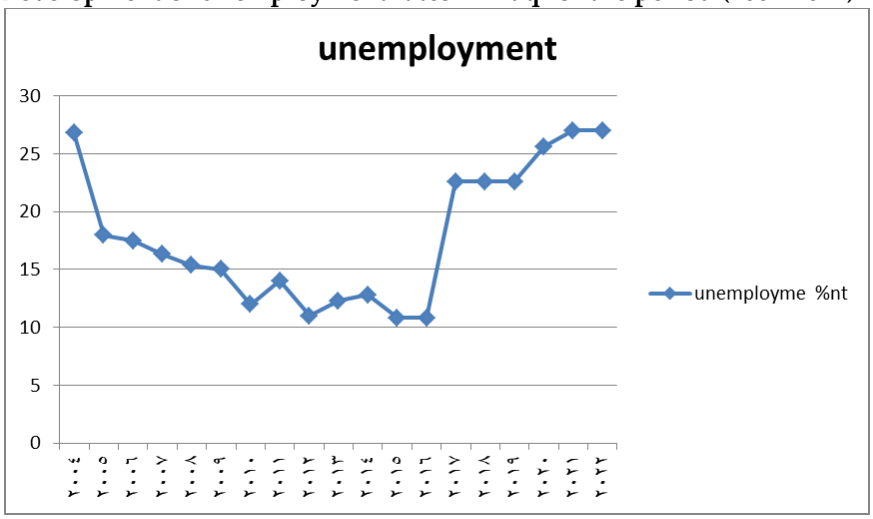
Years	Unemployment%
2004	**26.80**
2005	**17.97**
2006	**17.5**
2007	**16.3**
2008	**15.34**
2009	**15**
2010	**12**
2011	**14**
2012	**11**
2013	**12.3**
2014	**12.8**
2015	**10.8**
2016	**10.8**
2017	**22.6**
2018	**22.6**

2019	22.6
2020	25.6
2021	27.0
2022	27.0

Source: Ministry of Planning and Development Cooperation, Central Agency and Information Technology, Directorate of Population and Manpower Statistics, various years.

The following chart shows the rise and fall in unemployment rates in Iraq for the period (2004-2022):

Figure 2. Development of unemployment rates in Iraq for the period (2004-2022)



Source: Worked by the researcher based on the data in Table (2).

Third: Analysis of inflation rates in Iraq during the period (2004-2022):

Inflation is considered one of the most challenging challenges facing the Iraqi economy, especially after 2003. It means the continuous rise in the general level of prices, as it is linked to basic factors that affect the economic situation of the country, including political crises, internal conflicts, and the decline in oil prices, which is the main source of the Iraqi economy When the country's exports decrease and imports increase, there is a deficit in the trade balance, and this in turn increases pressure on the local currency, thus increasing the costs of imported goods and thus increasing the volume of inflation in Iraq.

We note from the data in Table (3) that inflation rates and the general level of prices were increasing during the period 2004 to 2006, as they increased from 27.0% to 53.2%. The reason for this increase in inflation rates is due to the decrease in customs duties, which in turn worked to increase the demand for imports as well as The deterioration of the security situation and an increase in consumer spending, as well as the emergence of other costs, including the costs of security protections, the lack of fuel, and the increase in its prices.

Table 3. The development of the inflation rate in Iraq for the period (2004-2020)

Years	general level of prices	% inflation
2004	36.4	27.0
2005	49.9	37.0
2006	76.4	53.2
2007	100	30.8
2008	112.7	12.7
2009	122.1	8.3
2010	125.1	2.4
2011	132.1	5.6

2012	**140.1**	**6.1**
2013	**142.7**	**1.9**
2014	**145.9**	**2.2**
2015	**148.0**	**1.4**
2016	**104.1**	**-29.6**
2017	**104.3**	**0.2**
2018	**104.7**	**0.4**
2019	**104.5**	**-0.2**
2020	**105.1**	**0.6**
2021	**111.5**	**6.0**
2022	**114.6**	**5.3**

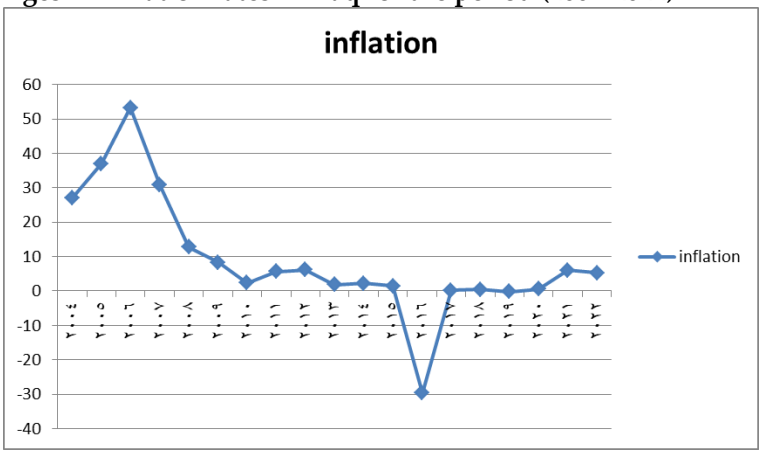
Source: Central Bank of Iraq, General Directorate of Statistics and Research, annual bulletins for different years (2010-2022).

During the period 2007 to 2009, inflation rates decreased from 30.8% to 8.3%, and this is a positive indicator for Iraq. The reason for this decline is due to the rise in the exchange rate of the Iraqi dinar during that period, in addition to the improvement of the security situation in the country as well as the decline in oil prices. As for the period 2010 - 2011-2012, inflation rates reached (2.4, 5.6, 6.1)% respectively. It decreased slightly, while the general level of prices in 2012 recorded a rate of (140.1)% as a result of the increase in the monetary supply and the weak flexibility of the production system.

While inflation rates continued to decline as shown in Table (3) during the period (2014, 2015, 2016) by (2.2, 1.4, -29.6)% respectively. The reason for this is due to the role of monetary policy in achieving stability in the general level of prices, after that Inflation rates also continued to decline until the end of the period studied, reaching a rate of (5.3)% in 2022. This means that the Central Bank of Iraq followed a method Currency auction with the aim of maintaining exchange rate stability and reducing inflation.

The following chart shows the changes in inflation rates in Iraq for the period (2004-2022):

Figure 3. Changes in inflation rates in Iraq for the period (2004-2022)



Source: Worked by the researcher based on the data in Table (3).

Part Three: The standard relationship of the impact of trade openness on unemployment and inflation rates in Iraq for the period (2004-2022) using the VECM model

The standard relationship was analyzed for the impact of trade openness as an independent variable on some economic variables as dependent, namely (unemployment, inflation) in Iraq using the VECM model, as the purpose of this research is to know the size of the impact that trade openness can have on unemployment and inflation rates.

3. Results and Discussion

Independent variable: trade openness T

Dependent variables: unemployment and inflation U,X

TR= B0-B1U-B2X+Ui

First: Results of the stability test for the variables (T, U, X)

Table (4) shows the results of the stationarity test for economic variables (trade openness, unemployment, inflation) in Iraq during the period (2004-2022) , We note that the trade openness data series (T) according to the ADF test is stable at the first difference with a fixed term, as the calculated t is greater than the critical t at the significance levels (10, 5)%, meaning that it is stable and integrated of degree ~(1)1, and this It means rejecting the null hypothesis and accepting the alternative hypothesis, As for the unemployment rate data series U, it was stable at the first difference with a fixed limit at all levels of significance (10,5,1)%, meaning that the calculated t is greater than the critical t, and thus it is stable and integrated of degree ~(1)1. This means rejecting the null hypothesis. Accept the alternative hypothesis, While the inflation data series also stabilized at the first difference with a fixed limit, where the calculated t is greater than the critical t at all levels of significance (10,5,1%), and thus it is stable and integrated of degree ~(1)1. This means rejecting the null hypothesis and accepting The alternative hypothesis, and since all data are stable at the first difference, the VECM model was adopted.

Table 4. Results of the stationary test for the variables (T, U, X) according to the expanded Dickey-Fuller test

Significance levels of variables T, U, and X		level			first difference		
		Fixed limit	fixed limit and general trend	Without a fixed limit and general trend	Fixed limit	fixed limit and general trend	Without a fixed limit and general trend
T-Statistic for T		-1.231291	-1.311974	-0.705445	-3.107301		
Moral level	%1	−3.857386	−4.571559	−2.699769	−3.886751		
	%5	−3.040391	−3.690814	−1.961409	−3.052169		
	%10	−2.660551	−3.286909	−1.606610	−2.666593		
T-Statistic for U		-1.510094	-2.615353	-0.414653	-4.499610		
Moral level	%1	−3.857386	−4.571559	−2.699769	−3.886751		
	%5	−3.040391	−3.690814	−1.961409	−3.052169		
	%10	−2.660551	−3.286909	−1.606610	−2.666593		
T-Statistic for X		-1.817786	-2.111492	-1.838242	-4.880221		
Moral level	%1	-3.857386	4.571559-	−2.699769	-3.886751		
	%5	-3.040391	3.690814-	−1.961409	-3.052169		
	%10	-2.660551	3.286909-	−1.906610	-2.666593		

Source: Worked by the researcher based on the Eviews10 statistical program.

Second: Correlation coefficient matrix for the impact of trade openness on unemployment and inflation rates in Iraq for the period (2004-2022)

The matrix of correlation coefficients aims to show the direction of regression of the relationship between the independent variable, trade openness, t, and the dependent variables, unemployment and inflation rates (u, for trade openness, There is also an inverse relationship between trade openness and the inflation rate With a degree of

correlation of (-0.115518) for trade openness, this means that an increase in the rate of trade openness is accompanied by a decrease in unemployment and inflation rates, and this is consistent with the logic of economic theory.

Table 5. Correlation coefficient matrix for variables (t, u, x)

	T	U	X
T	1.000000	-0.517246	-0.115518
U	-0.517246	1.000000	0.167463
X	-0.115518	0.167463	1.000000

Source: The work of the researcher based on the statistical program Eviews10.

Third: Applying the VECM co-integration model methodology

After conducting a stability test for the time series (trade openness, unemployment, inflation) in Iraq for the period (2004-2022), it was found that they are stable at the first difference, and therefore the VECM model was used. To apply this model, several steps must be followed, which we mention in detail as follows:

1. **Johansen Cointegration Test :** We note that Table (6) shows the existence of a long-term cointegration relationship between the variables (trade openness, unemployment, inflation) as a result of the presence of one significant parameter amounting to (0.01), which is less than (0.05). This indicates that the variables are common to each other. Here we will reject the null hypothesis. We accept the alternative hypothesis, which states that there is cointegration, and here the VECM model can be applied.

Table 6. Johansen's cointegration (X-U-T)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.691365	33.53705	29.79707	0.0177
At most 1	0.548379	13.55192	15.49471	0.0961
At most 2	0.002258	0.038423	3.841466	0.8446

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05

Source: Worked by the researcher based on the Eviews10 statistical program.

2. **Slowdown periods:** To determine the length of the slowdown periods for the model, several tests were followed, as shown in Table (7), where the optimal slowdown periods for the lowest value are chosen. The results show that the optimal slowdown periods for the first difference are the second slowdown period according to the five criteria because it gives the lowest values for most of the criteria used.

Table 7. Lag period test results

VAR Lag Order Selection Criteria
Endogenous variables: T U X
Exogenous variables: C
Date: 10/05/24 Time: 20:49
Sample: 2004 2022
Included observations: 16

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-185.8943	NA	3607951.	23.61179	23.75665	23.61921
1	-161.2393	36.98254*	526369.8*	21.65491	22.23436*	21.68459
2	-155.4771	6.482466	923399.7	22.05964	23.07366	22.11157
3	-140.1160	11.52083	659925.3	21.26450*	22.71311	21.33868*

Source: Worked by the researcher based on the Eviews10 statistical program.

3. **Vecm long-term co-integration model:** Table (9) shows the error correction model, where the error correction factor for trade openness (T) in the long run reached (0.132) with a probability level greater than (0.05)%. This indicates the existence of a long-term equilibrium causal relationship directed from the independent variables (U) to trade openness (T), but it is not significant , As for the long-term unemployment and inflation rate coefficients, they reached respectively (-0.184, -0.036) with a negative sign and a significance level of (0.05, 0.01)%. This indicates that these parameters are statistically significant and thus the existence of a long-term relationship between (U,) and trade openness (T).

Table 9. Co-integration test model between variables (X-U-T)

Error Correction:	D(T)	D(U)	D(X)
CointEq1	0.132067	-0.036091	-0.184909
	(0.13448)	(0.01260)	(0.05058)
	[0.98202]	[-2.86437]	[-3.65551]
D(T(-1))	-0.175651	0.028986	0.279842
	(0.39056)	(0.03659)	(0.14690)
	[-0.44975]	[0.79214]	[1.90499]
D(U(-1))	2.505865	-0.156849	-1.946959
	(2.26484)	(0.21220)	(0.85187)
	[1.10642]	[-0.73917]	[-2.28551]
D(X(-1))	-0.618189	-0.046138	0.189108
	(0.61504)	(0.05762)	(0.23133)
	[-1.00512]	[-0.80068]	[0.81747]
C	-3.602305	0.432890	-2.024667
	(6.88656)	(0.64521)	(2.59023)
	[-0.52309]	[0.67093]	[-0.78166]
R-squared	0.116312	0.548323	0.551289
Adj. R-squared	-0.178250	0.397764	0.401718
Sum sq. resids	9500.768	83.39840	1344.096
S.E. equation	28.13771	2.636260	10.58338
F-statistic	0.394865	3.641911	3.685813
Log likelihood	-77.89223	-37.64049	-61.26920
Akaike AIC	9.752027	5.016528	7.796376
Schwarz SC	9.997090	5.261591	8.041439
Mean dependent	-3.070588	0.531176	-1.864706
S.D. dependent	25.92209	3.397072	13.68270

Source: Worked by the researcher based on the Eviews10 statistical program.

4. Diagnostic tests:

Autocorrelation test for residuals LM Test: Table (10) shows the results of the LM test, as we note that all probability values are greater than (0.05). This means that we accept the null hypothesis, which states that there is no autocorrelation problem, and we reject the alternative hypothesis.

Table 11. Results of the autocorrelation test LM test for variables (X-U-T)

VEC Residual Serial Correlation LM Tests
Date: 10/05/24 Time: 21:06
Sample: 2004 2022
Included observations: 17

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	10.66599	9	0.2993	1.288310	(9, 17.2)	0.3109
2	9.886242	9	0.3598	1.170012	(9, 17.2)	0.3715
3	11.79469	9	0.2251	1.467641	(9, 17.2)	0.2361
4	5.951533	9	0.7448	0.636586	(9, 17.2)	0.7516
5	6.457290	9	0.6934	0.699605	(9, 17.2)	0.7014
6	8.459084	9	0.4886	0.964713	(9, 17.2)	0.4996
7	7.531065	9	0.5820	0.838618	(9, 17.2)	0.5919
8	15.93200	9	0.0683	2.215374	(9, 17.2)	0.0748
9	8.348196	9	0.4995	0.949347	(9, 17.2)	0.5104
10	12.48808	9	0.1872	1.582762	(9, 17.2)	0.1976
11	11.96432	9	0.2153	1.495448	(9, 17.2)	0.2262
12	5.526557	9	0.7862	0.584812	(9, 17.2)	0.7921

Null hypothesis: No serial correlation at lags 1 to h

Source: Worked by the researcher based on the Eviews10 statistical program.

a. **White test**: Table (12) shows the test of heterogeneity of variance for the variables trade openness and inflation and unemployment rates in Iraq. It was found that the model is free of the problem of heterogeneity of variance because the probability value of the chi-sq reached (0.4811), which is greater than (0.05), and on this basis we accept the null hypothesis. We reject the alternative hypothesis.

Table 12. Results of heterogeneity of variance test

Joint test:

Chi-sq	df	Prob.
47.79693	48	0.4811

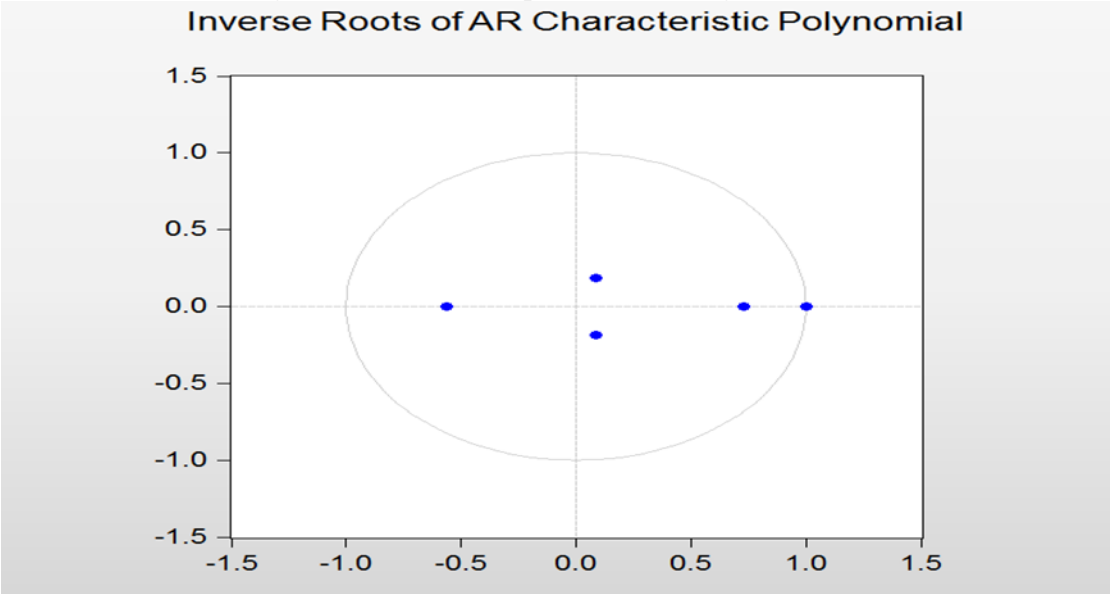
Individual components:

Dependent	R-squared	F(8,8)	Prob.	Chi-sq(8)	Prob.
res1*res1	0.310998	0.451375	0.8593	5.286973	0.7265
res2*res2	0.528633	1.121488	0.4376	8.986758	0.3434
res3*res3	0.531253	1.133348	0.4319	9.031306	0.3397
res2*res1	0.286362	0.401271	0.8910	4.868160	0.7716
res3*res1	0.542539	1.185979	0.4076	9.223165	0.3238
res3*res2	0.726324	2.653957	0.0945	12.34751	0.1364

Source: Worked by the researcher based on the Eviews10 statistical program.

5. **Testing the reciprocal of the single roots of the AR model:** The drawing below shows that the model's sentiment is stable because the movement of the variables (points in the drawing) is within the boundaries of the graphic circle. We also note that the model is structurally stable.

Figure 4. Draw the reciprocal of the single roots of the model



Source: Worked by the researcher based on the Eviews10 statistical program.

6. **Extracting variance analysis:** Table (13) shows the analysis of variance for the study variables (T, U, Unemployment and inflation rates (U, X) will increase over the next ten years.

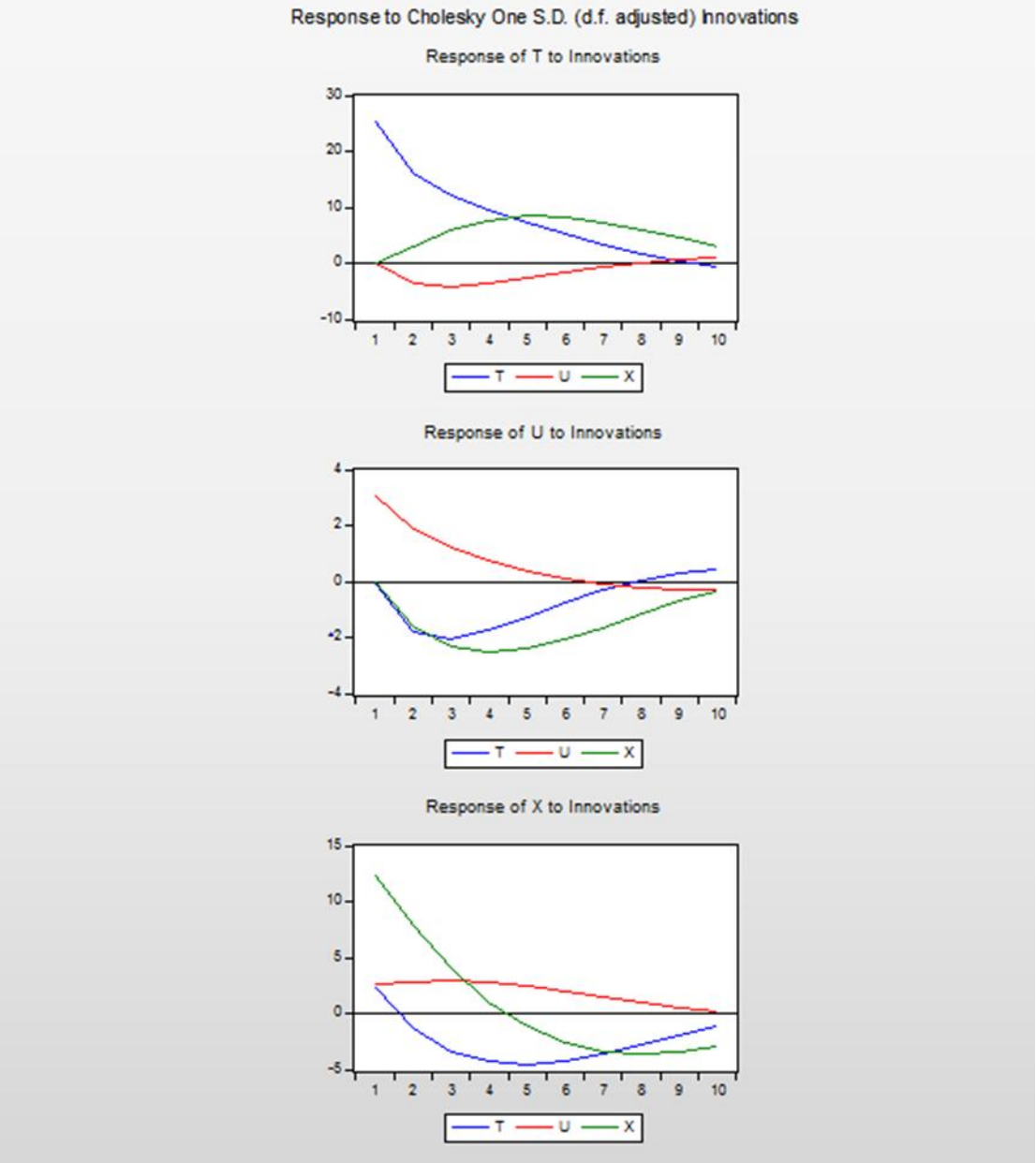
Table 13. Results of analysis of variance for variables (X-U-T)

Period	S.E.	T	U	X
1	28.13771	100.0000	0.000000	0.000000
2	40.26689	97.99976	1.925009	0.075226
3	51.41463	97.82954	2.121600	0.048857
4	62.24829	97.66247	2.157938	0.179594
5	72.80257	97.61195	2.006617	0.381435
6	82.86640	97.49733	1.888589	0.614076
7	92.44769	97.39909	1.771516	0.829394
8	101.5322	97.29542	1.679248	1.025337
9	110.1575	97.20497	1.600050	1.194982
10	118.3508	97.12233	1.535651	1.342019

Source: Worked by the researcher based on the Eviews10 statistical program.

7. **The effect of shocks and response functions:** Figure (5) shows the effect of shocks and response functions for trade openness, unemployment rates, and inflation. It turns out that when rates of trade openness increase, unemployment and inflation rates decrease, and the opposite happens when trade openness decreases. This shows the opposite relationship between them.

Figure 5. Shocks and response to (T,U,X)



Source: Worked by the researcher based on the Eviews10 statistical program.

4. Conclusion

1. We conclude that the Iraqi economy during the research period 2004-2022 is economically open.
2. It was found that there was an increase and decrease in unemployment and inflation rates in Iraq during the period 2004-2022.
3. The results of the static test showed that the variables used were stable at the first difference with a fixed limit.
4. The existence of a long-term and inverse relationship between trade openness, unemployment rates, and inflation during the research period.
5. Increasing rates of trade openness decreases unemployment and inflation rates, and the opposite occurs in the case of decreased trade openness, and this shows the opposite relationship between them.
6. The model is free of the problem of heterogeneity of variance, because the probability value of chi-sq reached (0.4811), which is greater than (0.05). On this basis, we accept the null hypothesis and reject the alternative hypothesis.

Recommendations:

1. The necessity of developing the economic infrastructure, meaning Iraq's tendency to invest in improving the infrastructure necessary for trade, such as ports, roads, and transportation and communications networks, which develops its ability to absorb growth in trade exchange and increases the attractiveness of the Iraqi market for foreign investments.
2. Directing inflation and unemployment. This means that economic policies must monitor the impact of trade openness on unemployment and inflation rates, and develop strategies that support economic stability. This could include flexible monetary policies and employment programs targeting the groups most affected by openness.
3. Diversifying the sources of the economy, as trade openness must coincide with efforts to reduce dependence on the oil sector as a main source of national income. Diversifying revenue sources by supporting manufacturing industries, tourism, and agriculture will make the Iraqi economy less vulnerable to external shocks.
4. The necessity of negotiating trade agreements, as Iraq must contribute effectively to international trade negotiations to ensure that trade agreements achieve its national interests, especially by protecting emerging industries and ensuring Iraqi products reach global markets on fair terms.

REFERENCES

[1] A. Y. Al-Seriti and A. M. A. Al-Sayyid, Contemporary Economic Issues, Alexandria: University House, 2007.
[2] A. A. Saadoun and S. Fakhri, "The impact of fiscal and monetary policy on inflation in the Iraqi economy for the period 2003-mid-2010," Tikrit J. Admin. Econ. Sci., vol. 7, no. 23, 2011.
[3] O. A. Abdel Samie, The Problem of Unemployment in Arab and Islamic Societies: Causes, Effects and Solutions, 1st ed., Alexandria: Dar Al-Fikr Al-Jami'i, 2008.
[4] A. A. Dagher, "The impact of economic growth on unemployment rates in a selected sample of countries for the period (2014-2016)," Kirkuk Univ. J. Admin. Econ. Sci., vol. 10, no. 2, 2020.
[5] A. Haddad and M. Hathloul, Money and Banking: A Theoretical and Analytical Introduction, 1st ed., Amman: Dar Al-Wael, 2005.
[6] Eviews10 Statistical Program.
[7] B. Al-Dabbagh and A. Al-Jarmoud, Introduction to Macroeconomics, 1st ed., Amman: Dar Al-Manhaj, 2003.
[8] M. Bin Al-Bar and A. Bin Al-Sailt, "The Impact of Monetary Policy on Growth Rates in Galaira during the Period (1990-2014)," J. Econ. Finance, Univ. of M'sila.
[9] Central Bank of Iraq, General Directorate of Statistics and Research, Annual Bulletins (2004–2022).
[10] H. D. Al-Saidi, Macroeconomics, 3rd ed., Amman: Dar Al-Masirah, 2005.
[11] R. J. Al-Khatib, "Measuring and Analyzing the Impact of Trade Openness on Economic Growth in Algeria (1990–2022)," J. Bus. Econ. Appl. Res., vol. 6, no. 1, pt. 2, 2024.
[12] R. K. H. Al-Sharaa, The Iraqi Economy Between Inflationary Pressures and the Problem of Unemployment, 1st ed., Baghdad: Dar Al-Doctor, 2017.
[13] S. S. Al-Hallaq and M. M. Al-Ajlouni, Money, Banks, and Central Banks, 1st ed., Amman: Dar Al-Yazouri, 2010.
[14] S. M. Allawi, "The Role of Fiscal Policy in Addressing the Phenomenon of Development in the Iraqi Economy (1996–2011)," J. Baghdad Coll. Econ. Sci., no. 48, 2016.
[15] S. A. G. Al-Mawla et al., "The impact of trade openness on the balance of payments in Iraq: ARDL model," J. Bus. Econ., no. 2, pt. 1, 2021.
[16] A. A. Abdos, The Policy of Trade Openness in Raising the Competitiveness of Arab Countries, Ph.D. thesis, Univ. of Abu Bakr, 2011.
[17] A. M. A. Al-Taie, "Measuring and analyzing the impact of trade openness on some economic variables in Iraq (2003–2017)," Karbala Univ. Sci. J., vol. 16, no. 4, 2018.
[18] A. M. S. Ali, The Economies of Money and Banking, 1st ed., Baghdad: Al-Ani Publishing, 1970.
[19] A. Al-Jilani, The Algerian Experience in Regulating Foreign Trade, Algeria: Dar Al-Khaldounia, 2007.
[20] G. A. R. Al-Naqqash, International Finance and Banking Operations, 3rd ed., Amman: Wael Publishing, 2006.

[21] K. Shamkhi, "Challenges of Unemployment and Underemployment in Iraq," presented at Dar Al-Hekma Symposium, Baghdad, 2018.
[22] M. A. Hussein and A. A. J. Saeed, Introduction to Macroeconomic Analysis, 1st ed., 2004.
[23] M. Al-Wadi, The Foundation of Economics, Jordan: Dar Al-Bazouri, 2006.
[24] M. Y. Hussein, Macroeconomics, 1st ed., Amman: Amjad Publishing, 2015.
[25] N. Al-Roubi, Inflation in Different Economies, 1st ed., Alexandria: Univ. Culture Foundation, 1979.
[26] H. A. J. Al-Janabi, Money, Equities, and Monetary Theory, 2nd ed., Amman: Dar Al-Wael, 2014.
[27] Ministry of Planning and Development Cooperation, Central Agency and Information Technology, Directorate of Population and Manpower Statistics, Various Years.
[28] Y. O. Idris, "Editing Capital, Advantages and Risks," Al-Sarfi Mag., no. 35, 2005.
[29] M. Artis, Inflation, Depression and Economic Policy in the West – Is There a Wage Equation?, Oxford: Mansell, Alexandrine Press, 1981, pp. 70–71..